



# Adapting to Climate Change: A Guide for the Food, Beverage, and Agriculture Industry

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This is a primer on climate change adaptation for food, beverage, and agriculture (FBA) executives. It summarizes how FBA companies are reporting on climate change risks and opportunities, which include supply chain security, water scarcity, infrastructure and distribution, evolving consumer demands, and workforce stability. It also outlines common current practices and discusses practices that can be expected to grow in importance. This guide serves as a resource for executives considering material issues tied to climate change and provides guidance on developing a proactive and responsible approach to adaptation.

## Contents and Methodology

This brief covers:

**Reporting on Risks and Opportunities.** Based on reporting of climate risk in 2009 by 90 FBA companies to the Carbon Disclosure Project (CDP).

**Current Practices.** An outline of actions related to climate change adaptation, based on reporting from the CDP, interviews, and other publications.

**Emerging Practices.** Synthesis of company disclosures, literature reviews, and input from climate change professionals through interviews.

This guide is part of a BSR industry series. For more, see [www.bsr.org/adaptation](http://www.bsr.org/adaptation).

## Introduction

As climate change brings warmer temperatures and increasingly erratic and volatile weather and rainfall patterns, the effects on food production will be felt globally, though with significant variation. Similarly, members of the FBA sector will experience impacts in varying degrees and different areas; for example, by increasing the chances that heat waves and floods will destroy crops and by changing weather patterns that will drive customer demand for certain products.

At the same time that companies are beginning to face a new generation of challenges, a picture of “climate-smart” agriculture is emerging that combines enhanced crop resilience, productivity, and food security, along with reduced environmental impact. At the forefront of this vision and the development of practices to achieve it are international agencies and initiatives such as the Climate Change, Agriculture, and Food Security research program, aiming to promote awareness and uptake of these practices from the farm to the international policy level.

Our analysis shows that there is a range in how FBA companies understand, manage, and communicate about climate change adaptation. There are many examples of adaptive practices to draw on, but there is also room for advancement, and a need to consider opportunities for identifying, developing, and scaling effective responses.

Proactive and responsible adaptation should concern most in the FBA sector, especially in light of:

- » The sector’s reliance on a stable supply of raw materials sensitive to the climate and vulnerable to changes in the natural environment. Climate change not only imposes constraints but multiplies the level of unpredictability around availability, quality, and price.
- » The heightened demand placed on growers’ ability to track, understand, and respond to changes in weather. Farmers who have thrived on successfully managing and absorbing these risks are finding that climate change is producing conditions they are neither accustomed to nor necessarily prepared to manage.

**CDP Highlight:**  
Eighty-eight percent of respondents stated that climate change presents physical risk, and 69 percent stated that climate change presented physical opportunity.

**Spotlight on Tea:**  
Crop yields and quality are being affected by rising temperatures in the tea-growing region of Assam, where the crop was estimated to have fallen by more than 100,000 tons (about 18 percent) from 2007 to 2010. Higher temperatures and rainfall have resulted in increased pests and no dormancy period.

New Independent. "How Assam's Tea is Beginning to Feel the Strain of Global Warming." (2011)

- » Pressure on and opportunity for the sector to help meet the nutritional needs of a growing population projected to reach 9 billion people by 2050—a population that will require double the amount of food currently produced.

With this backdrop, this brief examines how climate change is affecting the FBA industry and how companies are responding, discussing a few leading approaches and areas for further exploration. Based on company-reported risks, opportunities, and actions, this brief will assist FBA companies in starting to identify material climate risks and opportunities, and developing a practical approach to prepare and innovate for climate change.

## Reporting on Risks and Opportunities

FBA companies are reporting on various types of climate change risk and opportunity. The following is an analysis of 2009 company disclosures on climate change risks and opportunities to the Carbon Disclosure Project (CDP), one of the greatest repositories of company reporting on climate change.<sup>1</sup> Our review of company responses revealed common trends in reported risks and opportunities, which are grouped and summarized in the five areas below, and accompanied by examples of companies that provided those responses.

It is important to note that this list is not a perfect representation of all real risks and opportunities: Climate reporting is new; while standards are coalescing about reporting topics, detailed guidance is scant, and reporting is uneven among companies.<sup>2</sup> Also, because it is difficult to attribute a given weather event to climate change, it can be challenging to distinguish risks and opportunities that are specifically related to climate change. Finally, the distinction between risk and opportunity is not always clear—the difference might be how a company is poised to handle a given disruption or risk, especially relative to its competitors.

*Note that while company names are provided as examples, they do not represent a comprehensive list of all companies that provided similar responses.*

1. SUPPLY CHAIN SECURITY	
Changes to growing seasons and erratic and reduced rainfall patterns are disrupting raw material availability, quality, and cost for retailers and manufacturers.	
Impacts	Companies
Decreased productivity due to variable weather and rainfall and prevalence of pests affects availability and increases costs of key inputs such as sugar cane, corn, beets, citrus, coffee, tea, produce, and grains.	Coca-Cola, Brown-Forman, Tesco, Unilever
Increased risk offers companies an impetus to strengthen supplier relationships and increase oversight of the supply chain.	Kellogg's, Kraft Foods, Pick 'n Pay Holdings, Morrison Supermarkets
Growth of viability in some regions for certain crops creates opportunity to increase local sourcing (especially in higher latitudes) and in turn reduce emissions and logistics costs.	Whole Foods, Unilever

Key:
Risks
Opportunities

<sup>1</sup> See [www.cdproject.net](http://www.cdproject.net)

<sup>2</sup> For more on standards, see the [CDP Investor Questionnaire](#) and the U.S. Securities and Exchange Commissions' [Guidance Regarding Disclosure Related to Climate Change](#).

## 2. WATER SCARCITY

Exacerbation of water scarcity negatively impacts operations, suppliers, and customers.

Impacts	Companies
Increased risk of competition for water due to water scarcity in local communities, which may have consequences for cost, reputation, and social license to operate. Particularly an issue for bottlers.	Coca-Cola, PepsiCo
Declining water availability for growers and food manufacturers with operations in water-stressed areas.	Cadbury, ConAgra Foods, Campbell Soup Company, Unilever

## 3. INFRASTRUCTURE AND DISTRIBUTION

Projected rising sea levels and more frequent and severe weather events threaten to increase logistics disruption and cost, and heighten risk to physical assets.

Impacts	Companies
Greater disruptions of operations in supplies and inventory due to flooding, hurricanes, and higher temperatures.	Carrefour, Tesco, Walgreens, Greggs, Morrison Supermarkets
Higher temperatures will require more efficient heating and cooling systems.	Tesco, Woolworths
More distribution-network failures from weather damage to public infrastructure, such as roads and ports.	SABMiller, Anheuser-Busch InBev, Ajinomoto

*“The climate crisis is also a water crisis, a development crisis, and a health and wellness crisis—and we approach it in that way.”*

- Dan Bena, PepsiCo

## 4. EVOLVING CONSUMER DEMANDS

Unpredictable, potentially dramatic changes in temperatures, especially in developing countries, may cause consumer demands and needs to change with the weather.

Impacts	Companies
Increased demand for bottled beverages as a result of temperature increases.	Seven & i, Carlsberg Group, Coca-Cola
Greater ability to compete on monitoring and prediction of complex, uncertain weather patterns and trends.	Carrefour
Growth of customer demand for coping with environmental and social challenges, especially in emerging markets.	Unilever

## 5. WORKFORCE STABILITY

Adverse weather conditions may lead to increases of certain diseases and/or displacement.

Impacts	Companies
Increased incidence of diseases could affect employee absenteeism, productivity, and company insurance costs.	Pick 'n Pay Holdings, Carrefour

## About Adaptive Practices

Based on the previous risks and opportunities, companies report on pursuing a range of adaptive responses, which are included in this section.

Adaptive practices are grouped by two types:

- **Value protection:** Ensuring resilience of physical assets and planning responses to maintain business as usual.
- **Value creation:** Devising solutions that contribute to the ability to pursue new forms of revenue-generating opportunity and helping suppliers, stakeholders, and customers adapt to a changing climate.

## Current Practices

In response to risks and opportunities, companies are pursuing a range of adaptive practices that are designed to enable them to identify, respond to, and stay ahead of current and upcoming disruptions. In some cases, these practices are intended to manage risk or, more generally, *protect value* of existing assets and systems. In others, practices are aimed more at *creating value* through innovation and meeting new needs that stem from climate change effects.

The following examples of practices are drawn primarily from 2009 CDP responses, and supplemented by conversations with a few companies.

### VALUE PROTECTION

These practices provide examples of how companies are promoting resilience of physical assets and improving systems responses to effectively execute on existing plans and expectations and maintain business as usual.

- 1 **Site and asset risk assessments plus continuity planning:** Assessment of physical risks at sites and in key regions are regularly conducted and reviewed. While companies recognize heightened climate-related risks, they are typically evaluated as part of routine risk assessments, and subsequent actions are included in business continuity planning.
  - » **Diageo** conducts quarterly project and business unit risk assessments that are reviewed by an audit and risk committee. It then develops and implements risk and crisis management plans accordingly.
  - » **Kraft Foods, Whole Foods, and Walgreens** have emergency response plans in place to minimize damage to owned locations and disruption to business.
- 2 **Supply chain risk assessment and management:** Tools to assess risk and sustainability of suppliers and raw materials are created and shared.
  - » **Kraft Foods** has assessed sustainability risks to its key commodities.
  - » **Unilever** has created sustainable agriculture standards/tools for suppliers.
  - » **Brown-Forman** engages in commodity hedging and increases open market purchases to ensuring dual supply of key ingredients.

### VALUE CREATION

These practices offer examples of how companies are creating solutions that contribute to the ability to pursue new forms of revenue-generating opportunity by helping suppliers, stakeholders, and customers adapt to a changing climate.

- 1 **Development and use of technology for conservation:** Companies improve manufacturing technologies to increase processing yields and efficiencies in light of anticipated declines in yields, decreased water availability, and increased energy costs.
  - » **Danisco** develops products that enable adaptation to water scarcity (e.g., enzymes for cold- and reduced-water textile washing) and rising energy costs (e.g., ingredients to reduce refrigeration needs for ice cream).
  - » **Unilever** harvests rainwater at a quarter of its factories in India, with plans to expand this practice to all sites in order to safeguard water supplies for crops and manufacturing.
- 2 **Investing in supplier sustainability and adaptive capacity:** Capacity building and technical/financial assistance is provided to key agricultural suppliers to increase

productivity and climate resiliency through more sustainable growing practices, efficient resource management, and access to credit.

- » **Cadbury** trains suppliers in Ghana in sustainable agricultural practices through its Cocoa Partnership to increase yields and maintain quality in spite of the crop's sensitivity to variations in temperature.
- » **H.J. Heinz** works with global suppliers to improve water management practices that result in efficient and sustainable water use. Drip irrigation, for example, has been widely used, resulting in water savings in North America, Europe, and Australia.
- » **PepsiCo** partners with water-focused NGOs water.org and the Safe Water Network to use microfinance to enable communities in Ghana and India to access water. In India, the company invented equipment to automate direct seeding of rice and trained farmers in its use. Replacing traditional flooding, this farming method resulted in a 30 percent decrease in water use and cut greenhouse gas emissions by more than 70 percent.

3 **Researching and developing alternative inputs:** Identification and use of alternative, more climate-friendly and resilient ingredients are examined.

- » **ConAgra, Anheuser-Busch InBev, and SABMiller** are investing in research into more resilient, drought-tolerant, and productive seed varieties.
- » **Unilever** has initiated a multi-stakeholder partnership to begin cultivation of allanblackia seeds, intending to use the traditional African tree as a new source of oil. The project will boost rural incomes and provide the company with a sustainable alternative ingredient option.

4 **Product innovation and consumer engagement:** Catering to fluctuating consumer preferences, food-security-related (e.g. nutritional) needs, and household resource constraints is done in ways that consider expected climate change patterns.

- » **Tesco** promotes decreased environmental impacts of purchases by offering climate-friendly products, while **J. Sainsbury's** encourages energy conservation with "Make a Difference Day."
- » **Unilever** aims to provide products that help consumers adapt to increasingly resource-constrained environments.

*"If a crop can survive a 2°C increase, that's great ... but if the insect that pollinates it can't survive, we're still stuck. The ecosystem complexity is immense, and not incorporated in technological climate models."*  
- David Croft, Kraft Foods

## Emerging Practices

The previous section referred to responses that are readily observable, and many of them will be familiar to those who are managing climate change, sustainability, or business risk more generally. Yet, there is more to proactive and responsible management. A review of current climate science reveals the significant chance that impacts will be far more disruptive than companies commonly report being prepared for.<sup>3</sup> Also, many needs are only recently becoming evident. Moreover, because of the magnitude of the underlying risks and opportunities, traditional management techniques may not be adequate to address the rising degree of unpredictability and severity of climate change impacts, and thus such familiar-seeming manifestations as floods and droughts warrant more systematic new approaches. While many adaptive practices include measures that industry sustainability leaders have already embraced, strengthened adaptation may mean rebalancing the portfolio of actions in terms of investment, timeline, and priority.

<sup>3</sup> For example, see Intergovernmental Panel on Climate Change. "Climate Change 2007—Impacts, Adaptation and Vulnerability." (2007) <http://www.ipcc.ch/ipccreports/ar4-wg2.htm>.

What follows is a synthesis of practices that are likely to become viewed as increasingly relevant to FBA companies, based on our review of literature and interviews with climate change and CSR professionals.<sup>4</sup>

**Collaborating on adaptation with solutions providers**, such as insurance and information and communication technology companies. While climate science continues to be refined, the most confident projections are usually made at global or large-scale regional levels. Yet because impacts are highly localized, there is a significant lack of detail in the most vulnerable areas of agricultural production. There is, in short, a need for more and better data, and mechanisms to process and respond to what it shows. FBA companies can work with their suppliers and other industries (e.g., information and communications technology and insurance) to expand data gathering on climate and its impact on crops, then process and disseminate it across networks to users. This work can inform the development of innovative, accessible insurance solutions that can help protect growers (and their buyers) from the heightened risks posed by climate change.<sup>5</sup> In addition to promoting development of informational tools, companies will stand to gain by encouraging insurers and other professional risk managers to use that information to develop financial solutions.

## Questions to Consider

1. What are no-regrets actions (actions that would be justified under all possible scenarios) for your company?
2. Do you have operations in, or source from, countries that are considered climate “hotspots”?
3. Where are the information gaps?
4. Have you identified stakeholders and/or collaborative effort forums to work with?
5. How much visibility do you have into your raw-material supply base?

**Advancing supply chain security by investing in R&D.** Maintaining stable global supply chains has always posed challenges, and business is accustomed to responding by diversifying, negotiating contract terms, and hedging commodity prices. However, where having multiple sources of the same crop or product has historically been sufficient, companies are beginning to find exhausted options and the need to seek new, alternative sources.<sup>6</sup> Companies dedicated to maintaining a high-quality, stable supply of agricultural products are augmenting their supply chain management strategy by investing more in research and/or improved growing techniques and capacity building for existing suppliers, and also exploring alternative growing regions and crops.

**Ensuring license to operate by anticipating instability.** Climate change is likely to increase companies’ exposure to sociopolitical instability. Partly that is because they are more likely to find themselves in situations in which water and other basic resources are in shrinking supply and are therefore a source of conflict. And partly it is because climate change is likely to drive crop cultivation and populations into new regions, and FBA companies will face pressure to go where the food is, even if, for example, the government there is corrupt and human rights are not upheld. Thus, while companies may have the legal and financial means to acquire property and resource rights, they will find it increasingly valuable to consider current and probable future views of stakeholders in local areas to head off untenable conflicts. Appropriate consideration and assessment of environmental, social, and political risks can help companies develop positive relations from the outset, and determine how to operate in a way that contributes to the socioeconomic and environmental stability of the region.

**Advancing responsible solutions to building climate resilience.** Leading companies take a multipronged approach to exploring different options for increasing climate resilience: for example, investigating the durability of new seed varieties, building capacity for existing suppliers, and launching pilots to test

<sup>4</sup> Based on numerous interviews in 2010. More information on interviews and literature are at [www.bsr.org/adaptation](http://www.bsr.org/adaptation).

<sup>5</sup> Food and Agriculture Organization of the United Nations. “Climate-Smart” Agriculture.” (2010)

<sup>6</sup> Interview with Marks & Spencer, December 2010

new approaches.<sup>7</sup> Developing and testing potential solutions can help companies avoid maladaptive practices. Maladaptive practices are responses to climate change impacts that may temporarily alleviate one problem, but increase vulnerability elsewhere. Examples include: increasing use of air conditioners and offering more refrigerated products to meet consumer preferences (which contribute to climate change), cloning productive varieties (which reduces natural variation and could render an entire crop more vulnerable to a parasite), or securing resources for future food supply to the disadvantage of local vulnerable populations. Companies can develop effective, responsible solutions to climate adaptation through investigation of various options and collaboration with experts and stakeholders.

**Promoting “triple-win” solutions.** The high levels of greenhouse gas emissions and water intensity of typical agricultural practices are contributing to conditions that jeopardize the industry’s future. Adaptation actions may and should double as climate change mitigation activities.<sup>8</sup> Moreover, investments often create the opportunity to reduce poverty. Companies therefore may find that the best investments seek to achieve goals in all three of these areas (climate mitigation, adaptation, and poverty reduction)—a so-called triple-win.<sup>9</sup> For agriculture, this means climate-smart cultivation practices to reduce emissions (e.g., through zero-to-low tillage) and enable sequestration of carbon. These techniques are being collected and tested by international initiatives and offer opportunities for FBA companies to learn from ongoing research, identify best practices, and contribute to scaling solutions.

For more tools on managing climate change adaptation, visit [www.bsr.org/adaptation](http://www.bsr.org/adaptation).

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<sup>7</sup> Interview with Marks & Spencer, December 2010

<sup>8</sup> Agriculture and livestock and associated land use changes account for a substantial share of global greenhouse gas emissions. See, for example: Food and Agriculture Organization of the United Nations. “Livestock’s Long Shadow: (2006) <http://www.fao.org/docrep/010/a0701e/a0701e00.HTM>.

<sup>9</sup> UN News Centre. “Disaster Risk Reduction Key in Countering Climate Change, Boosting Development – Ban” (2010) <http://www.un.org/apps/news/story.asp?NewsID=34860&Cr=climate+change&Cr1>.