

## Agricultural Supply Chains as a Driver of Financial Risks

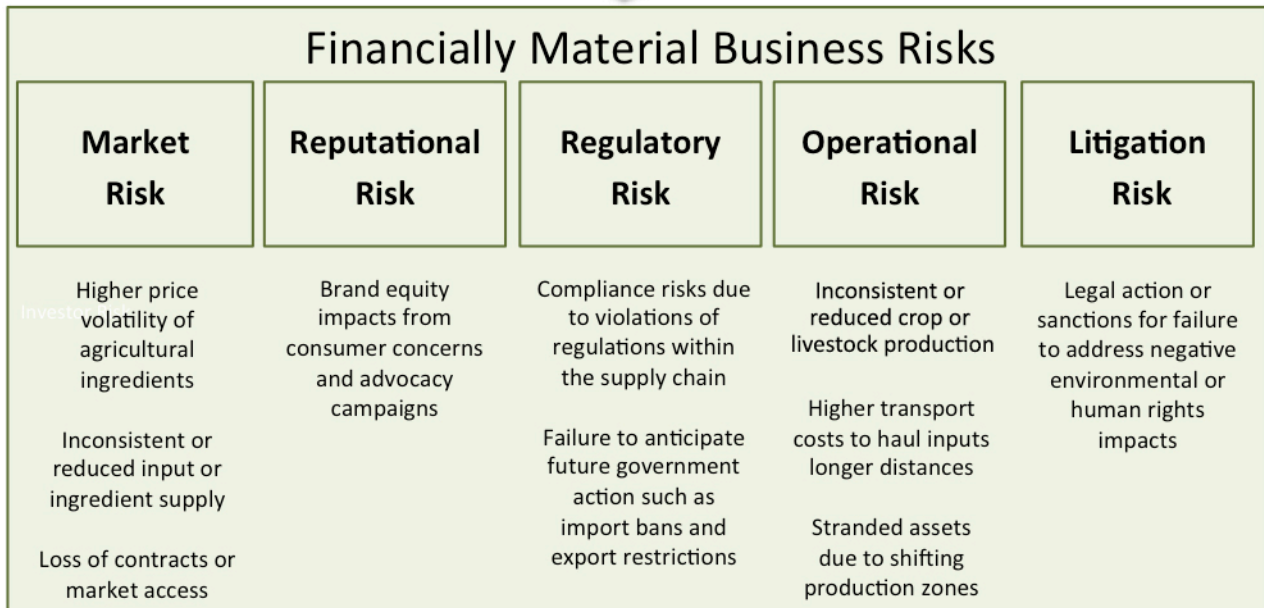
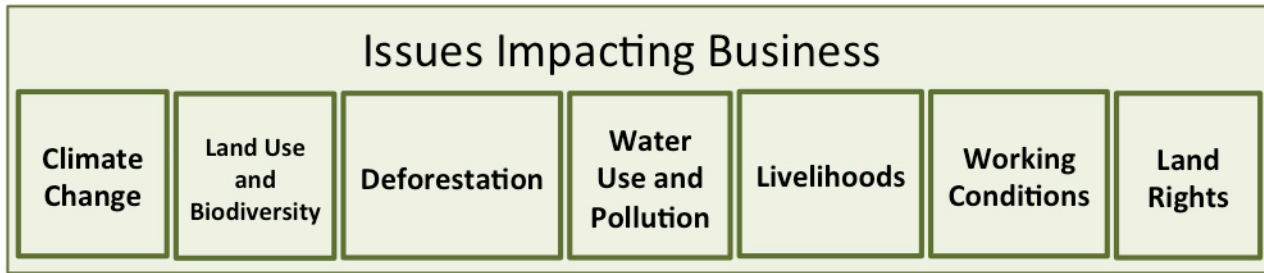
For food and agribusiness companies, commodity sourcing is an increasingly challenging business function. Traditional procurement strategies for managing agricultural supply risks are becoming less effective in managing supply volatility in an era of climate change and increasingly erratic weather patterns. Widespread groundwater depletion and soil erosion are further compromising agricultural productivity and increasing procurement costs. In short, secure access to a reliable and low-cost agricultural supply base is increasingly in jeopardy. Campaign groups are shining a light on questionable and illegal practices in supply chains, including deforestation and the use of forced labor, creating risks to brand equity and reputation, particularly for processed food, beverage and retail players.

Consider, for example:

- IOI Group's share price dropped 18 percent after its certification from the Roundtable on Sustainable Palm Oil (RSPO) was suspended in April 2016 following RSPO's ruling that it was not meeting the certificate's standards and was failing to adequately protect peat areas and forests.<sup>1</sup> This led several major brands including Unilever, Kellogg and Nestlé to cut supplies sourced from the IOI Group, and Moody's to consider downgrading the company in May 2016<sup>2</sup>.
- Uncontrolled burning to clear forestland for palm oil production in Indonesia generates the equivalent amount of CO2 pollution produced by the U.S. economy daily. It produces other air pollutants as well that in 2015 caused an estimated \$47 billion in economic losses, 500,000 respiratory illnesses and a projected 100,000 premature deaths.<sup>3</sup>
- In 2016 Brazil's largest grocery chain, Pão de Açúcar, promised to stop buying beef produced by workers living in slave-like conditions in response to NGO and consumer pressure to improve its sourcing practices.<sup>4</sup>

To maintain growth and profitability in this new, more challenging landscape, food companies must develop agricultural sourcing strategies that are climate resilient and fundamentally decoupled from environmental degradation and adverse human impacts. While the severity of environment and social impacts vary by commodity, region and company, these collective trends are producing tangible business risks that are increasingly affecting company bottom lines (see Exhibit 1).

### ***Exhibit 1. Agricultural Commodity Risks and Financial Impacts***



**Supply Chain Traceability Challenges and Business Risk**

*The way that companies source agricultural inputs—directly from farmers, through co-ops and wholesalers, or through multiple levels of intermediaries or commodities markets—can vary enormously. In addition, many agricultural supply chains are highly complex, making it very challenging to trace a particular input back to its geographic or farm origin. Some meat and agricultural products companies are vertically integrated, but many processed food companies are three to four links away from the agricultural producer. Some commodities such as corn and palm oil are aggregated at the silo or mill level, at which point tracing back to the original farm is lost. Companies may have a wide variety of sourcing structures for different divisions, products and manufacturing*

facilities.

*The structure of a company's supply chain drives not only the business risk but also the strategies employed to manage these risks. For these reasons, it is important for investors to seek information from companies on the nature of their agricultural supply chains and their ability to trace inputs back to the farm level.*

### **Sustainable Sourcing: The Opportunity for Food Companies**

Many food and beverage companies are finding ways to help growers shift to practices that build healthy soils, conserve water supplies, respect the rights of workers and support biodiversity. Some are offering technical assistance and incentives, either directly to growers in their supply chains or through intermediaries, such as agribusiness retailers or input suppliers. Others are developing practices and policies that improve farm communities and protect the rights of workers, or are working collaboratively through pre-competitive multi-stakeholder initiatives, such as The Consumer Goods Forum or Field to Market. For example:

- To address the long-term risks of climate change, **General Mills** has made a science-based commitment to reduce absolute greenhouse gas (GHG) emissions by 28 percent across its full value chain by 2025. Since nearly two-thirds of its total value chain GHG emissions occur in agriculture, a key focus of the company's climate strategy is advancing sustainable agriculture practices through multi-stakeholder collaborations. By working hand in hand with suppliers, farmers, NGOs and industry peers, the company hopes to catalyze action and scale solutions to address climate risks and opportunities within its business and across the food industry as a whole.<sup>5</sup>
- **Unilever** is creating added value throughout its supply chain by helping hundreds of thousands of smallholder farmers improve agricultural practices, enabling them to double or even triple their yields. This increased productivity improves both farmer livelihoods and the quality and security of key commodity supplies which in turn reduces volatility and uncertainty for Unilever by ensuring sustainable supplies of ingredients that will support the company's long-term growth plans.<sup>6,7</sup>

#### **CALL OUT BOX: SUSTAINABLE SOURCING**

- *Builds and protects brand identity* by showing consumers, shareholders and commercial customers that the business is managing its supply chain sustainably and responsibly.
- *Spurs innovation* and delivers bottom line benefits that come from improved resource efficiency, as well as safe and fair working conditions.
- *Provides competitive advantage* by better anticipating and adapting to environmental changes in the supply chain, such as water and resource scarcity and/or reputational risks and conflicts.

*Potential quote/Design element:*

*"It is important for The Coca-Cola Company to address agricultural challenges and opportunities system wide and across our entire value chain. Fifty percent of the Coca-Cola system's procurement expenditures goes toward agricultural ingredients, linking us closely with agricultural communities worldwide."<sup>8</sup> From: <http://www.coca-colacompany.com/sustainable-agriculture/our-approach/>*

### **Key challenges facing agricultural supply chains**

Agriculture’s environmental and social challenges are felt at every stage of food production, typically affecting farmers first, and then rippling across the supply chain to impact traders, distributors, processors and retailers. The challenges are all interrelated, and understanding them requires a system-wide view. Climate change, for example, affects water availability, but land management practices affect water quality and contribute to climate change.

### Environmental challenges

#### 1. Climate Change

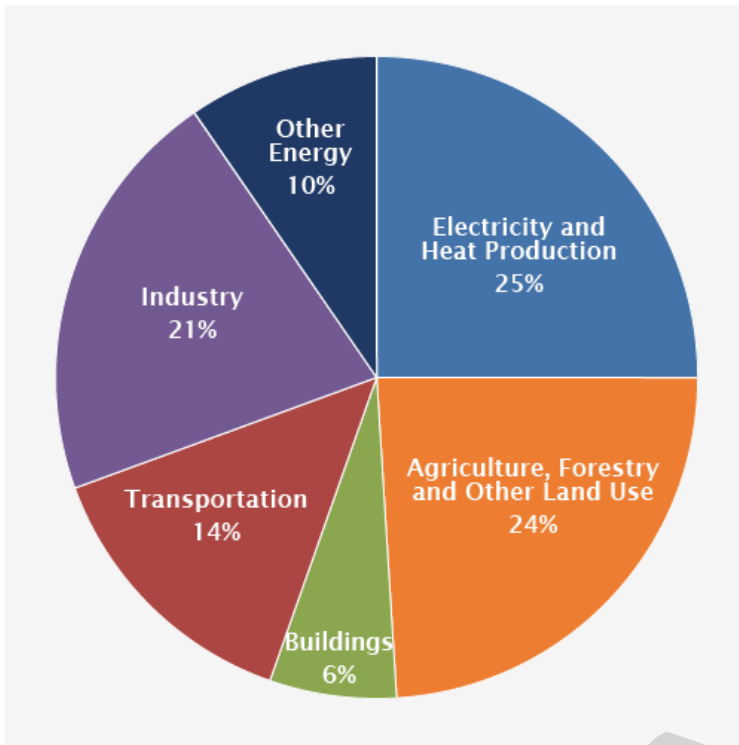
The strong consensus of scientists is that global warming will have major, generally negative impacts on cropland productivity and will alter global patterns of food production. More severe flooding, extreme heat, drought and changing rainfall patterns are just a few of the ways that a warmer planet will adversely affect yields<sup>9</sup> in many parts of the world, including the U.S.. Increased disease, pests and wildfires will also intensify as temperatures rise.<sup>10</sup> A drop in usable cropland is also occurring in some coastal regions as sea levels rise.<sup>11</sup>

At the same time, agricultural practices contribute to climate-warming pollution, both directly from agricultural production, such as methane released from livestock and nitrous oxide from fertilizer use, and indirectly as a result of deforestation and other land use changes.

#### Business Risks Associated with Climate Change Impacts

| Risk Category   | Examples  |
|---|---|
| Market Risk: Volatility in price or availability of key agricultural inputs                           | Beginning in 2012, GlaxoSmithKline found that more extreme and variable weather caused by climate change was having a major impact on British blackcurrant harvests, leading the company to work on developing more-resilient varieties. <sup>12</sup>  |
| Operational: Reduced agricultural productivity <sup>1</sup>   | Campbell Soup Company has struggled with extreme weather in California, a key growing region for its carrot supplies. In 2014, California's record-setting drought followed by intense rains led to a 28% decline in profits for its carrot division. <sup>13</sup>   |
| Litigation: Businesses that fail to manage environmental and social impacts may face legal litigation | In late 2015, a Peruvian farmer filed suit against RWE, a large European energy company, for its alleged contributions to global warming based on its total emissions over two centuries. The complaint claims that global warming is causing glaciers near the farmer's home to melt, which in turn is causing lakes in the area to flood and threaten his property. <sup>14</sup> |

#### Exhibit 2: Global Greenhouse Gas Emissions by Economic Sector



Source: IPCC 2014 based on 2010 emissions

## 2. Land Use and Biodiversity

Within 30 years, the global food system will need to feed 3 billion more people. Yet there's limited room to continue the rapid agricultural expansion that has taken place over the past half-century. Croplands and pasture already account for half of the world's vegetated lands.<sup>15</sup> Converting new land with high conservation value, including grasslands, forests and marshes to food production<sup>16</sup> impacts biodiversity and reduces the capacity of natural ecosystems to provide benefits critical to agriculture, including watershed and soil protection, as well as pollination and climate regulation.

Current soil management practices threaten the productivity and sustainability of food systems. About one-third of soil worldwide is moderately to highly degraded due to erosion, nutrient depletion, acidification, salinization, compaction and chemical pollution.<sup>17,18</sup> These factors deplete and pollute water resources used to grow and process food, increase operating costs and disrupt overall supply chains by contributing to lower and less dependable crop yields.

Pesticides and herbicides used in agriculture can also negatively impact essential services provided by insects, bats and birds, which pollinate 35 percent of the world's food crops.<sup>19</sup> Struggling bat and bee populations threaten to lower agricultural productivity. Honeybee pollination alone contributes \$15 billion annually to U.S. agricultural production.

### CALLOUT BOX: DEFORESTATION

One of the most visible examples of unsustainable land use is deforestation.<sup>20</sup> Commercial and subsistence agriculture cause 80 percent of global deforestation<sup>21</sup> and are a key driver of the conversion of peat lands, which store some of the highest quantities of carbon on the planet. Commodities-driven

deforestation creates an enormous amount of carbon pollution – roughly 11 percent of total GHGs globally – and ratchets up agriculture’s contribution to climate change. Beef production is also a key driver of deforestation, particularly in Latin America, where 71 percent of forest clearing is to create cattle pasture, while 12 percent is for planting commercial crops, including soybeans.<sup>22</sup> Deforestation also causes soil erosion, which leads to lower crop yields, less reliable production and water scarcity. Water scarcity is caused by eroding soils and mud that contaminate waterways and by disruption of the hydrological cycle of the forest.

**Business Risks Associated with Deforestation and Other Land Use Impacts**

| <b>Business Impact</b>   | <b>Examples</b>  |
|--|--|
| Market:<br>Businesses can lose contracts or market access due to changes in social preferences           | IOI Group’s share price dropped 18 percent after its certification from the Roundtable on Sustainable Palm Oil (RSPO) was suspended in April 2016 following RSPO’s ruling that it was not meeting the certificate’s standards nor adequately protecting peat areas and forests. <sup>23</sup> This led several major brands including Unilever, Kellogg and Nestlé to cut supplies sourced from the IOI Group, and Moody’s to consider downgrading the company in May 2016. <sup>24</sup>  |
| Reputational:<br>Business brand equity can be damaged due to consumer concerns and advocacy campaigns    | Many leading brands have been the focus of campaigns by NGOs such as Greenpeace, Rainforest Action Network, SumOfUs, and Union of Concerned Scientists. In 2012, Greenpeace’s mock advertisement linking Nestlé’s palm oil sourcing to orangutan deaths was viewed by over 300,000 during its first day on the Internet. Cadbury New Zealand went from number one in brand trust to number 36 after public criticism over irresponsible palm sourcing in 2009. Kellogg Co. was accused of rainforest destruction in over 30 prominent media outlets. <sup>25</sup> |
| Litigation:<br>Businesses that fail to manage environmental and social impacts may face legal litigation | The Government of Indonesia has recently begun prosecuting publicly traded companies associated with air pollution produced by palm oil fires. On August 15, 2016, the Government of Indonesia fined Sampoerna Agro \$81 million for 2014 forest fires on 3,000 hectares on its concessions in Riau Province, Indonesia. The \$81 million fine is slightly less than Sampoerna Agro’s revenue in the first six months of 2016. <sup>26</sup>   |

**3. Water Use and Pollution**

Growing competition for water supplies, combined with climate change and water pollution, threaten the food sector’s water security and contribute to a water availability threat that the World Economic Forum recently ranked as the world’s “top global risk.”

*Water Use:* Agricultural production is the most water intensive activity,<sup>27</sup> consuming roughly 70 percent of the world’s freshwater.<sup>28</sup> Moreover, one-third of the world’s food is produced in areas of high or extremely high “water stress” or competition.<sup>29</sup>

- About 21 percent of rainfed production and 56 percent of the world’s irrigated crop production takes place in high stress regions.<sup>30</sup>
- An estimated 20 percent of the Earth’s groundwater basins are being over-exploited, many of them in regions of significant agricultural importance, including California and the Midwest’s Ogallala Aquifer. (Exhibit 2.5). [ADD MAP SHOWING MAJOR AGRICULTURAL GROUNDWATER DEPLETION LEVELS FROM FOT]

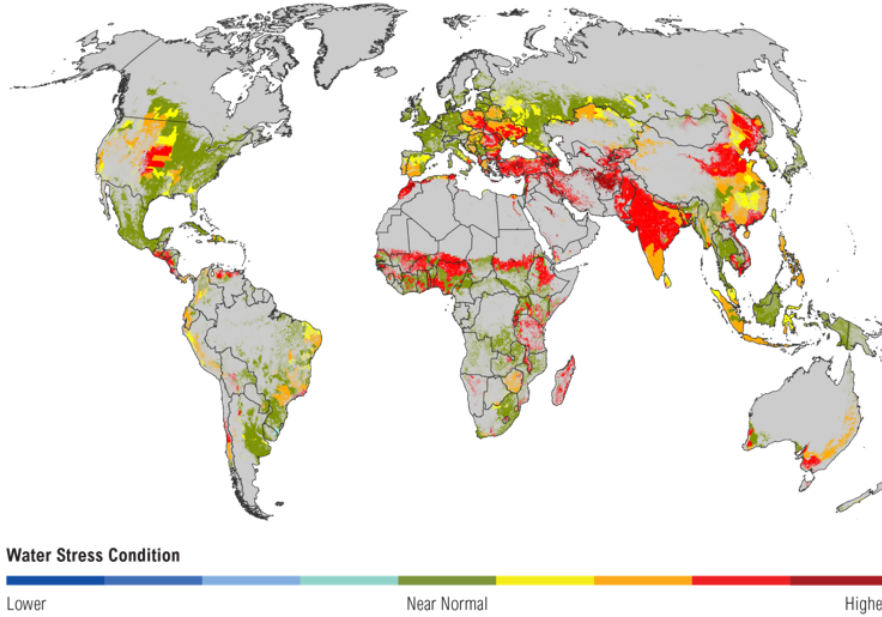
*Water Pollution:* Fertilizer, manure and pesticide runoff from farm fields is a major source of water pollution in most regions of the world.<sup>31</sup> Global chemical fertilizer use, which hit 180 million tons in 2012, has increased 500 percent over the past 50 years, with nitrogen use alone growing by 800 percent. Much of this fertilizer runs off into waterways, polluting rivers, groundwater and oceans. The number of hypoxic “dead zones” linked to fertilizer runoff (also called nutrient pollution) has increased exponentially since the 1960s, affecting more than 400 aquatic ecosystems worldwide, including the Gulf of Mexico and South China Sea. Nutrient pollution is the most significant water quality challenge in the United States, according to the EPA, which spends an estimated \$4.8 billion annually treating nitrogen pollution.

| Business Risk   | Examples  |
|---|---|
| Reputational:<br>Damage to brand equity due to conflicts over scarce resources                | The Coca-Cola Company decided not to move forward on the development of an \$81 million bottling plant in southern India in April 2015 due to resistance from local farmers who cited concerns about strains on local groundwater supplies. <sup>32</sup> |
| Regulatory:<br>Businesses that are unprepared for regulatory changes may face adverse impacts | In the spring of 2014, California’s record drought led to water restrictions in the state’s Central Valley, dry pastures, and higher hay and silage prices that cost the dairy and livestock sector \$203 million in lost revenues. <sup>33</sup>         |
| Operational:<br>Competition for water disrupts agricultural production and supply chains      | Illovo, the South African sugar producer, shut down a large sugar mill in early 2015 as drought was predicted to destroy \$81 million in local production. <sup>34</sup>  |

**Exhibit 4.**


# Water stress will increase in many agricultural areas by 2025 due to growing water use and higher temperatures

(Based on IPCC Scenario A1B)



Note: Areas in gray contain no croplands.

Source: World Resources Institute and The Coca-Cola Company. 2011. "Aqueduct Water Risk Atlas Global Maps 1.0." Accessible at <<http://wri.org/aqueduct>>. Cropped areas from Ramankutty, N., A. T. Evan, C. Monfreda, and J. A. Foley. 2008. "Farming the planet: 1. Geographic distribution of global agricultural lands in the year 2000." *Glob. Biogeochem. Cycles* 22: GB1003, doi:10.1029/2007GB002952.

 WORLD RESOURCES INSTITUTE

## Social challenges

### 4. Livelihoods and Working Conditions

Smallholder farmers<sup>35</sup> in the developing world play a critical role in key commodity supply chains, from palm oil to cocoa beans. Yet they typically face high levels of poverty and debt. Accessing credit and high-quality seeds and inputs is a challenge for many, which limits their ability to invest in more sustainable practices that often have higher upfront costs,<sup>36</sup> but also increase their productivity. Smallholder farmers often have limited power in contract negotiations and are subject to middlemen who pay them below market prices, and are especially vulnerable to the impacts of climate change. Inattention to these impacts can lower both the quality and quantity of supply for agribusinesses.

Agricultural wagedworkers as a group worldwide are among the poorest and, ironically, the most food insecure. In the United States, 23 percent of all hired farm workers had family incomes below the poverty guidelines.<sup>37</sup> Globally, reduced opportunities prompt many rural workers to move to cities to seek better paying jobs, reducing the pool of skilled agricultural workers.

An estimated 3.5 million people work in forced labor situations globally in agriculture, fishery and forestry.<sup>38</sup> In many countries, including the U.S., agricultural workers are exempt under most national labor laws, and may have few social protections that other workers enjoy, particularly regarding wages, overtime pay,<sup>39</sup> freedom of



association and collective bargaining.<sup>40</sup> Furthermore, the sector is plagued by illegal and unethical employment practices. Food and agriculture companies face considerable exposure to labor rights violations among suppliers, many of whom are based in countries lacking basic worker protections.<sup>41</sup> Migrant agricultural workers are at risk for exploitation by labor brokers who may employ unethical practices such as high recruitment fees, passport retention and contract fraud to lure them into forced labor schemes, and use threats of deportation to keep them from reporting abuses.<sup>42</sup>

Agriculture employs a high number of children – more than 98 million children in 2012 – particularly for commodities such as cocoa, coffee, tobacco, sugarcane, cotton and rice.<sup>43 44 45</sup> Forced and child labor in food company supply chains can cause reputational damage when “bad actors” tarnish the image of an entire industry or sector and subject companies to lawsuits. In addition, social conflict can cause disruptions in agricultural supply chains.

Even with widespread underreporting<sup>46</sup> of farmworker deaths, injuries and diseases, agriculture is still one of the most hazardous work sectors due to fatalities, injuries and work-related sicknesses. At least 170,000 agriculture workers are killed on the job each year globally, and millions more are seriously injured in workplace accidents involving agricultural machinery or poisoned by pesticides and other agrochemicals.

| <b>Business Risk</b>  | <b>Examples</b>   |
|---|---|
| Market:<br>Businesses can lose contracts or market access   | A line of Hershey’s chocolate was dropped by Whole Foods <sup>47</sup> and the company agreed to more aggressive human rights and labor certification in its supply chain in 2012 after NGOs (International Labor Rights Forum, Green America, etc) campaigned against the company, including threatening to run a Super Bowl ad on the issue of abuses in the coca supply chain. The company agreed to improvements (which have been further strengthened since) and the ad was dropped. |
| Reputational:<br>Business brand equity can be damaged due to consumer concerns and advocacy campaigns <sup>7</sup>    | A May 2016 Oxfam report on the appalling working conditions of poultry plant workers in the United States generated intense media scrutiny and pressure on the companies named to respond to the allegations, including Tyson Foods Inc., Pilgrim’s Pride Corp., Perdue Farms Inc. and Sanderson Farms Inc.   |
| Litigation:<br>Businesses that fail to manage environmental and social impacts may face legal litigation <sup>4</sup> | In 2015, the consumer rights law firm Hagens Berman filed separate class action lawsuits against food companies Mars, Hershey and Nestlé for failing to report the use of child labour in their cocoa production. <sup>48</sup>   |

## 5. Land Rights

Inadequate and insecure land rights are leading to conflicts over land, environmental degradation and overall exploitation of farmers.<sup>49</sup> International land acquisitions are also increasing, with governments and private firms investing in or purchasing large tracts of land in other countries, sometimes in situations where local land rights are ignored.<sup>50</sup> About two-thirds of agricultural land deals by foreign investors between 2000 and 2010 were in countries with serious food security problems, and two-thirds of foreign land investors in developing countries plan to export everything they produce.<sup>51</sup> These trends can cause wide-ranging social disruption, including loss of land titles which limits farmers' ability to pledge land as collateral and reinvest in their farms to raise productivity over time.

In regions where land rights of indigenous or local communities are not documented or recognized, local people are at risk of being evicted or wrongfully displaced during the acquisition of land or conversion of forests to make way for commercial agriculture operations. The livelihoods of forest-dependent communities are further disrupted when natural forests are replaced with managed tree plantations, which provide a much narrower range of services (such as food, fuel, medicine and wildlife habitat) than the original forest. Companies that do not respect the land rights of local people may face financial and reputational risks stemming from protests, work stoppages or damaging social campaigns.<sup>52</sup>

| <b>Business Impact</b>   | <b>Examples</b>   |
|--|---|
| Market:<br>Volatility in price or availability of key agricultural inputs                                | Farmers that lack land tenure are reluctant to make long term investments in their farms (or may be unable to access credit), which can result in higher price volatility <sup>53</sup> and lower productivity. <sup>54</sup>   |
| Reputational:<br>Damage to brand equity due to conflicts over scarce resources                           | Nestlé's report highlights that legal and other, often violent, disputes on rights to land and natural resources are increasing in some countries. The report confirms that companies must recognize and clarify rights to land and natural resources, through an inclusive and equitable process, to further sustainable agricultural development. <sup>55</sup> |
| Litigation:<br>Businesses that fail to manage environmental and social impacts may face legal litigation | A federal prosecutor in Brazil told Bunge in 2011 to stop sourcing sugarcane from Jatayvary, because of a land rights dispute with an indigenous community.   |

- 
- <sup>1</sup> “RSPO Suspension Negative for IOI Group.” *The Star Online*. 28 March 2016.  
<http://www.thestar.com.my/business/business-news/2016/03/29/rspo-suspension-negative-for-ioi-group/>.
- <sup>2</sup> “Moody’s Review of IOI Corporation.” *Moodys.com*. 10 May 2016. [https://www.moodys.com/research/Moodys-reviews-IOI-Corporation-Berhad-Baa2-ratings-for-downgrade--PR\\_348708](https://www.moodys.com/research/Moodys-reviews-IOI-Corporation-Berhad-Baa2-ratings-for-downgrade--PR_348708).
- <sup>3</sup> Lamb, Kate. “Indonesia’s Fires Labelled a ‘crime against humanity’ as 500,000 Suffer.” *The Guardian*. 26 October 2015.  
<http://www.theguardian.com/world/2015/oct/26/indonesias-fires-crime-against-humanity-hundreds-of-thousands-suffer>
- <sup>4</sup> Reuters. “Brazil’s Largest Grocery Chain Pledges to Chop Deforestation, Slavery from Supply Chain.” *VOA.com*. 08 April 2016.  
<http://www.voanews.com/a/brazil-grocery-chain-deforestation-slavery-supply-chain-beef/3277488.html>.
- <sup>5</sup> Church, John. “Inside the General Mills Roadmap to a Sustainable Food Future.” *The Guardian*. 23 October 2015.  
<https://www.theguardian.com/sustainable-business/2015/oct/23/general-mills-sustainable-supply-chain-un-climate-conference-paris>.
- <sup>6</sup> Cuff, Madeleine. “Sustainable Agriculture Can Unlock \$2.3 Trillion, Report Says.” *Greenbiz.com*. 17 October 2016.  
<https://www.greenbiz.com/article/sustainable-agriculture-can-unlock-23-trillion-report-says>.
- <sup>7</sup> “Livelihoods for smallholder farmers.” *Unilever Global Company Website*. <https://www.unilever.com/sustainable-living/the-sustainable-living-plan/enhancing-livelihoods/inclusive-business/livelihoods-for-smallholder-farmers/>.
- <sup>8</sup> “Our Approach.” *Coca-Cola Company*. 23 July 2015. <http://www.coca-colacompany.com/sustainable-agriculture/our-approach/>.
- <sup>9</sup> “Creating a Sustainable Food Future.” *World Resources Institute*. 2013-14. Pg. 14.  
[https://www.wri.org/sites/default/files/wri13\\_report\\_4c\\_wrr\\_online.pdf](https://www.wri.org/sites/default/files/wri13_report_4c_wrr_online.pdf).
- <sup>10</sup> “Feeding Ourselves Thirsty: How the Food Sector is Managing Global Water Risks.” Pg. 25. *Ceres*. May 2015.
- <sup>11</sup> “Creating a Sustainable Food Future.” *World Resources Institute*. 2013-14. Pg. 14.  
[https://www.wri.org/sites/default/files/wri13\\_report\\_4c\\_wrr\\_online.pdf](https://www.wri.org/sites/default/files/wri13_report_4c_wrr_online.pdf).
- <sup>12</sup> “Physical Risks from Climate Change.” *Oxfam, Calvert, Ceres*. May 2012.  
<https://www.oxfamamerica.org/static/media/files/physical-risks-from-climate-change.pdf>.
- <sup>13</sup> Giammona, Craig. “Campbell Soup Struggles With Role as Carrot Farmer Amid Drought.” *Bloomberg Markets*. 25 February 2015. <https://www.bloomberg.com/news/articles/2015-02-25/campbell-soup-struggles-with-role-as-carrot-farmer-amid-drought>.
- <sup>14</sup> Seley, Peter. “Emerging Trends in Climate Change Litigation.” *Law360.com*. 07 March 2016.  
<https://www.law360.com/articles/766214/emerging-trends-in-climate-change-litigation>.
- <sup>15</sup> “Creating a Sustainable Food Future.” *World Resources Institute*. 2013-14. Pg. 12.  
[https://www.wri.org/sites/default/files/wri13\\_report\\_4c\\_wrr\\_online.pdf](https://www.wri.org/sites/default/files/wri13_report_4c_wrr_online.pdf).
- <sup>16</sup> For more about high conservation value habitats, see: <https://www.hcvnetwork.org/about-hcvf/the-six-high-conservation-values>.
- <sup>17</sup> “Global Plans of Action Endorsed to Halt the Escalating Degradation of Soils.” *FAO of the UN*. 24 July 2014.  
<http://www.fao.org/news/story/en/item/239341/icode/>.
- <sup>18</sup> “Creating a Sustainable Food Future.” *World Resources Institute*. 2013-14. Pg. 68.  
[https://www.wri.org/sites/default/files/wri13\\_report\\_4c\\_wrr\\_online.pdf](https://www.wri.org/sites/default/files/wri13_report_4c_wrr_online.pdf).
- <sup>19</sup> “Insects and Pollinators.” *Natural Resources Conservation Service*. USDA.gov.  
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/#sthash.jObS0RnP.dpuf>.
- <sup>20</sup> Kissinger, Gabrielle, Martin Herold, and Veronique De Sy. “Drivers of Deforestation and Forest Degradation.” *Wageningen University*. World Bank Group. Pg. 10.  
<[https://www.forestcarbonpartnership.org/sites/fcp/files/DriversOfDeforestation.pdf\\_N\\_S.pdf](https://www.forestcarbonpartnership.org/sites/fcp/files/DriversOfDeforestation.pdf_N_S.pdf)>.
- <sup>21</sup> Kissinger, Gabrielle, Martin Herold, and Veronique De Sy. “Drivers of Deforestation and Forest Degradation.” *Wageningen University*. World Bank Group. Pg. 10.  
<[https://www.forestcarbonpartnership.org/sites/fcp/files/DriversOfDeforestation.pdf\\_N\\_S.pdf](https://www.forestcarbonpartnership.org/sites/fcp/files/DriversOfDeforestation.pdf_N_S.pdf)>.
- <sup>22</sup> Sy, V. De, et al. “Land Use Patterns and Related Carbon Losses following Deforestation in South America.” *Environmental Research Letters* 10.12 (2015)

- 
- <sup>23</sup> "Suspension Negative for IOI Group." *The Star Online*. 29 March 2016. <http://www.thestar.com.my/business/business-news/2016/03/29/rspo-suspension-negative-for-ioi-group/>.
- <sup>24</sup> "Moody's Reviews IOI Corporation Berhad's Baa2 Ratings for Downgrade." *Moody's.com*. 10 May 2016. [https://www.moody's.com/research/Moody's-reviews-IOI-Corporation-Berhad's-Baa2-ratings-for-downgrade--PR\\_348708](https://www.moody's.com/research/Moody's-reviews-IOI-Corporation-Berhad's-Baa2-ratings-for-downgrade--PR_348708).
- <sup>25</sup> "Standing on the Sidelines: Why Food and Beverage Companies Must do More to Tackle Climate Change." *Oxfam*. 20 May 2014. [https://www.oxfam.org/sites/www.oxfam.org/files/bp186-standing-sidelines-big10-climate-emissions-200514-en\\_2.pdf](https://www.oxfam.org/sites/www.oxfam.org/files/bp186-standing-sidelines-big10-climate-emissions-200514-en_2.pdf).
- <sup>26</sup> "The Chain: Sampoerna Agro Fined \$81 Million for Fires, RSPO Reaching out to Africa and Latin America." *Chain Reaction Research*. 29 August 2016. <https://chainreactionresearch.com/2016/08/29/the-chain-sampoerna-agro-fined-81-million-for-fires-rspo-reaching-out-to-africa-and-latin-america/>.
- <sup>27</sup> "Feeding Ourselves Thirsty: How the Food Sector is Managing Global Water Risks." Pg. 15. *Ceres*. May 2015.
- <sup>28</sup> "Feeding Ourselves Thirsty: How the Food Sector is Managing Global Water Risks." Pg. 15. *Ceres*. May 2015.
- <sup>29</sup> Some 21 percent of rain-fed production and 56 percent of the world's irrigated crop production takes place in these water high stress regions
- <sup>30</sup> Ceres, "Feeding Ourselves Thirsty: How the Food Sector is Managing Global Water Risks." Pg. 25. May 2015.
- <sup>31</sup> Ceres, "Digging into Sustainable Agriculture."
- <sup>32</sup> Kazmin, Amy. "Coca-Cola Forced to Abandon India Bottling Plant Plans." *Financial Times*. 22 April 2015. <https://www.ft.com/content/9e7d36da-e8e5-11e4-87fe-00144feab7de>.
- <sup>33</sup> Kerlin, Kat. "Drought Impact Study: California Agriculture Faces Greatest Water Loss Ever Seen." UC Davis. 15 July 2014. <https://www.ucdavis.edu/news/drought-impact-study-california-agriculture-faces-greatest-water-loss-ever-seen>.
- <sup>34</sup> Ntuli, Nokuthula. "Drought Closes KZN Sugar Mill." *IOL Business Report*. 19 January 2015. <http://www.iol.co.za/business-report/companies/drought-closes-kzn-sugar-mill-1806304>.
- <sup>35</sup> Smallholders are often defined as growers with a planted area of 50 hectares (just under 125 acres) or less, where the farm provides the majority of income to the family and, in turn, the family provides the majority of labor on the farm. Source: *Sustainable Sourcing Guide for Palm Oil Users, A practical handbook for US consumer goods and retail companies*, May 2015, World Wildlife Fund and Conservation International
- <sup>36</sup> "Don't Bank on it: Farmers Face Significant Barriers to Credit Access During Economic Downturn." *Food and Water Watch*. 11 April 2011. <http://www.foodandwaterwatch.org/reports/farmers-face-significant-barriers-to-credit-access/>.
- <sup>37</sup> Carroll, Daniel, Georges, Annie and Saltz, Russell. "Changing Characteristics of U.S. Farm Workers: 21 Years of Findings from the National Agricultural Workers Survey (presentation, Immigration Reform and Agriculture Conference: Implications for Farmers, Farm Workers and Communities Washington D.C., May 12, 2011)
- <sup>38</sup> *Profits and Poverty: Economics of Forced Labour*, ILO, 2014 (statistic from Table 2.3).
- <sup>39</sup> "Fact Sheet #12: Agricultural Employers Under the FLSA." *U.S. Department of Labor*. July 2008. <https://www.dol.gov/whd/regs/compliance/whdfs12.pdf>.
- <sup>40</sup> "Frequently Asked Questions." *National Labor Relations Board*. 02 April 2017. <https://www.nlrb.gov/resources/faq/nlrb#t38n3180>.
- <sup>41</sup> Kelly, Marjorie, et al. "Worker Equity in Food and Agriculture." *Sustainalytics*. October 2012. [http://www.sustainalytics.com/sites/default/files/workerequity\\_october2012.pdf](http://www.sustainalytics.com/sites/default/files/workerequity_october2012.pdf).
- <sup>42</sup> Verite & Manpower Group. "An Ethical for Cross-Border Labor Recruitment." 09 February 2012. [http://www.verite.org/sites/default/files/ethical\\_framework\\_paper\\_20120209\\_PRINTED.pdf](http://www.verite.org/sites/default/files/ethical_framework_paper_20120209_PRINTED.pdf).
- <sup>43</sup> "List of Goods Produced by Child Labor or Forced Labor." *U.S. Department of Labor*. <https://www.dol.gov/ilab/reports/child-labor/list-of-goods/>.
- <sup>44</sup> "Child Labour in Agriculture." *International Labour Organization*. <http://www.ilo.org/ipecc/areas/Agriculture/lang-en/index.htm>.
- <sup>45</sup> "Making Progress Against Child Labor." *International Labour Organization*. [http://www.ilo.org/wcmsp5/groups/public/---ed\\_norm/---ipecc/documents/publication/wcms\\_221513.pdf](http://www.ilo.org/wcmsp5/groups/public/---ed_norm/---ipecc/documents/publication/wcms_221513.pdf).
- <sup>46</sup> "Agriculture: A Hazardous Work." *International Labour Organization*. [http://www.ilo.org/safework/areasofwork/hazardous-work/WCMS\\_110188/lang-en/index.htm](http://www.ilo.org/safework/areasofwork/hazardous-work/WCMS_110188/lang-en/index.htm).

- 
- <sup>47</sup> "Whole Foods Drops Hershey's Scharffen Berger Chocolates Over Child Labor Issues." *Green America*. 03 October 2012. <http://www.greenamerica.org/about/newsroom/releases/2012-10-03-Whole-Foods-Drops-Heshey-Sharffen-Berger-Chocolates-Over-Child-Labor-Issues.cfm>.
- <sup>48</sup> "Hagens Berman: Consumers File Suit Against Nestle, Hershey's and Mars for Alleged Child Labor Used in Chocolate Production." *Business Wire*. 28 September 2015. <http://www.businesswire.com/news/home/20150928006623/en/Hagens-Berman-Consumers-File-Suit-Nestle-Hershey's>.
- <sup>49</sup> Bourdreaux, Karol, John Bruce. "Land Disputes and Land Conflict." *USAID Issue Brief*. 27 March 2013. <https://www.land-links.org/issue-brief/land-disputes-and-land-conflict/>.
- <sup>50</sup> "The Land Battle: 15 Organizations Defending Land Rights." *Foodtank*. <http://foodtank.com/news/2015/07/the-land-battle-15-organizations-defending-land-rights>.
- <sup>51</sup> "Our Land, Our Lives." *Oxfam*. October 2012. [https://www.oxfam.org/sites/www.oxfam.org/files/bn-land-lives-freeze-041012-en\\_1.pdf](https://www.oxfam.org/sites/www.oxfam.org/files/bn-land-lives-freeze-041012-en_1.pdf).
- <sup>52</sup> Global Reporting Initiative. "Land Tenure Rights: The need for greater transparency among companies worldwide". *GRI*. 2016. <https://www.globalreporting.org/resourcelibrary/GRI-G4-Land-Tenure-Rights.pdf>
- <sup>53</sup> Runsten, Lisen, Marja-Liisa Tapio-Bistrom. "Land Tenure, Climate Change Mitigation and Agriculture." *MICCA of the FAO*. June 2011. <http://www.fao.org/climatechange/30353-0c11859e8b0cac7aabe39520498b2df22.pdf>
- <sup>54</sup> Tenaw, Shimelles, K.M. Zahidul Islam, Tuulikki Parviainen. "Effects of Land Tenure and Property Rights on Agricultural Productivity in Ethiopia, Namibia and Bangladesh." *University of Helsinki*. FAO.org. 2009. [http://www.fao.org/fileadmin/user\\_upload/fsn/docs/HLPE/Discussion\\_Paper\\_33.pdf](http://www.fao.org/fileadmin/user_upload/fsn/docs/HLPE/Discussion_Paper_33.pdf)
- <sup>55</sup> "Nestlé Commitment on Land & Land Rights in Agricultural Supply Chains." *Nestlé*. July 2014. [https://www.nestle.com/asset-library/documents/library/documents/corporate\\_social\\_responsibility/nestle-commitment-land-rights-agriculture.pdf](https://www.nestle.com/asset-library/documents/library/documents/corporate_social_responsibility/nestle-commitment-land-rights-agriculture.pdf)