Appetite for Change

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Foreword

We conceived *Appetite for Change* for a food sector at a crossroads. We wanted to help advance and accelerate debate on the scope and scale of change needed to produce enough food, both safely and sustainably. The food system is under scrutiny for environmental impacts including habitat degradation, greenhouse gas emissions and freshwater use. From a social impact perspective, it dismays that half the world's farmers go hungry, and there are concerns about how equitably local and global food security issues are managed. Demographic curves predict huge growth in demand and shifts in its location. There is mounting evidence that crop yields are dropping. Change is required.

The operational, reputational and political challenges facing businesses in the sector are huge. Some food companies recognize and accept this and have begun to shift thinking and practice. Yet even leaders acknowledge an uncertain path forward, and the experts interviewed during *Appetite for Change* stated that no platform exists today capable of supporting the transition needed. There are tremendous opportunities too. There is clear potential to make unconventional approaches — like inclusive agriculture — more commercially viable. Companies stand to find new customers by imagining and implementing ways to deliver better, more affordable and more widespread nutrition. And less resource-intensive production methods will bring value to the innovators who create them.

Appetite for Change lays out an agenda that we believe capable of positioning the food sector and its partners to build a sustainable food system. Delivery will require new techniques, unprecedented collaboration among farmers, businesses and government, plus imagination, but change is necessary and possible. We invite debate on our findings and recommendations, and we hope many will join us on the journey.

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Key Findings

Appetite for Change asks: Is the private sector ready to embrace a new vision and play a central role in transforming the global food system so that it adequately addresses the increasingly critical issues of food security and sustainability? What role can and should companies play in this transformation — for the good of consumers, producers and their own bottom lines?

SustainAbility defines a sustainable food system as one that is reliable, resilient and transparent, which produces food within ecological limits, empowers food producers, and ensures accessible, nutritious food for all.

Key findings include:

1 The food sector is at an inflection point, with the macro forces already exerting tremendous pressure on the food system set to increase or accelerate. Shifting demographics, new patterns of supply and demand, over- and under-nutrition, escalating incidence of food-related illnesses, and resource constraints are fundamentally altering industry dynamics and value drivers.

2 There is growing recognition that failure to operate within ecological limits and equitably meet a wider range of societal needs will be unacceptable to a variety of stakeholders including consumers and governments. Needs include more widespread availability of adequately nutritious food, producer empowerment and more resilient supply chains.

3 A view is emerging, in and outside the industry, that the food system needs to be dramatically transformed. Some more systemic approaches are emerging and being tested by leaders in the food industry, but energy and innovation equal to the scale of the challenges are not yet in evidence. While food companies are at times at the forefront of new transition methods, they rely heavily on practices like acquisition that have resulted historically in incremental change rather than embedding sustainability in mainstream practices. Some of the most creative approaches to making the food system more sustainable are appearing outside the private sector, in multilateral organizations, governments, NGOs and coalitions.

4 A key question is whether and how companies can make it profitable to address societal food and nutrition needs fully. How should food sector companies, investors and entrepreneurs approach investment in value chain resilience and sustainability, food safety and traceability, and the universal provision of better and more affordable nutrition for all? What returns should they expect? While this will not be simple, significant parts of the answer lie in how we value food — in terms of pricing aspects of its production, manufacture and distribution.

"The food and agriculture industry is responsible for the food we eat and for satisfying consumers. However, as society changes, so do consumer needs and expectations for the industry."

Kavita Prakash-Mani
Head of Food Security, Syngenta

5 Special attention must be paid to how food-related policy needs to change to support a sustainable food future. The politics surrounding the food system are volatile. Food policy and regulation are driven by who is in power and where, by the moods of citizenry, and through conflict or compromise with other government objectives. Government sets the absolute boundaries on food security, determining which commodities and products cross borders. Companies must contribute to the policy debate more proactively, transparently and cooperatively so as to balance efforts to reduce business risk and maintain a predictable operating environment with the necessary steps to make the food system as a whole sustainable.

6 Imagining and creating a sustainable food system will require new kinds of leadership from those with appetite for change. Key attributes of the type of leadership necessary include:
- Redefined *Vision*, encompassing sometimes unfamiliar or unconventional concepts like fair shares, closed loops, 'un-innovating' or simplification, and new notions of productivity.
- Application of *Systemic Approaches*, capable of building networks and fostering mosaics as well as developing more inclusive approaches to agriculture.
- Use of *Information Technology*, which will make more robust the web of interactions and knowledge sharing mechanisms necessary to support a sustainable food system.
- Better understanding of *Societal Needs*, in order to re-value food, and to understand and then transform food-related policy and politics.

7 Food sector leaders are testing readiness to embrace these attributes e.g. imagining how today's institutions might morph from food producers and providers to health and wellness companies in order to differently meet demand, experimenting with new partnerships among market participants traditionally segregated by size or other attributes, testing the potential of information technology to inform and empower producers, and exploring ways to meet a range of societal needs ranging from accessibility to food security. While such efforts are welcome, on the whole the industry has a long way to go. There is an urgent need to accelerate the food industry's transition to sustainability, and it is how this acceleration might take place that *Appetite for Change* explores.

"All the market dynamism in food is in Asia; further down the road it will appear in Africa. In the US and Europe companies are fighting over the same pie. Businesses that stay in Europe are going to be very constrained in their growth opportunities, because markets are really expanding in other parts of the world."

Jason Clay
Senior Vice President,
Market Transformation,
WWF

Introduction

There is growing debate about the future of the global food system as questions about its capacity and limitations become increasingly evident and pressing. The current industrialized model has been highly successful in delivering vast quantities of affordable, reliable, safe and varied food to many. However, the system comes with significant social, economic and environmental trade-offs. Further, despite its success in food delivery, it leaves too many people without access to the quantity or quality of food they need to lead healthy, productive lives. Consider: 44 million people have been pushed into poverty due to rising food prices since mid-2010,[1] and 925 million people are presently undernourished.[2] Paradoxically, around another billion consume too much (the US alone spends $147 billion each year on medical costs related to obesity[3]).

Even as the global food system struggles to meet present needs adequately, it is set to come under still greater strain as shifting demographics mean it will need to be able to meet the nutrition needs of two to three billion more people by mid-century. Additionally, it will need to cope with a growing geographic mismatch between food supply and demand, the consequences of increased natural resource depletion, the anticipated impacts of climatic shifts on food production systems, and often unpredictable policy interventions.

While a broad range of stakeholders must come together to bring about this transformation, companies in the food sector will be especially critical. Indeed, one of the key ways to drive change will be to answer the question of how to make it profitable to address societal food and nutrition needs fully — from value chain resilience, to sustainable production processes, to food safety and traceability, to universal provision of better and more affordable nutrition.

A Sustainable Food System

If it is to adequately rise to the challenge, the global food system must be transformed from its present incarnation into a sustainable system. SustainAbility defines a sustainable food system as one that is reliable, resilient and transparent, which produces food within ecological limits, empowers food producers, and ensures accessible, nutritious food for all.

There are examples of individual companies, as well as collaborative efforts such as the World Economic Forum's *New Vision for Agriculture*, working to find new and innovative ways to realize the profit potential of better meeting societal needs. Taken as a whole, however, the food industry maintains the course that has made it successful since the Green Revolution and has taken only incremental steps to address the food system sustainability challenge. Perhaps the most visible transition strategy to date has been acquisition of smaller, sustainability-oriented brands whose offerings help target niche market segments within developed countries, rather than integration of sustainability principles within mainstream production. Food industry portfolios and operations have not changed significantly — the focus remains on the cost of inputs, supply security, and consumer and shareholder loyalty. And even the most forward-thinking companies admit that they have yet to discover how to meet their sizable and challenging sustainability goals profitably.

Today, increased awareness of the looming challenges facing the global food system is building some momentum for exploring alternatives. To cite just one example, the UN Special Rapporteur for the *Right to Food* recently issued a report calling on nations to invest in eco-agriculture — the application of ecological principles to agriculture[4] — as the most effective way of meeting food security needs. This would represent a seismic shift away from the status quo of industrialized agriculture.

While the private sector is most certainly involved, much present energy and innovation in addressing systemic food sustainability challenges stems from multilateral organizations, governments, NGOs and other non-corporate bodies. Business' proven ability to adapt to new circumstances and opportunity means it is unlikely to be left behind when change occurs. However, the private sector is not adequately engaged in the debate, either to position itself for market advantage or to make the full contribution it is capable of and which is so desperately needed.

In exploring these questions to create *Appetite for Change*, SustainAbility interviewed experts from the private, public and non-profit sectors to gather perspectives on the current role of the food industry, and which changes it must embrace. Interviews were bolstered with research on innovation within the food sector and the state of existing leadership among food companies and their affiliates in the finance and technology industries. Finally, SustainAbility assessed current industry performance against the attributes we believe will be instrumental in driving food system transformation: re-defining vision, applying systemic approaches, using information technology and meeting societal needs. This report presents our findings and outlines key elements of the change agenda the food sector is most likely to need to adopt in order to meet escalating societal needs and demands around accessible, nutritious and sustainably produced food for all.

Why *Appetite for Change*?

Appetite for Change asks: Is the private sector ready to embrace a new vision and play a central role in transforming the global food system so that it adequately addresses the increasingly critical issues of food security and sustainability? What role can and should companies play in this transformation — for the good of consumers, producers and their own bottom lines?

Pressure for Change

The challenges facing the global food system are myriad and profound, but — thanks to the wealth of recent research that has emerged — they are relatively well profiled. Unfortunately, visibility of issues has not yet produced adequate action in the form of innovative solutions. Section three of this report, *Pressure for Change*, will look at which issues have become most prominent and the early responses emerging. The section looks at the global food system from the perspective of a business leader empathetic to the need for change and wanting both to better understand the landscape and make good choices about which investments might help future-proof his or her organization. When the agenda is seen through this lens, three issues eclipse all others: consumer demand, supply security and political risk.

"Today it's about getting food produced according to local preferences. What can be global is knowledge and alignment around key goals."

José Lopez
Executive Vice President, Operations, Nestlé

Consumer Demand

Consumer trust in corporations in developed markets rests increasingly upon companies' ability to satisfy not only individual consumer demands but also broader societal expectations simultaneously. After the quality of products and services, transparent and honest business practices are now the main determinants of a company's reputation — more important than price or financial returns in some studies.[5] SustainAbility believes an extension of this focus on transparency and honesty will be a greater portion of consumer trust and demand built on the specific ways companies are involved in mitigating food-related sustainability challenges such as supply chain sustainability, traceability, and over- and under-nutrition.

While basic needs dominate in emerging economies (where hunger in its most visceral forms and the fight to eliminate it tops the agenda), it is anticipated that consumer expectations in developing nations will follow a similar path as (and more quickly than) in developed markets. Namely, once basic nutrition needs in these dynamic and rapidly expanding markets are met, the focus there also will turn increasingly to quality and business practices (as it is doing already among emerging economy consumers in the upper and the rapidly-expanding middle classes).

Recognizing the tremendous existing (mostly underserved or wholly untapped) consumer base and proportion of demographic growth set to occur over the next few decades in the developing world, food multinationals are rapidly expanding operations in these regions. But noting where 82% of current global population lives and where 95% of demographic growth through mid-century will occur[9] is not the same as shifting the operational strategies so successful in the developed world into approaches suited to emerging economies; importing (or even locally manufacturing) the same food portfolios into regions where hunger and malnutrition are widespread will rarely if ever be the complete answer. While companies rush into these markets based on the tremendous opportunity they present, more must be done to tailor strategies to local needs and to address challenges.

Market Evolution

Health conditions related to obesity, such as heart disease and stroke, are now the leading causes of death globally, with the incidence of childhood obesity becoming more marked. This trend is set to spread further as a growing number of people are shifting towards Western-style diets. At the other end of the spectrum over 925 million people are undernourished,[6] and then there are a range of issues arising from malnutrition, notably micronutrient deficiencies which affect vital functions of millions of people worldwide and cripple the development of entire societies. High and unpredictable food prices (reacting to the combination of increasing demand and commodity price increases as well as volatility) have contributed to inflation in recent years and grown by over 144 million the number of undernourished worldwide since 2008, adding to the already existing burden of hunger and other forms of malnutrition.[7] [8]

Supply Security

Success in the modern food industry is premised on continuous access to smoothly operating markets. Though the food supply chain is certainly complex, until now international markets have created a sufficiently predictable business environment for major food MNCs to thrive.

The future is far less certain. An array of sustainability challenges threatens the operating context of the food system, not least of which is the sudden rush by investors and governments to acquire farmland in developing countries to secure food supply in the face of expected increased demand. These changes are having a profound effect on both multinational corporations and domestic food producers. As competition for resources becomes more fierce, what can be done to build that predictability on which smooth operations depend and that investors prefer?

Future markets will be more complex and volatile; the question is how to build adequate stability in spite of this. As now, companies will have to manage impacts to operations of various individual resource constraints — e.g. water prices, water access rights and disputes with other users relating to water use, both legal and desired — though at a heightened level. Additionally, they will need to become far more able to tackle multiple complex challenges affecting supply security simultaneously as surging populations compete more vigorously for dwindling basic resources.

As private sector food companies follow population growth trends into emerging markets, supply security will be determined also by the ability to align with tightening and increasingly intense regulatory environments and expectations of governments, who will become more ardent advocates of their resources and citizenry.

"There is a growing geographical mismatch in supply and demand. Demand growth is occurring predominantly in Asia, whereas supply growth will be in South America and possibly Central and Eastern Europe. More global trade will be the result."
Carel van der Hamsvoort
Global Head, Food & Agribusiness Research and Advisory, Rabobank

Political Risk

Declining trust in business generally and recent, high-profile food crises have drawn greater public attention and concern to the fragility of the global food system. As *Appetite for Change* goes to print, the European Union is fighting (and EU members are fighting about) an E. coli outbreak centered on Hamburg, Germany. About two dozen people have died to date, and more than 2000 are ill. Initially blamed on cucumbers from Spain, farmers there were forced to destroy millions of dollars' worth of crops even though it was not certain they were responsible. As the crisis continues to unfold it appears the outbreak may derive from a completely different source. Whatever the final outcome, incidents like this generate public and consumer anxiety, infighting among political bodies, and trigger increased public sector scrutiny of the food industry.

Present and future government responses and attempts to direct or control the market — sometimes through outright intervention as with banning trans-fats in some regions, and sometimes indirectly as when regulation is threatened if behaviors do not change — will have a massive impact on food companies and their investment decisions. As with supply security, policy interventions can undermine predictability of operations. What is the most appropriate way for such political risk to be minimized?

While the food industry is frequently intensely regulated, the private and public sectors too often seem to operate in isolation from one another as relates to food system sustainability. SustainAbility believes the private sector fails to take political risk into account in an adequately structured or consistent way.

Global organizations such as the United Nations Food & Agriculture Organization, United Nations World Health Organization, United Nations Environment Program, the International Assessment of Agricultural Science & Technology for Development and some national governments have recently articulated alternative views of the food security challenge and the actions required to address it. For example, a recent report from the UN special rapporteur on the *Right to Food*[10] lays out the rationale for widespread adoption of eco-agricultural methods in both industrial and developing societies in order to facilitate better outcomes in terms of food security, nutrition and sustainable production. This represents a different and more nuanced potential view of the future of food than the straightforward determination of most government and industry to increase agricultural production (with existing methods) by 70% by 2050. How do we make room for debate about the best way forward?

The UN *Right to Food* approach can go the eco-agriculture route without massive increases in production because it recommends reallocating for human consumption cereals currently used for animal feed. Controversial? Radical, even? Certainly, but just expressing and exploring the strengths, weaknesses and potential of ideas like this helps to foster creative thinking.

In this case, while wholesale adoption is unlikely, the *Right to Food* agenda illustrates the tremendous impact alternate approaches to food production and consumption patterns might have, especially in developing countries (which would stand to benefit most from improved public health and environmental performance), but also globally (due to factors such as decreased food waste and accelerated development of alternative animal feeds). UNEP estimates that 3.5 billion people could be fed with the amount of calories today in cereals that go to feeding animals, even after the energy value of the meat produced is taken into account. People will continue to eat meat — obviously, consumption of animal protein is spiking now, not decreasing — but whether visions like *Right to Food*'s even partially shape the future of the food system challenges us to consider whether the calories available are put to best use, and illustrates the enormous impacts, from corporate profits to consumer choice, various shifts to the system might produce. How does industry adequately plan for all the potential scenarios — and which should it endeavour to have come about?

"There are two discussions going on with hardly any overlap. In policy, people talk about how we are going to provide food to so many billions of people, while industry is much more concerned with environmental sustainability, but there is little or no cross-fertilization between the two."

Alex Evans
Non-Resident Fellow,
NYU Center on International Cooperation

Appetite for Change

The expert interviews conducted during *Appetite for Change*, and SustainAbility's own research, confirm what is known to industry players and inadequately served food system stakeholders alike: the food sector, in advance of the demographic wave expected over the next few decades, is struggling to make sufficient, safe, nutritious food widely enough available, even in developed markets. In emerging economies, price is a huge barrier to many even when food is available. Waste in the food system is enormous. And the security and diversity of food industry supply chains are under mounting pressure for reasons ranging from shifting weather patterns, to land purchases by sovereign wealth funds, to volatile policy intervention in response to protests over escalating food prices and concerns about the environment.

Appetite for Change suggests in Section 3 above that the most immediate pressures on the food system as viewed from the perspective of business relate to consumer demand, supply security, and political risk. Here in Section 4, we will explore early industry responses to these present and potential disruptions and outline the manner in which vision, systemic approaches, information technology and meeting societal needs will be critical to delivering the sustainable food system which policymakers, consumers and citizens increasingly demand, and which is required if scarce resources are to be better preserved for future generations.

Where do we begin the quest for change? The experts surveyed by SustainAbility during *Appetite for Change* were widely diverse, with backgrounds in crop science, trading, food processing, manufacturing, retailing, food service, technology, finance (including venture capital), government and policy, and new enterprise development. In terms of preparedness to meet the challenges articulated above, the group generally views the industry as operating at a below-passing grade (most commonly expressed as 'about a four out of ten'). No one gave even those incumbent companies identified as leaders a score higher than a six; rare higher marks went to newer, generally smaller, entrepreneurial enterprises only. Marks & Spencer, widely praised for its leadership, said of itself that it 'has only done 10% of what it needs to become sustainable'.

"Improving plant varieties is the ultimate form of sustainability, especially when it improves yields for farmers and delivers better nutrition."
Howard Shapiro
Global Staff Officer Plant Science and External Research, Mars

But such rough scores mask what these experts think the industry does well and their universal belief that the industry has the skills and potential to deliver the more sustainable food system needed. In terms of present practice, interviewees offered praise regarding the remarkable degree to which food is available and safe, for recent improvements in performance in meeting basic nutritional needs, and for sensitivity to public concern. This does not eliminate the challenges — e.g. all interviewees pointed at the persistence of unsustainable environmental and societal externalities, and suggested the best practice efforts extant are simply too few and moving too slowly — but the sum of *Appetite for Change* interviews and research points to large market opportunities with the potential to be good for business and food industry stakeholders alike.

Vision

Vision — a clearly articulated path and well-defined desired end state — will be a crucial element of the leadership required to develop a better, more sustainable food system. Again, SustainAbility defines a sustainable food system as one that is reliable, resilient and transparent, which produces food within ecological limits, empowers food producers, and ensures accessible, nutritious food for all. Given the challenges already facing today's food industry, reaching such an ambitious vision will be a significant task. Some corporate visions have been adjusted to reflect the ambition (and grasp of ambiguity) such a long-term outlook requires, but the industry as a whole has not articulated a clear vision for how it will address these macro, systemic challenges.

Take food security. For decades, food security has been interpreted first and foremost as a numbers game. When industry talks about its vision for the future, it tends to focus on the necessity of ramping up production and its own role in that. Appetite for Change interviewees indeed praised industry's ability to churn out massive quantities of food that many access with convenience and at relatively low price. While yield increases are important, 'more' alone will not produce the results required. We need a food system that produces enough, for everyone, within ecological limits, while treating all players fairly, not simply the same system producing more while becoming less and less sustainable itself.

In a few cases, particularly in food manufacturing and retailing, companies have started to define ambitious non-growth targets. Some leaders have gone so far as to declare their businesses will fundamentally transform into nutrition and wellness companies. Danone, Marks & Spencer, Nestlé, PepsiCo and Unilever are among the leaders expressing the potential (and need) for their businesses to evolve along these lines; they are making public developing roadmaps, that include commitments against which their progress can be measured.

"There is consensus in terms of the major challenges — how many people are hungry, where, why, the impact of agriculture on the environment, etc. But it is in the interpretation of the challenges and the development of the solutions that the difference of opinion arises."
Kavita Prakash-Mani
Head of Food Security, Syngenta

With at least some corporate leaders changing operational strategies and investing to respond to shifting value drivers and meet new market opportunities and challenges, the rest of the industry must seize the opportunity to learn and change similarly — or perhaps surrender influence and profit to others who are braver, more capable, or both. The most rapid evolution possible of the existing industry will be critical to the fastest development of a sustainable food future. Below we present the key aspects of vision emerging from Appetite for Change that future leaders will be required to balance: fair shares, closed loop processes, simplification and new definitions of or approaches to productivity.

Fair Shares

As population and consumption trends reverberate and reshape markets, a race to secure land and resources is forcing discussion of a new operating context for the food sector — that of 'fair shares'. Fuelled by cyber-connectivity and improved access to information, citizens and governments are becoming more aware of issues relating to food and resource access, price and control. This will lead to companies being expected to explain and to be judged according to whether they are taking more than their fair share from any part of the food value chain.

While fair shares thinking is nascent in the food sector, there are illustrations in other industries of how this might work. This is true especially in the climate change arena, where understanding of the atmospheric limits for GHG emissions and the implications of exceeding certain thresholds is sufficient to allow private sector organizations (as well as governments) to set emissions reductions targets for their own operations in the context of global (IPCC) goals. Software design companies like AutoDesk (which is working with the Carbon Disclosure Project and the Clinton Climate Initiative) are producing simulation software that enables customers to plan operations and growth footprints that 'fit' their climate fair share. Equivalent tools are being developed and tested to help assess and proportionally (re-) assign fresh water and other resources. As they mature, their application will present opportunity for food sector actors to get ahead of expectations and get their shares right (which will minimize inputs and boost reputation) as well as risk for those who trail expectations to assess and address sustainability challenges this way.

Fair shares will apply not only to resource use but to issues of food sourcing, production and distribution. For example, companies — particularly multinationals — will be required to more carefully consider and address local food security and livelihood needs in the regions where they source and produce. This will entail tough, complex decisions about levels of return to local communities from foreign trade, and careful consideration of what portion of food produced should be reserved for local consumers (who are so often also agricultural producers).

Closed Loop

In order to operate within a fair shares context, companies will need to align their operations with basic ecological principles. Once perceived as a separate realm belonging to the part of the environmental movement seeking to live off the grid, mainstream businesses are now setting and pursuing zero waste goals and doing everything to optimize resource use, trends which will only accelerate.

Zero Waste

According to the *Foresight Report on the Future of Food and Farming*, halving the current level of waste throughout the food value chain can do a tremendous amount to counter food security issues. Estimates are that at least 30% — and as much as 50% — of food produced globally goes to waste. Waste related to production and storage (largely in developing countries) and consumption (mostly in developed countries) is roughly equal. Halving the current level of waste by 2050 is considered a realistic target, and achieving it would decrease projections for 2050 calorie production requirements by 25%.[11]

Companies have leapt to the forefront of the zero waste movement. For example, one of Wal-Mart's three overarching sustainability goals is to produce zero waste, and it is working vigorously with suppliers and civil society partners such as the Environmental Defense Fund to achieve this. In the UK, Tesco is experimenting with ways to help reduce food waste in the home, such as through novel 'buy one, get one free later' offers. Finally, new businesses such as RecycleMatch exist to find alternate end uses for business' waste — alternatives that create value and keep materials out of landfills.

"It starts with emissions but it ends up with communities that can feed themselves in the long-term."
Susan Sweitzer
Program Officer,
Sustainable Food Lab

Stacking

As sustainability value drivers are more clearly understood and their effects made measurable, it becomes possible to optimize activities across multiple dimensions of benefit by 'stacking' (or 'stacking functions'). Agricultural sequestration efforts provide some excellent examples, like the way "no-till" practices simultaneously sequester carbon dioxide, improve soil fertility and reduce soil erosion — all of which deliver value, directly or indirectly, to the farmer, and which are indirectly enjoyed by society as a whole. For example, Unilever recently commissioned the University of Aberdeen to develop the key tool being applied in the Sustainable Food Lab's Cool Farming Initiative which is now being piloted with a host of other companies including PepsiCo, Marks & Spencer, Pulse Canada, Yara and Sysco. The tool promises to advance analysis of the costs and trade-offs associated with different greenhouse gas reduction strategies and help determine which to implement at field and farm level.

At a whole other point in the agriculture and food production spectrum, entrepreneur Cityscape Farms is building food systems on urban rooftops in an effort to minimize land use and provide ultra-local, climate-friendly food. Cityscape not only turns city rooftops into food production zones, it utilizes aquaponics, where fish fertilize the greens it sells and eat food scraps from production— a business model that reuses waste and literally stacks functions many times over.

Simplification

"Stop innovating, stop needing" was the suggestion made by one contributor to OpenIDEO's recent challenge on better connecting food production and consumption.[12] Unpacked for a food sector where innovation trends toward more highly processed, 'fun' and/or convenient foods, the challenge is to focus on simple ways to get food to people that has had less processing done to it (reducing energy inputs as well as avoiding additives). The rule applies to non-food experimentation in the sector too, as with currently popular packaging innovations like those made out of corn or sugar, which have mostly proved counterproductive so far from an eco-footprint point of view.

Some of the most beneficial transitions possible in the food sector beg a return to basics. Whole Foods made waves and sponsored imitators with its 'less is more' approach to its extensive bulk raw foods selection and more minimally-manipulated food product offerings overall. Organics also 'un-innovate', in part generating value where *less* is done to products. While packing, storage and waste challenges can be increased when less processing is done, the challenge for the food industry is to determine when and where a 'back to basics' approach might be successful.

"In a context of ecological, food and energy crises, the most pressing issue regarding reinvestment [in agriculture] is not how much, but how." [13]

Olivier De Schutter
Right to Food
Report by UN Special Rapporteur

Productivity

Since growth is what MNCs thrive upon, it is unsurprising that the food sector — like others — has had an almost wholly production-centric agenda.

Today's food production methods are vastly more efficient than previous ones. This is due in large part to the fact that environmental impacts and resource constraints have become better understood and easier to measure. As a result, industry has responded, especially by reducing water and fertilizer inputs, which produces environmental benefits, limits access conflicts and reduces costs. Indeed, most are managing water far more efficiently than even five years ago, and there is a positive competition underway to embed water best practices across the agricultural supply chain. While such progress is welcome, it has been made with a view to improving the efficiency of existing food production methods. What if making current production systems leaner is just half the story?

Green Revolution techniques have provided tremendous yield increases. Sometimes controversial — think about the debates past, present and future over the role of genetic modification — this is where the crop science industry focuses and has excelled. Today, the industry perceives enormous future market opportunity in emerging markets, especially in the provision of seeds, pesticides and fertilizer to previously underserved smallholder farmers, who represent significant new customer groups for existing product lines.

Crop science will continue to have significant influence and critical roles to play, but more diversity of approaches has the potential to benefit everyone. For example, purely input-based productivity approaches are starting to be supplemented by more holistic, ecological views.

"The world now demands that farmers go beyond increasing yield. It is no longer acceptable just to grow more food; it must now be done in a way that is intrinsically sustainable. Therefore, we must not only help farmers enhance the calories produced per acre but also enable them to protect natural resources and ensure that rural communities are both vibrant and economically viable."[14]

Martin Taylor
Chairman of the Board, Syngenta

An example of new productivity approaches is the orphan crop agenda, where genome research is allowing classical breeding techniques to improve productivity across a widening range of crops. Such is the case in Mars' cocoa genome sequencing work, which is expected to lead to vast improvements in the yields of smallholder cocoa farmers and improve the financial bottom line of both farmers and chocolate producers. A host of other orphan crops is now under study (e.g. broccoli, strawberries and various potato strains) and might lead to similar, non-input based productivity gains.

So a (re-)emerging focus on less intrusive or manipulative means to enhance overall system productivity seems to be gathering steam. Much of the present energy in this agenda is found in academic, non-profit and government circles, but, as the Mars example above illustrates, corporations are switching on to these approaches as well. The UN and WorldWatch both have placed bets on eco-agricultural methods, eschewing the prevailing model of production in favor of gaining greater longer-term productivity through the recycling of nutrients and energy on farms and "diversifying species and genetic resources."[15] The focus in such alternate approaches to productivity and resiliency is on enhancing the entire system — soil, plants, agro-biodiversity, etc. — instead of merely focusing on development of higher-yield or pest-resistant plants.

Systemic Approaches

Once visions — the clear pathways towards a well-defined end state for a sustainable food future — are articulated, the industry and individual organizations within it will need a full array of new tools and methods capable of supporting the massive transition entailed.

Appetite for Change interviewees described an industrial food system that is fractured and narrow in its thinking and practice, and they were strongly supportive of the need for more systemic approaches. While not labelled specifically as such, the discussion around the ways in which productivity is being re-thought in the previous section is an example of the kinds of more holistic practices and new partnerships that will be required. Similarly, systemic approaches will be necessary to tackle the complexity and interdependence of other challenges up and down food sector value chains.

While perhaps adequate previously, the sum of *Appetite for Change* research suggests that the interconnectedness and scale of the global food system now renders individual actors and piecemeal solutions less and less likely to have impact. Instead, the industry's future success will depend on its ability to address issues in a holistic manner. This section describes some of the networks, mosaics and inclusive agriculture practices to watch as indicators of the emergence of a better integrated, more resilient food system.

"For commodity companies to succeed we have to be global; we have to build a global asset network and be everywhere food is grown, traded and consumed in large quantities. For farmers to succeed they have to be connected to the market and receive economic incentives to expand production. Yet today a lot of farmers are not. When you think of the bottom billion, getting more small farmers connected to and participating in the market should be a goal of industry and others."

Stewart Lindsay
Director Global Corporate Affairs, Bunge

Networks and Mosaics

Intermixed patches of habitat — forests, meadows, shrub lands, farms, etc. — form mosaics critical to the diversity and resilience of their ecosystems. Embracing a greater mix of scale among participants than typical current models usually do can make food landscapes more resilient also. An inclination to fewer, larger partners has ruled the food industry in the past; complexity was perceived as likely to add risk and/or cost. Some today have a new point of view, realizing that more complex networks have greater heterogeneity that can enhance value chain stability and offer a greater array of products and ingredients, ultimately enhancing consumer choice. This new perspective has industry leaders experimenting with building supply bases that are less linear chains and more interwoven mosaics.

Work on supply base networks follows myriad avenues, but better cooperation and communication are essential throughout. One new area of collaboration sees manufacturers, as well as some food service and retail companies, working in partnership to rethink their supply base and transportation networks, including a broader range of farm sizes and reducing costs and carbon emissions at the same time. Another energized space sees major international players working directly with producers to improve management practices. Examples of such activity include Unilever's efforts to build more in-house agricultural capacity in order to better relate to and communicate with suppliers, and Costco's pilot work to source fresh produce from smallholder farmers (like green beans from Guatemala for its US stores). Nestlé, PepsiCo and other manufacturers are buying from more smallholder farmers also, while retailers including Carrefour, Costco, Shoprite and Wal-Mart are buying more local produce generally. This is good for local farmers, appeals to customers and brings business benefits like reduced food waste and lower transportation costs (which balance sometimes higher purchase price) due to reduced time and distance between field and plate.

"There are many barriers to address and so we need to think holistically. This requires partnerships — with of all sorts of stakeholders including other companies, governments, NGOs, etc. Everyone has a role to play."
Kavita Prakash-Mani
Head of Food Security, Syngenta

While such moves to work with different kinds and sizes of farmers and other partners are encouraging, it is proving challenging to scale such relationships; even successful pilots often have proven costly and/or difficult to replicate. Danone, Nestlé, Unilever and others all have had at least as many experiments with inclusive or sustainable sourcing models stumble over logistical or financial constraints as succeed. Further experimentation, plus still more collaboration among a broader array of actors (adding government in particular to the mix more often), will be required to determine which new networks and mosaics might play the biggest roles in the future food system.

Inclusive Agriculture

While new kinds of networks and mosaics represent one path towards a better integrated and more resilient food system, large scale, international networks also need to be improved, leveraged and made more inclusive of a greater variety of actors, right down to smallholders. Processors and traders are perhaps best positioned to meet food security and sustainability challenges in ways attuned to their business given their role connecting the food industry value chain upstream and downstream.

According to the WTO, only 25% of global farm output is traded internationally. While this means the vast majority of food is produced and consumed within national boundaries today, there is already a rapidly growing geographical discrepancy between supply and demand. As demographic and climatic changes alter global food system production and consumption patterns further and faster over the next few decades, global trade in food commodities and food products will increase, offering enormous business opportunities, particularly for companies like ADM and Cargill or Bunge. With that opportunity comes also the chance — and responsibility — to influence or actively help ensure development of a system that is more resilient and more able to provide adequate nutritional outcomes for all.

Success in processing and trading is presently defined primarily in logistical terms; reliably and affordably finding, securing and transferring food commodities (cereals, oilseeds, coffee, sugars and meats) among industry players is paramount. However, the shifting and new producer and consumer markets now emerging necessitate new notions of supply security at least in part based on an increase in more diverse and sustainable crops sourced from a broader range of farmers. Global traders and processors are uniquely positioned to actively shape the international networks the new global food context will demand. The challenge and complexity cannot be underestimated — this is inclusive agriculture at a scale hitherto largely unimagined — but the need and opportunity for this large scale, holistic approach is very real.

"The food industry in its broadest sense can have a very significant influence on agricultural sustainability, particularly if the consumer end of business can work together with agricultural raw material suppliers — the opportunity undoubtedly is there."

Karen Hamilton
Vice President Sustainability, Unilever

Drawing smallholder farmers into the supplier base and building the infrastructure necessary to support them has the potential to create business value through diversification of supply and reduced dependence on increasingly highly volatile bulk commodities. At the same time, it would help to lift farmers out of poverty and increase their ability to contribute to national and global food security. In addition, enhancements to the sector's macro-level intelligence on geographic and demographic patterns of nutritional supply and demand, plus insight on what commodities are best produced where in order to minimize resource liabilities (e.g. water and soil productivity), could prove invaluable — to business and policymakers — in narrowing the enormous data-gap that hinders smarter decision-making.

Examples of what this type of inclusive agriculture might look like are already emerging. Consider the Southern Agriculture Growth Corridor of Tanzania, where strong support of the government, NGOs and aid in combination with private partners Yara International, Unilever, Syngenta and SAB Miller are working together to link smallholder farmers into commercial supply chains, provide access to finance and modern inputs, and to build the necessary infrastructure to get the farmers' products to market. Currently operating in Tanzania, it aims to unleash these regions' potential to become agricultural productivity models capable of lifting farmers out of poverty and benefiting the region and the country.

While the expanding geographic mismatch of supply and demand is real and expanding, and programs like the Agricultural Growth Corridor project are promising, there is much to learn about what makes large scale, international inclusive agriculture successful anywhere, and more still to determine about the most effective means of replication. We do know inclusion — not just in terms of trade and extended economic opportunity, but also in terms of food security at the base of the pyramid where so many smallholder farmers toil — requires new production models oriented around *scaling out* (i.e. a greater number and diversity of partners) versus *scaling up* (i.e. continued growth of a limited number of centralized players), as the latter can fail to address regional needs. Global companies will need to leverage their assets alongside those of local manufacturers, entrepreneurs and producers as never before in order to adapt and replicate business models tailored to local conditions,[16] yet capable of participating in and improving the global food system as well.

"Our strategy is shifting from independent business lines to developing integrated offers that meet the various needs of the grower. This is a big shift for the company and industry. We recognize that more things have to come together — agronomy knowledge, crop protection, seeds, mechanization, water management, etc. — to meet many needs. We also have to look at the socio-economic and environmental impacts of our solutions. For example, do they put people out of work?"
Kavita Prakash-Mani
Head of Food Security, Syngenta

Information Technology

Modern farming has been committed to simplification — isolating relatively few variables and growing a homogenous system capable of extremely high yields. In contrast, the better integrated, more resilient and sustainable food system we need in the future requires recognizing, accepting and addressing many and subtle complexities. This in turn demands better and different knowledge, as well as new knowledge management methodologies and tools. Thankfully, the modern information technology (IT) industry is increasingly suited to and interested in delivering services and tools to meet these challenges and should be a catalyst in the food sector's transition from homogenous agribusiness, to a food system capable of embracing the complexity of scaling better and sustainable alternatives — literally building a new food knowledge economy. While serious IT involvement in the food industry is relatively nascent, examples are emerging demonstrating enormous potential for information technology and know-how to improve the food system.

"Proliferation of mobile technology in emerging markets is exerting a powerful influence on ways of working. It will continue to evolve, facilitating two-way communications that allow national and local governments to get a granular, real-time view of what is happening at the farm level and to make smarter macro-level decisions."

Guy Blissett
Wholesale Distribution Lead, IBM

Macro-level Management

IBM is one IT company becoming highly visible in the food arena. Its *Smarter Food* platform applies IBM's expertise to food safety, traceability and waste reduction, while applying its computational skills to genome mapping orphan crops like cocoa.

Another example of IT's impact on the food industry is found in the system dynamics model recently released by the Consultative Group on International Agricultural Research (CGIAR). The model aspires to sort and interpret a host of extremely complex agricultural, environmental, social and economic variables and how they relate. CGIAR's aim is to be able to model and assess agricultural system performance on food accessibility as well as environmental and livelihoods end goals. By taking into account human, economic, policy and environmental drivers, CGIAR will help private and public sector decision-makers better understand our present state and how food systems might best evolve.

Yet another illustration is AgroAtlas, a new interactive web platform sponsored by the US State Department that maps the shifting geographic distribution of crops, diseases, and pests as well as wild crop relatives — information that can inform and improve eco-agricultural resilience.[17] AgroAtlas and efforts like Smarter Food and the CGIAR program hint at a food future where historically baffling or inaccessible data might be made clear, allowing previously intractable problems to be solved near term.

Farmer Empowerment

Technology is a great leveller, allowing farmers independent access to critical information on market conditions, weather, topography and crop science, then helping them to analyze that information and apply it in decisions. This makes them better farmers and more sophisticated commercial players. With this information in their hands, farmers are able to assess trade-offs, better allocate their time and resources, and understand the consequences of their actions in the larger context. For example, IT can inform the timing and amount of irrigation, and the impact of same on watersheds. This IT-enhanced perspective empowers smallholders in ways previously unimaginable, knitting together farm- and macro-level information in ways that transform livelihoods while improving agricultural sustainability.

Mobile technology sits at the vanguard of IT tools empowering farmers and drastically improving their ability to make informed decisions about how to run their businesses. Mobile has proved the ultimate leapfrog technology, and access to telecommunications continues to increase and become more affordable; already two-thirds of the world's 4.6 billion mobile phone owners live in emerging markets.[18] Farmers of all scales, even smallholders, can now access a previously unimaginable wealth of current, reliable, relevant and actionable information like weather forecasts and commodity prices for very small fees (presently as little as one or two dollars per month). Nokia's *Life Tools* (which provides real-time commodity price data) is but one example of mobile technology being applied to meet farmers' information needs, even at the base of the pyramid; over six million people in India, China and Indonesia have become subscribers already.[19]

"The industry needs to have a better understanding of the consequences of [its] decisions re where we grow food, how much energy is used, etc. We continue to make decisions about food with an incomplete set of information."
Guy Blissett
Wholesale Distribution Lead, IBM

While fees related to services like *Life Tools* are often tiny, the potential scale of the marketplace in terms of total number of customer transactions is huge, resulting in more and more experimentation and innovation in this space. And the sponsors or providers of such tools often receive benefits other than income — like improved supplier relationships and/or enhanced supply chain security. For example, Hershey, in partnership with the Ghana Cocoa Board and the World Cocoa Foundation, recently launched CocoaLink, which uses mobile phone technology to provide farmers with information on "improving farming practices, farm safety, child labor, health, crop disease prevention, post-harvest production and crop marketing" at zero cost. CocoaLink also enables interactive Q&A by text and voice message.[20] Indian conglomerate Tata plays in this space too. Tata's *Innovation Lab* provides farmers with customized advice on how to protect crops, pulling together GPS and Google Earth data on individual farmer locales, enabling access to information on soil and weather conditions as well as pests and pest management.[21]

Mobile and other technology has myriad potential applications well beyond farmer information services too. Another activity hotspot right now is found in the realm of new online marketplaces that directly connect producers and buyers of different types. Often geared to bridge the particular distribution and logistics challenges of small- and mid-sized farmers, such platforms can provide more and better commercial opportunities (or at least alternatives to existing channels). Think of an Amazon.com-like service for food consumers, letting them see when local produce is available within a certain radius, purchase it online, and then either pick it up from a farmer or have it delivered to them.

Smarter Consumers

In the food system as elsewhere, consumer behavior too often seems to promise to lead significant change (in surveys) and then peter out (at point of purchase). While consumers are not the most significant driver of food system change, they are influential — particularly in certain markets — and they are increasingly equipped with innovative tools that better and more quickly inform their decisions, even at the actual point of purchase. GoodGuide is trailblazing in this manner, allowing consumers to scan product bar codes with a mobile phone and receive guidance on which are the most "healthy, green and socially responsible".[22] Given the food industry's relatively high sensitivity to consumer demand and concerns, GoodGuide and tools like it may empower and illustrate purchasing decisions in ways that incent (or compel) manufacturers and retailers to bring more sustainable products to market in greater number and at greater speed than otherwise.

Meeting Societal Needs

Appetite for Change has now outlined the current consumer, supply and political pressures forcing change on the food sector as well as considered how refined and better vision, more systemic approaches and the application of new technology will be critical to addressing the pressures and moving towards a sustainable food future. Still, a significant piece of the puzzle remains. How will markets maintain adequate profitability and growth while changing?

At heart here is a question about how to make it profitable to address societal food and nutrition needs fully — from value chain resilience and sustainability, to food safety and traceability, to universal provision of better and more affordable nutrition for all. While not pretending this will be simple, significant parts of the answer lie in how we value food — in terms of pricing aspects of its production, manufacture and distribution — and in the politics surrounding the food system, particularly as related to incentive and subsidy. This section of *Appetite for Change* examines how we might re-value food and some new ways to 'do the politics', but first looks at how shifting societal needs are compelling the changes in the first place.

"We have to realize that the basic thinking of economies of scale has to go — that the world has to of course be more efficient but that it has to develop solutions that will impact not only one company but also consumers and society as a whole."

José Lopez
Executive Vice President, Operations, Nestlé

Shifting Societal Needs

Societal needs in relation to food production and consumption are numerous, complex and shifting at great speed. The shifts stem from issues including those touched elsewhere in this report, such as: demographics and the growing geographic mismatch between food supply and demand; under-nutrition and over-consumption affecting billions of people, and; the emerging and anticipated climatic pressure on food systems. These and other factors have conspired to create a global context in which food security and food system sustainability are increasingly paramount. Leaders — those with appetite for change — must understand the context of and deliver on the key societal needs now evident and emerging, for the good of producers, consumers and their own bottom lines.

What are the pressing societal needs not adequately addressed by today's food system? Obviously under-nutrition and over-consumption, and certainly total systemic safety and reliability as the system becomes ever more global. But while these challenges are massive, they are also obvious and, inasmuch as they are well-recognized (they are the ones most likely to make headlines), they already attract at least some of the energy needed to address them. It is when we parse the food system more closely that multiple dynamic and difficult issues become visible, making clear the layers of effort that will be required to effect all the change needed. Consider:

1 **Lack of accessibility**
As one *Appetite for Change* interviewee said "We have a bifurcated food system where some people don't have choices — there is no access to less calorie dense food that is sustainable at a lower price." Simply put, we lack widespread affordability of adequately nutritious food.

2 **Misguided or inequitable investment**
Population growth and increasing demand in the developing world for animal protein are often what make food and agriculture plays attractive to investors, but rather than such investment strengthening sector sustainability long term, it can undermine it. And a risk averse mentality leads investors to neglect resource constraints and climatic impacts on agriculture when these are precisely the areas where investment and innovation are needed most.

3 **Food security — and inequity**
Until 2008 investment in farmland had been running at about 4 million hectares per year; before the end of 2009, it leapt to over 56 million hectares . Seventy percent of those acquisitions took place in Africa, generally untethered to commitments to local markets, begging the question whose food security is being underwritten, whose is being passed by — and who decides.

4 **Overcautious product reformulation**
Manufacturers and retailers see the opportunity to meet growing demand for healthier foods and to participate in the wider health and wellness agenda by adjusting the nutritional content of products, but efforts are reactive and glacially incremental. In emerging economies, micronutrient fortification has the potential to deliver immense commercial and societal value. Danone, Unilever and Nestlé are marketing micronutrient fortified products in the developing world, but these efforts are limited and they are essentially alone in such ventures.

5 **Misalignment between science and industry on nutritional content change**
The UK Department of Health, through its Public Health Responsibility Deal, recently encouraged manufacturers to reduce the salt levels in their products by a further 15% by 2012 . Yet scientists in the US and the UK have called for salt intake reductions between 30 and 55%, meaning that even if industry reaches its voluntary target, a gap remains.

6 **Unimaginative approaches to agriculture**
Crop science companies see the developing world as their greatest growth opportunity and future core market. They are intent on extending their current portfolios of seeds, pesticides, herbicides and fertilizers to emerging economies. This is almost certain to raise yields short term, but vastly different than studying what's unique about needs between and within regions and tailoring offerings to suit them.

Such issues as outlined above stand between today's status quo and a sustainable food future. Where movement is evident, it is generally where issues align with businesses' traditional approaches — there is little radical thinking and breakthrough innovation. That space must be made to explore ways to develop the business case for change is often most problematic for incumbents, whose very success creates strong inertia resisting new thinking. Ultimately, this will hurt the industry, which will find the demographic and other shifts pending unyielding in their insistence on transformation. As referenced earlier, *Appetite for Change* identified two means with particular potential to break this deadlock and demonstrate how to create business value while meeting long-term societal needs: re-examining how we value food and re-casting food system politics.

Re-value Food

The business of food is not often lucrative. In the corporate sphere, food industry executives settle for lower margins than peers in many other sectors, while most producers literally find farming a ticket to poverty — amazingly, half of the world's malnourished are themselves farmers.[26] Consumers in the developed world pay amazingly little for (and have grown accustomed to) plentiful, cheap and highly caloric food. US consumers spend just 13% of their income on food[27] — and, yes, many wonder whether such extreme affordability of calories is the root of modern food-related health issues like obesity. Meanwhile, people in developing countries spend up to 70% of their earnings on food and don't get enough. Finally, the modern food system hampers efforts to account for social and environmental externalities. Is this situation the result of a mismatch between a natural system — farming — and capitalism, as Paul Roberts posits in his *End of Food?* Perhaps, though a number of ways to re-value food and close the gap exist.

The last decade begat a massive surge in the acquisition and/or expansion of premium-priced, more sustainable product offerings, with brands such as Odwalla, Ben & Jerry's and Stonyfield Farm initially reaching new scale through outlets like Whole Foods, where good-for-you foods became synonymous with gourmet. Natural and organic products moved from the fringe co-op shelf to prime locations in mainstream outlets, allowing entrepreneurs to benefit from growing demand for healthier, more sustainable food.

Suddenly organic was big business. That there is monetary value in this part of the sector — it is now a $50 billion market in Europe and the US[28] — is one lesson, but beyond that is the learning that food products can be differentiated by having less done to them, showing industry how to link less processing and packaging to greater value.[29]

"The true cost of food needs greater transparency. This will allow policy makers and companies to make smarter decisions about who's growing what, when, where, and how it is priced."

Guy Blissett
Wholesale Distribution Lead, IBM

In addition to re-valuing food in ways like organic's inversion of the processing-packaging-price relationship, shifting perceptions of food's worth comes about when the thinking behind food- and agricultural-related investment changes. A range of actors — food producers and manufacturers, banks and select venture capitalists — are testing the potential returns that might come from investment in more sustainable food systems.

Among producers and manufacturers, Cargill's venture arm, Black River Asset Management, identifies entrepreneurs capable of "capturing value in transitional environments due to macroeconomic factors, regulatory or political change, and globalization," focusing on actors in the agriculture, food, clean energy and sustainability, and metals and mining spaces.[30] Syngenta's venture arm, Syngenta Ventures, seeks to identify "early stage companies with a strong technology base, or business model, or both" in which to invest financially and via its 26,000 employees around the world.[31] Syngenta established this initiative "to accelerate the search for external innovation, new technologies and new business models in core and close to core areas." Meanwhile, mainstream investors (in part because of the volatility of commodity markets) are thinking differently about their food and agriculture portfolios too. Rabobank, a sector specialist, considers 7.0% of its total assets under management sustainability-related, including its investments in water-efficiency technologies and start-ups serving water-stressed agricultural markets.[32]

Indeed, while there is a tremendous amount the private sector can do, and the trends in terms of how markets think about and (re-) value food are beginning to improve, government policy (for example regulation requiring incorporation of eco-agricultural practices, increased subsidies for sustainable agriculture or other incentives spurring change) will be critical also. In the final section of *Appetite for Change*, we explore the necessary evolution of food politics and policy.

"The explosion in food production and entrepreneurship is getting the attention of investors. Traditionally they were interested in clean tech and how those technologies applied to agriculture, but now we're seeing the development of funds that are actually interested in the food space."

Anjali Oberoi
Finance and Operations Consultant, Sustainable Food & Agriculture

New Politics, Realigned Incentives

Political and regulatory risks can haunt business. While crop yields and commodity prices are volatile, they can be modelled and closely predicted, and the variations are neutral in that productivity does not change with the aim of boosting or restraining particular aspects of business; it just happens, and the system adjusts. In contrast, policy and regulation are driven by who is in power and where, by the moods of citizenry, and through conflict or compromise with other government objectives. It touches everything from production through manufacturing, and dictates much of the consumer experience in the retail environment. And only government sets the absolute boundaries on food security, determining which commodities and products from where (and from which companies) cross borders — and when to stop such flows. While all business engages government and navigates regulation, food politics can be explosive (think of the food price protests kicked off by Mexican 'tortilla riots' in 2007, or the role that the price of food and other commodities has played in unrest and revolution during 2011's Arab Spring), demanding special attention be paid to how food-related policy must change to support a sustainable food future.

While *Appetite for Change* interviewees discussing the creation of a sustainable food future did not generally begin with issues relating to government, nearly every one listed new and better policy as prerequisite to progress before closing. Distressingly, few are optimistic that improvements will come without major disruptions to the food system occurring first, sharing a perception that we likely will stretch the current system to (or beyond) its limit before acting.

The food system's need for better infrastructure, different incentives, new regulation and stronger market oversight has been widely debated and well-documented, but the exact means for getting there remain in contest. Without question, a sustainable food future depends in part on wholly new networks of producers and manufacturers (and others) of very different scales coming to work together efficiently and equitably. Government needs to entice such partners together and help guarantee the success of all players, and to grease the skids for private sector investment that will lead to rebuilt infrastructure and distribution networks able to serve more diverse supplier and consumer bases. Sometimes mistrusted, there are instances when government is the only actor of scale capable of both setting an example (through its own investment) and acting as an honest broker between parties, whether informally or by setting the formal rules of trade through treaty and regulation.

If meaningful, rapid and large-scale change depends in good part on government engagement, communication today between innovators specifically, the private sector generally and policy developers is too thin. Public policy vis-à-vis food is too responsive, often lagging public awareness and concern on given issues, and only beginning to recognize the existence and importance of things like local food movements. Multilateral organizations have broken some new ground with recent recommendations on eco-agriculture, but the suggestions have to be owned and implemented by national and regional governments if anything other than random voluntary efforts is to be hoped for in response.

For their part, food industry companies need to determine the most appropriate, fair and effective means to support evolution of better food policy, then advocate transparently for the policy changes they believe required. Collective approaches will be important; while individual corporate policy positions have influence, the food sector might be best served by a model like that of the US Climate Action Partnership, renowned for how it aligned extremely diverse stakeholders (from coal companies to environmental NGOs) around common recommendations for US climate policy. There exists tremendous knowledge in the private sector essential to evolving a sustainable food system. Industry leaders must seize the opportunity and responsibility to consolidate and promote their best ideas with other stakeholders to encourage government to set the frameworks necessary to facilitate a successful industry transition to sustainability.

Final Remarks

SustainAbility embarked on *Appetite for Change* to explore approaches to creating a sustainable food system, defined as one that is reliable, resilient and transparent, which produces food within ecological limits, empowers food producers, and ensures accessible, nutritious food for all. The key questions examined in the course of the project were: Is the private sector ready to embrace a new vision and play a central role in transforming the global food system so that it adequately addresses the increasingly critical issues of food security and sustainability? What role can and should companies play in this transformation — for the good of consumers, producers and their own bottom lines?

Appetite for Change identified the key consumer, supply and political pressures faced by the food industry. The project then mapped the key leadership attributes organizations with appetite for change will be required to demonstrate to thrive in the face of those pressures, including: redefined vision, more systemic approaches, effective use of information technology and meeting societal needs.

In searching for evidence that the attributes are attainable, or even already being developed and deployed, *Appetite for Change* found some more systemic approaches emerging and being tested by leaders in the food industry, but also concluded that energy and innovation equal to the scale of the challenges are not yet in evidence. While a view is emerging, in and outside the industry, that the food system needs to be dramatically transformed, and the early steps some have taken are laudable, on the whole the industry still has a long way to go.

As catalyst to the urgent need to accelerate the food industry's transition to sustainability, *Appetite for Change* offers these final remarks, aiming particularly at the role the private sector might play in creation of a sustainable food system:

"The industry as a whole will have to play a role — retailers, distributors, traders — we all have to help out because, if not, there will be no business in the end."

José Lopez
Executive Vice President, Operations, Nestlé

1 **Demographics and demand patterns are not destiny**
Population growth is real and will massively impact demand. More affluent consumers in developing nations are consuming more animal protein. Diseases of affluence are becoming more prevalent globally in part as a result of Western diets being adopted by more and more people. But this does not — cannot — mean that the only way to feed the world is via more and more intensive agriculture. Companies are not passive; they already battle globally to shape demand for their own products and to influence policy affecting their business. The private sector must use its considerable knowledge and influence to help shape more sustainable demand among consumers worldwide, as well as more sustainable policy such as regulation bringing production methods in line with ecological limits.

2 **Production must be judged by more than volume**
While yield increases are important, 'more' alone will not produce the results required. We need a food system that produces enough, for everyone, within ecological limits, while treating all players fairly. Future food system success has to be judged not just quantitatively, but also based on performance against metrics covering sustainability issues such as: economic equity, soil health, freshwater use and distribution, and biodiversity.

3 **Equity is essential**
The sustainable food system of the future must embrace and uplift producers, especially the smallholder farmers who comprise half the world's malnourished, for in no way is a system that leaves out the very people who produce the food just or tenable long term. Additionally, agriculture as a whole needs to become more inclusive. This will enhance economic livelihoods throughout food value chains, making those value chains more diverse and therefore more resilient. This means the largest multinationals and regional players, especially traders and processors, must actively shape new networks of producers of all sizes in order to procure a greater range of more sustainable crops. Simultaneously, these odd bedfellows of varying scales need to teach one another everything each knows about improving nutrition and quality, and share best practices regarding reducing the environmental impacts of production.

4 **Technology and its disciples are welcome**
IT partners bring tools, approaches and experience with the potential to shortcut work on challenges like empowerment and inclusion. Technology also offers the ability to track and apply hitherto unmanageable (if not plain unimaginable) amounts of data relating to everything from weather to nutritional content. Applied judiciously by food companies themselves and by IT partners, such data will increase understanding of food system complexity and enable better decision-making in the quest to make it sustainable. A focus also on making such technology accessible and attainable by smaller players, including and especially those in developing countries, is essential.

5 **Investment must be encouraged — and shaped**
Creating a sustainable food system will be expensive. Figuring out how to make investments in this transformation profitable and beneficial to society simultaneously is critical. Food sector companies themselves and outside investors won't have neutral impact when they pour money into the sector; they will either underwrite desired outcomes (for example by increasing R&D committed to developing food that is more nutritious and also more affordable) or undermine sustainability (as when food security in production regions is not given equal shrift to the food security of the places for which food is produced, perpetuating inequity).

6 **Policy matters**
As mentioned, business must use its considerable knowledge and influence to help shape more sustainable policy outcomes. In addition to regulation seeking to align production with ecological limits, this also encompasses policy affecting compensation flows in the food system, manufacturing, nutritional content and consumption. It is not always clear exactly what policy will prove best for the planet or for human health, but the process by which policy is shaped today is too much driven by narrow self-interest and short term results. Food industry companies need to determine the most appropriate, fair and effective means to support the evolution of better food policy, then advocate transparently for the policy changes they believe required.

7 **Time is short**
The Introduction to Appetite for Change reminded us that nearly a billion people — half of them farmers — are undernourished, while another billion consume too much. Demographers predict a global population increase of two to three billion by mid-century, nearly all of it in the developing world. Our current food system does not operate with respect for planetary boundaries and the resource constraints they create, nor deliver adequate nutrition to all who need it. Changing the status quo is urgent. There is risk here, certainly, but also enormous opportunity if we perceive the challenge to be not whether we feed nine-ten billion people sustainably, but how. A sustainable food system — one that is reliable, resilient and transparent, which produces food within ecological limits, empowers food producers, and ensures accessible, nutritious food for all — has been defined. How quickly can we make it real?

Interviewees

Jill Auburn
Senior Advisor for Sustainability, Office of the Chief Scientist and Research, Education and Extension Under Secretary, USDA

Mike Barry
Head of Sustainable Business, Marks & Spencer

Robert Berendes
Head of Business Development, Syngenta

Guy Blissett
Whole Distribution Lead, IBM

Gilles Boumeester
Global Head of Food & Agri Coverage, Rabobank

Melanie Cheng
Founder, FarmsReach and Om Organics

Jason Clay
Senior Vice President Market Transformation, WWF

Alex Evans
Head of Center on International Cooperation research program on Resource Scarcity, Climate Change and Multilateralism, NYU

Bill Gilmour
Industry General Manager Consumer Products, IBM

Karen Hamilton
Vice President Sustainability, Unilever

Kevin Henry
Senior Director Sustainable Livelihoods, CARE

Diane Holdorf
Vice President Environmental Stewardship, Kellogg

Stewart Lindsay
Director Global Corporate Affairs, Bunge

José Lopez
Executive Vice President, Operations, Nestlé

Tom MacMillan
Director, Food Ethics Council

Patrick Medley
Global Consumer Products Industry Leader, IBM

Anjali Oberoi
Finance & Operations Consultant, Sustainable Food & Agriculture

Kavita Prakash-Mani
Head of Food Security, Syngenta

Will Rosenzweig
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