

# *DISRUPTING THE GLOBAL COMMODITY BUSINESS*

How Strange Bedfellows  
Are Transforming a  
Trillion-Dollar Industry  
to Protect Forests, Benefit  
Local Communities, and  
Slow Global Warming



Climate and Land Use Alliance

*Cultivating solutions for people and the planet*





## Climate and Land Use Alliance

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The Climate and Land Use Alliance is a collaborative initiative of the ClimateWorks Foundation, David and Lucile Packard Foundation, Ford Foundation, and Gordon and Betty Moore Foundation. Our mission is to realize the potential of forested and agricultural landscapes to mitigate climate change, benefit people, and protect the environment.

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Cover photo: The contrast between forest and agricultural landscapes near Rio Branco, Acre. Brazil.

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## **Disrupting the Global Commodity Business**

**HOW STRANGE BEDFELLOWS ARE TRANSFORMING A  
TRILLION-DOLLAR INDUSTRY TO PROTECT FORESTS,  
BENEFIT LOCAL COMMUNITIES, AND  
SLOW GLOBAL WARMING**

September 2014



## Foreword

From the first agricultural revolution, some 8,000 years ago, when humans transitioned from hunting and gathering to farming crops and tending livestock, we have been changing the natural environment around us, clearing forests and other natural habitats to produce the food we need to sustain ourselves. Today, with a global population of over 7 billion people, commercial agriculture is driving 71 percent of global tropical deforestation. The world's forests are becoming scarcer, and conflicts over their use are becoming more acute.

Agriculture is also a major contributor to climate change—the production and consumption of food is responsible for approximately a fifth of global greenhouse gas emissions.<sup>1</sup> With a global population set to grow to over 9 billion by 2050, 60 percent more food will be needed to sustain us if current global trends in diet and population hold.<sup>2</sup>

We need to adopt a radically different approach—one that breaks the cycle of clearing forests so we can produce more goods and food. To succeed, we must not only shift commodity production away from native forests, but also protect these forests by increasing recognition of the rights of indigenous peoples and rural communities to manage them. We can avoid the negative social and environmental impacts of deforestation when farmers, local governments, local communities, and agricultural commodity traders work together to avoid deforestation and produce more efficiently.

There are signs around the world, from the Amazon to Borneo, that this is beginning to happen. Unlikely partnerships are emerging between environmental organizations, indigenous peoples' groups, forest communities, businesses, and governments. Consumer demand is driving change all the way down the supply chain.

We describe these changes as the process of “disrupting the global commodity business,” drawing on the theory of disruptive innovation popularized in *The Innovator's Dilemma*.<sup>3</sup> Following the usual pattern, the disruptive innovations affecting commodity supply chains began with niche markets (e.g., sustainability certifications)—but the underlying ideas of removing deforestation and human rights violations from entire supply chains are now poised to redefine the global commodities industry writ large.

These innovations give reason for hope and should serve as motivation for each of us to do all we can to support continued efforts to break the cycle of agriculture driving deforestation. If we use land more efficiently and manage it more wisely, we can produce enough food and goods to feed our growing global demand without sacrificing the world's forests and the people who depend upon them—and without sacrificing our climate, upon which we all depend.

Chris Elliott, Executive Director  
Climate and Land Use Alliance



Smoke from illegal forest fires on the Indonesian island of Sumatra engulfs Singapore, resulting in record levels of pollution well-beyond the threshold deemed hazardous to human health (June 19, 2013).

## Executive Summary

The global economy depends on a vast and mostly invisible web of trade in international agricultural commodities—the \$1.4 trillion annual business in products like soy, beef, paper, and palm oil that are vital inputs to the food and consumer goods in our daily lives.<sup>4</sup> For generations, the formula for success in producing agricultural commodities was simple: More land in production equals more profit. Long ago, in pursuit of that success, Europeans and North Americans cleared huge swaths of forests, at the expense of indigenous peoples and the environment. That business model subsequently spread to developing countries, allowing commodity-based products to become abundant and relatively affordable throughout much of the world.

But the social and environmental costs have been high and, thanks to new technologies and increasing global interconnectedness, they are less hidden

than before. New agricultural lands have come at the expense of vulnerable, forest-dependent indigenous populations, pushing them off their lands and into poverty. Each year deforestation, mostly driven by the expansion of commercial agriculture, is adding more carbon pollution to the atmosphere than all the world's cars, trucks, ships, trains, and airplanes combined. And this forest destruction is a major factor in global biodiversity loss.

These previously hidden costs of doing business are increasingly unacceptable and unnecessary. Indigenous groups and a growing consumer movement are pushing back, supported by a broad array of nongovernmental organizations (NGOs). In response, forward-thinking companies and governments are changing the rules of the marketplace by committing to produce and purchase only commodities that do not harm forests and forest-dependent people.

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Traditional  
harvesting of açai,  
an economically  
important fruit  
native to Amazonian  
floodplain forests.



And communities that depend on forests are pledging to protect their forests from encroachment, and asking for support to do so.

In some cases, these agents of change—indigenous peoples, activist NGOs, brand-name corporations, and progressive governments—are gaining ground and are nearing a tipping point for transforming the way food and consumer goods are produced. The story of how these strange bedfellows are transforming this trillion-dollar industry is still evolving. From the Amazon to Indonesia, this white paper describes the story behind the unfolding transformation in the global commodities business, highlighting the agents of change that are reshaping the industry. It also examines what needs to happen to fully transform the global marketplace.

During the past decade, Brazil has achieved enormous reductions in deforestation in the Amazon while actually increasing commodity production, rural living standards, and farm incomes—a paradigm shift from the old business model. Brazil's success could spread to Southeast Asia and Africa, thanks to new progress in the palm oil industry—where over 60 percent of global trade is now controlled by companies that have committed to eliminating deforestation and human rights violations from their supply chains. These pledges, mostly made since December 2013, are from companies with \$30 billion in annual palm oil sales. Implementing these commitments by 2020 would reduce global warming pollution by the same amount as taking more than 400 million cars off the road for a year.<sup>5</sup>





These Amazonian giants, the Brazil nut tree, only thrive in natural forests, and when trees are cut down around them, they no longer produce.

Many more companies must commit to ending deforestation and human rights violations. Those that have already made the commitment need to turn words into action, and provide credible, independent evidence of implementation.

Governments must get serious about resolving unclear, overlapping, and unenforced land tenure systems, and they need to help mediate conflicts between companies and communities. Commodity-importing countries need to adopt and enforce regulations to exclude from their domestic markets those commodities that are illegally produced in ways that harm people and forests. And indigenous peoples and local communities need to continue to build political and technical capacity to defend their rights.

Many challenges lie ahead, but the disruption of the global commodities business has begun. Business laggards that are unable or unwilling to embrace the new demands and opportunities of the 21st century will lose out, as they have in other disrupted industries. But the private sector, governments, civil society, and indigenous leaders can work together toward a world where the high but previously hidden costs of commodity production appear on the balance sheet and are finally eliminated.

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## A Defining Moment

Three fundamental global challenges are converging to make the 21st-century transformation of the commodity business essential.

**Growing middle class.** The world's population will top 8 billion by 2025, and 9.6 billion by midcentury.<sup>6</sup> By 2030, at least half these people will be middle class.<sup>7</sup> By 2050, two-thirds of them will live in cities, and in the developing world.<sup>8</sup> Like their counterparts in developed countries, the new middle class will eat more food, with a much higher proportion of protein, fats, and sugar.<sup>9</sup> Global food consumption increased more than 20 percent from 1961 to today, and is projected to increase nearly as much again by 2050.<sup>10</sup>

**Significant inequality and injustice.** Even with a rising middle class, income inequality in the developed world rose 10 percent between the 1980s and the late 2000s.<sup>11</sup> Globally, the wealthiest 20 percent of the population enjoys more than 70 percent of total income.<sup>12</sup> In developing nations, forest-dependent communities are often the poorest of the poor and have few legal rights. In tropical forests, where many indigenous peoples still live, most do not have a clear title to the lands that have been theirs for centuries.<sup>13</sup> Although, globally, over 50 laws clarifying these rights have passed since 1992, progress has been concentrated in just a few countries and has slowed in recent years.<sup>14</sup> Today, indigenous peoples and local

communities have formal, legally recognized rights to just one-eighth of the world's forests.<sup>15</sup> Those who lack official rights to their lands and resources are often marginalized and face significant poverty. Traditional communities and indigenous peoples are also increasingly under attack; in 2012, 147 grassroots environmental activists were killed defending their land and resources, nearly three times as many as in 2002.<sup>16</sup> In 2014, these activists are being killed at the shocking rate of two per week.<sup>17</sup> Forest dwellers are often powerless to protect their rights when confronted by well-capitalized and well-connected companies.

### **Urgent global environmental crises.**

During the past decade, about 13 million hectares of forest have been lost each year—an area equivalent to circling the equator with soccer fields laid end to end 47 times over.<sup>18</sup> Commercial agriculture was by far the top driver of forest loss between 2000 and 2012, directly accounting for 71 percent of tropical deforestation worldwide.<sup>19</sup> Deforestation accounts for approximately 12 percent of global carbon dioxide emissions.<sup>20</sup> Stopping deforestation is one of the most cost-effective climate solutions and is essential to meeting the internationally agreed goal of limiting global warming to no more than 2 degrees Celsius. It would also help protect our planet's most biodiverse ecosystems.<sup>21</sup> Growing evidence also indicates that large forest regions, such as the Amazon,





Forests are cleared and burned to make way for oil palm plantations.

regulate rainfall—and that losing these forests would undermine global food production.<sup>22</sup>

The implications are clear: Global agriculture is on an unsustainable path. Unless there is a major change in how commodities are produced, deforestation

will accelerate to provide more land for agriculture to feed the rising middle class, which in turn will create more income inequality, injustice, global warming, and biodiversity loss. But the potential for change is real—and in some places it is already happening.

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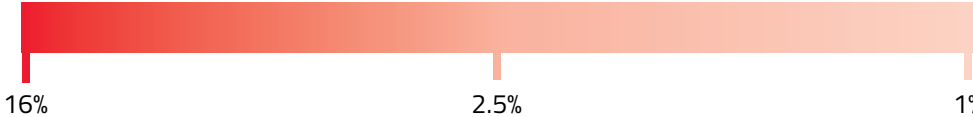
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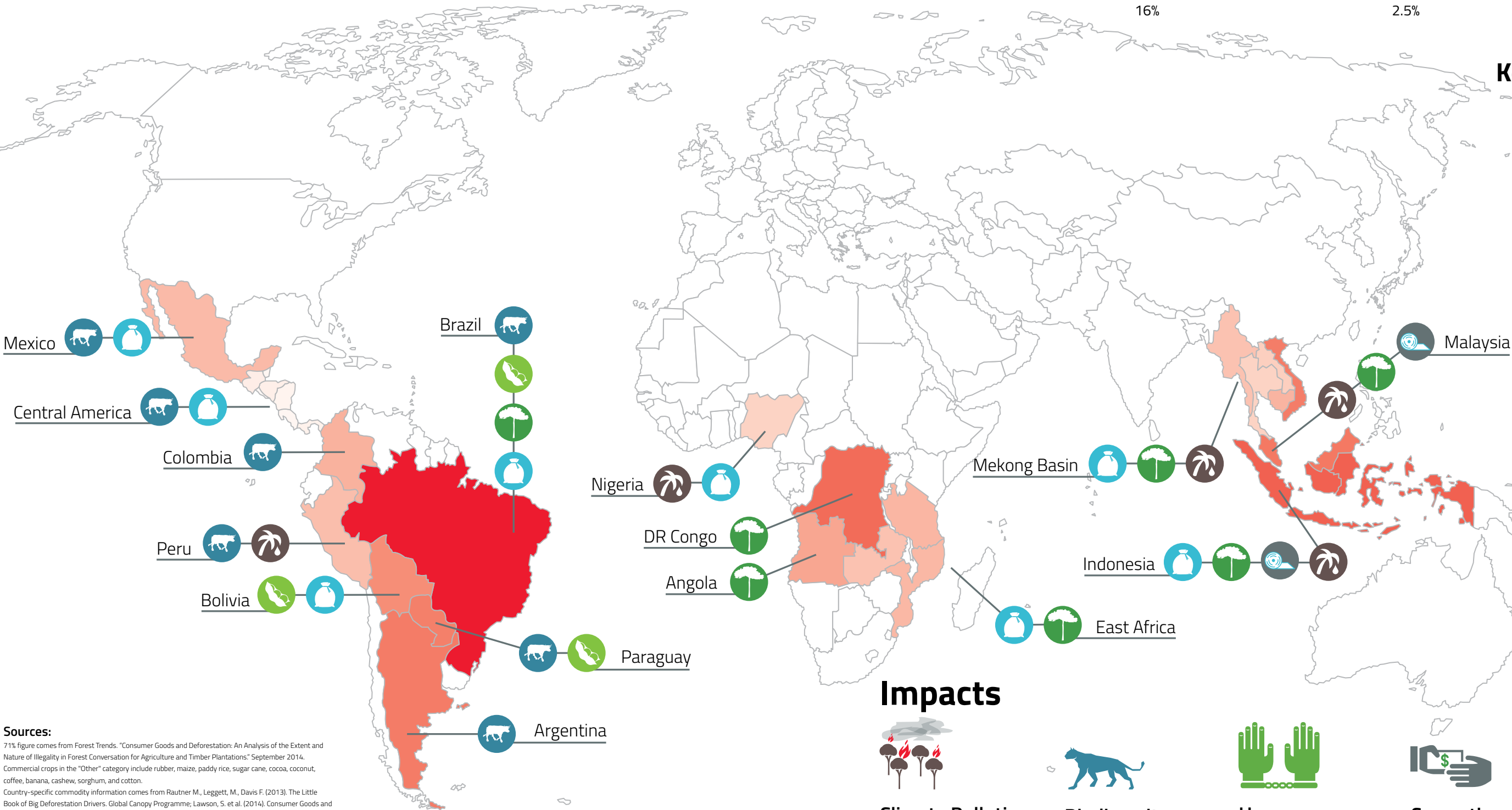
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# Commercial agriculture drives 71 percent of tropical deforestation

Forest Area Loss as % of Total Tropical Forest Loss, 2010-2012  
(darker countries are responsible for a higher percentage of tropical forest loss)



## Key Commodities:



## Sources:

71% figure comes from Forest Trends. "Consumer Goods and Deforestation: An Analysis of the Extent and Nature of Illegality in Forest Conversion for Agriculture and Timber Plantations." September 2014. Commercial crops in the "Other" category include rubber, maize, paddy rice, sugar cane, cocoa, coconut, coffee, banana, cashew, sorghum, and cotton. Country-specific commodity information comes from Rautner M., Leggett, M., Davis F. (2013). The Little Book of Big Deforestation Drivers. Global Canopy Programme; Lawson, S. et al. (2014). Consumer Goods and Deforestation: An Analysis of the Extent and Nature of Illegality in Forest Conversion for Agriculture and Timber Plantations. Forest Trends; European Commission. (2013). The impact of EU consumption on deforestation: Comprehensive analysis of the impact of EU consumption on deforestation. Study funded by the European Commission, DG ENV, and undertaken by VITO, IIASA, HIVA and IUCN NL.

1. Houghton 2013 and Hansen 2013  
2. <http://www.worldwildlife.org/habitats/forests>  
3. [http://www.globalwitness.org/sites/default/files/library/Deadly Environment.pdf](http://www.globalwitness.org/sites/default/files/library/Deadly%20Environment.pdf); [http://www.forestpeoples.org/sites/fpp/files/publication/2012/05/forest-peoples-numbers-across-world-final\\_0.pdf](http://www.forestpeoples.org/sites/fpp/files/publication/2012/05/forest-peoples-numbers-across-world-final_0.pdf)  
4. The status of information on corruption in the forestry sector. 2010. <http://www.u4.no/publications/the-status-of-information-on-corruption-in-the-forestry-sector/>  
5. <http://link.springer.com/article/10.1007%2Fs11135-011-9513-2>; The political economy of reforestation and forest restoration in Asia-Pacific: Critical issues for REDD+; Biological Conservation, <http://www.sciencedirect.com/science/article/pii/S0006320712001632>; Potential Legality Issues from Forest Conversion Timber, Forest Trends, [http://www.forest-trends.org/documents/files/doc\\_4137.pdf](http://www.forest-trends.org/documents/files/doc_4137.pdf)  
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Climate and Land Use Alliance, Disrupting the Global Commodity Business, September 2014.

## Impacts



### Climate Pollution

Forest loss, mostly for agricultural commodities, is responsible for the same amount of climate pollution as up to a billion passenger vehicles every year.<sup>1</sup>



### Biodiversity Loss

80 percent of the world's known terrestrial species are found in tropical rainforests. Deforestation destroys the habitat these species depend on.<sup>2</sup>



### Human Rights Abuses

Since 2002, over 900 activists were killed protecting land and environmental rights. 1.6 billion people depend on forests to support their livelihoods.<sup>3</sup>



### Corruption

The "resource curse" of corruption threatens local communities that depend on forest resources, undermines legitimate business, and steals government revenue.<sup>4</sup> In one example, a major Indonesian forest fund lost \$5.2 billion to corruption throughout the 1990s.<sup>5</sup>



### Illegality

49 percent of tropical deforestation is due to illegal conversion for commercial agriculture.<sup>6</sup>



## Amazon Paradigm Shift

On February 12, 2005, a nun named Dorothy Stang was murdered in broad daylight as she walked to a community meeting in the rural municipality of Anapu, Brazil. Born in Ohio, but a naturalized Brazilian citizen, she had lived for 30 years in the Amazon as a humble, tireless advocate for the region's rural poor, seeking to protect the forests upon which they depend.<sup>23</sup> She had received many death threats from criminal gangs working for large ranchers, who were illegally expelling subsistence farmers from their traditional lands and destroying forests so they could graze their cattle on an industrial scale.<sup>24</sup> Sister Dorothy's murder is part of the story that prompted the Brazilian government to reduce deforestation in the Amazon at a previously unimaginable scale and speed.

Spanning nine countries in South America, the Amazon Basin is nearly the size of the continental United States. Most of that area lies within Brazil, and it constitutes 60 percent of the nation's territory. Since 1988, the Brazilian space agency has reliably reported the country's annual deforestation rates using advanced satellite imagery. From 1998 to 2004, deforestation in the Brazilian Amazon consistently increased, in step with rising global demand for beef and soy—for which, respectively, Brazil is the world's number one and number two exporter. But after a peak in forest clearance in 2004, that relationship reversed. Deforestation dropped, and

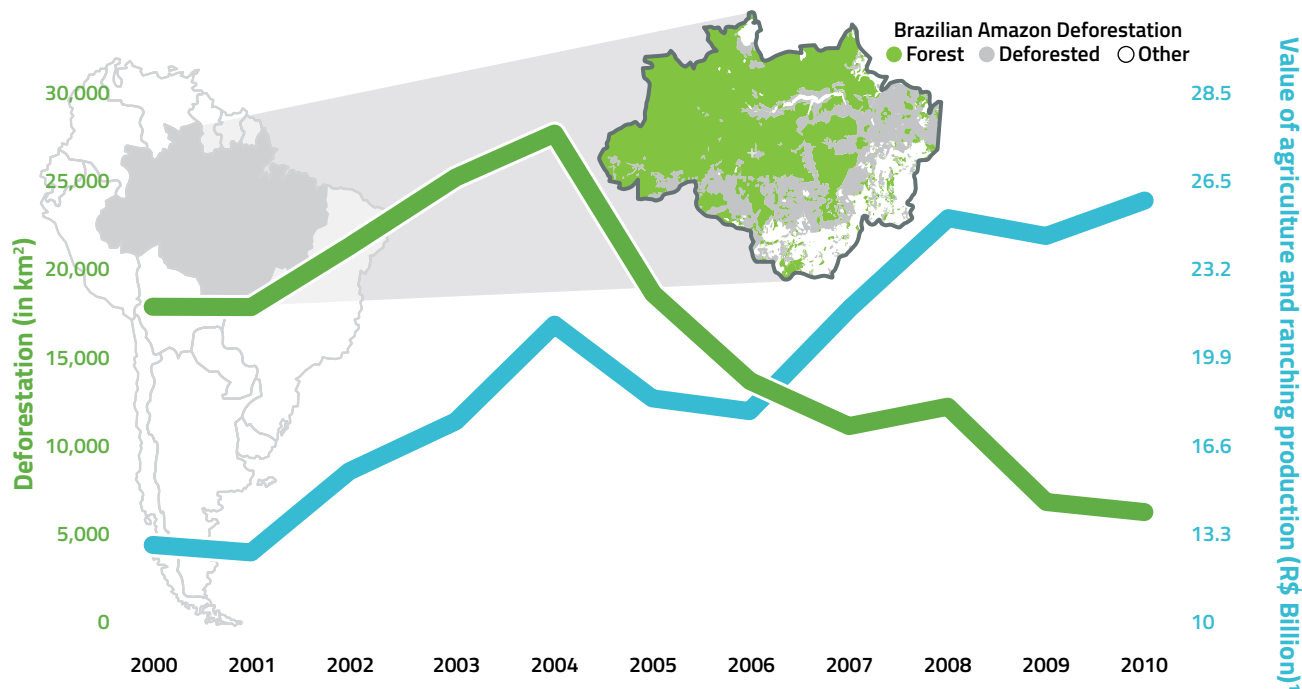
when agricultural prices and production rose, it continued to decline. The overall drop in deforestation in the Brazilian Amazon has been huge; in 2013, deforestation was 70 percent less than the annual average between 1996 and 2005.<sup>25</sup> The resulting reduction in greenhouse gas emissions from deforestation amounts to the largest decrease in climate pollution achieved by any country to date.<sup>26</sup> And Brazil achieved these reductions in deforestation while increasing productivity, farm incomes, and rural livelihoods in its Amazon region during this same period.<sup>27</sup>

Dozens of activists for the rural poor have been assassinated in the region in recent decades.<sup>28</sup> Yet, because Dorothy Stang was a nun from the USA, her murder gained a level of international attention not seen since the killing of rubber tapper leader Chico Mendes 25 years ago. International outrage combined with growing domestic calls for change—both to end the destruction of the Amazon, and to combat the lawlessness and social injustice associated with deforestation. Brazil's national government responded rapidly, forcefully, and strategically. Within days, thousands of army troops were dispatched to the region to halt the violence and prevent chaos. In rapid succession, new protected areas were created by presidential decree to stop wanton commodity speculation and land clearing in formerly undesignated forest areas, and to





## Agricultural Production Uncouples from Deforestation



### Paradigm Shifters



**Mobilization of Civil Society:** Brazilian NGOs and social movements mobilize and coordinate to pressure government and the private sector to address deforestation in the Amazon.<sup>2</sup>



**Monitoring and Enforcement:** "Whole-of-government" approach to control deforestation—including real-time satellite imagery, coordinated policy action against environmental crimes, high-profile prosecutions of corruption and fraud, and black-listing of the worst municipalities.<sup>3</sup>



**Legal Designation of Indigenous Territories and Protected Land:** More than half of the Brazilian Amazon under legally protected status by the end of 2020, including over 1 million square kilometers reserved for indigenous communities.<sup>4</sup>



**Zero-Deforestation Commodities:** Highly successful sectoral moratorium on deforestation for soy production since 2006. Beef moratorium initiated in 2009.<sup>5</sup>

1. Barreto, P. and Silva, D. (2013). How can one develop the rural economy without deforesting the Amazon? Amazon Institute of People and the Environment (IMAIZON). Belém, PA, Brazil. 2. D. Boucher et al., "Deforestation Success Stories: Tropical Nations Where Forest Protection and Reforestation Policies Have Worked," Union of Concerned Scientists, 2014. Retrieved September 9 from <http://is.gd/deforestationstories>. 3. Dozens held over Amazon destruction. (June 03, 2005). The Guardian. Retrieved August 21, 2014, from <http://is.gd/guardianamazon>. 4. Boucher, D., Elias, P., Faires, J., Smith, S. (2014). 5. (Nepstad, D., McGrath, D., et al. (2014); Boucher et al. (2011).

safeguard the livelihoods of traditional communities.

In April 2006, global attention again focused on the Amazon, when Greenpeace documented that soybeans harvested from illegally deforested properties in Brazil's Amazon region had

penetrated global supply chains, making their way into name-brand products—notably, into feed consumed by chickens that were ultimately processed into McNuggets for McDonald's.<sup>29</sup> Under pressure, consumer goods companies, including McDonald's—along with major commodity traders like McDonald's

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supplier Cargill—called for a moratorium on clearing Amazon forests for soy production.<sup>30</sup> Within a few months, Brazil's two major soybean trade associations announced that their members would not buy soybeans produced on Amazon farmland deforested after July 24, 2006.<sup>31</sup> The impact was swift. By 2010, only 0.25 percent of Amazon deforestation came from soybean expansion into forest areas covered by the moratorium,<sup>32</sup> accounting for just 0.04 percent of the total soybean crop in Brazil.<sup>33</sup> This soy moratorium, as it is known, has been renewed annually—but its continuation beyond 2014 is in doubt. Ultimately, the moratorium succeeded because, in the words of Greenpeace's Paulo Adario, "companies worldwide demanded it, knowing that their customers would not want to buy products linked to Amazon rainforest destruction."<sup>34</sup>

As part of the government's push to prevent and control deforestation, Brazil's federal prosecutors initiated several high-profile cases against some of the most egregious perpetrators of illegal clearing. For example, in 2005, prosecutors in Mato Grosso state arrested 85 people, including 48 government officials, in the largest single enforcement action against environmental crime to date in Brazil's history.<sup>35</sup> Prosecutors also pursued civil actions against ranchers who were deforesting illegally, and against the meatpacking plants that purchased their cattle. Supermarket chains were advised to avoid buying from those plants.<sup>36</sup> Timber

harvested illegally and cattle grazed within protected areas were confiscated. In July 2009, increased pressure from civil society and federal prosecutors led Brazil's major cattle distributors and processors to follow the soy example and announce a moratorium on the purchase of beef from any ranch that expanded grazing land at the expense of forests.<sup>37</sup> Federal prosecutors also helped end land-related conflicts and took legal action against illegal encroachment into forests set aside for indigenous communities.

In a particularly innovative approach, combining enhanced enforcement actions and a suspension of access to credit, 43 municipalities with historically high deforestation rates were targeted for special measures; this policy alone saved thousands of square kilometers of forest and kept over 100 million tons of carbon dioxide out of the atmosphere.<sup>38</sup>

At the end of 2009, Brazilian president Luis Inácio Lula da Silva signed new national climate change legislation that included the goal of reducing deforestation in the Amazon region 80 percent by 2020.<sup>39</sup> By the end of his term in office, more than 50 percent of Brazil's Amazon forest was under some form of legal protection, with nearly half reserved for indigenous communities.<sup>40</sup> These lines on the map made a difference. New legally protected areas created during the Lula administration were responsible for over a third of the decline in deforestation.<sup>41</sup> The data clearly show that when indigenous peoples and local



communities have secure legal rights to manage their forests, deforestation rates are significantly reduced. From 2000 to 2012, forest clearing in Amazonian indigenous lands was only 0.6 percent, compared with 7 percent (more than 10 times higher) on neighboring lands. Recent analysis indicates that indigenous peoples in Brazil have done a better job of protecting their

forests than any other group, despite also facing the strongest deforestation pressures.<sup>42</sup> Government enforcement of indigenous lands rights helped make this possible.<sup>43</sup> Closing the forest frontier to further expansion of commodity production has already helped catalyze investments to make agriculture more productive without new forest destruction.

### SUSTAINING BRAZIL'S MOMENTUM

The decline of deforestation in the Brazilian Amazon has been rapid and dramatic, but its durability remains an open question. Brazilian agribusiness is debating the future of the soy moratorium, currently set to expire in January 2015.<sup>44</sup> Many in the soy industry argue that the sharp decline in deforestation over the past several years means that the moratorium is no longer necessary. But major soy buyers—including McDonald's, Carrefour, Nestlé, Tesco, Ahold, Marks & Spencer, Waitrose, Sainsbury's, and Asda—supported by NGOs, are pushing to extend the moratorium beyond 2014 and keep Amazonian soy deforestation-free.

In 2013, Amazon deforestation rose by 27 percent, following a revision of Brazil's Forest Code that included amnesty for companies and individuals involved in illegal deforestation. This year, the protection of indigenous lands could be undermined by a bill moving through Brazil's National Congress. Deforestation continues to increase outside the Amazon region, particularly in the cerrado, Brazil's wooded savanna, where commodity expansion advances unabated.

A group of eminent Brazilian scientists from a diverse range of research institutes, universities, and government agencies recently concluded that the current productivity of Brazil's pasturelands is only a third of their potential, and that increasing their productivity to just half their potential would allow growth in demand for meat, crops, wood products, and biofuels to be met at least until 2040, without any further deforestation.<sup>45</sup> These issues have yet to emerge as political priorities in Brazil's upcoming elections. But sustaining Brazil's progress, and consolidating the Amazon paradigm shift, will require continued leadership from government, the private sector, and civil society.

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## Progress in Palm Oil

### FROM LAGGARD TO LEADER

Palm oil is an inexpensive and highly versatile oil derived from the fruit of the oil palm tree, a native of West Africa's tropical forests. It is found in half of all consumer goods on the shelves today in Western grocery stores, from chocolate, ice cream, and baked goods to soaps, lotions, and detergents.<sup>46</sup> Palm oil is also used as a petroleum substitute (a biofuel) to power vehicles, heat homes, and manufacture plastics. Palm oil plantations produce more useful oil per unit of land than any other crop.<sup>47</sup> Due to its high yields and many uses, palm oil is the most actively traded edible oil in the world, with 90 percent of its global production traded on the world market.<sup>48</sup>

And with annual sales of \$50 billion, palm oil is big business.<sup>49</sup> Indonesia and Malaysia have expanded plantations and tripled production over the past 15 years, and today account for 85 percent of global production.<sup>50</sup> In Sub-Saharan Africa, large-scale palm oil production is growing rapidly and cash-strapped countries are jumping on the bandwagon, as demand is expected to grow.<sup>51</sup>

For decades, however, the palm oil business has been criticized for its links to corruption, social injustice, and deforestation.<sup>52</sup> In Southeast Asia, government officials award oil palm growers legal rights to clear forests, often in exchange for bribes, and generally without regard for the customary rights of people living within affected

areas. Companies exploit confusing, contradictory, and unclear regulations related to land ownership. To make way for plantations, palm oil companies often force indigenous peoples and other forest dwellers off their land, and sometimes use slave and child labor.<sup>53</sup> In 2012, 59 percent of the Indonesia's 1,000 palm oil companies were linked to land conflicts with local communities.<sup>54</sup> Forest clearing for palm oil, including in peatlands, has pushed iconic species like Bornean orangutans and Sumatran elephants and tigers to the brink of extinction, and has added hundreds of millions of tons of carbon pollution to the atmosphere.<sup>55</sup>

To the extent that the palm oil industry paid attention to concerns about deforestation or the exploitation of vulnerable communities, it responded with mostly cosmetic measures.<sup>56</sup> Occasionally, some companies did the right thing.<sup>57</sup> But mostly, business as usual moved plenty of money into the pockets of well-placed palm oil executives, bankers, and corrupt officials. Governments promoted or tolerated this "collateral damage" in the name of economic development. Yet—contrary to public opinion—in Indonesia the entire plantation sector contributes only 2 percent of gross domestic product (GDP), despite massive public subsidies.<sup>58</sup>

But change is on the horizon. In the past year, the palm oil sector has experienced unprecedented progress. During the first



Although the Government of Indonesia declared Tesso Nilo a national park in 2004, it remains under constant threat of fire, illegal logging, and encroachment by oil palm plantations.

nine months of 2014, led by some of the most unlikely converts, a number of major multinational agricultural powerhouses—collectively controlling roughly 60 percent of global palm oil trade<sup>59</sup>—have made unprecedented commitments to break the link between palm oil and deforestation, while also protecting the rights of local communities. As Paul Polman, chief executive officer of Unilever, has said: “It only takes a handful of sizable companies to reach a tipping point and to transform markets.”<sup>60</sup>

## GLOBAL PRESSURE

For decades, environmental activists around the world have been pressuring consumer products companies to demand more sustainable business practices from palm oil suppliers. These consumer companies—such as Unilever, Nestlé, and Kellogg’s—use palm oil in the familiar brands they sell to big retailers, like Walmart and Safeway.

In 2004, the environmental group WWF teamed with palm industry companies to form the Roundtable on Sustainable Palm Oil (RSPO). RSPO was established as a self-governing body to set voluntary standards that companies could follow and to certify sustainable practices within the industry. RSPO currently has more than 1,000 members, including three dozen nongovernmental organizations. Some RSPO member companies have improved their policies and practices, but RSPO has been slow to act and its standards have not been strong. Many leading environmental and social justice organizations now consider RSPO an unacceptable lowest-common-denominator standard that provides rogue companies with an excuse for not taking stronger action. In April 2013, WWF itself declared RSPO’s standards insufficient for achieving sustainability.

In 2010, Greenpeace turned up the pressure on the palm oil industry with a media campaign designed to force reforms at Golden Agri-Resources (GAR),

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## CONSUMER GOODS FORUM

The Consumer Goods Forum is made up of some of the world's largest and best-known consumer-facing companies, including Walmart, Coca-Cola, Nike, Unilever, and Nestlé. It is a forum for consumer companies to discuss issues of mutual concern and to advocate for their collective interests. In 2010, the Forum pledged to eliminate deforestation from its supply chains by developing "specific, time-bound, and cost-effective action plans for the different challenges in sourcing commodities like palm oil, soya, beef, paper, and board in a sustainable fashion." It also established sourcing guidelines for paper in 2013 and soy in 2014.<sup>68</sup> Implementation of the guidelines is up to each of the member companies and, while some are leading, many are still lagging behind.

a leading palm oil company. Greenpeace's first major target was Nestlé, which used palm oil in everything from chocolate bars to infant formula.<sup>61</sup> Greenpeace sponsored protests—including orangutan-suited demonstrators at Nestlé headquarters and a campaign video showing office workers biting into a Kit Kat bar, only to discover a bloody orangutan finger inside the chocolate wafer. In response to the negative publicity and a dip in its share price, Nestlé stopped contracting with GAR.<sup>62</sup> Worried about losing a major customer and also facing growing investor pressure for reform, GAR hired The Forest Trust (TFT), a technical advisory group focused on supply chain management, to help develop a new sustainability policy. On February 9, 2011, GAR became the first major Asian palm oil grower to pledge to eliminate deforestation from its own palm plantation business.

Meanwhile, Western governments have also taken note of troubling practices in the palm oil industry. Faced with mounting evidence of environmental and social problems, Europe (2009) and the United States (2012) both imposed strict sustainability requirements on palm oil-based biofuels.<sup>63</sup> And because the demand for biofuels is expected to significantly increase, these regulatory actions have created strong economic incentives for reforms across the industry.<sup>64</sup> Governments are also pressing for more sustainable edible palm oil. In 2010, trade bodies in the Netherlands committed to purchase only RSPO-certified palm oil by the end of

2015.<sup>65</sup> The UK followed suit in 2012, in an announcement made jointly with 14 trade associations and NGOs. The UK's pledge broke new ground by explicitly including palm oil procured by the UK government.<sup>66</sup>

Although a few governments took action, the private sector remained the engine of change. In 2010, the Consumer Goods Forum—an industry association representing companies with more than \$3 trillion in annual revenues, equivalent to the GDP of France—pledged to eliminate deforestation from its supply chains and achieve "zero net deforestation" by 2020.<sup>67</sup>

In addition, a number of socially responsible investors have turned their attention to the palm oil industry's contribution to climate change, human rights abuses, and biodiversity loss. In 2009, the International Finance Corporation (IFC) temporarily suspended investments in palm oil businesses following allegations of environmental and social abuses in Indonesia by two of Wilmar's subsidiaries (see "The Turnaround", page 18). Since then, a number of banks have adopted specific lending policies for palm oil or agribusiness projects. These include BNP Paribas,<sup>69</sup> Citi,<sup>70</sup> Credit Suisse,<sup>71</sup> ING,<sup>72</sup> Rabobank,<sup>73</sup> and Standard Chartered.<sup>74</sup> In April 2013, Norway's sovereign wealth fund—the world's largest—announced zero tolerance for investments in deforestation and social conflict and divested from 23 palm oil companies because of their unsustainable business practices.<sup>75</sup>





## REFORMS IN SOUTHEAST ASIA

International pressure to reform the palm oil industry has been matched by simultaneous calls for change emanating from parts of Southeast Asia, particularly Indonesia and Singapore.

Indonesia is both the world's largest producer and consumer of palm oil. It is also one of the world's largest emerging democracies, most rapidly evolving societies, and most swiftly growing economies. Indonesia's recent efforts to tackle corruption, social injustice, and environmental damage in the forest and palm oil industries represent in microcosm the larger challenges the country faces.

Every year, across the Indonesian archipelago companies and farmers set fire to forests to clear lands for palm oil plantations and other types of agriculture.<sup>76</sup> The haze from these Indonesian fires, which is dangerous to breathe, settles on rich and poor alike—creating record levels of pollution not only in Indonesia but also in neighboring Malaysia and Singapore.<sup>77</sup> In 2011, in response to domestic concern about haze and international pressure to fight climate change, Indonesia's president, Susilo Bambang Yudhuyono, imposed a two-year moratorium on the issuance of most new licenses to clear forests. Not surprisingly, palm oil companies actively lobbied against the moratorium. They succeeded in weakening it, but they could not stop its adoption.

At the same time, Indonesia also pursued substantial social reforms. Following an unprecedented commitment in 2011 from the Indonesian government to respect indigenous rights, a landmark Constitutional Court ruling in 2013 recognized, for the first time, the legal rights of Indonesia's 70 million indigenous peoples to their customary lands and forests.<sup>78</sup> Until this ruling, these forests were as a matter of law considered state-owned lands, despite having served for centuries as the homes of traditional peoples. In practice, the court's ruling made it harder for government officials to authorize new permits for deforestation, by the palm oil companies or anyone else, in areas where forest communities live. Following pressure from indigenous peoples, this ruling was followed in 2014 by the launch of a national inquiry by the Human Rights Commission into violations of indigenous peoples' traditional rights over the forests they have inhabited for generations.<sup>79</sup> In the words of Abdon Nababan, secretary-general of the Indigenous Peoples' Alliance of the Archipelago in Indonesia, "Forest for indigenous peoples does not solely serve as an economic resource but it is indeed the center of spiritual life and cultural integration of indigenous peoples."<sup>80</sup>

In parallel, Indonesia's financial powerhouse neighbor, Singapore, also pressed for changes in the way palm oil companies operate. In 2013, during the height of the seasonal forest fires in Indonesia, the prevailing winds uncharacteristically carried the harmful smoke from

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Indonesia across the narrow Malacca Strait to Singapore, closing hundreds of schools and businesses, and canceling flights to and from this Asian business hub—at a cost of billions of dollars.<sup>81</sup> The local pollution index hit an all-time high at a level classified as life threatening to ill and elderly persons.<sup>82</sup>

The normally politically reticent Singaporean public strongly criticized the companies that were complicit in the Indonesia fires and insisted on action.<sup>83</sup> In response, the Government of Singapore introduced a bill to hold companies that operated in Singapore liable for harmful air quality, regardless of whether the air pollution they caused occurred inside or outside Singapore.<sup>84</sup>

By mid-2013, the combined strength of domestic, regional, and global pressure for reform had set the stage for rapid progress in the palm oil industry.

### THE TURNAROUND

Remarkably, the story of how this intense pressure changed the global palm oil industry runs through the experience of one dominant company, Wilmar International. Founded in 1991, Wilmar is a big player in the global soy and sugar markets; but in palm oil, the company is the undisputed king. It alone controls 45 percent of the global palm oil market.<sup>85</sup> More than 80 percent of palm oil growers, over 400 suppliers, sell to Wilmar.<sup>86</sup> For palm oil producers, the math is simple: Wilmar gives them access to global markets. Without

Wilmar, these producers risk market isolation and financial ruin.

Until recently, Wilmar had a poor record on deforestation, community rights, and climate change. Like many companies in the palm oil industry, Wilmar had embraced RSPO's lowest-common-denominator approach. In 2008, Wilmar became one of the first companies to begin RSPO certification of its plantations and mills and in the years that followed, it certified an ever-growing share of its operations as RSPO-compliant.<sup>87</sup> But, in 2011, the World Bank confirmed that Wilmar's plantations had evicted poor families from their homes and bulldozed the homes down into nearby creeks;<sup>88</sup> in response, the World Bank's private financing arm suspended its investments in the palm oil sector. In 2012, Wilmar came in dead last in *Newsweek* magazine's ranking of the environmental performance of the world's 500 largest companies.<sup>89</sup> That year, at least one indigenous community in Indonesia organized around-the-clock surveillance of its remaining forests to protect itself from encroachment by Wilmar's plantation bulldozers.<sup>90</sup> In June 2013, WWF reported that Wilmar had purchased palm oil fruits harvested from illegally cleared land within Indonesia's Tesso Nilo National Park.<sup>91</sup> In July 2013, Wilmar's response was merely to reaffirm its commitment to the inadequate RSPO standards.<sup>92</sup>

However, less than six months later, Wilmar would undergo a dramatic conversion. On December 5, 2013,



# Cascade of Corporate Commitments to Zero-Deforestation Palm Oil

## Top-Tier\*



In **2011**, Nestlé announced the first zero-deforestation commitment



**December 6, 2013<sup>1</sup>**



**December 18, 2013<sup>2</sup>**



**February 14, 2014<sup>3</sup>**



**February 28, 2014<sup>4</sup>**



**March 12, 2014<sup>5</sup>**



**March 24, 2014<sup>6</sup>**



**March 25, 2014<sup>7</sup>**



**May 1, 2014<sup>8</sup>**



**May 26, 2014<sup>9</sup>**



**June 4, 2014<sup>10</sup>**



**July 29, 2014<sup>11</sup>**



**August 1, 2014<sup>12</sup>**

## Second-Tier



**December 11, 2013<sup>13</sup>**



**January 30, 2014<sup>14</sup>**



**February 17, 2014<sup>15</sup>**



**February 21, 2014<sup>16</sup>**



**March 20, 2014<sup>17</sup>**



**March 24, 2014<sup>18</sup>**



**April 9, 2014<sup>19</sup>**



**May 23, 2014<sup>20</sup>**



**August 18, 2014<sup>21</sup>**

\* Top tier commitments contain more immediate, measurable and stringent environmental and social standards.

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3. <http://bigstory.ap.org/article/kellogg-use-environmentally-friendly-palm-oil>
4. <http://news.mongabay.com/2014/0303-gar-palm-oil.html>. In 2011, GAR committed to a zero-deforestation policy for the palm oil it grows; its 2014 policy extends that standard to the palm oil it trades.
5. <http://www.mars.com/global/press-center/press-list/news-releases.aspx?Siteld=94&Id=5548>
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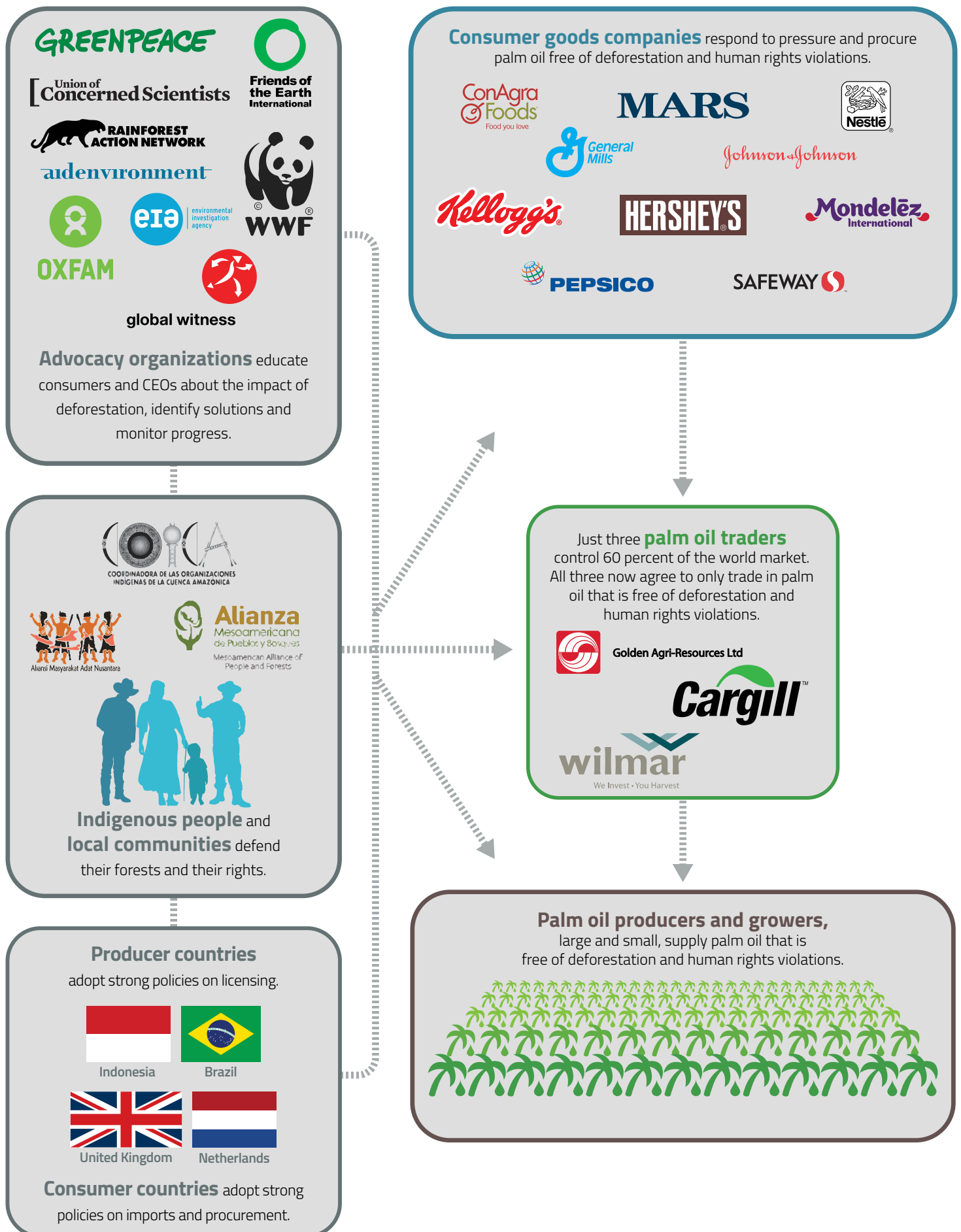
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# The Palm Oil Transformation: Agents of Change





Wilmar announced a groundbreaking commitment to “No Deforestation, No Peat, No Exploitation” sourcing.<sup>93</sup> Its commitment applied not only to the company’s own extensive plantations but also (and critically) to its third-party suppliers. Wilmar—the palm oil market gatekeeper—would no longer engage in deforestation or buy from companies that did. Its commitment to deforestation-free operations was worldwide, moreover, covering all commodities grown in any country.<sup>94</sup> Wilmar’s announcement was a seismic event for the industry, and the aftershocks are still reverberating through the supply chain.

How did this turnaround happen? According to Wilmar’s founder and chairman, Kuok Khong Hong, sometime in early 2013 Wilmar recognized that environmental NGOs were going to intensify their attacks on the company and that its largest customers in its most lucrative markets (Europe and the United States) were going to eliminate unsustainable palm oil from their supply chains by 2020, in line with the Consumer Goods Forum’s pledge.<sup>95</sup>

Wilmar was also deeply affected by public criticism at its Singapore headquarters over Indonesia’s forest fires and the harmful haze.<sup>96</sup> Kuok sensed a need to update Wilmar’s image and to renew its implicit license to operate in its own country and region. Unless it reformed, Wilmar faced government fines and civil lawsuits, as well as public shame. In Kuok’s words:

*We did it because having seen the deterioration in the environment in many countries and changes in global climate, we felt something needed to be done and that big corporates must take the lead and work together as never before. Furthermore, consumers globally are moving towards and favoring responsibly produced commodities. The industry must therefore adjust to market needs and expectations if it wants to remain competitive.<sup>97</sup>*

Because of its dominant market position, Wilmar’s commitment reset the expectations for the palm oil business globally. In February 2014, GAR matched Wilmar’s pledge to stop buying from suppliers engaged in deforestation.<sup>98</sup> (GAR’s earlier no deforestation commitment had applied only to its own plantations.) In July 2014, US-based agribusiness giant Cargill announced a similar commitment for palm oil.<sup>99</sup> In little more than six months, more than 60 percent of globally traded palm oil was covered by deforestation-free commitments and community-friendly sourcing policies, signaling a high-level commitment to market transformation. These pledges, the vast majority of which have been made since December 2013, cover \$30 billion in annual palm oil sales. Assuming they are implemented, by 2020 these commitments will reduce global warming pollution by the same amount as taking more than 400 million cars off the road for a year.<sup>100</sup> Environmental advocacy groups tracking corporate implementation of new sustainability commitments in the palm oil sector have highlighted continued

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problems in the supply chain, illustrating the challenges companies like Wilmar face in eliminating deforestation from their businesses.<sup>101</sup>

With palm oil suppliers committing to provide deforestation-free palm oil, watchdogs and campaigners increasing their advocacy, and communities upping their on-the-ground vigilance, many more consumer goods companies have come on board. Within nine months of Wilmar's conversion, Kellogg's, Johnson & Johnson, Hershey's, Safeway, and 16 other consumer goods companies and retailers announced their own responsible sourcing policies for palm oil, and in some cases, for other global agricultural commodities, such as soy, paper, and beef, as well.<sup>102</sup>

In response to requests from major corporate customers, banks have also begun taking action, either by pledging to underwrite sustainable palm oil purchases or by refusing to finance projects associated with deforestation and human rights abuses.<sup>103</sup> The French banking giant BNP Paribas now often seeks independent verification by civil society organizations before approving financing in the palm oil industry.<sup>104</sup> Deutsche Bank recently divested from the Bumitama group in response to the company's deforestation activities.<sup>105</sup> HSBC, which has been a significant financier of palm oil plantations, helped convince GAR to adopt its new sustainability policies in 2011,<sup>106</sup> and strengthened its own sustainability standards in 2014.<sup>107</sup> That same year, following

pressure from the advocacy group Global Witness and local communities, HSBC withdrew banking services from the state of Sarawak, in Malaysian Borneo, due to concerns about money laundering and deforestation.<sup>108</sup>

Investors are also weighing in. Building on the earlier example of Norway's sovereign wealth fund, several other pension funds and institutional investors have either publicly or privately expressed serious concerns about deforestation to Southeast Asian companies. Thus, investors representing over \$350 billions in assets have written to a variety of palm oil companies—most recently the major commodity trader Bunge—pressing them to adopt a deforestation-free sourcing policy.<sup>109</sup>

## NEW GOVERNMENT ACTION

On August 5, 2014, Singapore approved its law against transboundary air pollution. Under this new law, Singapore can impose fines on companies or individuals that cause harmful air pollution, including violators outside Singapore. In addition, Singaporean citizens can bring civil cases against those polluters. In a sign of how much the times have changed, Wilmar actively supported the adoption of this new law.

In Indonesia, the push to disrupt business as usual in the palm oil industry continues to gather steam. President-elect Joko Widodo won by campaigning against corruption. A number of senior Indonesian officials and plantation owners have received multiyear prison



A truck transports harvested oil palms, Sabah, Malaysia.

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Men gather in Boepe village and participate in a mapping exercise in Merauke district, Papua province, Indonesia.



sentences for corruption cases linked to deforestation for palm oil.<sup>110</sup> A comprehensive push for government reform is already beginning to have an impact on land tenure and the palm oil industry.<sup>111</sup> Indigenous people have mapped millions of hectares of their forests, using hand-held geopositioning devices and unmanned aerial vehicles, for inclusion in the government's official One Map initiative, which will clarify and strengthen land rights across the country.<sup>112</sup>

Indonesia is now undertaking a review of its existing forest concessions, many of which were granted illegally. It is stepping up law enforcement by issuing millions of dollars in fines for illegal destruction of forests,<sup>113</sup> and is working with the European Union to support independent monitoring of illegally logged timber shipments and exports.<sup>114</sup>

Recently, the Indonesia Chamber of Commerce called for companies to embrace the Wilmar model.<sup>115</sup> It would have been difficult to predict these

changes in the region in early 2013. For the industry and for the incoming administration, the challenge of translating words into actions remains.

#### **AFRICA: THE PALM OIL FRONTIER**

Transforming the palm oil sector will require change not only in Southeast Asia but also in Africa. In pursuit of new profits and to escape new restrictions in Indonesia, many of the same companies responsible for forest loss and community rights violations in Southeast Asia have set up operations in Africa. Almost 2 million hectares in West Africa and the Congo Basin have been leased to palm growers, and developers are seeking access to another 1.4 million hectares.<sup>116</sup> The problems are familiar. Palm oil plantations are displacing communities in countries such as Liberia and Cameroon and threatening forests and forest-dwelling species.<sup>117</sup> More than half the land licensed for palm oil development is habitat for endangered great apes.<sup>118</sup>



A woman harvests the leaves from Gnetum (okok) in village of Minwoho, Lekie, Center Region, Cameroon. The leaves are used for cooking and medicinal purposes.

New concessions in Africa often overlap with areas where impoverished forest dwellers reside, and in most African countries these vulnerable communities lack legal rights to their customary forests—a problem exacerbated by unclear land tenure arrangements. Communities are often not informed or consulted about new palm oil developments, violating their right to free, prior, and informed consent. Leases are issued to companies for 50 years or more, based on poor surveys that ignore customary rights. Communities are often unclear about the effects of the legal or

contractual obligations into which they enter; whether they have rights to negotiate the distance of planting from their village or household boundaries; what rights of way and access to water or hunting grounds in a closed forest may be blocked off; whether they have the right to compensation for forest resources lost; and about possible plans for resettlement.<sup>119</sup> Countries, companies, and advocates will all need to work together to bring sustainable agricultural development to Africa without allowing the palm oil industry to repeat the mistakes made in Southeast Asia.

# How to feed the world, protect forests, benefit communities and slow global warming



## From Disruption to Transformation

The Amazon paradigm shift and the disruption of the palm oil market invite an audacious question: What would it take to radically transform global agriculture—to feed the world and stock shelves without destroying forests, harming communities, or fueling climate change? The lessons learned from recent experiences suggest that taking commodity sustainability global depends on companies and governments getting a few important things right.

### SUPPLY CHAIN MANAGEMENT

Companies need to get serious about actively managing their supply chains for sustainability and social justice outcomes. Over decades, companies have honed commodity supply chains to

deliver high volumes of relatively affordable and uniform products. Changing course to value not just the intrinsic qualities of the commodities themselves but also the manner in which they were produced will require commodity businesses to undertake fundamental reforms. To lead, individual companies need to start with time-bound commitments to eliminate deforestation and conflict from their supply chains for every commodity they touch in every part of the world. This means that companies must think in new ways about three core business practices.

**Create enforceable contractual obligations.** Companies need to convert

their abstract sustainability commitments into concrete, real-world practices—that is, into contractual obligations, embedded in standard commodity purchase agreements for each and every supplier. Only by contractually requiring suppliers to eliminate deforestation and protect communities will companies succeed in convincing their business partners that they mean business. Companies must also make sure that their commitments apply not only to the commodities they purchase but also to their investments and financial dealings with partner companies and affiliates.

**Insist on transparency and traceability.** To monitor progress and enforce new contractual provisions, companies need to build internal business systems to trace products from their source and to

identify deforestation hot spots in real time. Creating what experts call commodity traceability is the only way to know which specific commodity shipments are free from the taint of deforestation and comply with corporate sustainability policies. To demonstrate compliance with new sustainability policies and harness the power of civil society, companies need to regularly make public their internally audited and third-party-verified progress reports.

**Protect vulnerable communities.** Companies need to work with local communities and the government to resolve existing conflicts over land. They must ensure that future developments take place only with the free, prior, and informed consent of affected indigenous peoples and other vulnerable





Seized illegal logs are marked with police tags, Riau, Sumatra, Indonesia.



communities. And they must be sure that bringing traceability to supply chains does not have the unintended consequence of squeezing out smallholder farmers.

### COMMODITY GOVERNANCE

Transforming the global commodities business and breaking its link with deforestation also depends on policy reforms and better governance of natural resources, in both producer and consumer countries.

**Producer countries need better maps, clearer land rights, and real accountability.** In producer countries, the numerous conflicting rules and regulations related to forests, coupled with secretive decisionmaking, create opportunities for confusion and corruption.<sup>120</sup> Separate, incomplete, and often-conflicting decisions by government agencies mean that many of these countries lack a single, transparent map showing where forests, plantations, communities, indigenous territories, and conservation

areas lie—making it difficult to crack down on illegal producers and organized crime. Land titles and plantation concessions need to be clear, consistent, and publicly available. Governments must resolve overlapping and competing claims to land, formally recognizing the land rights of indigenous peoples and other local communities. This can reduce both inequality and deforestation. To build accountability, governments need to get serious about rooting out corruption by embracing transparency in decisionmaking, utilizing technology-enhanced law enforcement, and prioritizing the collection of the taxes and fees associated with the commodities business.

**Consumer countries need to end support for illegality.** Nations that import global agricultural commodities must do their part by passing laws that prohibit trade in illegally produced timber, paper, and agricultural commodities. Both the United States and Europe already have laws against the





importation of illegal timber and wood products. These laws, combined with improved governance and law enforcement in producer countries, have been enormously effective in reducing deforestation in some places—preventing upward of 100 millions tons of carbon dioxide emissions annually at a cost of less than \$2.50 per ton.<sup>121</sup> Some of the success in cracking down on the

trade in illegal timber can be extended to other commodities, such as denying market access to companies that engage in criminal behavior while sourcing products like soy, beef, and palm oil. Rules to exclude commodities produced on illegally deforested land would remove major economic incentives for illegal deforestation and create fair competition globally.

### RADICAL TRANSPARENCY

The story about disruption as a positive force in the global commodity business continues to unfold around the world, and it is not yet clear how it will end. But it is already abundantly clear that the enhanced access to information that characterizes the 21st century has served as a critical disruptive enabler of much of the recent progress.

In Indonesia, remote sensing technology has enabled both advocates and government reformers to pinpoint fires accurately on satellite maps, and to trace them to specific companies and intermediaries. Global positioning system-enabled smart phones and web-based tools have empowered local communities to document deforestation and mobilize a global advocacy community. The Internet has enabled news concerning government decisions about forests to spread rapidly, and for corruption to be unmasked far more fully and quickly than ever before.

What remains unclear is whether this radical transparency, backed by new corporate commitments, will be enough to overcome entrenched special interests, weak government institutions, and pervasive corruption. While promising, changes in the palm oil industry have yet to turn the tide of deforestation. In Indonesia, for example, deforestation nationally has increased, at least through 2012, even with the moratorium on forest concessions in place.<sup>122</sup> It is also not clear how successfully and quickly companies such as Wilmar can or will impose changes across their supply chains. But the world is watching.



## Conclusion

Until recently, the big business of global agriculture neither recognized nor internalized the social and environmental costs of commodity production. These high costs were borne by displaced indigenous peoples and local communities, and also by the global community through climate change and biodiversity loss. By any honest accounting, the costs on vulnerable people and the planet have been high and unnecessary.

Now, however, the radical transparency created by new technologies is making business as usual in the commodity business untenable. As the societal costs of corporate indifference become far more visible, the global commodity business is poised for a fundamental transformation. The pressure for reform is growing each day, and bad actors have few places to hide. With disruptive innovations, there are losers along with winners.

While it is easy to be cynical about the challenges ahead—the difficulty of reforming a trillion-dollar global industry with powerful vested interests, and of stamping out corruption in places like Indonesia and Africa—there are reasons for hope. Brazil’s impressive progress over the past decade and the disruptive forces that have recently been unleashed in the palm oil sector provide reason for cautious optimism. Success will depend on more companies getting serious about managing their supply chains to eliminate the hidden costs of production, and on targeted governance reforms in both producer and consumer countries. These are not small things, and as momentum for change builds, the potential for backlash may also grow. Some entrenched interests will be unwilling or unable to adjust to 21st-century demands. But whether viewed from the ground or at the global scale, the cost of failure is far higher than the price of success.

Forest of Gede  
Pangrango,  
Indonesia.





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