

# Sustainable Development Law & Policy

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Article 1

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# SUSTAINABLE DEVELOPMENT LAW & POLICY



EXPLORING HOW TODAY'S DEVELOPMENT AFFECTS FUTURE GENERATIONS AROUND THE GLOBE

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<http://www.wcl.american.edu/org/sustainabledevelopment>

# EDITORS' NOTE

The food crisis has been at the forefront of the global consciousness for much of this year. Although food inflation is nothing new, the combination of rising commodities prices, increased fuel costs, greater consumer demand, and shifts from food to energy crops has made the cost of food an issue at every table. The issue brings with it a myriad of questions about not only the cause of rising prices but also how global food and agriculture impacts sustainability, climate change, and individual health and consumption decisions.

Our global agricultural system is about much more than the food we eat. On a large scale, it is also about how domestic and international agricultural policies impact our air, water, and soil. On a more local scale, it is also about working landscapes, urban sprawl, and rural livelihoods. And individually, it is about our health, nutrition, and lifestyle choices. Finally, it is about the access and equity necessary for everyone to realize the potential benefits of a thriving and efficient global food and agricultural system.

As we considered putting together an SDLP issue on food and agriculture, the wide range of potential topics was striking. We hope to provide a broad overview of some of these issues along with explanations of ongoing and potential future solutions. Articles range from a synopsis of the recent global food crisis to the potential for and limitations of genetically modified crops in addressing the crisis. Our contributors touch on biofuels, organic agriculture, green labeling, tobacco farming, rural land use, and the 2008 Farm Bill in the United States. With this issue, we hope SDLP will help move the discourse beyond the common rhetoric of blame and defeat towards creative solutions for effective and efficient use of our global agricultural resources for today's growing population and future generations.



Lisa Novins  
EDITOR-IN-CHIEF



Addie Haughey  
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# AN OVERVIEW OF THIS ISSUE:

## CLOSELY-LINKED NATURE OF GLOBAL FOOD AND FINANCE

by Siwa Msangi\*

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The tumultuous economic events of the past year have given us all a stark reminder of the closely-linked nature of the global food and financial economy, and the ability of market-level ripple effects to quickly spread from one corner of the globe to the other. In the case of the food crisis, the origin and underlying causes of these ripple effects are both diverse and complex in nature—as they include ‘drivers’ of change that are both socio-economic and environmental. While the role of crop-based biofuels in certain OECD countries might explain part of the rapid increase in prices for commodities like corn, the underlying causes of rapid increases in rice prices in East and Southeast Asia stem from a very different set of policies—some of which, in themselves, helped to magnify the original market shocks, and worsen the effects. Among such policies were export bans and unilateral trade actions, which tend to allow less room for flexibility in the system just at the time when it is needed most, and distort the market signals that might help to bring about needed corrections and adjustments.

Production-side shocks to food economies were driven by droughts, floods, or other extreme weather events that coincided with a much ‘tighter’ set of market conditions in many countries, where historically abundant stocks of grain reserves had slowly been run down over time, and demands had slowly been ramping upwards. The relatively low level of global grain stocks is largely due to either policy neglect or the desire to privatize the operation of the food system, so that a ‘just-in-time’ principle of inventory management could be exercised for the sake of efficiency. Some of these changes were driven by the incentives of structural adjustment regimes, others were brought about by a more laissez-faire attitude towards how food economies should be managed and the persistent belief that there’s always plenty to be had from the market at low prices—which is clearly no longer always the case.

One of the deficiencies in the world socio-political and economic infrastructure that the food crisis has helped to bring to light is the widespread lack of compensating mechanisms that can provide social protection to those most in need of help. The ‘low-hanging’ fruit of price controls turned out to be a favored policy instrument for many governments eager to suppress the inevitable discontent that high food prices cause among highly-vocal, urban populations, and who lacked any other form of social protection programs. These price controls, while easy to implement, tend to dampen the very incentives and signals that food producers need to receive in order to boost their output, and help prices ease towards the lower levels that we’re now beginning to see. When these highly-vocal populations begin to suffer

the effects of high food prices, they also tend to be more cantankerous and critical of other less-desirable aspects of government policy—which is why low food prices are often the opium that poorly-performing governments prefer to give to their constituent masses.

The overall conclusion that we are forced to draw from these lessons of the recent past is that we live in a much tighter and more volatile world food market situation, where the failure of certain countries to maintain consistently high exports, for whatever reason, will result in a rapid escalation of prices and deterioration of socio-economic welfare for the world’s poorest and most vulnerable. There may not be the ‘fat’ in the system that we might have taken for granted in the past, that might help us to stave off the worst effects of food price volatility for long enough to make the corrective measures needed to avoid high inflation. As we anticipate the growth of today’s nearly 6.2 billion people into a global population of over nine billion in 2050—many of whom will be more wealthy and sophisticated in their diets and lifestyles—and contemplate the implications for global food supply, and the constraining effects of land degradation and climate change, we are given reason to pause. Malthusian doom is not upon us yet—but we must work to prevent his herald from appearing. Much work is yet to be done in strengthening agricultural production, distribution, and marketing systems in regions which have the worst-functioning infrastructure, and weak systems of agricultural extension and research. Multi-lateral effort needs to be applied, at a global level, to bolster the mechanisms of trade and commerce which can help smooth periods of turbulence and uncertainty. These efforts would allow for free movement of goods to where they’re most needed and valued, but the markets, by themselves, cannot save us entirely. Good systems of governance and well-targeted public interventions need to be made to fill in gaps, as they arise, and step into the widest breaches that might suddenly appear on the path of development.

Such are the competing (and sometimes conflicting) demands of governance within these trying and turbulent times—to let the market-based incentives work when they’re most useful, and to protect those who are least served by the market at the same time.



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## ABOUT SDLP

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# BIOFUEL, THE ENVIRONMENT, AND FOOD SECURITY: A GLOBAL PROBLEM EXPLORED THROUGH A CASE STUDY OF INDONESIA

by Nicola Colbran & Asbjørn Eide\*

## INTRODUCTION

This paper examines the environmental and food security controversies over the production and use of biofuel for transportation. During the last decade, tremendous interest has been paid to biomass refined into biofuel (mainly ethanol and biodiesel) and used to power transport vehicles. It is widely claimed that the use of biofuel can contribute to the solution of a range of problems, both environmental and social in nature.

In the face of the growing threat of global warming caused by greenhouse gas (“GHG”) emissions, it has been argued that biofuel used for transport can partly or wholly replace gasoline and lead to a significant reduction of such emissions. Another often made claim is that biofuel can provide a renewable, and therefore sustainable, energy source with positive consequences for the environment. Some also claim that production of biofuel can increase the agricultural income for rural poor in developing countries.

If such achievements could indeed be made, there is a very strong ethical argument in favor of liquid biofuel production, but are these claims justified? Do they correspond with reality?

In recent years, grave concerns have emerged and during the last year have particularly grown in strength and significance. There are well documented claims that there can be serious harmful environmental and social consequences of biofuel production and that these have been grossly underestimated. It also appears that the alleged benefits of biofuels have been exaggerated. The growing concerns are strikingly reflected in the title of a recent working paper for the Organization for Economic Co-operation and Development (“OECD”): *Is the cure worse than the disease?*<sup>1</sup>

This debate has received increasing topicality due to the food crisis caused by a steep increase in prices without a corresponding increase in income for the food insecure. One cause of this crisis arises from the production of biofuel which competes with food production for the use of land and water. In this article we examine the situation in one large country which has engaged massively in crops for biofuel production: Indonesia.

Liquid biofuel is primarily produced as ethanol or biodiesel. The feedstocks for ethanol are generally sugar cane and maize, and to a lesser extent wheat, sugar beet, and cassava.

The feedstocks for biodiesel are oil-producing crops, such as rapeseed, palm oil,<sup>2</sup> and jatropha.<sup>3</sup>

Brazil pioneered the production of liquid biofuel well before World War II, using parts of its vast sugar cane plantations for the production of ethanol. The second major producer is the United States, starting its production of ethanol from maize in the 1980s. Around the turn of the millennium the European Union became

heavily involved, mainly using rapeseed and to a lesser extent soybean and sunflower oil for biodiesel production. In 2006, Indonesia developed its own policy on the production and use of biofuel.

The United States and the European Union consume the whole of their own bio-

fuel production internally, but they are far from meeting their own targets of consumption through self-production. They will therefore be increasingly dependent on imports from developing countries if they are going to rely heavily on biofuel. The European and American demand for liquid biofuel has motivated substantial production in other countries, particularly in Indonesia and Malaysia, which both engage in biodiesel production from palm oil. Indonesia has also focused on biofuel production from jatropha plantations as part of a strategy to meet its own biofuel needs.

As of today, liquid biofuel has contributed only a tiny part of overall energy consumption. In 2007, it provided only 0.36% of the total energy consumption in the world. To achieve this very modest fraction of the total energy use, twenty-three percent of U.S. coarse grain production was used to produce ethanol and about forty-seven percent of EU vegetable oil production was used to produce biodiesel.<sup>4</sup> It is estimated that in 2008 the ethanol share of the gasoline fuel market in the United States will be about 4.5%, with a quarter of the coarse grain production in the country devoted to biofuel. The U.S. National Academies of Sciences made a calculation, using 2005 as an example, showing that even if all the corn and soybeans produced in the United States in 2005 had been used for bioethanol production,

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*Biofuel production  
raises rather than reduces  
GHG emissions.*

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this would only replace twelve percent of the country's gasoline demand and six percent of its diesel demand.<sup>5</sup>

If consumption of biofuel were scaled up enough to significantly reduce the need for fossil fuel (gasoline), enormous land areas would be required with serious impacts on the environment and food security.

## ENVIRONMENTAL AND SOCIAL CONSEQUENCES OF BIOFUEL PRODUCTION

### ENVIRONMENTAL HARM

Monocultural production of feedstock for biofuel can cause a number of environmental harms. With the possible exception of sugarcane production for ethanol, there is increasing evidence that when the whole life-cycle of the production, distribution, and use of biofuel is taken into account, and when direct and indirect effects are counted, biofuel production actually increases GHG emissions and thereby intensifies rather than mitigates global warming.<sup>6</sup>

The Joint Research Centre of the European Commission is now largely endorsing the view that biofuel production raises rather than reduces GHG emissions. It has done so partly on the grounds that the GHG effects of the use of nitrogen fertilizers have been underestimated and partly because land use changes could release such quantities of GHG that it would negate the savings from EU agofuels.<sup>7</sup>

Compounding these negative environmental effects of biofuel production is the claim by critics that monoculture production is harmful to biodiversity, which in turn has considerable consequences for the necessary dietary diversity required for adequate food. Furthermore, the production of biofuel causes both competition for water and the pollution of remaining water resources. Palm oil for biodiesel is heavily dependent on water. The jatropha bush is less dependent on water and can grow in marginal and dry areas, but its yield is low compared to what can be obtained when grown in more fertile land or with more access to water. It is likely that even with jatropha, the competition for water can be severe. Pesticides connected with biofuel production are also reported to contaminate remaining water resources and give rise to health problems.

### IMPACT ON FOOD SECURITY

The second issue with biofuels is the impact on food security. In their paper prepared for the OECD, Doornbusch and Steenblik have argued that government policies around the world to replace oil with ethanol and other liquid biofuels could draw the world into a "food-versus-fuel" battle. They focused in particular on the impact on food prices. "Any diversion of land from food or feed production to production of energy biomass will influence food prices from the start, as both compete for the same inputs."<sup>8</sup> It is not only the conversion of traditional agricultural land that may spark the "food-versus-fuel" battle. Following conversion, areas like forests and marginal land previously used as common property resources, and which are traditional suppliers of food, fodder, fuelwood, building materials, and other locally important resources, are now no longer available to

communities. The impact of such conversion on food security is outlined below in the case of Indonesia.

Putting it starkly, the "food-versus-fuel" game makes it possible for a car owner in a developed country to fill a 50 liter tank with biofuel produced from 200 kg of maize, enough to feed one person for one year.<sup>9</sup> The purchasing power of the owner of the car is vastly higher than that of a food insecure person in a developing country; in an unregulated world market there is no doubt who would win this game.

Concentration, eviction, and transformation of the living conditions in rural areas exacerbate the impact of liquid biofuel production on food security. Production of feedstock for biofuel is by its very nature best suited for large tracts of land, and it is a monoculture production, with all its negative implications. Large-scale monoculture production opens the land for foreign and outside investors on an unprecedented scale. Traditional, small-scale agriculture in developing countries is not attractive for investors, but biofuel is—as long as there is a guaranteed market. The implication of this is ominous: it may lead to a process of marginalization or eviction of smallholders to an unprecedented degree, transforming them either into badly paid workers or to the swelling number of urban poor. The long-range consequences can be even more serious than the impact of the soaring food prices. The impact of marginalization of local communities on food security is examined more closely below in the case of Indonesia.

There are many other problems associated with the production of biofuel that are outside the scope of this article. These include the particularly negative effect the process of land concentration, monoculture, and eviction or marginalization are likely to have on women's role in agriculture. In many developing countries, women have the most important role both in production and preparation of food. A recent Food and Agriculture Organization ("FAO") study analyzes the risks that women will face if large-scale production of feedstock for biofuel goes ahead.<sup>10</sup> The authors argue that liquid biofuels production might contribute to the socio-economic marginalization of women and female-headed households in several ways. For example, large-scale plantations for such production require an intensive use of resources and inputs to which smallholder farmers, particularly female farmers, traditionally have limited access.<sup>11</sup>

Returning to the main topic of this article, the impact of biofuel on the environment and food security, we have decided to use Indonesia as a case study to explore these issues in more depth.

## THE CASE STUDY OF INDONESIA

Oil palm plantations, and to a lesser extent jatropha plantations, are two of the main sources of bioenergy produced in Indonesia. Oil palm plantations were initially established by the Dutch colonial government between 1870 and 1930.<sup>12</sup> Since then, the development of oil palm plantations has expanded rapidly, and Indonesia is now the largest producer of crude palm oil ("CPO") in the world, producing almost half of the world's palm oil.<sup>13</sup>

## THE ENVIRONMENTAL EFFECTS OF BIOFUEL PRODUCTION

### LAND USE CHANGE THROUGH DEFORESTATION

In early 2008, Indonesia had 7.3 million hectares of oil palm plantations,<sup>14</sup> with a further 18 million hectares of land cleared for expansion but not yet planted.<sup>15</sup> Regional development plans have allotted an additional 20 million hectares (an area the size of England, the Netherlands, and Switzerland combined) for plantation development mainly in Sumatra, Kalimantan, Sulawesi, and West Papua.<sup>16</sup> One million hectares have been allocated for jatropa plantation and production. By 2009, this area will increase to 10 million hectares.<sup>17</sup>

#### DRIVING THE DEMAND—DOMESTIC AND INTERNATIONAL

Domestic and international demand for biofuel is one incentive for plantation expansion. At the international level, as discussed above, the EU and United States promote biofuel as an alternative energy source for transport and for use in power stations.<sup>18</sup> In 2006, Malaysia and Indonesia announced their intention to supply twenty percent of the market in Europe and declared that they would set aside forty percent of their palm oil output for biodiesel.<sup>19</sup> This commitment requires about 12 million tons of CPO and plantation acreage of around 4 million hectares.<sup>20</sup> China is also considering palm oil from Southeast Asia as a main source of alternative energy and has made large investments in oil palm development.<sup>21</sup>

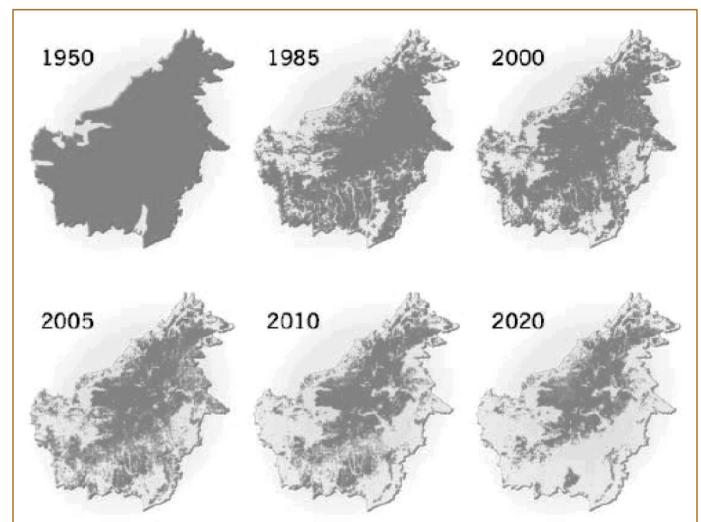
At the domestic level, in 2006 the Indonesian government announced an ambitious policy targeting the development of renewable energy as a priority, especially the production of biofuel, with the production of biofuel having two equally important stated benefits: the alleviation of poverty and the creation of employment.<sup>22</sup> To support its policy, the government has passed legislation for the production and promotion of biofuel;<sup>23</sup> established a National Team for Biofuel Development;<sup>24</sup> provided financial incentives; and made efforts to simplify licensing procedures for biofuel plantation and production. Since the policy was announced in 2006, twenty-two companies have been set up to produce biofuels.<sup>25</sup>

While biofuel provides an incentive to develop and expand plantations, it is only one of a number of potential uses for palm oil. The oil is used in a variety of non-biofuel products,<sup>26</sup> and demand for these products is sky-rocketing. Since the 1990s, economic growth in China and India alone has meant that one quarter of the world's population depends on palm oil as its preferred vegetable oil.<sup>27</sup> Demand for palm oil in the United States has also increased as food manufacturers try to reduce trans fats associated with soy oil (U.S. palm oil imports have quadrupled in two years).<sup>28</sup> Global demand is expected to double by 2020 with four percent annual rate of increase per year.<sup>29</sup> This means that irrespective of the level of demand for biofuel, any consequences on the environment and food security of such crops are likely to continue.

The EU, China, and Indonesia have embraced biofuel as a clean, reliable alternative energy source. But are these claims justified? Do they correspond with what happens in reality? Does biofuel fulfil the claims of environmental benefits once factors like land use change, air pollution, the use of agrochemicals, water course diversion, and pollution are taken into account? Does it cause food insecurity as feared by many?<sup>30</sup>

Indonesia has 120.35 million hectares of forest, which is the largest forest area in Southeast Asia and the world's third largest after the Amazon and Congo Basins.<sup>31</sup> Its forests are home to around 10% of all species of flowering plants, 17% of all bird species, 12% of all mammal species, 16% of all reptile species, and 16% of all amphibian species.<sup>32</sup> In large part owing to its rainforests, Indonesia is among the world's ten most mega diverse countries. Importantly for food security, which is discussed later, its forests are also a source of food or the means to procure it for an estimated 60-90 million people.<sup>33</sup>

However, in 2008 Indonesia became "the country which pursues the world's highest annual rate of deforestation" with 1.8 million hectares of forest cleared each year between 2000 and 2005.<sup>34</sup> Today, oil palm plantations are a primary cause of deforestation, as Indonesia acknowledged itself in its Third Implementation Report on the Convention on Biological Diversity ("CBD").<sup>35</sup>



**Figure 1: The Extent of Deforestation in Kalimantan 1950-2005, and Projection Towards 2020<sup>36</sup>**

The destruction of primary and secondary forests on such a scale places enormous pressure on biodiversity and species such as the Sumatran tiger and orangutan found in the forests of Kalimantan. In the last decade their habitat has declined while the plantation area in Sumatra and Kalimantan has increased rapidly.<sup>37</sup> An oil palm plantation can only support up to twenty percent of the mammals, reptiles, and birds that a primary rainforest supported prior to its conversion. To survive, wildlife (especially mammals) must share the same environment as humans. Plantation workers and local communities encounter orangutans, tigers and other wildlife for some time after deforestation, leading to often serious and sometimes fatal consequences.<sup>38</sup> According to Greenpeace, 1,600 orangutans were killed on oil palm plantations during 2006.<sup>39</sup>

The loss of natural forests around the world each year contributes more GHG emissions to the atmosphere than the global transport sector.<sup>40</sup> Indonesia's primary (old growth) forests are estimated to store around 230 tons of carbon per hectare,<sup>41</sup> while secondary (re-growth) forests store around 176 tons of carbon.<sup>42</sup> By contrast, oil palm plantations only store around 91 tons of carbon per hectare, meaning there is a large deficit of carbon when primary and secondary forests are converted to oil palm plantations.<sup>43</sup>

Although the Indonesian Environment Minister has publicly promised that "we are not going to sacrifice any trees for biofuels,"<sup>44</sup> a substantial part of Indonesia's planned oil palm expansion continues to be in forest areas. This is not surprising given Presidential Instruction No.1/2006 concerning the Supply and Utilisation of Biofuel as an Alternative Fuel directs the Ministry of Forestry to make "unproductive" forests available for conversion to plantations, and requires the Ministry of Home Affairs, provincial governors, regents, and mayors to encourage communities to turn land over to biofuel development. It is further complicated by conflicts of interest within the government. In Aceh, fourteen of the twenty-three district Heads of the Department of Forestry, who implement the mandate of the forestry department to protect forests from illegal loggers and plantation companies, are also the Heads of the Department of Plantations, whose priority it is to develop plantations.<sup>45</sup>

#### LAND USE CHANGE THROUGH THE DRAINING OF PEATLANDS

In addition to its vast forests, Indonesia has 22.5 million hectares of peatlands,<sup>46</sup> which is most of the 27.1 million hectares of peatlands in the Southeast Asian region.<sup>47</sup> Peatlands act as a natural carbon store, but release carbon when drying out or oxidizing. According to Wetlands International, about a quarter of palm oil originates from drained peatlands<sup>48</sup> and over fifty percent of new oil palm plantations are allocated on peatlands.<sup>49</sup> Conservative estimates indicate that each year around 660 million tons of carbon is released from peatlands that are drying out and oxidizing.<sup>50</sup> Over ninety percent of these emissions originate from Indonesia. Recently calculated GHG emissions place Indonesia as the world's third largest emitter,<sup>51</sup> although some oil palm companies and members of the government dispute the figures.<sup>52</sup> Adding to this bleak picture is a study by Wetlands International which has shown that palm oil produced on tropical peatlands contributed more CO<sub>2</sub> to the atmosphere than the use of fossil fuels.<sup>53</sup> When peatlands in Indonesia are converted into oil palm plantations, studies estimate it takes 423 years to pay off the carbon debt.<sup>54</sup>

In 2007, the Indonesian Agriculture Minister ordered provincial governors to stop awarding new permits to palm oil companies in peatlands, but according to Greenpeace, there have been no changes since the Minister's order.<sup>55</sup> Palm oil companies oppose any moratorium on forest and peatland conversions, arguing that it will negatively impact on the industry and on Indonesia's economy, causing job losses and increased poverty.<sup>56</sup>

#### LAND USE CHANGE THROUGH FIRES

Forest fires to clear land for plantations are a regular source of haze in Southeast Asia, posing serious health problems, traffic disturbance, and substantial economic costs. Fires are a quick and cheap land clearing technique that save almost twenty percent of the cost of establishing an oil palm plantation once the land has been clear felled.<sup>57</sup>

The worst forest fires in Indonesia to date were those in 1997-98, which affected at least six percent of the country's total landmass, causing smog to cover large parts of Indonesia, Malaysia, Brunei and Singapore for at least three months.<sup>58</sup> Indonesia's Third Implementation report on the CBD states that large-scale land conversion was the largest cause of the 1997-98 fires, which burned nearly 5 million hectares of forest and caused approximately \$8 billion in economic losses in Indonesia alone.<sup>59</sup> Of the larger 1997-98 fires, 46-80% occurred in plantation concessions, around three-quarters of which were oil palm plantations. Although it is difficult to prove, most fires were likely lit by company staff or locals paid by the company. Arson as a result of conflicts between local communities and plantation companies was apparently another cause of the fires.<sup>60</sup>

#### WATER POLLUTION, SOIL EROSION, AND PESTICIDES AND FERTILIZERS

Biofuel plantation establishment and management also effects the environment in ways felt most acutely by the local communities whose land is converted into plantations.

The establishment of plantations diverts water from local communities, disturbs stream flows, and pollutes water resources. This also impacts water resources as a source of food for local communities. As oil palm is a monoculture crop, the land must be cleared of all vegetation. Roads and drainage canals are constructed using heavy machinery.<sup>61</sup> This reduces the permeability of the land, causes a loss of soil faunal activity, and compacts the land, all of which increases top soil runoff and causes soil erosion. Sediment loads in rivers and streams increase significantly. Flooding escalates in the rainy season, while there are water shortages in the dry season due to interrupted or reduced water flows.<sup>62</sup>

Oil palm plantations also cause the deterioration of water quality. The cultivation of oil palms requires pesticides and fertilizers for optimum production, which often leach into rivers, contaminating the water.<sup>63</sup> In the oil palm plantation sector, around twenty-five different pesticides are used, but monitoring their usage is difficult as it is reportedly not controlled or documented.<sup>64</sup> The most commonly used weed killer is paraquat dichloride, which is very toxic and accumulates in the soil with repeated applications.<sup>65</sup> Its toxicity and accumulation in the soil negatively affect the ability to use the land as a source of food and income.

Water quality is worsened by the overflow or dumping of untreated palm oil mill effluent ("POME") into waterways, which threatens community health and reduces aquatic diversity. POME is a mixture of water, crushed shells, and fat residue. Most CPO mills have outdoor waste tanks to store and detoxify

POME by adding oxygen, but the tanks can overflow in heavy rain or during intensive production periods. Some companies also allow the effluent to flow directly into the rivers.<sup>66</sup> A mill with a capacity of sixty tons of fresh fruit bunches (“FFB”) per hour can produce 1,200 cubic meters of liquid waste per day, equivalent to the sewage produced by a city of 75,000 people.<sup>67</sup> As FFB needs to be processed within twenty-four to forty-eight hours of harvest, one palm oil mill is usually built for about every 4,000-5,000 hectares of plantation.<sup>68</sup> There are 7.3 million hectares of oil palm plantations in Indonesia.

Jatropha is also dependent on water. Although in principle it can grow in marginal and dry areas, the yield is low compared to what can be obtained when grown in more fertile land with access to increased water. In areas such as Sumba in East Nusa Tenggara, where extensive jatropha plantations are planned, there is no precedent for water management on the scale required for productive and profitable large-scale jatropha plantations.<sup>69</sup>

Contributing to potential environmental issues is that no jatropha species have been properly domesticated and, as a result, the long-term impact of its large-scale use on soil quality and the environment is unknown.<sup>70</sup> Jatropha has been banned in the Australian state of Western Australia, as it is claimed to be an invasive plant that is highly toxic to livestock.<sup>71</sup>

Without change in the way biofuel crops are planted and managed in Indonesia, there are no sufficient ethical justifications for biofuel use that override its harmful environmental implications. We are still far from the situation where all alternative energy sources are exhausted. There are other more efficient ways of using energy, and there are better ways to address the reduction of GHG emissions and urban pollution than by way of biofuel production.

### THE IMPACT OF BIOFUEL PRODUCTION ON FOOD SECURITY

On May 2, 2008, in his background note calling upon the UN Human Rights Council to convene a special session on the current world food crisis,<sup>72</sup> the Special Rapporteur on the Right to Food pointed to the demand for biofuels as one determining factor in the crisis. An increased production of crops for biofuel has contributed to higher prices as less food is produced in order to fill gas tanks. This has caused evictions and marginalization, thereby undermining the livelihood of the most vulnerable groups. The result is that many individuals, either alone or in community with others, no longer enjoy physical and economic access to adequate food or the means for its procurement.<sup>73</sup>

#### TRANSFORMING TRADITIONAL AGRICULTURAL LAND INTO PLANTATIONS

In Indonesia, both traditional agricultural land and forests have been converted into plantations. This denies individuals the possibility of feeding themselves directly from productive land or other natural resources.<sup>74</sup> In regards to traditional agricultural land, between 1993 and 2003 there was a decline in the number of staple crop farmers in Sumatra (3,140,000 to 3,080,000) but a steep increase in plantation smallholders (1,766,000 to 2,831,000).<sup>75</sup>

Land conversion impacts productive agricultural land by increasing flooding and landslides. In Aceh Tamiang in eastern Aceh, oil palm plantations were identified as a main reason for flooding in recent years, as a result of which “at least 128,028 hectares of farmland will become swampy when the rainy season arrives, and during the dry season will suffer drought.”<sup>76</sup>

#### THE IMPACT ON FOOD SECURITY OF PLANTATION-STYLE MONOCROPPING

Communities dependent on forests as a source of food are well-off in terms of food security, sovereignty over production, and management and stability in supply and income. Such communities create secure livelihoods through a range of strategies, including planting a variety of annual food crops as well as perennial cash crops. In addition, community economies are supported by ecosystem goods and services and common pool resources—a source of monetary and non-monetary income.<sup>77</sup>

Land made available for biofuel production through deforestation transforms areas that once supported forest-dependent communities into areas dominated by monocropping. Once monocropping is introduced, there is a loss of biodiversity, and a loss of ecosystem goods and services, as well as common pool resources. It also introduces a new crop requiring intensive management through permanent cultivation, which many local communities are unfamiliar with.<sup>78</sup> Traditional rotational farming is no longer possible because there is no natural forest left to fertilize the poor rainforest soils, which are needed for the planting of crops.

As the transformation destroys indigenous peoples’ traditional food sources, it leads to food insecurity, and endangers the dietary diversity of local communities. Such a transformation of biologically diverse areas takes away the local community’s sovereignty over production and management, as well as stability in supply and income. Dependence on a single crop commodity may also increase the vulnerability of those working in the palm oil industry. For example, CPO prices on the international market fluctuate widely. In May 2007, CPO prices were \$400 per ton, but in May 2008 were \$1,150 per ton.<sup>79</sup> In August 2008, they had fallen back to below \$800 per ton.<sup>80</sup>

Communities also find that their overall cost of living increases once monoculture has been introduced. This increase affects the ability of local communities to procure adequate food. They need more cash to survive as communities can no longer harvest food and products from the forest and do not have land to grow their own crops. To meet this need for cash, they can either become smallholders, laborers, or part of the swelling number of urban poor.

The effect on food security caused by oil palm plantations could be even more serious in regard to jatropha, which is to be planted in the eastern regions of Indonesia (West Nusa Tenggara, East Nusa Tenggara, Sulawesi, and Papua).<sup>81</sup> Jatropha has been promoted as a good solution to the impact of biofuel production on food security as it is a non-food crop that can be grown on “marginal lands” not normally suitable for foodcrops.<sup>82</sup> The eastern regions of Indonesia are often considered marginal as

they are deemed to have limited food production ability and are prone to drought. In these regions there is an abundance of land not permanently cultivated, which is considered ideal for biofuel plantation development. However, if so-called marginal land is converted into biofuel plantations, the land can no longer be used as common property resources, which have traditionally supplied food, fodder, fuelwood, building materials, and other locally important resources.

The introduction of large-scale jatropha plantations will also increase the need for cash as workers and farmers have less time to feed themselves directly from productive land or other natural resources. Jatropha is quite labor intensive with calculations indicating one hectare of jatropha will require 108 working days per year (from land preparation to post-harvest), with each worker being annually paid Rp.1.7 million (\$187).<sup>83</sup> For farmers themselves, the price they receive for jatropha seeds is low, at less than one dollar per kilo, and in some cases less than six cents.<sup>84</sup> This is a very small amount of money and there is little time remaining for workers to either tend to their own land for food production or to carry out other income generating activities to procure food.

An important aspect of the right to food is the ability to procure adequate food without compromising the satisfaction of other basic needs.<sup>85</sup> Like many countries, Indonesia is experiencing steep increases in food prices, particularly staple foods. The price of palm-oil-based cooking oil experienced the steepest rise; from Rp.9,000 per kilo in August 2007,<sup>86</sup> to Rp.14,000 per kilo by March 2008.<sup>87</sup> This price is prohibitively expensive for many Indonesians given that forty-two percent of Indonesians (nearly 100 million people) live on less than Rp.9,000 to 18,000 per day.<sup>88</sup> One of the causes of this increase is that Indonesian palm oil producers are more interested in selling CPO to the international market, drawn by the possibility of higher prices.<sup>89</sup> The shortage of cooking oil has meant many families are using recycled cooking oil, bought from vendors at a reduced price.

Indonesia is not immune to the recent world food crisis. Many Indonesians do not have regular access to, or means for the procurement of, sufficient, nutritionally adequate, and culturally acceptable food for an active, healthy life.<sup>90</sup> In pursuing the plantation and production of biofuel, Indonesia needs to address the possible consequences that not managing biofuel sustainably may have on food security. Failure to do so may seriously weaken the availability of food in quantity and quality sufficient to satisfy the dietary needs of individuals and the accessibility of such food.

The question then is whether Indonesia is likely to address the possible consequences of not managing biofuel sustainably. One challenge is that Indonesia has simply not publicly

acknowledged the social and environmental problems associated with unsustainable biofuel production. For example, in September 2008, the Indonesian Minister for Agriculture lobbied the EU over concerns that the EU was planning a policy that would limit imports of palm oil for biofuel from Indonesia. The Minister claimed “the EU was influenced by negative campaigns from non-governmental organizations (“NGOs”). We feel it’s not about environmental issues, it’s about trade.”<sup>91</sup> He emphasized the Indonesian government’s belief that biofuel is a solution to poverty through employment creation by stating that the palm oil sector currently employs more than 5 million people. He added that “we should choose between human interests or those of the monkeys.”<sup>92</sup> However, sustainable biofuel production does not require such a choice.

At the international level, there is an increasing awareness of the dangers inherent in unregulated palm oil and biofuel production. Voluntary guidelines relating to certain crops

used for biofuel production have been developed, such as the Roundtable on Sustainable Palm Oil (“RSPO”) Principles and Criteria for Sustainable Palm Oil Production.<sup>93</sup> These Principles were finalized in November 2007, although they will be reviewed again within five years. According to these Principles, “sustainable palm oil production is comprised of legal, economically viable, environmentally appropriate and

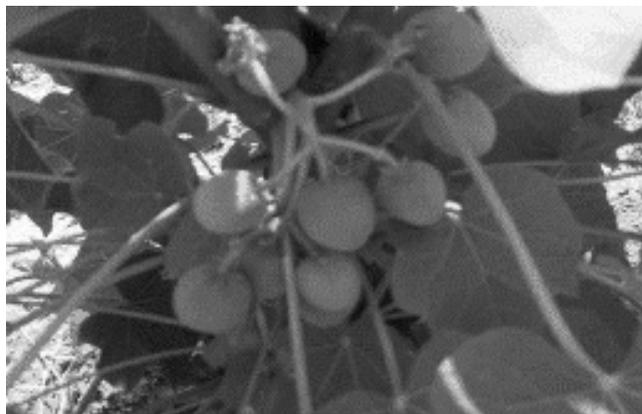
socially beneficial management and operations.”<sup>94</sup> On the positive side, these Principles represent a potentially useful tool for civil society groups to evaluate companies’ social and environmental practices and to hold them accountable. The grievance panel of the RSPO has already been used by communities in West Kalimantan as part of a suite of measures to challenge the environmentally and socially unsustainable practices of the Wilmar Group operating in the region.<sup>95</sup> Wilmar International (and the International Finance Corporation) has since withdrawn its claims of sustainable palm oil production, and Wilmar claims to have set up procedures to ensure that the RSPO Principles will be adhered to.<sup>96</sup>

However, there are also challenges in relation to the Principles. The Principles are voluntary and may only be truly enforced through market forces where there is higher consumer awareness about sustainability. There is also the question of who will ultimately bear the time and financial burden of proving that the palm oil produced is sustainable: will it be small plantation holder producers, who in many cases produce oil palm fruit for the companies that control their lands and debts? An additional problem with the Principles was outlined by Unilever, the world’s largest consumer of palm oil, when it admitted to Greenpeace that it is not possible to trace the origin of palm oil once it is on the international market.<sup>97</sup>

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*In 2008 Indonesia became  
“the country which  
pursues the world’s  
highest annual rate of  
deforestation.”*

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[http://www.svlele.com/jatropha\\_photo.htm](http://www.svlele.com/jatropha_photo.htm)

**Jatropha seeds and fruit**

Finally, it is important to consider whether domestic legal systems that regulate biofuel production facilitate compliance with the Principles. If the legal systems do not, and in fact are contrary to the Principles, it will be impossible for companies that have already established plantations in compliance with domestic law to produce sustainable biofuel.

Irrespective of the efficacy of such Principles, the formulation and implementation of national strategies for the production of biofuel requires full compliance with principles of good governance: adequate and representative legislative capacity which can link the human rights principles to the concrete situations and needs of the country concerned, people's participation, accountability, transparency, rule of law, and an independent judiciary, well versed with human rights.

### **CONCLUSION**

In this article, we have presented the general environmental and food security issues relating to biofuel production and its use for transportation and have explored the real impact on the ground through a case study of biofuel plantation and production in Indonesia.

Two key lessons stand out from the environmental harm described above and from the soaring food prices, which are having a devastating impact on vulnerable people. The first is that food availability is becoming an increasingly serious problem and has to be met by increased production. Future intensification of agricultural production or expansion to formerly uncultivated land should focus on food production, not on fuel production, and particularly not on liquid fuel production. The second lesson should be based on the awareness that prices will remain high for a long time, even though somewhat reduced from the present level. Taking into account that hundreds of millions of people in developing countries will not be able to buy their necessary food on the market at such high prices, alternatives must be found. This can take two directions, both of which must be pursued.

The first step is to ensure adequate land and protect the assets of small farmers and peasants so that they may produce the necessary food for themselves, their families, and the local market with low input costs. The possibilities for small-scale and more organic farmers should be significantly expanded and given

support, nationally and internationally. The second step, which supplements the first, is to establish a functioning safety net for those who cannot gain access to the necessary assets. Safety nets must be established through national and international cooperation. They should not be restricted to the minimum food or cash required to survive, but should facilitate empowerment of the recipient by helping them move from dependency to self-reliance, whether through agricultural activity or other means. The safety net should not be merely an emergency device but a tool for sustainable development.

### **RECOMMENDATION: THE NEED FOR INTERNATIONAL GUIDELINES**

To avoid the harmful environmental and human consequences and maximize the possible benefits from biofuels, international guidelines must be urgently developed for biofuels production. The exact form of the guidelines is a matter to be explored through international negotiations. This is of increasing urgency as a result of the food crisis. Existing guidelines on crops that can be used to produce biofuel and their associated strengths and weaknesses should serve as models. All guidelines should complement, not contradict, each other and should not impose an unnecessary burden on those who produce biofuel in a socially and environmentally satisfactory way.

In regard to the content of international guidelines for biofuel production, the following concerns should be taken into account:

- Avoid production of biofuel in ways which lead to increased greenhouse gas emissions, when direct and indirect impact is taken into account, or which divert water from existing users and prevents previously existing access to water for drinking and sanitation, which degrade the soil or pollute water or the local air conditions (e.g. by burning).
- Avoid introducing non-native species which carry risks of invasion before appropriate safeguards are adopted—full application of precautionary principle is required.
- Abstain from measures which evict previous users of the land without negotiation and acceptable alternatives for the previous users, whether they had recognized tenure or not. Abstain from production of biofuel in ways which undermine previously existing opportunities for women to

produce food or have access to woodfuel, unless other alternatives are made available prior to the initiation of the biofuel project.

- Establish legally binding certification schemes and a reliable monitoring system to ensure that the international certification is effective and enforced.
- Give priority to projects based on small-scale farming, possibly through cooperative arrangements, with a combination of biofuel and food production for local consumption,

and projects that ensure stable and healthy working conditions, which ensure adequate dignity and independence of the worker.

- Choose feedstock that has the potential, in its production, transport, distribution, and use, to reduce GHG emissions compared to the use of fossil fuel, and which avoids diverting water from established and necessary uses, and avoids soil degradation or pollution.



## Endnotes: Biofuel, the Environment, and Food Security

<sup>1</sup> ORGANIZATION FOR ECONOMIC COOPERATION & DEVELOPMENT, BACKGROUND PAPER: IS THE CURSE WORSE THAN THE DISEASE? (Doornbusch & Steenblik 2007) [hereinafter OECD].

<sup>2</sup> There are two terms used in this section, namely “oil palm” and “palm oil.” “Oil palm” refers to two species of the *Arecaceae*, or palm family, which are used in the production of palm oil. “Palm oil” is a form of edible vegetable oil obtained from the fruit of the oil palm tree. The oil can also be used to create biodiesel for internal combustion engines. See generally S. SUMATHIA ET AL., UTILIZATION OF OIL PALM AS A SOURCE OF RENEWABLE ENERGY IN MALAYSIA (2007), available at [http://www.sciencedirect.com/science?\\_ob=ArticleURL&\\_udi=B6VMY-4PC93D8-1&\\_user=10&\\_rdoc=1&\\_fmt=&\\_orig=search&\\_sort=d&view=c&\\_acct=C000050221&\\_version=1&\\_urlVersion=0&\\_userid=10&md5=a74c1b3630bfd66bd909fd548e8ac7af](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VMY-4PC93D8-1&_user=10&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=a74c1b3630bfd66bd909fd548e8ac7af) (last visited Nov. 13, 2008).

<sup>3</sup> *Jatropha* is a “non-food” crop, however, its seeds are used as a remedy for constipation, its sap is used to dress wounds, and its boiled leaves are used as a remedy for malaria and fever. See Biodiesel Technologies India, *Jatropha Curcus*, <http://www.biodieseltechnologiesindia.com/jatropha.html> (last visited Oct. 15, 2008).

<sup>4</sup> High Level Conference on World Food Security: The Challenges of Climate Change and Bioenergy, June 3-5, 2008, *Bioenergy, Food Security and Sustainability—Towards an International Framework*, 1-2, FAO HCL/08/INF/3 (2008), available at [http://www.fao.org/fileadmin/user\\_upload/foodclimate/HLCdocs/HLC08-inf-3-E.pdf](http://www.fao.org/fileadmin/user_upload/foodclimate/HLCdocs/HLC08-inf-3-E.pdf) (last visited Oct. 16, 2008).

<sup>5</sup> MARK MULLER ET AL., INST. FOR AGRIC. & TRADE POLICY, FOOD VERSUS FUEL IN THE UNITED STATES—CAN BOTH WIN IN THE ERA OF ETHANOL? (2007), available at <http://www.iatp.org/iatp/publications.cfm?accountID=258&refID=100001> (last visited Oct. 13, 2008).

<sup>6</sup> In a recent issue of *Science*, Fargione et al. presented research concluding that “converting rainforests, peat lands, savannas, or grasslands to produce food crop-based biofuels in Brazil, Southeast Asia, and the United States creates a ‘biofuel carbon debt’ by releasing seventeen to 420 times more CO<sub>2</sub> than the annual greenhouse gas reductions that these biofuels would provide by displacing fossil fuels.” See Joseph Fargione et al., *Land Clearing and the Biofuel Carbon Debt*, 312 *SCIENCE* no. 5867, Feb. 29, 2008, at 1235-38.

<sup>7</sup> EUROPEAN COMMISSION JOINT RESEARCH CENTER, BIOFUELS IN THE EUROPEAN CONTEXT: FACTS AND UNCERTAINTIES 12 (Giovanni de Santi, ed., European Communities 2008), available at [http://ec.europa.eu/dgs/jrc/downloads/jrc\\_biofuels\\_report.pdf](http://ec.europa.eu/dgs/jrc/downloads/jrc_biofuels_report.pdf) (last visited Oct. 16, 2008).

<sup>8</sup> OECD, *supra* note 1, at 4.

<sup>9</sup> The Secretary General, *Note of the Secretary-General on the Right to Food*, ¶ 21, delivered to the U.N. General Assembly, U.N. A/62/289 (Aug. 22, 2007) (Quoting G.Gendron, Radio Canada, Aug. 12, 2007).

<sup>10</sup> See ANDREA ROSSI & YIANNA LAMBROU, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, GENDER AND EQUITY ISSUES IN LIQUID BIOFUELS PRODUCTION: MINIMIZING THE RISKS TO MAXIMIZE THE OPPORTUNITIES 50 (2008).

<sup>11</sup> *Id.*

<sup>12</sup> EYE ON ACEH, THE “GOLDEN” CROP? PALM OIL IN POST-TSUNAMI ACEH 6 (2007), available at [www.aceh-eye.org/data\\_files/english\\_format/ngo/ngo\\_eoa/ngo\\_eoa\\_2007\\_09\\_00.pdf](http://www.aceh-eye.org/data_files/english_format/ngo/ngo_eoa/ngo_eoa_2007_09_00.pdf) (last visited Nov. 11, 2008) [hereinafter THE GOLDEN CROP].

<sup>13</sup> U.S. DEP’T OF AGRIC., COMMODITY INTELLIGENCE REPORT, INDONESIA: PALM OIL PRODUCTION PROSPECTS CONTINUE TO GROW (2007), available at [http://www.pcad.fas.usda.gov/highlights/2007/12/Indonesia\\_palmoil/](http://www.pcad.fas.usda.gov/highlights/2007/12/Indonesia_palmoil/) (last visited Oct. 16, 2008).

<sup>14</sup> MIKE BONNELL & L.A. BRUIJNZEEL, FORESTS, WATER AND PEOPLE IN THE HUMID TROPICS: AN EMERGING VIEW 910-15 (2004), cited in FRIENDS OF THE EARTH, LIFE MOSAIC & SAWIT WATCH, LOSING GROUND: THE HUMAN RIGHTS IMPACTS OF OIL PALM PLANTATION EXPANSION IN INDONESIA 97 (2008), available at <http://www.wrm.org.uy/countries/Indonesia/losingground.pdf> (last visited Oct. 14, 2008) [hereinafter LOSING GROUND].

<sup>15</sup> See MARCUS COLCHESTER ET AL., PROMISED LAND: PALM OIL AND LAND ACQUISITION IN INDONESIA: IMPLICATIONS FOR LOCAL COMMUNITIES AND INDIGENOUS PEOPLES 11-12 (Forest Peoples Programme & Sawit Watch 2006) (alleging that the land was cleared to access the timber rather than to establish oil palm plantations).

<sup>16</sup> *Id.* at 26 (observing in Table 1.2 the provincial government’s plans to expand oil palm plantations).

<sup>17</sup> PRAJOGO U. HADI ET AL., PROSPEK PENGEMBANGAN SUMBER ENERGI ALTERNATIF (BIOFUEL) [PROSPECTS FOR DEVELOPING AN ALTERNATIVE ENERGY SOURCE (BIOFUEL)] (2006), available at [www.litbang.deptan.go.id/berita/one/403/file/Biofuel\\_PUH\\_.pdf](http://www.litbang.deptan.go.id/berita/one/403/file/Biofuel_PUH_.pdf) (last visited Nov. 11, 2008).

<sup>18</sup> COUNCIL OF THE EUROPEAN UNION, PRESIDENCY CONCLUSIONS, (Mar. 8-9, 2007), available at [http://www.consilium.europa.eu/cms3\\_applications/applications/newsroom/loadDocument.ASP?cmsID=221&LANG=en&directory=en/ec/&fileName=93135.pdf](http://www.consilium.europa.eu/cms3_applications/applications/newsroom/loadDocument.ASP?cmsID=221&LANG=en&directory=en/ec/&fileName=93135.pdf) (last visited Nov. 11, 2008). But see Ian Traynor, *EU Set to Scrap Biofuels Target Amid Fears of Food Crisis*, GUARDIAN, Apr. 19, 2008, available at <http://www.guardian.co.uk/environment/2008/apr/19/biofuels>. food (last visited Oct. 13, 2008). See generally European Environment Agency, Suspend 10 percent Biofuels Target, Says EEA Scientific Advisory Board (Apr. 10, 2008), available at <http://www.eea.europa.eu/highlights/suspend-10-percent-biofuels-target-says-eeas-scientific-advisory-body> (last visited Oct. 16, 2008); OLIVIER DE SCHUTTER, UN SPECIAL RAPPORTEUR ON THE RIGHT TO FOOD, BACKGROUND NOTE: ANALYSIS OF THE WORLD FOOD CRISIS 9 (2008) available at <http://www2.ohchr.org/english/issues/food/docs/SRRTFnotefoodcrisis.pdf> (last visited Nov. 12, 2008).

<sup>19</sup> UN Permanent Forum on Indigenous Issues (UNPFII), *Working Paper: Oil Palm and Other Commercial Tree Plantations, Mono-Cropping: Impacts on Indigenous Peoples’ Land Tenure and Resource Management Systems and Livelihoods*, ¶ 29, UN Doc. E/C.19/2007/CRP.6 (May 7, 2007) (prepared by Victoria Tauli-Corpuz and Parshuram Tamang).

<sup>20</sup> A. ZAKARIA ET AL., POLICY, PRACTICE, PRIDE AND PREJUDICE: REVIEW OF LEGAL, ENVIRONMENTAL AND SOCIAL PRACTICES OF OIL PALM PLANTATION COMPANIES OF THE WILMAR GROUP IN SAMBAS DISTRICT, WEST KALIMANTAN (INDONESIA) 13 (Friends of the Earth 2007), available at <http://redapes.org/news-updates/policy-practice-pride-and-prejudice-review-of-legal-environmental-and-social-practices-of-oil-palm-plantation-companies-of-the-wilmar-group-in-sambas-district-west-kalimantan-indonesia/> [hereinafter *Wilmar Group*].

# THE REAL PRICE OF ATLANTIC SALMON

by Courtney Henson\*

The price of salmon has drastically decreased in the United States in the past decade, largely because of increased salmon aquaculture in countries like Chile. However, this price reduction was not achieved with sustainable methods. The real costs have been absorbed by the environment and workers in Chile's salmon industry.

Salmon aquaculture has developed commercially in countries with natural salmon populations since the 1970s.<sup>1</sup> Aquaculture is the farming of fish under controlled conditions in natural water bodies or in closed systems. Fundación Chile, a nonprofit organization associated with the government whose goal is to foster Chilean business and industrial growth, introduced salmon aquaculture to Chile in the 1980s. The industry has boomed and Chile has become the world's second largest salmon-producing country.<sup>2</sup> Chilean salmon and trout exports have increased about 500% in the past decade.<sup>3</sup> The expansion of commercial salmon aquaculture has resulted in the cost of salmon to consumers being one-fourth the cost in the 1980s.<sup>4</sup> Salmon has shifted from being an expensive delicacy to a common substitute for meat and poultry.<sup>5</sup> The drastic price reduction is a result of simple supply economics: aquaculture and improved technology caused increased salmon production in more geographical areas, like Chile, which did not historically supply wild-caught salmon. Lower prices lead consumers to consume more salmon and has increased demand, particularly for value-added products like fillets, smoked salmon, and prepared meals.<sup>6</sup> This shift has been particularly pronounced in the United States, the largest importer of salmon.<sup>7</sup> Chile supplies sixty-five percent of the salmon consumed in the United States.<sup>8</sup>

Salmon aquaculture in Chile has been credited as bringing development to several regions in Southern Chile. In Southern Chile's Region X, with the majority of aquaculture sites, poverty has decreased by nearly half within a decade.<sup>9</sup> Extreme poverty in the same period dropped from thirteen to seven percent, and even further gains have been made since 2000.<sup>10</sup> SalmonChile, an industry organization, estimates fifty-five thousand workers are directly or indirectly employed by the salmon industry.<sup>11</sup> In addition, Chile's export-oriented economy has diversified its exports from copper and fruit; salmon is now Chile's third largest export.<sup>12</sup> Foreign direct investment has also increased, especially from Norway and Japan.<sup>13</sup> Development of roads, banking services, and universities have also extended into the southern regions because of the salmon industry.<sup>14</sup>

Cheaper prices in the supermarket and rapid development are not without costs, however. Impacts to the environment are more severe in Chile, because there is less regulation than in Norway, its primary competitor.<sup>15</sup> There are several major environmental impacts from the salmon aquaculture industry. The salmon themselves produce waste in addition to the

antibiotics and other chemicals in their food. Escaped salmon present another environmental hazard. Salmon that escape their farm pens, which can amount to millions of salmon, are especially harmful in Chile because they are not a native species. They upset the ecological balance of the Pacific waters they are penned in because they are carnivorous and have few predators in their adopted habitat.

Like Chilean environmental concerns, Chile's labor practices in the salmon industry do not match their peers due to inadequate regulation. The industry's close relationship with the government and the emphasis on exporting salmon has resulted in anti-union practices, substandard working conditions, and very low wages for workers.<sup>16</sup> For example, Norwegian salmon industry workers make 378% more than their Chilean counterparts.<sup>17</sup>

Economic development in southern Chile is highly dependent on the salmon industry, which thus far has not demonstrated long-term sustainability. The industry faces an additional threat in the form of infectious salmon anemia ("ISA"), a disease that has plagued the salmon farming industry all over the world. ISA does not affect humans, but it is fatal to salmon and extremely contagious, especially to farmed salmon which are kept in close quarters. ISA finally spread to Chile in 2007, when much of the salmon stock in the country had to be destroyed. In the wake of the disease outbreak some importers, such as Safeway, refused to import Chilean salmon because the quality of the stock had declined.<sup>18</sup> The effect of ISA has led to the loss of jobs in Region X as companies—especially the giant in the industry, Marine Harvest—relocate or close.<sup>19</sup>

The ISA outbreak has dramatically exacerbated the negative impacts of poor environmental regulation and labor practices on the salmon aquaculture industry in Region X, where ninety percent of salmon production is located. Many of the companies in Chile have moved their operations further south to Regions XI and XII, or have closed, laying off over four thousand workers in Region X.<sup>20</sup> The disease outbreak has illustrated the unsustainability of the salmon farms' practices. To prevent further outbreaks, companies have to improve their husbandry practices, and the government has to ensure greater regulation, such as protecting union efforts, mandating the space between aquaculture sites, and monitoring the chemicals administered to the fish. Regulatory agencies need to catch up to the growth of the salmon industry in Chile in order for the industry to become sustainable.<sup>21</sup>



**Endnotes:** The Real Price of Atlantic Salmon *continued on page 67*

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# TWO GLOBAL CRISES BRING OPPORTUNITY TO INTERNATIONAL TOBACCO CONTROL

by Chris A. Bostic, M.S.F.S., J.D. \*

## INTRODUCTION

In many low-income countries, particularly those hardest hit by rising food prices, resources such as valuable land and human labor are diverted into the production of a cash crop that society would be better off without, tobacco leaf. Ironically, many of these farmers are rendered poorer than their food-producing neighbors in the process, owing to the oligopolistic nature of the tobacco leaf processing industry, including predatory credit and other practices.<sup>1</sup> As the world takes greater action to combat the devastating health effects of tobacco consumption, nations that largely depend on tobacco leaf for export earnings are anxiously looking for alternatives.<sup>2</sup> The nexus between this problem and the world food crisis is obvious. What is lacking is a coordinated, holistic approach. This paper will provide an overview of global tobacco leaf cultivation and efforts to promote a transition to other livelihoods for farmers, as well as suggest actions that may lead to greater cooperation toward solutions.

The health costs of tobacco consumption are well known, although few appreciate the magnitude. The World Health Organization (“WHO”) estimates that tobacco killed 100 million people over the course of the 20th century.<sup>3</sup> It predicts that one billion will die this century.<sup>4</sup> Unlike last century’s casualties, the majority of these deaths will be in lower income countries.<sup>5</sup> Addiction to tobacco causes more than just deaths. Tobacco-related diseases cost families and governments untold billions in health care costs, lost wages, and lost productivity.<sup>6</sup> Poor families that spend money on cigarettes must make up the difference somewhere else in the budget by reducing spending on food, housing, health care, or education.

In response to the coming catastrophe, the WHO Framework Convention on Tobacco Control (“FCTC”) came into force in 2005.<sup>7</sup> The treaty is focused on halting and reversing the alarming trends in tobacco consumption and its related death and disease.<sup>8</sup> The FCTC includes several provisions focused on the developing world, including Article 17, which calls for cooperation in finding alternative livelihoods for persons involved in tobacco leaf cultivation.<sup>9</sup> Article 17 has been a back-burner issue for the governing body of the treaty, but recently many have called for increased efforts to take advantage of opportunities in other vocations.<sup>10</sup> The world food crisis has changed the equation for farmers and governments wishing to move away from tobacco cultivation.

## THE FCTC AND ARTICLE 17

Negotiations for the Framework Convention on Tobacco Control began in 1999 under the leadership of then-WHO Director Gro Brundtland.<sup>11</sup> It was ground-breaking in two ways. First,

it is the only treaty ever negotiated under the auspices of the World Health Organization.<sup>12</sup> Second, it is the world’s first public health treaty.<sup>13</sup> In contrast to many environmental treaties, which have been seen as a threat to the profit margins of private industries, the goals of the FCTC and those of the multinational tobacco industry are diametrically opposed; complete success for the treaty necessarily means the bankruptcy of the tobacco industry. Public health advocates often point to the tobacco industry as the “vector” of diseases caused by tobacco consumption, explicitly comparing them to mosquitoes or parasites.<sup>14</sup>

As a framework convention, the FCTC is meant as a starting point for further negotiations. Many of its articles are broad and few include definite obligations on parties. Still, six intergovernmental negotiating body sessions, along with innumerable national and regional meetings, were required to hammer out the final language, which was unanimously adopted by the World Health Assembly in May 2003.<sup>15</sup> To date, the FCTC includes 168 national Parties, representing 83.5% of global population.<sup>16</sup> The only two mega countries—those with over 100 million persons—not Party to the FCTC are Indonesia and the United States.

The issue of tobacco cultivation is not a traditional concern of the public health community. Owing to the relatively small percentage tobacco leaf contributes to the total value of retail tobacco products, raising the price of leaf is not vital to efforts to curb tobacco consumption. There was, therefore, little reason from a public health perspective to include Article 17, which addresses farmers’ livelihoods rather than direct public health implications of tobacco use. Like all treaties, however, the FCTC is a political instrument. A number of WHO member states that depend to a great degree on export earnings from tobacco leaf were reluctant to support a treaty process that aimed, ultimately, to destroy this market by eliminating consumption. Article 17 was the compromise that brought these countries on board by providing for alternative economic activities. It is short enough to quote in its entirety.

Article 17: Provision of support for economically viable alternative activities

Parties shall, in cooperation with each other and with competent international and regional intergovernmental

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organizations, promote, as appropriate, economically viable alternatives for tobacco workers, growers and, as the case may be, individual sellers.<sup>17</sup>

The framers of the FCTC also gave a nod to environmental concerns, particularly as they relate to tobacco cultivation:

Article 18: Protection of the environment and the health of persons

In carrying out their obligations under this Convention, the Parties agree to have due regard to the protection of the environment and the health of persons in relation to the environment in respect of tobacco cultivation and manufacture within their respective territories.<sup>18</sup>

The first Conference of the Parties (“COP”) (the governing body of the FCTC) created an ad hoc study group (“Study Group”) to address Articles 17 and 18.<sup>19</sup> The Study Group, made up of interested FCTC States, has met twice and reported back to the COP.<sup>20</sup> While they are far from developing concrete solutions, the group has made a number of general recommendations, which will be further discussed below.

### OVERVIEW OF GLOBAL TOBACCO LEAF CULTIVATION

As the absolute number of smokers in Europe and North America has leveled off and even fallen over the last four decades,<sup>21</sup> the tobacco industry has increasingly looked to the developing world as a largely untapped market.<sup>22</sup> As tobacco sales have exploded in developing countries, increased manufacturing and commercial leaf cultivation have followed.<sup>23</sup> In spite of public health efforts to combat consumption, the global demand for tobacco leaf is expected to continue to rise for decades.<sup>24</sup> The United Nations Food and Agriculture Organization expects total production to reach 7.1 million metric tons in 2010, a twenty percent increase over 1998.<sup>25</sup> Cultivation in developed countries continues a slow decline that began in the early 1980s; increased production is occurring entirely in developing countries, particularly China.<sup>26</sup>

Tobacco can be grown in a variety of climates and soil types, and is grown in over 100 countries.<sup>27</sup> For most nations, it is a minor crop, accounting for less than one percent of total exports.<sup>28</sup> Two-thirds of the world total is grown in just four countries: China, Brazil, India, and the United States.<sup>29</sup> South American leaf production is dominated by Brazil, the world’s number one exporter, which earned more than U.S. \$1 billion in 2003, the last year for which full figures are available.<sup>30</sup> Brazil’s total production is dwarfed, however, by China, which produced more than 2.4 million metric tons in 2004, compared to Brazil’s 928,000 metric tons.<sup>31</sup>

Africa has seen steady growth in tobacco cultivation since 1970, increasing by an average of 3.7% from 1970-2000.<sup>32</sup>

Malawi and Zimbabwe dominate continental production, producing about half of Africa’s total.<sup>33</sup> The two countries are major leaf exporters. Although most of the crop in China and India is destined for domestic consumption, Malawi and Zimbabwe<sup>34</sup> earn sixteen percent and sixty-three percent, respectively, of their total export revenue from tobacco leaf. They are seventh and third, respectively, in the world in total export value.<sup>35</sup> For obvious reasons, both countries were keenly interested in including language in the FCTC regarding the fate of tobacco farmers.

Farmers in poor countries turn to tobacco for a variety of reasons. It has a relatively high yield per unit of land, and is therefore attractive in areas where individual farms are very small. The market for leaf is perceived as stable, anticipating high returns over the long term. Cured tobacco is far less perishable than food, a major reason why countries with poor infrastructure and far from developed world markets tend to produce tobacco. Finally, support and loans (of both money and inputs) are often available from the tobacco industry, assistance that is not traditionally available for other crops.<sup>36</sup>

The benefits of tobacco cultivation are often illusory, however. In many instances, farmers who switch to tobacco cultivation find themselves poorer as a result,<sup>37</sup> in monetary, health, educational as well as other terms, for several reasons. First, the initial investment is higher for tobacco than for many other crops. While economies of scale allow large-scale growers to

make money, peasant farmers are rarely able to realize enough profits to make the investment worthwhile.<sup>38</sup>

A second barrier to profitability is the inherent power imbalance between tobacco farmers and transnational tobacco leaf buying companies.<sup>39</sup> A typical scenario plays out as follows: farmers enter into contracts with the

companies whereby they receive up-front loans, seed, fertilizers, pesticides, advice, assistance, and a guaranteed buyer. Farmers must promise to sell the entire crop to the company, at a price determined by the buyer. Sometimes payment for a partial crop will be withheld until the entire crop is delivered. Since the farmer has no control over the price paid for a crop, and no option to choose another buyer, in many cases the earnings do not equal what is owed under the contract. The farmer is able to put off the debt by signing a similar contract for the following year. Since these are legal contracts, and the farmer’s only collateral is usually the farm itself, the leaf buyers can now use the domestic legal system to force the farmer to continue growing tobacco. This is known as “debt bondage.”<sup>40</sup>

The third drawback to tobacco cultivation is its relatively high reliance on labor. In order to make ends meet, farmers often require the full-time work of the entire family, including children. Precluded from attaining an education, the children will be unable to break out of the cycle of poverty.<sup>41</sup>

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*Farmers who switch to tobacco cultivation find themselves poorer as a result.*

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In addition to concerns about poverty cycles, tobacco cultivation brings on a host of health concerns that are unrelated to smoking or other forms of consumption. Field workers often suffer an ailment known as green tobacco sickness, which occurs when nicotine is absorbed through workers' skin during leaf handling. Symptoms include nausea and other gastro-intestinal maladies, weakness, headaches, dizziness, difficulty breathing, and increases in blood pressure and heart rates.<sup>42</sup> Tobacco is also highly dependent on fertilizers and pesticides, including a number of organophosphate insecticides that have been shown to be highly toxic to humans.<sup>43</sup>

In addition to the human costs, there is an environmental cost to tobacco cultivation. First, runoff from heavy use of chemical fertilizers and pesticides pollutes waterways and drinking water.<sup>44</sup> Second, one of the reasons fertilizers are so necessary is that the tobacco plant leaches nutrients from the soil at a rate higher than most other plants, reducing the fertility of the soil for years to come.<sup>45</sup> Finally,

tobacco cultivation is a major contributor to deforestation when wood is used as fuel to cure tobacco leaves. A researcher in 1999 estimated that 200,000 hectares of forests are cut down per year as a result of tobacco farming, and that this accounts for nearly five percent of all deforestation in tobacco-growing developing countries.<sup>46</sup> As tobacco cultivation has expanded in the first ten years of the new millennium, this figure has surely gone up.

Finally, one must consider the opportunity costs of growing tobacco instead of food crops. In addition to the millions of hectares devoted to tobacco, an estimated eleven to twelve million farmers are largely dependent on the crop, with perhaps an additional twenty million somewhat dependent.<sup>47</sup> One researcher has estimated that if the land and resources devoted to tobacco were switched to food crops, an additional 10-20 million people could be fed.<sup>48</sup> This figure may seem pale in comparison to the world's hungry, but one must consider that few farmers are profiting from tobacco and that leaf is the first step in a product stream that causes massive harm to society as a whole. Such obvious "win-win" trade-offs are rare.

### THE FCTC STUDY GROUP

At its first meeting after the FCTC came into force, the Conference of the Parties established an ad hoc study group to address Parties' issues arising under Articles 17 and 18. The study group has four objectives:

- (1) summarizing the uptake of existing economically viable alternatives for tobacco workers, growers, and, as the case may be, individual sellers;
- (2) recommending to the Conference of the Parties mechanisms to assess the impact over time of the tobacco companies practices;

- (3) reporting on initiatives that are being taken at national level in accordance with Article 17; and
- (4) recommending cost-effective diversification initiatives.<sup>49</sup>

In addition, the COP mandated that the study group work closely with international organizations in related fields, such as the UN Food and Agriculture Organization ("FAO") and the World Bank.<sup>50</sup> The study group is comprised of interested Parties. As an ad hoc group, membership is not fixed, and a greater number of Parties attended the second session than the

first. Nongovernmental organizations with relevant expertise have also been invited to both official meetings.

The study group is not well-funded and has undertaken little original research, instead focusing on meta-analyses of other research in order to draw conclusions and make recommendations. Issue areas examined include economics, labor, health, social and environmental impacts, alternative crops,

non-crop alternative livelihoods, national policy frameworks, and tobacco industry corporate practices.<sup>51</sup>

The study group is tasked with reporting on its progress to each meeting of the Conference of the Parties, and produced a document in preparation for the third COP, held in Durban, South Africa in November 2008. In that document the group comes to a number of specific conclusions, recommendations, and observations:

48. The pursuit of alternative livelihoods to tobacco growing must be addressed from a development perspective, as it involves health, social, environmental and economic aspects beyond substitution of one economic activity for another. Despite advances in terms of national experiences, further work remains to be done.
49. Standardized, regularly collected data are needed on employment, health and environmental and social issues, and independent studies should be conducted, especially in less developed countries, that provide credible evidence.
50. Intersectoral approaches are needed to address alternative livelihoods, and public policies are required to ensure, for example, research and development, technical assistance and market access.
51. At all levels, undue influence of the industry must be avoided in policy decisions by careful monitoring.
52. The group agreed that a holistic framework is required that addresses all aspects of the livelihood of tobacco growers. Such a framework was discussed at the meeting, and it was agreed that a

similar approach should be used to evaluate experiences with alternative livelihoods and to provide a basis for implementing Articles 17 and 18 of the Framework Convention.

53. To this end, the group identified the following objectives, which the Conference of the Parties might consider when expanding the group's mandate: (1) adjust the suggested framework to address alternative livelihoods to tobacco growing; (2) standardize the terminology, instruments and variables in line with the standards and practices of the specialized international agencies; (3) identify mechanisms and areas of cooperation with international organizations with expertise in the matter; and (4) elaborate policy options and recommendations for implementation of Articles 17 and 18 of the Framework Convention.
54. The group agreed that a successful shift from tobacco growing to economically sustainable alternatives requires public policies that give priority to profitability, technical and financial assistance, capacity-building and market and social support, especially during the transition from one economic activity to another, and that ensure the involvement of farmers in decision-making.
55. An international database of information, research, experiences, best practices and regulations should be established, covering the status of tobacco growing, employment and the role of the tobacco industry. A baseline database should be established initially.
56. While progress has been made in finding economically sustainable alternatives to tobacco growing, further studies are needed, particularly on the health, social and environmental impacts of tobacco growing in developing countries and countries with economies in transition. Further monitoring is needed, and information should be made available to farmers and to the public.
57. States and international organizations should take a multisectoral approach in addressing the issue of alternative livelihoods, incorporating them into poverty reduction strategies and programmes. The World Food Programme and relevant development agencies should consider alternative livelihoods for tobacco crops as an opportunity. The involvement of farmers in all stages of decision-making should be encouraged.
58. Better understanding is needed of the role of the tobacco industry in tobacco production and its influence on the identification of sustainable alternatives. In accordance with Article 5.3 of the Convention, governments should protect their policies for alternative livelihoods for tobacco farmers from the vested interests of the tobacco industry,

affiliates and front groups, as defined in the Framework Convention.

59. The group considered that the Convention Secretariat should support Parties in raising and accessing funds for implementation of Articles 17 and 18 of the Framework Convention.<sup>52</sup>

The global food crisis, and its nexus with the goals of FCTC Article 17, is specifically mentioned in the study group's report, but only in passing.<sup>53</sup> The group's main contribution to a shift away from tobacco cultivation is in the gathering of evidence and data. It is simply not mandated or designed to react quickly to developments in international economics. By asking for specific expansions in its mandate—particularly in expanding cooperation with other international actors—the group is giving the COP the opportunity to accelerate the process. It remains to be seen whether the COP, which has so far seen Article 17 as a side issue, will rise to the challenge.

### FUNDING STREAMS AND PRACTICAL OBSTACLES

The study group's final recommendation, while simple, is arguably the most important. Many of the other recommendations for action will require funding, including further research, expanding infrastructure, technical assistance, monitoring, and market support. Over the life of the FCTC, Parties have been reticent to assign a meaningful percentage of the budget to alternative livelihoods work. This reflects a common, and quite correct, attitude among tobacco control professionals that demand-based interventions are the priority. Even on the supply side, it is tobacco smuggling that receives the lion's share of attention.

There is also a perception among many that tobacco farmers, as a part of the tobacco industry, are part of the problem and should be left out of any solution. FCTC Article 5.3 specifically calls for such a policy: "In setting and implementing their public health policies with respect to tobacco control, Parties shall act to protect these policies from commercial and other vested interests of the tobacco industry in accordance with national law."<sup>54</sup>

The perception that farmers should be included as members of the tobacco industry contradicts the FCTC itself, however, which defines the tobacco industry as "tobacco manufacturers, wholesale distributors and importers of tobacco products."<sup>55</sup>

Finally, the needs of tobacco farmers receive short shrift due to the compartmentalization of problems. The phenomenon is not limited to tobacco control or public health, but is universal and very natural. Tobacco control focuses on a problem that simply doesn't include the plight of farmers. The focus of public health when it comes to tobacco was summarized very clearly in the chapeau of the FCTC:

The objective of this Convention and its protocols is to protect present and future generations from the devastating health, social, environmental and economic consequences of tobacco consumption and exposure to tobacco smoke by providing a framework for tobacco control measures to be implemented by the Parties at the national, regional and international levels in order

to reduce continually and substantially the prevalence of tobacco use and exposure to tobacco smoke.<sup>56</sup>

Without a doubt, most public health professionals working in the tobacco control field, on a personal level, are also sympathetic to the plight of tobacco farmers. They simply do not wish to see time and resources diverted from the core issues of tobacco control.

This discrimination against core WHO funding for Article 17 issues is mirrored by private funding sources. In January of 2007, billionaire and New York City Mayor Michael Bloomberg announced a major funding initiative to aid global tobacco control efforts.<sup>57</sup> With additional financial support from the Bill and Melinda Gates Foundation, this now amounts to hundreds of millions of dollars a year, a massive increase over the sparse funds allocated by WHO and donor countries in the past.<sup>58</sup> Public health professionals in low and middle income countries who wish to be considered for a grant under the initiative are directed to an explanatory web page, which includes the following information: “What kind of projects will NOT be funded? The grants program is NOT designed to fund education programs (school-based or otherwise) nor is it designed to fund agricultural or crop-substitution programs.”<sup>59</sup>

However, there are reasons to differentiate between farmers and the rest of the tobacco industry. First, the FCTC explicitly carves farmers and farm workers out for special treatment.<sup>60</sup> The FCTC is a legally-binding instrument. When considering any one aspect, Parties must take into account all of its obligations. This does not necessarily mean that farmers must receive attention and funding equal to more mainstream tobacco control strategies, but it would be antithetical to the spirit of the main document to treat them as partners in one aspect but lump them in with tobacco manufacturers in another.

Second, farmers are in some respects natural allies of the tobacco control movement, since they are often victims of the tobacco industry, albeit in a different form than consumers and those exposed to secondhand smoke. Large tobacco farmer unions, which are controlled by international leaf buyer companies, have attempted to influence the ad hoc study group’s work. However, a number of smaller unions and cooperatives have joined forces with public health groups to support the study group.

There are few in the public health community who would argue to shift existing tobacco control resources in order to pay for programs to aid farmers to move away from tobacco. It is therefore unlikely that either public or private entities will decide upon such a diversion. Clearly, if progress is to be made on this issue, either new money must be found, or an existing funding stream for a related issue must be diverted.

Strong evidence already exists that funding crop diversity, substitution, and alternative livelihoods would not be wasted.<sup>61</sup> In the United States, the state of Maryland has successfully reduced tobacco cultivation by eighty-six percent in a decade through a voluntary buyout program.<sup>62</sup> Tobacco is a traditional crop in Maryland and, for most of its roughly four hundred year history, has been its leading commercial agricultural product.

Funding for the buyout came via the Master Settlement Agreement, a landmark legal settlement between most U.S. states and the tobacco industry, compensating governments for public health expenditures. The State’s plan included three steps:

1. The tobacco buyout—Farmers voluntarily entered into a contract with the State to cease tobacco farming permanently while continuing to use the land for agriculture for ten years. In exchange, farmers received compensation for ten years based on earlier tobacco yields.
2. Infrastructure/agricultural development—The State funded development of alternative industries, such as vegetables, flowers, etc.
3. Agricultural land preservation—The State offered further incentives for farmers to place former tobacco lands in agricultural preservation.<sup>63</sup>

To be sure, not many developing countries will have the financial means to adopt the Maryland strategy wholesale. But other experiments are underway and showing signs of success. According to studies presented at the second meeting of the FCTC ad hoc study group on alternative livelihoods:

- In Mexico, a reconversion project run by the Government aims to seize the opportunity opened by current international food prices to promote cultivation of vegetables, fruits and grains.
- In Kenya, bamboo was found to grow well under agro-climatic conditions similar to those for tobacco; this crop was selected on the basis of potential demand, its multiple uses, and the low investment and labor costs required.
- In India, the net returns from cropping systems were found to be higher than from tobacco monoculture.
- In Bangladesh, viable crop combinations were identified on the basis of food requirements, cash earnings, and improving soil health, as well as increasing livestock-keeping.
- In Pakistan, the State is involved in research on economically viable alternative crop cycles, particularly in the case of hybrid spring maize and hybrid sunflowers.<sup>64</sup>

Brazil is also experimenting with a model promoting alternative livelihoods beyond crop substitution that focuses on five types of capital: natural, human, physical or infrastructure, financial, and social.<sup>65</sup> Much research remains to be done, and there will be no one solution that fits every country, or even every region in a single country.

## CONCLUSION

From one perspective, the need to promote a global transition away from tobacco leaf cultivation is not urgent. The WHO and the World Bank expect a dramatic increase in the number of smokers worldwide from approximately 1.1 billion today to 1.6 billion in 2025.<sup>66</sup> Demand for tobacco leaf will therefore actually go up, not down, for the foreseeable future, offering a potential livelihood for farmers for decades.

The purpose of Article 17, however, is to help farmers transition away from tobacco cultivation before the market forces them out. There is presently a unique opportunity to take advantage of increased global demand and prices for food. Several changes are

required to fully realize this opportunity. First, the compartmentalization of problems must be solved, meaning greater cooperation among disparate but interested parties. The ad hoc study group has been admirable in reaching out to other groups, such as FAO, the UN Ad Hoc Interagency Task Force on Tobacco Control, the International Labour Union, the World Bank, and others. What is needed is an umbrella group, comprised of experts from each group, focused on bringing various resources together to face the issue. Perhaps this could be a UN task force on alternative livelihoods for tobacco farmers. Such a group could coordinate research and allocate funds for pilot projects.

Second, funding streams must be found. The most obvious place to start is with tobacco industry profits. In 2005, revenues for Altria alone were nearly \$98 billion.<sup>67</sup> Article 6 of the FCTC calls for Parties to implement excise taxes on tobacco products in order to raise the price and therefore reduce demand.<sup>68</sup> A side benefit, of course, is greater government revenue. A relatively small earmark would provide large sums to help farmers through infrastructure development, crop experimentation, and debt relief, among others.

Another source is development funding, both public bilateral and private. As we have seen, transitioning farmers away from tobacco cultivation cuts across a number of issues, including food, environment, labor, and social justice. Presently, each funding mechanism seems to view the problem as outside its mandate. Private foundations should consider an overarching group, similar to the UN group called for above, to address how to best use existing funds to target tobacco farmers. Donor nations must reevaluate priorities.

As populations rise and environmental degradation reduces the amount of arable land on the planet, humanity can ill-afford to spend land and labor on growing a crop that causes a social ill. The need for new alternatives is obvious and the opportunity and funds exist. All that is needed is the will of the international community. The FCTC ad hoc study group on alternative livelihoods has produced an excellent set of recommendations for the Conference of the Parties. However, the message needs to be heard beyond the mandate of a single treaty mechanism. 

## Endnotes: Two Global Crises Bring Opportunity in International Tobacco Control

<sup>1</sup> Raegan Payne, *The Current Global Food Crisis and World Hunger*, CELSIAS, Aug. 19, 2008, available at <http://www.celsias.com/article/current-global-food-crisis-and-world-hunger/> (last visited Oct. 21, 2008).

<sup>2</sup> See, e.g., THE WORLD BANK, CURBING THE EPIDEMIC: GOVERNMENTS AND THE ECONOMICS OF TOBACCO CONTROL 67 (Prabhat Jha & Frank J. Chaloupka eds., 1999), available at <http://www1.worldbank.org/tobacco/book/pdf/tobacco.pdf>.

<sup>3</sup> Edith M. Lederer, *Tough Tobacco Control Urged*, S. FLA. SUN SENTINEL, Feb. 8, 2008, at 19A.

<sup>4</sup> World Health Organization [WHO], Tobacco Free Initiative: Overview, <http://www.wpro.who.int/sites/tfi/overview.htm> (last visited Oct. 23, 2008).

<sup>5</sup> THE WORLD BANK & THE INTERNATIONAL MONETARY FUND, TOBACCO CONTROL AT A GLANCE (2003), available at <http://www1.worldbank.org/tobacco/pdf/AAG%20Tobacco%206-03.pdf> (last visited Nov. 2, 2008).

<sup>6</sup> *Id.*

<sup>7</sup> See WHO Framework Convention on Tobacco Control [FCTC], May 21, 2003, WHO Doc. A56/VR/4, 2302 U.N.T.S. 166 (2003) entered into force Feb. 27, 2005, available at [http://www.who.int/entity/tobacco/framework/WHO\\_FCTC\\_english.pdf](http://www.who.int/entity/tobacco/framework/WHO_FCTC_english.pdf) (last visited Oct. 23, 2008) [hereinafter FCTC].

<sup>8</sup> *Id.*

<sup>9</sup> *Id.*

<sup>10</sup> Press Release, WHO, More Efforts Needed to Defeat the Tobacco Scourge, Sept. 26, 2008, available at [http://www.wpro.who.int/media\\_centre/press\\_releases/pr\\_20080926\\_tobacco.htm](http://www.wpro.who.int/media_centre/press_releases/pr_20080926_tobacco.htm) (last visited Nov. 13, 2008).

<sup>11</sup> See FCTC, *supra* note 7, at Annex 2.

<sup>12</sup> See *id.* at v.

<sup>13</sup> Framework Convention Alliance, What is the Framework Convention on Tobacco Control?, [http://fctc.org/index.php?option=com\\_content&view=article&id=8&Itemid=5](http://fctc.org/index.php?option=com_content&view=article&id=8&Itemid=5) (last visited Oct. 22, 2008). The International Code of Marketing of Breast-milk Substitutes, which served in some ways as a model for the drafters of the FCTC, is a resolution adopted in 1981 by the World Health Assembly and as such does not constitute a treaty.

<sup>14</sup> See Alyssa Woo, *Health versus Trade: The Future of the WHO's Framework Convention on Tobacco Control*, 35 VAND. J. TRANSNAT'L L. 1731, 1734-35 (2002).

<sup>15</sup> WHO Framework Convention on Tobacco Control, Full list of Signatories and Parties, [http://www.who.int/fctc/signatories\\_parties/en/index.html](http://www.who.int/fctc/signatories_parties/en/index.html) (last visited Nov. 2, 2008).

<sup>16</sup> *Id.*

<sup>17</sup> See FCTC, *supra* note 7, at 16.

<sup>18</sup> *Id.*

<sup>19</sup> Conference of the Parties to the WHO FCTC, 1st Session, Geneva, Switz., Feb. 6-17, 2006, *List of decisions for document A/FCTC/COP/1/DIV/8*, at FCTC/COP(17), Doc. A/FCTC/COP/1/DIV/8 (Mar. 23, 2006) available at [http://www.who.int/gb/fctc/PDF/cop1/FCTC\\_COP1\\_DIV8-en.pdf](http://www.who.int/gb/fctc/PDF/cop1/FCTC_COP1_DIV8-en.pdf) (last visited Nov. 2, 2008) [hereinafter *List of decisions*].

<sup>20</sup> WHO FCTC, Second Meeting of the Study Group on Economically Sustainable Alternatives to Tobacco Growing, June 17, 2008, available at [http://www.who.int/fctc/cop/study\\_group/en/index.html](http://www.who.int/fctc/cop/study_group/en/index.html) (last visited Nov. 2, 2008) [hereinafter *Second Meeting*].

<sup>21</sup> Food and Agriculture Organization of the UN [FAO], *Projections of Tobacco Production, Consumption and Trade to the Year 2010*, § 3.3 (2003), available at <ftp://ftp.fao.org/docrep/fao/006/y4956e/y4956e00.pdf> (last visited Nov. 2, 2008) [hereinafter *Tobacco Production*].

<sup>22</sup> *Id.*

<sup>23</sup> *Id.*

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> *Id.*

<sup>27</sup> JUDITH MACKAY, ET AL., THE TOBACCO ATLAS 44-48 (2d ed. 2006).

<sup>28</sup> KATHARINE M. ESSON & STEPHEN R. LEEDER, WHO, *MDG and Tobacco Control: An Opportunity for Global Partnership* 40 (2004) available at [http://www.who.int/tobacco/publications/mdg\\_final\\_for\\_web.pdf](http://www.who.int/tobacco/publications/mdg_final_for_web.pdf) (last visited Nov. 2, 2008).

<sup>29</sup> See Mackay, *supra* note 27.

<sup>30</sup> *Id.*

<sup>31</sup> *Id.*

<sup>32</sup> *Tobacco Production*, *supra* note 21, at 18.

<sup>33</sup> *Id.*

<sup>34</sup> Figures are not yet available to clarify how the current political and economic upheaval in Zimbabwe will affect the tobacco leaf market there.

# SUSTAINABLE SOILS: REDUCING, MITIGATING, AND ADAPTING TO CLIMATE CHANGE WITH ORGANIC AGRICULTURE

by Meredith Niles\*

## INTRODUCTION

On April 2, 2007, the U.S. Supreme Court handed down its decision in *Massachusetts v. EPA*, its first case dealing with the issue of global warming.<sup>1</sup> Yet, even before the ruling, the effects of climate change were already being felt and documented throughout the world. In late 2007, the Intergovernmental Panel on Climate Change (“IPCC”) released its Fourth Assessment Report, which famously noted that warming of the global climate system is now “unequivocal.”<sup>2</sup> As policymakers throughout the world continue to feel the impacts of climate change and are compelled to action, oversight measures aimed at reducing greenhouse gas (“GHG”) emissions and their impacts can no longer ignore the effect of industrial agriculture on climate change. Similarly, policymakers should recognize the role organic agriculture can play in stabilizing and lessening the impacts of climate change, and provide adequate funding for transition programs and initiatives utilizing organic production methods.

The IPCC’s Fourth Assessment Report, and several subsequent reports, including a recent synthesis and assessment report by the U.S. Climate Change Science Program (“CCSP”), all conclude that climate change is already occurring and will likely accelerate in the future.<sup>3</sup> New research suggests that our food system will be singularly affected by climate change. Agricultural yields in the United States are set to notably decrease for crops ranging from corn to rice to sorghum.<sup>4</sup> Longer growing seasons will increase crop water requirements,<sup>5</sup> while rainfall events will become more sporadic and the intensity of rainfall events is expected to increase, resulting in more significant flood conditions.<sup>6</sup> Weed growth is projected to blossom as weeds respond positively to higher carbon dioxide (“CO<sub>2</sub>”) levels, and glyphosate, the most frequently used herbicide in the United States, will lose its efficacy.<sup>7</sup> Warmer temperatures will also likely increase the insect and pest populations throughout the United States, and a recent study has demonstrated that soybeans grown at elevated CO<sub>2</sub> levels had more than fifty percent more insect damage than soybeans grown in normal conditions.<sup>8</sup>

Such significant damage to our food system would have widespread implications throughout the world. As the evidence of climate change continues to mount, oversight paradigms like regional cap-and-trade programs have focused mostly on the industrial and transportation sectors as targets of GHG emissions mitigation. To date, the agricultural sector has been largely

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overlooked as both a source of GHG emissions and a potential tool for mitigation. Estimates of agricultural GHG emissions, as a percentage of total emissions, range from 13.5% to nearly 33% of all global emissions.<sup>9</sup> Furthermore, the U.N. Food and Agriculture Organization (“FAO”) estimates that animal production alone accounts for eighteen percent of global GHG emissions.<sup>10</sup> In comparison, transportation emissions account for a little over thirteen percent of total global GHG emissions.<sup>11</sup> Clearly, there is a need for a shift in climate change policy to address the agricultural sector.

As policymakers and individuals grapple with ways to reduce carbon footprints, it is essential that agriculture be recognized as a sector that needs to decrease its GHG emissions. Such reductions are essential, as they are in other sectors; however, agriculture has a unique role to play in climate change discussions because of its potential to mitigate GHG emissions through carbon sequestration, as well as lessen and prevent climate change impacts on agricultural, land, and water systems. This article will discuss recent and mounting evidence which suggests that organic agriculture, more than any other production system, has the greatest potential for combating climate change by reducing overall GHG emissions, sequestering more

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carbon, and promoting land management that lessens or eliminates the potential climate change impacts on land and agricultural systems.

Reducing GHG emissions in agriculture and adapting to climate change will depend on organic production systems for three reasons:

- 1) The overall emission reductions possible using organic production methods;
- 2) The increased ability of organic production systems to sequester carbon; and
- 3) The demonstrated ability of organic production to better adapt to potential climate change related events, including drought, floods, pest increase, and loss of biodiversity.

### REDUCING EMISSIONS THROUGH ORGANIC PRODUCTION METHODS

Agriculture in the United States has changed significantly in the past several decades. Farming has shifted largely toward the adoption of industrial practices that rely heavily on synthetic chemical pesticides and fertilizers, equipment and machinery reliant on fossil fuels, and monoculture. Most large farms now grow only one crop, typically corn or soybeans. The industrialization of our food system has had a heavy impact on the environment and played a major role in increasing global GHG emissions—especially with the rapid adoption of synthetic fertilizers and pesticides.<sup>12</sup>

Each year, the U.S. food system uses nearly 40 billion pounds of synthetic fertilizers<sup>13</sup> and more than one billion pounds of synthetic pesticides.<sup>14</sup> The GHG emissions associated with the production, packaging, transport, and application of these chemicals contribute to climate change and air pollution. The production of synthetic fertilizers and pesticides contributes more than 480 million tons of GHG emissions to the atmosphere each year.<sup>15</sup> The U.S. Environmental Protection Agency (“EPA”) estimates that, once on our soils, synthetic fertilizers generate over 304 million pounds of GHG emissions.<sup>16</sup> Frequent over-application of synthetic fertilizers results in “run-off” when fertilizers are carried off of fields during weather events and irrigation.<sup>17</sup> Build-up of synthetic fertilizers has caused hypoxia, or “dead zones” lacking sufficient oxygen, in water bodies throughout the world where animals, plants, and plankton are dying in vast quantities.<sup>18</sup>

Shifting to organic production systems will cause an immediate drop in GHG emissions as organic production systems produce fewer GHG emissions than conventional industrial farming systems. FAO concluded that, “[w]ith lower energy inputs, organic systems contribute less to GHG emissions and have a greater potential to sequester carbon in biomass than conventional systems.”<sup>19</sup> Because organic production systems are prohibited from using synthetic fertilizers and pesticides, they often rely on less intensive methods for fertilization including animal manure, cover crops, and integrated pest management strategies.<sup>20</sup> Research performed at the Rodale Institute, in conjunction with Cornell University, demonstrated that a conventional

corn production system required significantly more energy per hectare than organic systems.<sup>21</sup> The reduced reliance on fossil fuel energy in the organic system reduced energy inputs about thirty percent, mostly because the organic systems relied on animal and legume nitrogen nutrients rather than synthetic fertilizers and pesticides.<sup>22</sup> In addition, nitrate leaching from fertilizers is significantly higher for intensive conventional systems as compared to organic systems,<sup>23</sup> and organic compost has the ability to reduce nitrogen and phosphorus leaching five fold when compared to synthetic fertilizers.<sup>24</sup> Switching to organic production will thus reduce not only initial GHG emissions from the production of fertilizers, but will also prevent fertilizers from leaching into waterways and exacerbating emissions in hypoxic systems.

Many of the synthetic fertilizers and pesticides used in the United States are for feed crops for animal production. It is estimated that about half of the grain and oilseeds grown in the United States are fed to livestock,<sup>25</sup> and conventional grain-fed beef requires twice as many energy inputs as grass-fed beef.<sup>26</sup> Animals that are “grass-fed,” or produced using organic methods, produce significantly fewer GHG emissions than conventionally raised animals. Organic systems typically require fewer synthetic inputs and less energy to operate than conventional industrial facilities.<sup>27</sup> In addition, because pastured systems require fewer feed crops than confined systems, significant reductions in nitrous oxide would result from a shift to grass-fed animal production.<sup>28</sup> Overall, the global warming potential of organic animal production is about one third as much as intensive animal farming.<sup>29</sup> USDA-certified, grass-fed animals “cannot be fed grain or grain byproducts and must have continuous access to pasture during the growing season.”<sup>30</sup> While some animals (like chickens or pigs) do not eat grass and may rely on feed crops, if raised organically the animals are fed 100% organic feed grown without synthetic pesticides and fertilizers.<sup>31</sup> Thus, organic meat and dairy products result in significantly fewer GHG emissions than conventional meat and dairy.<sup>32</sup>

Animal production contributes nearly one fifth of all global GHG emissions,<sup>33</sup> and in addition to the impact of synthetic fertilizers and pesticides used on feed crops, manure management, and enteric fermentation are also significant sources of GHG emissions.<sup>34</sup> In 2007, EPA reported that livestock manure management is responsible for over 55 million metric tons of GHG emissions,<sup>35</sup> mostly in the form of methane and nitrous oxide, which are approximately 21 times and 310 times more potent as GHGs than CO<sub>2</sub>, respectively.<sup>36</sup> Improper manure storage in large-scale, conventional animal production increase GHG emissions because waste is often pooled in large lagoons and holding ponds, rather than being directly incorporated into soils.<sup>37</sup> During manure storage and decomposition, gaseous byproducts including hydrogen sulfide, CO<sub>2</sub>, ammonia, and methane are produced and released into the atmosphere.<sup>38</sup> Research has documented that manure stores on conventional farms emitted about twenty-five percent more methane gas than organic farms, demonstrating the significant impact that organic animal production can have in reducing GHG emissions.<sup>39</sup>

## CARBON SEQUESTRATION IN ORGANIC AGRICULTURE

Addressing climate change issues involves not only reducing GHG emissions, but also incorporating mitigation techniques that can sequester excessive GHG emissions. More than any other sector, agriculture is uniquely positioned to sequester vast amounts of carbon and thus reduce the impacts of climate change. Microbes and other soil organisms play a vital role in maintaining the health of agricultural soils as they decompose organic matter, cycle nutrients, and convert atmospheric nitrogen into organic forms.<sup>40</sup> EPA estimates that composting one ton of organic materials results in a net storage of nearly 600 pounds of CO<sub>2</sub>.<sup>41</sup> While all types of agriculture have the ability to sequester carbon, organic agriculture can sequester significantly more carbon than conventional systems, and even conventional no-till systems,<sup>42</sup> because organic agriculture prohibits synthetic fertilizer and pesticide use, incorporates leguminous cover crops, and prioritizes increasing soil organic matter.<sup>43</sup> Moreover, several studies have shown that organic soils can sequester more carbon than conventional soils and that synthetic fertilizer can have a negative impact on carbon sequestration.<sup>44</sup>

In comparisons of field trials of organic and conventional farming plots, researchers found that while soil carbon levels were initially the same, after more than two decades the organic systems had significantly higher soil carbon levels. The organic systems—one using legume cover crops and the other using manure—retained more carbon in the soil, “resulting in an annual soil carbon increase of 981 and 574 kg per hectare . . . , compared with only 293 kg per hectare in the conventional system.”<sup>45</sup> Similar long-term research at the United States Department of Agriculture (“USDA”) demonstrated that organic agriculture increased overall soil health more than conventional no-till methods and resulted in increased yields over conventional production.<sup>46</sup> In addition, carbon sequestration is not exclusive to crop systems and can also provide substantial opportunities for farmers in animal production.<sup>47</sup>

### UTILIZING ORGANIC AGRICULTURE TO ADAPT TO CLIMATE CHANGE IMPACTS

Climate change will impact many aspects of our lives, but the effects on agriculture may be the most noteworthy. CCSP noted:

Ecosystems and their service (land and water resources, agriculture, biodiversity) experience a wide range of stresses, including pests and pathogens, invasive species, air pollution, extreme events and natural disturbances such as wildfires and flood. Climate change can cause or exacerbate direct stress through high

temperatures, reduced water availability, and altered frequency of extreme events and severe storms.<sup>48</sup>

One of the greatest challenges of climate change will be finding ways to adapt to its myriad potential impacts. Securing and maintaining a food system that can continue to produce, despite unexpected weather and climate events, is crucial for the future. Organic agriculture, which is more resilient to climate change impacts, will be a necessary component to this challenge.

Among the greatest threats of climate change will be the impact on biodiversity and the potential global loss of life. Biodiversity contributes to ecosystem functioning and maintenance; as biodiversity decreases it will be extremely difficult to retrieve

and recover.<sup>49</sup> Endangered and extinct species are already documented throughout the world, but climate change is causing more subtle losses in species and diversity.<sup>50</sup> Many of the species more prevalent in organic farming were known to have declining diversity and numbers as a result of previous agriculture intensification.<sup>51</sup> The biodiversity benefits associated with organic farms likely derive from the management

practices absent from or rarely utilized in most conventional systems.<sup>52</sup> Specifically, organic farms have considerably more spiders,<sup>53</sup> birds,<sup>54</sup> butterflies,<sup>55</sup> and other species,<sup>56</sup> in both number and species count. Maintaining biodiversity on farms will be crucial to sustaining food production and ecosystem functions and organic production can certainly perform this task.

Climate change also has the potential to threaten agriculture through changing water and weather patterns increasing both drought and run-off.<sup>57</sup> Soil organic matter and soil carbon content are important for water absorption and retention and can be greatly affected by changes in these elements.<sup>58</sup> Increasing organic matter in soils leads to a direct increase in the ability of soils to retain water<sup>59</sup> and will be an important tool for combating drought and potential flood conditions from increasing snow melt and runoff.<sup>60</sup> Organic soils have higher levels of soil carbon and research has shown that in drought conditions, organic systems produced corn yields twenty-eight to thirty-four percent higher than conventional systems.<sup>61</sup> As weather patterns and precipitation continue to change, organic agriculture will be better able to adapt and continue to produce in uncertain conditions.

### PROVIDING THE FRAMEWORK FOR TRANSITIONING TO CLIMATE RESILIENT AGRICULTURE

Climate change is real, and its current and foreseeable future impacts can no longer be overlooked. As policymakers in the United States examine ways to reduce GHG emissions, mitigate climate change, and adapt for its effects, it is apparent that our food and agriculture system cannot be ignored. Conventional agriculture cannot continue on the same path because it causes a

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*Organic agriculture, more than any other production system, has the greatest potential for combating climate change.*

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significant portion of our global and domestic GHG emissions. Without a paradigm shift in farming, excessive and unnecessary GHG emissions will continue and our food system will become ever more susceptible to collapse as a result of climate change.

The policy and legal approaches to addressing climate change through agriculture must involve a transition to a more organic way of farming. In 2007, the U.S. government allocated more than \$3.7 billion in direct subsidies for corn, soy, and wheat.<sup>62</sup> Less than one percent of corn, soy, and wheat are grown organically in the United States, meaning almost all of these subsidies were given for industrial or conventional production.<sup>63</sup> Moreover, as described by Environmental Working Group:

Direct payment subsidies are provided without regard to the economic need of the recipients or the financial condition of the farm economy. Established in 1996, direct payments were originally meant to wean farmers off traditional subsidies that are triggered during periods of low prices for corn, wheat, soybeans, cotton, rice and other crops.<sup>64</sup>

Yet, prices for these commodities are currently at record highs, with the cost of corn per bushel rising nearly sixty percent between 2006 and 2007.<sup>65</sup>

Such subsidies contribute to significant increases in annual GHG emissions and promote increased production and over-application of synthetic fertilizers, loss of biodiversity, and simplification of the soil that leads to reduced soil health, which in turn reduces carbon sequestration capacity. Meaningful reductions in GHG emissions from agriculture will require broad-based and large-scale legislative initiatives that stop rewarding an agriculture system that is worsening the global climate change crisis. Billions of dollars of subsidies for conventional production could be reallocated to organic transition programs and water and land conservation initiatives that will ensure that agriculture in the United States will continue to produce and function.

### **INCREASING FUNDING FOR ORGANIC CERTIFICATION, CONSERVATION AND CONVERSION**

The 2008 Farm Bill allocated a total of \$22 million for the national organic certification cost share program, which is designed to help decrease the amount of money farmers pay for organic certification.<sup>66</sup> While this allocation did increase the annual cost-share eligibility from \$500 to \$750 per operation,<sup>67</sup> it pales in comparison to the vast subsidies received by larger conventional industrial farms. The National Organic Program received \$39 million through 2012<sup>68</sup> and was authorized up to \$10 million dollars for organic research.<sup>69</sup> To foster the transition of farmers to organic production systems and reduce GHG emissions, future legislation must allocate significantly greater funds.

Unique opportunities also lie in providing carbon offsets to farmers who transition to organic agriculture. Given the increasing evidence that organic agriculture is better suited to sequester carbon, offset programs established within cap-and-trade programs and public-based carbon offset initiatives should consider

adding offset components for agriculture. Currently, only a few agriculture-based offset programs are in place within cap-and-trade programs, including a methane digester offset program in the Northeast Regional Greenhouse Gas Initiative.<sup>70</sup> While converting methane from manure can reduce emissions, research estimates that methane digesters could potentially only provide about 0.0002% of the energy currently consumed in the United States.<sup>71</sup> Moreover, the compression of methane gas requires significant amounts of energy, which may offset any potential emissions reductions.<sup>72</sup> Transportation of methane gas may also present difficulties, as most large scale farms will be able to produce more gas than they can use on farm; yet, given the economic investment of digesters, only large farms are usually able to invest in this technology.<sup>73</sup> Creating opportunities for farmers transitioning to organic production to receive carbon credits will create incentives for organic production and also help decrease the costs of transition.

### **REDUCING FEED CROPS AND TRANSITIONING TO PASTURE-BASED ORGANIC ANIMAL PRODUCTION**

With roughly fifty percent of grains grown in the United States being fed to livestock, much of corn, soy, and wheat subsidies are diverted to animal production.<sup>74</sup> Livestock and animal production is an important source of income for billions of people throughout the world; yet, our current production methods are not sustainable. Transitioning livestock production to pasture-based organic systems will utilize grasses unsuitable for human consumption and, through proper management, increase carbon sequestration.<sup>75</sup> Reducing crop production for animal feed is one of the most efficient methods for mitigating GHG emissions from agriculture<sup>76</sup> and ensuring sustainable food sources in the face of increasing fossil fuel prices. “[N]o other form of agriculture is less dependent on external, finite resources, such as fossil fuels, and/or external, potentially environmentally disruptive resources, such as fertilizers or pesticides, than grazing of native grasslands.”<sup>77</sup>

### **ADVOCATING FOR ORGANIC CONSERVATION MEASURES**

Transitioning to organic agriculture is not a process that can happen overnight and will certainly require significant investments of time and money. Yet, in the meantime, many organic practices can be incorporated into existing conventional farming methods that will help to reduce GHG emissions. For example, integrating perennial crops, riparian zones, cover crops, and grasslands, and increasing crop diversity on farms have a demonstrated ability to not only reduce the climate change impacts of agriculture, but also increase yields and decrease costs associated with land management and fertilizer.<sup>78</sup>

Traditionally, the USDA’s Conservation Reserve Program (“CRP”) has assisted farmers and ranchers to comply with federal, state, and tribal environmental laws, and encourages farmers, by providing annual rental payments under multi-year contracts, “to convert erodible cropland or other environmentally sensitive acreage to vegetative cover” including native grasses, trees, or

riparian buffers.<sup>79</sup> The CRP has increased carbon sequestration and promoted the maintenance of important ecosystem functions that help reduce environmental pollution. Since 1985, the program “has protected 170,000 miles of streams and restored 2 million acres of wetlands and buffer zones.”<sup>80</sup> Unfortunately, with recent steady increases in ethanol production, land-use has begun to change. Subsidies for ethanol production have caused land previously held in reserve under the CRP to be taken out of conservation for corn production.<sup>81</sup> In 2006, USDA Chief Economist Dr. Keith Collins testified before the Senate Committee on Environment & Public Works about ethanol production, noting that the CRP, “which has 36 million acres set aside from crop production for environmental reasons, may provide a source of additional crop acreage. . . . [A] preliminary assessment concluded that 4.3 to 7.2 million acres currently enrolled in the CRP could be used to grow corn or soybeans . . . .”<sup>82</sup>

Policies that advocate for the removal of CRP land for ethanol production will not decrease GHG emissions.<sup>83</sup> Instead, increased ethanol production is releasing carbon stores in grasslands and creating a “carbon debt.”<sup>84</sup> If ethanol production increases to the congressionally suggested 15-36 billion gallons by 2022, nitrogen fluxes into the Gulf of Mexico could increase by as much as thirty-four percent.<sup>85</sup> Such measures would have devastating effects on water quality, aquatic ecosystems, and GHG emissions. Policies encouraging ethanol production, specifically with land-use changes, should be strongly reconsidered in this context and re-evaluated for their overall effectiveness at reducing GHG emissions. Instead, CRP funding should continue

and be strengthened to encourage organic conservation methods to be incorporated into farms throughout the country.

## CONCLUSIONS

Climate change is a critical environmental issue and has broad implications for sustainable development and the future of our economy, health, and food system. The ability to respond to the momentous task of regulating GHG emissions will have implications for the overall well-being of our entire country. Reducing and sequestering GHG emissions and adapting to climate change impacts demand comprehensive approaches that fully integrate agriculture, recognizing its contribution to climate change and unique ability to sequester GHG emissions and reduce climate change impacts. Organic agriculture offers much hope for the future of environmental sustainability and food production and should be recognized for the many contributions it can make. Providing and increasing funding for organic transition, certification, and conservation programs will allow the United States and other countries throughout the world to reduce and offset GHG emissions. At the same time, organic agriculture policy initiatives will ensure environmental protection in our waterways and promote biodiverse ecosystems in the face of looming global reductions in species. Ensuring the future of our environment and the vitality of our food systems in the shadow of climate change depends on organic production systems and our ability to transition to more sustainable agricultural policies.



## Endnotes: Sustainable Soils

<sup>1</sup> See generally *Massachusetts v. EPA*, 549 U.S. 497 (2007). The decision was a landmark victory for environmentalists because it legitimized the urgency of the global warming crisis and the claim that the Bush Administration was illegally withholding regulation that could help address this crisis. The Court held, among other things, that the Environmental Protection Agency (“EPA”) was legally bound to address greenhouse gas (“GHG”) emissions under the Clean Air Act. *Id.* The momentous decision fundamentally altered the climate change debate in the United States and has led to a flurry of activity by the federal and state governments, as they attempt to piece together regulations and interim rules on how to best comply with the Court’s decision and to generally address climate change. *Id.* See also Environmental Protection Agency, *Advanced Notice of Proposed Rulemaking: Regulating Greenhouse Gas Emissions Under the Clean Air Act*, 73 Fed. Reg. 44354-44520 (July 30, 2008); Department of the Interior, *Implementation of the National Environmental Policy Act (NEPA)*, 73 Fed. Reg. 126 (Jan. 2, 2008); Government Accountability Office (GAO), *Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources*, GAO-07-863 (Aug. 7, 2007); Letter from Henry Waxman, U.S. Congressman, to Stephen L. Johnson, EPA Administrator (Mar. 12, 2008); Ctr. for Biological Diversity v. Nat’l. Highway Traffic Safety Admin., 508 F.3d 508, 550 (9th Cir. 2007) (NHTSA failed to evaluate adequately global warming impacts of changes to fuel efficiency standards for vehicles); Ana Compoy, *States Sue EPA Over Refinery Emissions*, WALL STREET JOURNAL, Aug. 26, 2008, at A3; Beth Daley, *Mass. leads bid to limit greenhouse emissions; 18 states ask court to press EPA on car, truck gases*, BOSTON GLOBE, Apr. 2, 2008; Lieberman-Warner “America’s Climate Security Act,” S. 3036, 110th Cong. (2008); Bingaman-Specter “Low Carbon Economy Act” of 2007,

S. 1766, 110th Cong. (2008); Midwest Greenhouse Gas Reduction Accord, <http://www.midwesternaccord.org/>; Regional Greenhouse Gas Initiative, <http://www.rggi.org/home> (Ten Northeast States signed on Sept. 25, 2008).

<sup>2</sup> INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE [IPCC], CLIMATE CHANGE 2007: SYNTHESIS REPORT, SUMMARY FOR POLICY MAKERS 2 (2007), available at [http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr\\_spm.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf) (last visited Nov. 13, 2008).

<sup>3</sup> For instance, forest fires are growing in frequency and intensity, and snow-pack in the western United States has decreased and melts earlier. See, e.g., U.S. CLIMATE CHANGE SCIENCE PROGRAM [CCSP], THE EFFECTS OF CLIMATE CHANGE ON AGRICULTURE, LAND RESOURCES, WATER RESOURCES, AND BIODIVERSITY IN THE UNITED STATES 3 (2008), available at <http://www.climatechange.gov/Library/sap/sap4-3/final-report/sap4-3-final-exec-summary.pdf> (last visited Nov. 13, 2008); IPCC, *supra* note 2, at 7-9 (discussing projected climate change and its impacts).

<sup>4</sup> CCSP, *supra* note 3, at 30.

<sup>5</sup> *Id.* at 39.

<sup>6</sup> *Id.* at 58.

<sup>7</sup> *Id.* at 59.

<sup>8</sup> EVAN H. DELUCIA ET AL., BROOKHAVEN NAT’L LAB., INFLUENCE OF ELEVATED OZONE AND CARBON DIOXIDE ON INSECT DENSITIES 13 (2005), available at <http://www.pubs.bnl.gov/documents/30743.pdf> (last visited Nov. 13, 2008).

# USDA ORGANIC:

## ECOPORNOGRAPHY OR A LABEL WORTH SEARCHING FOR?

by Blake M. Mensing\*

“**E**copornography,”<sup>1</sup> more commonly known as greenwashing,<sup>2</sup> is a term that applies to any entity that disseminates disinformation in order to promote an environmentally friendly public image without actually taking significant action to protect the environment.<sup>3</sup> Greenwashing is pervasive and a nearly unavoidable component of consumers’ evaluations of potential purchases.<sup>4</sup> Food producers and packagers are often guilty of greenwashing their products to appeal to the environmentally conscious consumer by using such terms as “free range”<sup>5</sup> or “all natural.”<sup>6</sup> The United States Department of Agriculture (“USDA”) has set standards for the use of the word “organic” on food labels. These standards, while significantly more meaningful than those behind the “free range” label, are by no means the most stringent in the world.<sup>7</sup> Is the USDA organic label indicative of an environmentally friendly product or is it greenwashing?

The 1990 Organic Foods Production Act<sup>8</sup> provided for the formation of a National Organic Standards Board (“NOSB”) within the USDA’s Agricultural Marketing Service.<sup>9</sup> The NOSB serves as an advisor to the Secretary of Agriculture in promulgating the final standards that the USDA National Organic Program oversees.<sup>10</sup> The USDA organic labeling standards are broken down into four categories. The first category allows 100% organic products to carry the USDA organic logo.<sup>11</sup> In the second category, the USDA organic logo may appear on the packaging if, excluding water and salt, the product is ninety-five percent organic by weight.<sup>12</sup> Third, the front panel of a product made with seventy percent organic content may state that the product is “made with organic” and it may list a maximum of three organic ingredients.<sup>13</sup> Last, if the product is made with less than seventy percent organic content, the back or side panel may list those ingredients that are organic.<sup>14</sup>

Since October 21, 2002, it has been a federal offense punishable with a maximum civil penalty of \$10,000 to place the word “organic” on any food product that has not been certified by a USDA accredited certifier or state certification program.<sup>15</sup> Making uncertified labeling a federal offense should tend to reduce the probability of greenwashing. However, it is important to note that although the organic certification process focuses on the materials and methods of production,<sup>16</sup> some synthetic materials are nonetheless allowed in foods labeled “USDA organic.”<sup>17</sup> For example, nitrates and nitrites are permitted in organic meats.<sup>18</sup> These chemicals give meat the bright red color that, to the average consumer, denotes “freshness.”<sup>19</sup> Meat that does not have nitrates or nitrites added will naturally turn an unappetizing grey color before it decomposes or spoils.<sup>20</sup> Consumers are eating

chemically dyed meat carrying the USDA organic label. Despite the strict certification process behind the USDA organic label,<sup>21</sup> a charge with significant gravamen may be leveled at the agency for allowing synthetics in foods labeled “organic.”<sup>22</sup>

Synthetic additives permitted under an organic label are not the only area of weakness in the USDA labeling standard. The USDA may validly be charged with greenwashing for the standards behind the “free range” label, which on its face seems to indicate safe and humane treatment of animals raised for consumption. However, under USDA standards, an animal that is “free range” must be given merely the opportunity to go outside for an undetermined period of time.<sup>23</sup> There is no actual guarantee under the “free range” label standard that the animal exited its enclosure.<sup>24</sup> A willingness on the part of the USDA to lend credence to “free range” labels raises suspicions about the organic label as well.

If the USDA organic label is bordering on greenwash, then what standard is worth searching for? One possible answer is the Demeter Biodynamic certification, which imposes more stringent requirements than the USDA organic certification standard.<sup>25</sup> Debio, Norway’s national organic certification body, includes the Demeter standard in its organic certifications.<sup>26</sup> The Demeter standard has long enjoyed popularity in Europe, Australia, and New Zealand,<sup>27</sup> and is currently used in wineries and vineyards in the United States.<sup>28</sup> It focuses on treating a farm as a living organism, with frequently-composted soil as its heart.<sup>29</sup> Because the Demeter standard goes above and beyond what the USDA requires for its “organic” label, using the standard would help assuage the fears of American consumers facing a heavily-greenwashed marketplace.<sup>30</sup> The current USDA standard has been watered down to the point of greenwashing because synthetics such as nitrites are permitted in “organic” food. For the organic label to be meaningful, the standards behind it must be closer to the Demeter standard and further from today’s “USDA Organic” standard. 

### Endnotes:

<sup>1</sup> See Joshua Karliner, *A Brief History of Greenwash*, Mar. 22, 2001, <http://www.corpwatch.org/article.pho?id=243> (last visited Oct. 12, 2008) (describing the vast advertising budgets of high pollution corporations).

**Endnotes:** USDA Organic continued on page 70

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# THE GROWING SUPPLY OF ECOLABELED SEAFOOD: AN ECONOMIC PERSPECTIVE

by Nicolai V. Kuminoff, Darrell J. Bosch, Dan Kauffman, Jaren C. Pope, & Kurt Stephenson\*

## INTRODUCTION

Consumers respond to names and labels on food products. In the seafood industry, this has led to the renaming of species that sound like they would taste bad. For example, “slimehead” (*Hoplostethus atlanticus*) was renamed as “orange roughy” in order to increase its marketability in restaurants and supermarkets.<sup>1</sup> Unfortunately the marketing strategy worked too well. After first becoming widely available in the United States in the 1980s, this New Zealand and Australian fish became so popular that it was overfished and the population crashed.<sup>2</sup> Today, orange roughy is on the Monterey Bay Aquarium’s “Seafood Watch” list of fish to avoid.<sup>3</sup> The Seafood Watch list is part of a growing effort by independent organizations and government agencies to inform consumers about the health of fisheries and the sustainability of their harvesting practices. The seafood industry has begun to use this information to develop ecolabels for fish caught from fisheries that are managed sustainably.

Ecolabeling refers to placing a seal of approval on a product to recognize that it has been certified as meeting specific criteria for the environmental impacts of its production process. The largest independent certification program for fisheries is the Marine Stewardship Council (“MSC”).<sup>4</sup> Wild fisheries that satisfy the Council’s criteria for sustainability may display its seal on their products.<sup>5</sup> This ecolabel is intended to induce consumers to pay a premium for sustainable seafood or to consume MSC certified products rather than unlabeled seafood. If consumers are willing to pay a premium for ecolabeled seafood, they will provide an economic incentive for fisheries to shift toward more sustainable production practices.

Seafood bearing the MSC label is currently sold in thirty-nine countries and can be found in major supermarkets including Wal-Mart and Whole Foods.<sup>6</sup> Since the number of fisheries currently seeking MSC certification is more than twice as large as the number currently certified, the supply of ecolabeled seafood will continue to grow in the near future.<sup>7</sup> This article describes the growing market for ecolabeled seafood and provides an economic perspective on emerging legal and policy issues. We begin with an overview of the different ecolabeling schemes, with emphasis on the Marine Stewardship Council. We then summarize the state of knowledge on the demand for ecolabeled seafood and discuss three issues: conflicting labeling claims, the impact of ecolabeling on the demand for fish which are harvested sustainably but not sold under an ecolabel, and the effect of ecolabeling on the health of aquatic ecosystems.

## SEAFOOD ECOLABELING AND THE CERTIFICATION OF SUSTAINABLE FISHERIES

Perhaps the first non-governmental effort to bring fisheries management to the attention of consumers was the Earth Island’s Institute campaign for “dolphin safe” tuna. The campaign took off in 1988, when an Earth Island employee videotaped dolphins drowning in tuna nets.<sup>8</sup> This campaign was instrumental in passing federal legislation and getting major U.S. tuna packers to change their harvest practices and put “dolphin safe” labels on their cans.

In 1996 the World Wildlife Fund and Unilever, a multinational corporation, jointly developed an independent organization to certify sustainable fisheries—the Marine Stewardship Council.<sup>9</sup> Subsequently, other independent certifying organizations have been formed, such as the Monterey Bay Aquarium’s Seafood Watch program.<sup>10</sup> Meanwhile, industry groups such as the Alaska Seafood Marketing Institute have developed their own sustainability criteria.<sup>11</sup> International growth in seafood ecolabeling has also led the Food and Agriculture Organization of the United Nations to issue broad guidelines for ecolabeling of marine products.<sup>12</sup> Domestically, the U.S. National Oceanic and Atmospheric Administration’s (“NOAA”) Fish Watch program tracks whether specific fisheries meet the ten conservation and management standards defined by the Magnuson-Stevens Fishery Conservation and Management Act.<sup>13</sup> For the interested seafood consumer, there is clearly a wealth of information about the sustainability of fisheries.

Today, the Marine Stewardship Council is still the largest independent third-party certification program and its sustainability seal is the most widely recognized seafood ecolabel.<sup>14</sup> The label is intended to provide consumers with information about

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the sustainability of the seafood they purchase in order to help them make informed decisions in the marketplace.<sup>15</sup>

To receive MSC certification, a fishery must demonstrate that it complies with three broad principles for sustainable fishing.<sup>16</sup>

**MSC Principle 1:** A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

**MSC Principle 2:** Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

**MSC Principle 3:** The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.<sup>17</sup>

These general principles underlie twenty-three specific criteria that each fishery must satisfy in order to license the MSC ecolabel.<sup>18</sup> For example, one of the criteria that must be satisfied under MSC Principle three is that mechanisms must be in place to limit or close the fishery when designated catch limits are reached.<sup>19</sup> Likewise, fisheries must demonstrate that they do not use poisons or explosives.<sup>20</sup>

A fishery seeking MSC certification can hire an independent certifier who has been accredited by MSC to determine whether their harvesting practices meet MSC standards.<sup>21</sup> Certification lasts for five years and a fishery is also subject to annual audits.<sup>22</sup> After a fishery has received certification, manufacturers and processors who want to use the MSC logo must pay an additional licensing fee to do so.<sup>23</sup>

Since 1997, the Marine Stewardship Council's ecolabel has been licensed by nearly fifty different seafood brands and over 200 specific products, which are sold in restaurants and national supermarket chains in the United States.<sup>24</sup> This is not limited to small organic groceries and local health food stores. National retail chains have become interested in the MSC label. Whole Foods, the nation's largest retailer of organic foods, started supporting the MSC label in 1999.<sup>25</sup> In February 2006, Wal-Mart announced that it would purchase all of its wild-caught fresh and frozen seafood from MSC certified fisheries within three to five years.<sup>26</sup>

One limitation of the Marine Stewardship Council's certification program is that its standards only apply to wild capture fisheries. MSC does not currently certify aquaculture and has no plans to do so in the future.<sup>27</sup> Other independent organizations do monitor aquaculture. The Monterey Bay Aquarium's Seafood Watch Program, begun in 1999, developed a "stoplight" system for reporting the sustainability of both wild caught and aquaculture fisheries. Its regional "pocket guides" use color coding to tell consumers whether a particular fish is a best choice (green), a good alternative (yellow), or a fish to avoid (red).<sup>28</sup> Compared to MSC, Seafood Watch is more comprehensive in its

coverage. Fisheries do not pay to be evaluated. Seafood Watch conducts independent audits of major fisheries that serve different regions of the country.<sup>29</sup> From an industry perspective, however, Seafood Watch's pocket guides are more difficult to integrate into product labeling than the MSC label because the guides are updated biannually whereas MSC certification lasts for five years which facilitates longer term planning.

Have the Marine Stewardship Council, Seafood Watch, and other ecolabeling programs been effective in promoting marine conservation and sustainable fishing practices? At the time of writing, thirty-five fisheries are certified by MSC and another seventy-eight are undergoing the assessment process for potential future certification.<sup>30</sup> These fisheries, which are located around the world, have perceived the potential economic gains from ecolabeling to be sufficiently large to induce them to pay independent certifiers to verify that their fishing practices meet MSC standards. Whether their short run investment in certification will translate into higher profits in the long run will depend on the extent to which ecolabels increase the demand for sustainable seafood.

### THE DEMAND FOR ECOLABELED SEAFOOD

Market data on the sales of ecolabeled seafood are only beginning to become available. Without access to sales data, seafood economists have traditionally relied on statistical analysis of consumer surveys to assess the potential demand for ecolabeled products. In one of the first studies of the demand for ecolabeled seafood, economists at the University of Rhode Island conducted a mail survey of 1,640 potential seafood consumers in the lower forty-eight states during the fall of 1998. Participating households were asked to make a hypothetical choice between two regular seafood products (cod and shrimp) and ecolabeled versions of the same products that would cost up to five dollars more per pound.<sup>31</sup> The survey results indicated that consumers would be willing to pay a premium for ecolabeled seafood, but that the size of the premium would differ across seafood products and consumer groups. Consumers with larger budgets and those who were members of environmental organizations were more likely to be willing to pay a premium for ecolabeled products.<sup>32</sup> These results were reinforced by subsequent surveys of consumers in the United Kingdom.<sup>33</sup>

While consumers say they are willing to pay more for ecolabeled seafood, it is less clear whether the increasing availability of ecolabeled products will have a large impact on their purchasing decisions. Recent evidence suggests that while consumers would be willing to pay more for ecolabeled versions of their favorite fish products, this "ecolabel effect" is too small to convince average consumers to switch from their favorite fish (without an ecolabel) to a less preferred fish (with an ecolabel).<sup>34</sup>

As more ecolabeled seafood products have entered the market, there have been some preliminary efforts to measure the effects on demand. For instance, preliminary evidence from supermarket scanner data suggests that the introduction of the dolphin-safe tuna label increased the market share of canned tuna by one percent between 1990 and 1995.<sup>35</sup> However, this

analysis focused on sales of all canned tuna relative to lunchmeat, red meat, and other seafood products and, therefore, did not isolate the shift of consumption away from unlabeled tuna and toward products bearing the dolphin-safe label. More recently, after the New Zealand hoki fishery received its MSC certification in 2001, the Unilever corporation increased its hoki purchases by an estimated \$3 million.<sup>36</sup> Hoki prices rose in the year after certification although the portion of the rise attributable to ecolabeling is difficult to estimate precisely.<sup>37</sup>

Overall, there is still very little evidence on the market demand for ecolabeled seafood. Survey results indicate that consumers would be willing to pay a premium for their favorite ecolabeled fish in restaurants and supermarkets, and case studies of specific fisheries indicate that ecolabels can increase returns to the industry.<sup>38</sup> Yet the magnitude of the “ecolabel effect” on demand appears to be small. In order for consumers’ purchasing decisions to influence the sustainability of fisheries, the price effect would have to pass through the marketing chain to provide a sufficiently large incentive for fishermen to change their harvesting practices.<sup>39</sup> It is also important to remember that the existing evidence on market demand is almost entirely based on anecdotes and survey questions that ask consumers to speculate on their *hypothetical* future purchasing decisions. There is almost no market-based evidence on how consumers have actually reacted to the recent introduction of fresh and frozen seafood products that have been certified by MSC or other organizations.

### EMERGING ISSUES IN SEAFOOD ECOLABELING

The impact of ecolabeling on the demand for seafood is one of many questions raised by the recent growth in the supply of “sustainable” seafood. Other interesting issues for industry experts, researchers, and policymakers to consider include labeling conflicts, the impact on the demand for seafood products that lack ecolabels but meet standards for sustainability, and the impact of ecolabeling on environmental quality.

#### LABELING CONFLICTS

Labeling conflicts can occur when different ecolabeling schemes use the same terminology with different interpretations, or when they present conflicting information. For example, consider two of Alaska’s fisheries: coho salmon and king crab. The Marine Stewardship Council, Seafood Watch, NOAA’s Fish Watch program, and the Alaska Seafood Marketing Institute all seem to agree that the coho salmon fishery is sustainable. Coho salmon has MSC certification, Seafood Watch gives it the “green light,” NOAA’s Fish Watch program notes that Alaska’s stocks are healthy, and the Alaska Seafood Marketing Institute (“ASMI”) advertises that coho salmon is one of many sustainable fisheries in the state of Alaska, which is “one of the most bountiful fishing regions on the planet, and has been recognized as a world model for sustainability.”<sup>40</sup>

There is less agreement on Alaska king crab. While ASMI includes king crab among its list of sustainable fisheries, the crab fishery does not have MSC certification.<sup>41</sup> NOAA and

Seafood Watch both report that Alaska’s red king crab population is healthy, but note that the pots used to catch crab can disturb aquatic habitat and result in bycatch of females, juveniles, and non-targeted species.<sup>42</sup> These concerns motivated Seafood Watch to give Alaska king crab its “yellow light.”<sup>43</sup>

The differences in the way NOAA, MSC, Seafood Watch, and ASMI characterize the sustainability of Alaska’s king crab fishery exemplify a broader issue in ecolabeling and green marketing. Rapid growth in green marketing claims, conflicting reports, and vague language can leave consumers misinformed or confused. This is especially true when products are advertised using adjectives like “sustainable,” “renewable,” “eco-friendly,” and “green,” which are inherently vague or at least open to interpretation. In response to the growth in environmental marketing, the Federal Trade Commission recently began reviewing its *Guides for the Use of Environmental Marketing Claims*, more commonly known as the “Green Guides.” This process may affect seafood ecolabeling practices because one of the issues being reviewed is the allowable use of the word “sustainable” among other environmental buzzwords that are frequently used in product labeling and advertising.<sup>44</sup>

#### UNLABELED SUSTAINABILITY: THE CASE OF CHESAPEAKE BAY OYSTER AQUACULTURE

A second issue is that the best known ecolabeling schemes do not necessarily identify the fisheries with the strongest potential for sustainability. Oyster aquaculture in the Chesapeake Bay provides an example. In the 1950s, the Chesapeake Bay was by far the nation’s largest oyster fishery. Since then, disease and habitat degradation have caused annual landings for the native Bay oyster (*Crassostrea virginica*) to decrease from 30 million pounds to 0.3 million pounds, cutting U.S. oyster production in half.<sup>45</sup>

Small oyster harvests pose a concern for commercial growers and people who care about water quality in the Bay. The oyster fishery provides a source of income for growers and an economic base for some Chesapeake Bay communities. In addition, oysters provide ecological services, particularly water filtration. By filtering phytoplankton (and seston in general) oysters help to improve water clarity.<sup>46</sup> The nitrogen and phosphorus embodied in the filtered material can be removed from ambient waters through natural biomass sequestration as well as through natural chemical transformation of oyster feces and pseudofeces.<sup>47</sup> These processes in turn aid the growth of submerged aquatic vegetation and help to protect essential habitat for other aquatic species.<sup>48</sup> The Chesapeake Bay states have noted the importance of restoring oyster populations by signing the Chesapeake Bay 2000 Agreement, which aims for a tenfold increase in native oysters in the Chesapeake Bay by 2010, among other goals.<sup>49</sup>

Commercial oyster aquaculture, which involves submersing oysters in cages or floats, provides water quality services without further depleting the wild oyster stock. This is a proven way to overcome the disease, predation, and habitat degradation problems that have plagued oyster restoration in the Chesapeake Bay region.<sup>50</sup> If aquaculture is proven to be a financially viable means of producing oysters, it may relieve pressure on wild stocks.

Given the fishery's extraordinary credentials for sustainability, developing an ecolabel for aquacultural oysters would appear to have strong potential to promote conservation and reward growers for the water quality services they provide. Ironically, the MSC ecolabel is not available to the Chesapeake Bay's aquaculture oyster fishery because it is a form of aquaculture. NOAA's Fish Watch program does not currently include aquaculture oysters among the species it tracks, and the Chesapeake Bay growers do not currently engage in green marketing.<sup>51</sup> While Seafood Watch gives aquaculture oysters a "green light" and recognizes their water quality services, the Seafood Watch pocket guides are only distributed in a limited number of restaurants and groceries.<sup>52</sup> Thus, consumers may be largely unaware that unlabeled aquaculture oysters from the Chesapeake Bay meet Seafood Watch's definition for sustainability and provide additional water quality services.

#### THE IMPACT OF ECOLABELING ON ENVIRONMENTAL QUALITY

Ecolabeling is a decentralized tool for obtaining the goals of environmental *policy*. Will this tool lead to improved environmental *quality*? Recent research in economic theory has suggested that the development of markets for "green" goods presents both advantages and disadvantages with respect to environmental quality, and the net effect may be product specific.<sup>53</sup> The possibility that the introduction of green goods could have a detrimental effect on environmental quality is counterintuitive, but can be illustrated by an example.

One of the key questions is whether the dimension of sustainability that is highlighted by an ecolabel is a substitute or a complement for the seafood product itself. For example, aquaculture oysters remove some nitrogen and phosphorous from the Chesapeake Bay through their normal filtration of water and consumption of phytoplankton. Many consumers may enjoy eating oysters and may also want to improve water quality in the Chesapeake Bay. But these same consumers may be reluctant to eat "green" oysters that are labeled in a way that highlights the fact that they remove nutrients from the Bay. Is there a special health risk associated with eating aquaculture oysters? Will they taste bad? Of course not. Wild oysters provide the same water filtration services as aquaculture oysters, and all saleable oysters must be harvested in waters that are approved for shellfish consumption. The point is that it may be difficult to convey this to consumers as part of an ecolabeling strategy that centers on water filtering services rather than simply one promoting sustainable harvests. If oyster lovers are turned off by the idea

that aquaculture oysters are advertised as filter feeders (the "kidneys" of the Chesapeake Bay), they may seek out oysters from wild populations that are harvested in a less sustainable manner.

A second issue is that the introduction of ecolabeled seafood products (and "green" goods in general) has the potential to drive out donations to environmental organizations. If consumers feel that they are making their contribution to the health of aquatic ecosystems by paying a premium for ecolabeled seafood, they may be reluctant to make charitable contributions to environmental organizations such as the Chesapeake Bay Foundation.<sup>54</sup> In this case, whether the introduction of a market for ecolabeled seafood will ultimately improve the health of an aquatic ecosystem will depend partly on whether environmental organizations are more or less effective in improving environmental quality than fisheries which meet the criteria for sustainability that are reflected by the presence of an ecolabel.

#### CONCLUSION

The challenges in developing sustainable fisheries are well known. In the past, governments have sought to overcome these challenges through policies which limit fishing effort, catch rates, and harvests for wild fisheries. Ecolabeling offers a more decentralized approach to environmental policy by seeking to illuminate the connection between the choices we make in the marketplace and their environmental consequences. While the ecolabeling of seafood is still relatively new, a variety of government, industry, and independent third-party organizations have developed schemes during the past decade to measure the sustainability of fisheries.

Evidence based on the number of fisheries that have obtained or are currently seeking ecolabeled status suggests that the market for ecolabeled seafood will continue to grow. The number of wild fisheries seeking MSC certification is more than double the number of fisheries currently certified. This growth raises a number of important questions. Is there a significant long-run demand for ecolabeled seafood, or are fisheries overly optimistic? How can conflicting ecolabeling claims be resolved? Will the introduction of ecolabels decrease the demand for sustainable seafood that is not ecolabeled? Will ecolabeling actually improve the health of aquatic ecosystems? What are the best strategies for conveying ecolabel information to consumers to maximize the market advantage of environmentally sound fisheries? These are important topics for economic research and legal analysis.



## Endnotes: The Growing Supply of Ecolabeled Seafood

<sup>1</sup> Daniel Pauly et al., *The Future of Fisheries*, 302 *SCIENCE* 1359 (2003).  
<sup>2</sup> Melissa M. Stevens, *Seafood Watch: Seafood Report – Orange Roughy* (2003), available at [http://www.montereybayaquarium.org/cr/cr\\_seafoodwatch/content/media/MBA\\_SeafoodWatch\\_OrangeRoughyReport.pdf](http://www.montereybayaquarium.org/cr/cr_seafoodwatch/content/media/MBA_SeafoodWatch_OrangeRoughyReport.pdf) (last visited Nov. 2, 2008).

# THE FOOD CRISIS: A NEW-FOUND MOMENTUM TO REDEFINE AFRICAN AGRICULTURAL POLICIES

by Meti Zegeye\*

The unprecedented magnitude of the current global food crisis took the world by surprise. Its hardest-hit victim, Sub-Saharan Africa (“SSA”), is in the midst of its worst food crisis in recent history.<sup>1</sup> Immediate responses such as food-aid and cash-handout programs, although necessary to address the urgent humanitarian dimensions of the food crisis, are not long-term solutions.<sup>2</sup> Attaining a sustainable solution to SSA’s reoccurring food crises requires that African governments engage the international community in candid discourses tackling the crisis’ main cause, namely the inherent structural fallacies of these countries’ agricultural policies.<sup>3</sup> The recent food riots and civil unrest that occurred in many of these countries should incentivize such policy discourse, as SSA’s fragile peace is closely linked with governments’ willingness and ability to offer and sustain long-term solutions to food security.<sup>4</sup>

Most land in SSA countries is agrarian, with varied agro-ecological zones that are not conducive to uniform, large-scale farming techniques.<sup>5</sup> SSA farmers predominantly engage in rain-fed agriculture which makes them highly vulnerable to climate variations in an area which already suffers from low soil fertility and low rainfall.<sup>6</sup> Frequent weed and pest infestations, as well as inadequate farming and water management techniques, further hinder farming productivity.<sup>7</sup> Despite these shortcomings, agriculture remains the most important economic sector in most SSA countries.<sup>8</sup> Agricultural output represents about forty percent of exports, thirty percent of GDP, and about thirty percent of foreign exchange earnings in the region.<sup>9</sup> The sector also employs more than seventy percent the workforce.<sup>10</sup>

Ironically, while other agrarian regions, such as parts of Asia, invested in green revolution, SSA adopted Bretton Woods championed developmental policies, which discounted and

neglected agriculture’s role in these countries.<sup>11</sup> Therefore, since independence, these countries have adopted various agricultural policies, which span from a focus on industrialization, to agro industries, integrated rural development, export crop-led agriculture, and finally to smallholders’ staple food crops.<sup>12</sup> These varied and often contradictory policies have hindered agriculture development in most of SSA countries. For instance, the neo-liberal development paradigm of the 1980s promoted drastic reduction in international assistance for agriculture.<sup>13</sup> While agriculture

received eighteen percent of overseas development assistance in 1980, its share dwindled to about four percent in 2007.<sup>14</sup> Similarly, SSA governments felt compelled to reduce their agriculture expenditure.<sup>15</sup> Although recently on the rise, these countries allocated less than four percent of their expenditures to agriculture for the past twenty years.<sup>16</sup>

African governments’ withdrawal from the sector has

crippled farmers’ productivity. SSA farming is predominantly a household enterprise, and is mostly undertaken by poor smallholder farmers.<sup>17</sup> These farmers represent a very large portion of the world’s most marginalized people.<sup>18</sup> Given their extreme marginalization, SSA farmers have historically depended on government services and subsidies for access to credit and farming techniques, such as fertilizers and irrigation.<sup>19</sup> Without government intervention, these farmers could not afford the high transaction costs associated with agriculture and experienced extensive market failures.<sup>20</sup>



Photo courtesy of Megan Chapman

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Consequently, over the last twenty years, crop production per capita has decreased by 0.2% per year, while food demand has continued to increase.<sup>21</sup> Confronted with such stringent realities, these farmers have expanded the arable farming land, at the expense of forests, soil fertility, and water.<sup>22</sup> Their efforts have been unsuccessful as is evidenced by the prevalence of drought and famine throughout the continent. In SSA, agricultural productivity growth, as opposed to expansion in arable farming land, is the means to achieve food security.<sup>23</sup> Furthermore, agriculture must become the engine of growth in these countries, especially given the fact that three quarters of the poor in SSA depend on agriculture for their livelihood.<sup>24</sup>

African governments must use this opportunity to revamp their agricultural policies. SSA countries should continue to increase their budgetary allocation for agricultural development to about fifteen to twenty percent of their revenues. They should also develop new agricultural policies, which take into account their particular agro-ecological characteristics.<sup>25</sup> These policies should create the kind of incentives and market opportunities necessary to reduce the marginality of smallholder farmers.<sup>26</sup> Particularly, the new policies must improve soil and water management, and must invest in drought resisting crops.<sup>27</sup> Finally, African countries should invest in research and development and come up with home grown viable farming.



## Endnotes:

<sup>1</sup> See, e.g., UN CONFERENCE ON TRADE AND DEVELOPMENT, TACKLING THE GLOBAL FOOD CRISIS (June 2008), available at [http://www.unctad.org/en/docs/presspb20081\\_en.pdf](http://www.unctad.org/en/docs/presspb20081_en.pdf) (last visited Nov. 1, 2008) (noting that agricultural productivity in lesser developed countries is declining, and was in fact more productive fifty years ago).

<sup>2</sup> See IRIN News, *Ghana: Government Expands Cash Handouts* (Oct. 29, 2008), available at <http://www.irinnews.org/Report.aspx?ReportId=81166> (last visited Nov. 1, 2008); see also IRIN News, *West Africa: Region Among the World's Hungriest* (Oct. 14, 2008), available at <http://www.irinnews.org/Report.aspx?ReportId=80912> (last visited Nov. 1, 2008).

<sup>3</sup> See INDEPENDENT EVALUATION GROUP, WORLD BANK ASSISTANCE TO AGRICULTURE IN SUB-SAHARAN AFRICA xxiii (2007) [hereinafter INDEPENDENT EVALUATION GROUP], available at [http://siteresources.worldbank.org/EXTASSAGRSUBSAHAFR/Resources/ag\\_africa\\_eval.pdf](http://siteresources.worldbank.org/EXTASSAGRSUBSAHAFR/Resources/ag_africa_eval.pdf) (last visited Nov. 1, 2008).

<sup>4</sup> See Vivienne Walt, *The World's Growing Food-Price Crisis*, TIME MAGAZINE, Feb. 27, 2008, <http://www.time.com/time/world/article/0,8599,1717572-1,00.html> (last visited Nov. 1, 2008).

<sup>5</sup> See INTERACADEMY COUNCIL, REALIZING THE PROMISE AND POTENTIAL OF AFRICAN AGRICULTURE 14 (2004), available at <http://www.interacademycouncil.net/Object.File/Master/8/405/Africa%20-%20Chapter%203%20African%20agriculture%20-%20Pt%20I.pdf>; see also THE WORLD BANK, WORLD DEVELOPMENT REPORT 2008: THE AGENDA FOR AGRICULTURE-BASED COUNTRIES IN SUB-SAHARAN AFRICA 1 (2008), available at [http://siteresources.worldbank.org/INTWDR2008/Resources/Brief\\_AgBased\\_SubSahara\\_web.pdf](http://siteresources.worldbank.org/INTWDR2008/Resources/Brief_AgBased_SubSahara_web.pdf) (last visited Nov. 1, 2008) (defining agriculture-based countries as countries where a high share of overall growth originates in agriculture and where the poor are concentrated in rural areas. Some countries that are not included in this category have sub-national regions that can also be classified as agriculture based).

<sup>6</sup> INDEPENDENT EVALUATION GROUP, *supra* note 3, at 13-14. See also Agriculture World Group, Dryland Farming and Dryland Farming in India, <http://www.world-agriculture.com/dry-land-farming/dry-land-farming.php> (last visited Nov. 13, 2008) (noting that this type of agriculture refers to the profitable production of useful crops, without irrigation, on lands that receive annually a rainfall of 500 millimeters, or roughly twenty inches, or less).

<sup>7</sup> See INDEPENDENT EVALUATION GROUP, *supra* note 3, at 14.

<sup>8</sup> *Id.* at 13.

<sup>9</sup> *Id.* at 17.

<sup>10</sup> *Id.* at 3.

<sup>11</sup> See generally Alexandra Spieldoch, Foreign Policy In Focus, The Food Crisis and Global Institutions (Aug. 5, 2008), available at <http://www.fpif.org/fpifxt/5442> (last visited Nov. 1, 2008); see also Walden Bello, *Africa's Food Crisis: The Handwork of IMF, World Bank*, BUSINESS DAILY (Africa), Aug. 19, 2008, [http://www.bdafrica.com/index.php?option=com\\_content&task=view&id=9406&Itemid=5821](http://www.bdafrica.com/index.php?option=com_content&task=view&id=9406&Itemid=5821) (last visited Nov. 5, 2008); see generally INDEPENDENT EVALUATION OFFICE OF THE IMF, AN EVALUATION OF THE IMF AND AID TO SUB-SAHARAN AFRICA (2007), available at <http://www.imf.org/external/np/ieo/2007/ssa/eng/pdf/report.pdf> (last visited Nov. 5, 2008) [hereinafter INDEPENDENT EVALUATION OFFICE].

<sup>12</sup> See generally NAMANGA NGONGI, INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE, POLICY IMPLICATIONS OF HIGH FOOD PRICES FOR AFRICA 21, 1-2 (2007), available at <http://www.ifpri.org/pubs/books/ar2007/ar07essay03.pdf> (last visited Nov. 1, 2008).

<sup>13</sup> *Id.* at 1-2.

<sup>14</sup> *Id.* at 1.

<sup>15</sup> INDEPENDENT EVALUATION OFFICE, *supra* note 11, at 10.

<sup>16</sup> *Id.*

<sup>17</sup> INDEPENDENT EVALUATION GROUP, *supra* note 3, at 9 (noting that women involvement in farming varies between fifty to seventy percent of the labor force. African countries also account for eighty-nine percent of the rural population in agriculture-based countries).

<sup>18</sup> See WELLINGTON N. EKAYA, ACP-EU TECHNICAL CENTRE FOR AGRICULTURAL AND RURAL COOPERATION, STRATEGIES FOR DEVELOPING DRYLAND AGRICULTURE: ROLE OF KNOWLEDGE (Aug. 2, 2007), available at <http://knowledge.cta.int/en/content/view/full/4104> (last visited Nov. 1, 2008) (stating that fifty percent of the world's most disadvantaged countries are in dryland Africa).

<sup>19</sup> INDEPENDENT EVALUATION GROUP, *supra* note 3, at 14.

<sup>20</sup> *Id.* at xxii-xxv.

<sup>21</sup> INTERACADEMY COUNCIL, *supra* note 5, at 9.

<sup>22</sup> *Id.* at 17.

<sup>23</sup> *Id.* at 18.

<sup>24</sup> *Id.* at 18.

<sup>25</sup> *Id.* at 16-18.

<sup>26</sup> See generally INDEPENDENT EVALUATION GROUP, *supra* note 3, at 15.

<sup>27</sup> INTERACADEMY COUNCIL, *supra* note 5, at 18-19.

# THE GLOBAL FOOD CRISIS: URGENT NEED AND EMERGING SOLUTIONS

by Terence P. Stewart, Stephen J. Norton, Jumana G. Madanat, and Hanna E. Stewart\*

## INTRODUCTION

The global food crisis has affected hundreds of millions of people worldwide, causing a surge of sociopolitical unrest in many countries as families struggle to find ways to survive soaring food and fuel prices.<sup>1</sup> In the United States, many families find it harder to feed their children on a daily basis and more families are turning to local food banks.<sup>2</sup> In developing countries, the World Bank estimates that at least 100 million could fall back into poverty, swallowed by what Josette Sheeran, the director of the World Food Program (“WFP”), dubbed the “silent tsunami” of soaring food prices.<sup>3</sup>

At the UN General Assembly meeting on September 23, 2008, UN Secretary-General Ban Ki-moon “told the UN’s 192 member states that in a single year, staple foods that feed half of the world more than doubled in price,”<sup>4</sup> highlighting the severity of the global food crisis. A report by the United Nations Food and Agriculture Organization (“FAO”) produced in conjunction with a summit on the food crisis in Rome last June stated that the prices of all major commodities have reached their highest levels in nearly fifty years (prices in real terms were at a thirty-year high).<sup>5</sup> The FAO price index rose, on average, eight percent in 2006 in comparison to 2005, but then twenty-four percent from 2006 to 2007.<sup>6</sup>

Governments and multilateral bodies have met to discuss possible solutions, for both the short and long-term. They have debated issues such as the possible effects of climate change on food production and the problems caused by increasing biofuel production.<sup>7</sup> Governments and international organizations must play the lead role in designing policy in this area and encourage multilateral solutions to this problem. Short-term monetary donations are needed for emergencies, but multilateral institutions will have to work together to achieve a sustainable solution that develops economies and promotes wise environmental stewardship around the world. Already, organizations such as FAO, WFP, the World Bank, the International Monetary Fund (“IMF”), and the UN Children’s Fund (“UNICEF”) have begun a multifaceted approach to addressing this problem, targeting “high risk” countries first. Of course, these efforts are just the first steps of an effort that could go on for years.

This paper will survey briefly some of the causes of the global food crisis, identified by economists and policy experts, and will discuss multilateral responses to date.

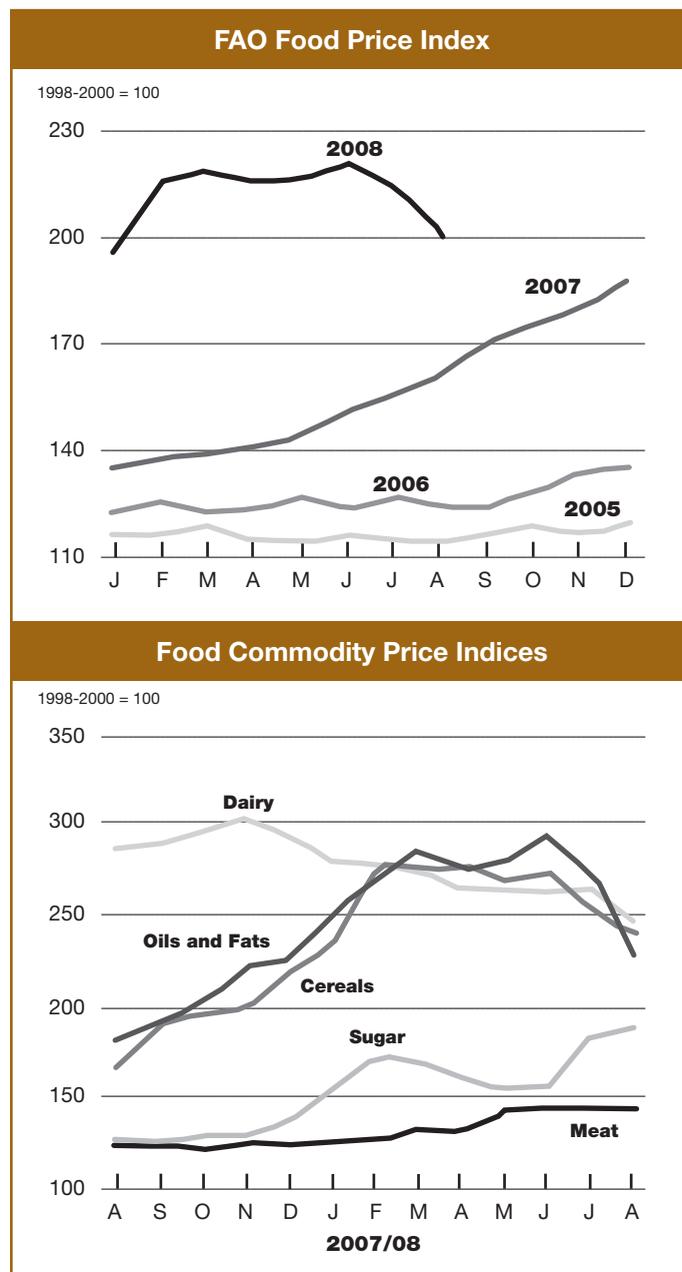


Figure 1

Source: FAO, WORLD FOOD SITUATION: FOOD PRICES INDICES (2008), available at <http://www.fao.org/worldfoodsituation/FoodPricesIndex/en/>.

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## FACTORS OF A “PERFECT STORM”

Numerous factors have contributed to increasing food costs from 2005-2008 and created the “perfect storm” that led to the global food crisis.<sup>8</sup> This “perfect storm” has been catastrophic to millions of people and has threatened the world’s political stability.<sup>9</sup> Perhaps more disturbing, the confluence of factors from climate change to increased production of biofuels to changing consumer demand could mean a fundamental change is occurring in the dynamics of food production, distribution, and consumption. The FAO and the Organization for Economic Cooperation and Development (“OECD”) warned in a May 2008 study that the changes occurring could take ten years to address and to reestablish market equilibrium needed to make food affordable to millions of people.<sup>10</sup> Some of the factors that led to the crisis are discussed below.

### WEATHER-RELATED FACTORS

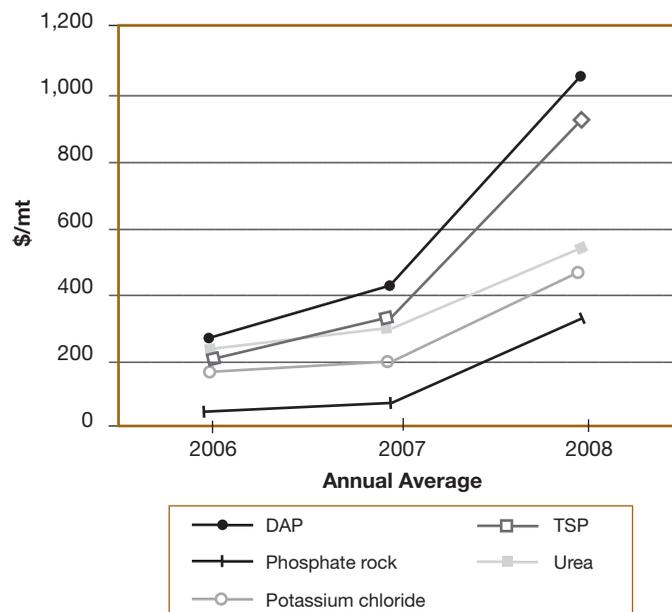
Weather, either in single catastrophic events or subtle shifts possibly related to climate change, has impacted food production causing structural changes to the agricultural system.<sup>11</sup> According to the FAO, cereal production among major exporting countries has been declining since 2005,<sup>12</sup> and much of this decline can be attributed to droughts and other weather disasters in grain producing countries. For example, Burma’s cyclone destroyed its supply of rice,<sup>13</sup> a commodity with prices that have risen by as much as 130% or more since 2007.<sup>14</sup> As climate change is altering or threatening to disrupt growing patterns around the world in the coming decades, experts warn prices could continue to go up. For example, the Intergovernmental Panel on Climate Change, in a 2007 report, warned that melting glaciers in the Himalayas could have serious ramifications for farmers in China and India during the dry season in those countries.<sup>15</sup> On the other hand, climate change could allow for the cultivation of crops in areas now inhospitable for agriculture.<sup>16</sup> The challenge is how quickly the world’s growing population can adapt to these changes in areas for cultivation.

### INCREASING FUEL AND FERTILIZER COSTS

The increasing price at the gas pump that has affected millions of drivers has also affected the farming industry and contributed to the increase in food prices. According to the FAO, these higher fuel prices have been coupled with increasing fertilizer costs and have driven up the cost of producing and transporting major agricultural products all over the world.<sup>17</sup> Some farmers and ranchers who pay these high fuel and fertilizer costs are forced to pass on the increased costs to consumers.<sup>18</sup> Furthermore, this year’s record oil prices are driving up food prices by increasing costs of production and transportation which also increases the prices consumers pay.<sup>19</sup>

### BIOFUELS

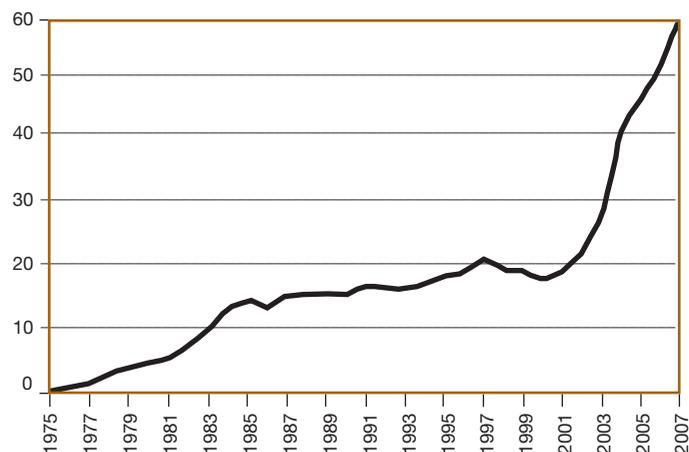
Many policy experts believe that another factor contributing to higher food prices is the production of biofuels. The worldwide approaches to energy security and food security have been in conflict. The increasing production of alternatives to fossil fuels has depleted supplies in commodities such as corn and sugar,



**Figure 2: Increasing Prices of Fertilizer 2006-2008**

Source: World Bank Commodity Price Data (Pink Sheets) September 2008. (Potassium chloride (muriate of potash), standard grade, spot, f.o.b. Vancouver TSP (triple superphosphate), up to September 2006 bulk, spot, f.o.b. US Gulf; from October 2006 onwards Tunisian, granular, f.o.b.).

leading to unsustainable prices. Moreover, government support for the biofuels industry in the form of consumption mandates, tax credits, import barriers, investment subsidies, and other policies can be substantial in some cases. This support accelerates the shift in usage for some commodities from food and feed to fuel, thereby driving up prices for food. Ethanol production tripled from 2000-2007, with the United States and Brazil accounting for a major part of this increase in production.<sup>20</sup> Europe has also been a significant contributor to increase in ethanol production as the European Commission has set a goal of having at least 5% of all road transport fuels come from renewable sources by 2015, with at least 1% of that share derived from second-generation biofuels, electricity, or hydrogen.<sup>21</sup>



**Figure 3: Ethanol production 1975–2007 (billion liters)**

Source: Global Subsidies Initiative 2007, Joachim von Braun, International Food Policy Research Institute, Seminar at IFAD Rome, February 19, 2008.

## INCREASING DEMAND

Increased economic development and international trade have led to the growth of the middle class worldwide, which in turn has increased demand for costly meat and dairy products by people who have changed their diets to match their incomes. While the FAO report<sup>22</sup> cautions against overestimating the role changing diets are playing on food price spikes, Joachim von Braun, the Director General of the International Food Policy Research Institute (“IFPRI”), estimates that changing demand could account for half of the recent price hikes.<sup>23</sup> China exemplifies this phenomenon as its per capita meat consumption grew by 140% between 1990 and 2006.<sup>24</sup> This increased demand also puts a strain on grain supplies because it takes seven pounds of grain to produce one pound of meat, further burdening the commodities already experiencing production decreases due to weather-related disasters and other factors.<sup>25</sup>

## TRADE POLICY

Trade policy is also a key factor to consider as it can determine access to food. Proponents of trade argue that it is more urgent than ever to complete the World Trade Organization (“WTO”) Doha Development Agenda.<sup>26</sup> They argue that market forces would better ensure the right level of production and distribution. However, even before the food crisis emerged, free market advocates argued that subsidies distort trade, reward farmers in developed countries, and punish those in developing countries. The food crisis has intensified calls for cutting subsidies. But, before subsidies are sharply reduced or eliminated, it is important to keep in mind that this could cause the cost of production to rise, and many importing countries would not be able to afford the food they need. Imports of subsidized products are often their chief source of food.

As the food crisis unfolded, some twenty-six countries began to prohibit the export of certain products in order to ensure that their own populations were able to eat.<sup>27</sup> This drove up prices even more and prompted calls for the export controls to be lifted. Some countries, such as Ukraine, did lift their bans.

Of course, it is important to keep in mind that under global trading rules established in the General Agreement on Tariffs and Trade (“GATT”) after World War II, nations retain the right to restrict exports in certain situations. Specifically, GATT Article XI:2(a) permits “[e]xport prohibitions or restrictions temporarily applied to prevent or relieve critical shortages of foodstuffs or other products essential to the exporting” country. When such rights are used simultaneously by many countries, as was done

earlier this year, the implications for the trading system and for net food-importing countries are significant.

## DECLINE IN AGRICULTURAL RESEARCH

The steep and prolonged reduction in agricultural research in developing countries and major agricultural research institutions has also been cited as a contributing factor to the food crisis. Nicholas Minot of the IFPRI explained at a June 5, 2008 briefing before the U.S. House Hunger Caucus that national agricultural research institutes in developing countries have experienced declining budgets since around 1990, and international agricultural research centers have suffered budget cuts as well.<sup>28</sup> This decline has hindered the ability of countries to respond quickly to short-term and long-term solutions to the food crisis. Without current research, countries have been unable to respond to new pests, climate change, and other impacts on agriculture in a timely fashion.

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*Higher fuel prices have been coupled with increasing fertilizer costs and have driven up the cost of producing and transporting major agricultural products all over the world.*

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## FINANCIAL MARKETS

According to the FAO report, investments of non-commercial interests, such as financial funds, in futures trading on commodity markets have also played a role in determining the decisions of farmers, traders, and processors of agricultural commodities.<sup>29</sup> Essentially, the activities of major futures investors appear to have a causal relationship with spot or cash markets.<sup>30</sup> As this trend increases, it may mean large institutional investors could control futures of wheat and other commodities causing new spikes in demand, and therefore even higher prices.

## CRISIS MITIGATION

As noted earlier, the scope and likely duration of the food crisis has commanded the attention of elected officials, multilateral institutions, non-governmental organizations, and private sector companies around the world. In the months after the media began to focus on the crisis in the spring of 2008, there have been high-level meetings, an increase in monetary donations to relief operations, and steps by over thirty countries ranging from easing import restrictions to distributing seeds in an effort to mitigate the short- and medium-term effects of the crisis and to design long-term strategies for preventing a recurrence of this catastrophe.

In April 2008, the Chief Executives Board of the United Nations pulled together its major departments as well as representatives from other multilateral institutions to create a High-Level Task Force (“HLTF”), and began work on a framework for action to mitigate and eventually solve the food crisis. United

Nations participants included the FAO, the UN Conference on Trade and Development (“UNCTAD”), and the UN Development Program (“UNDP”). Other multilateral organizations represented in the task force included the WTO, the World Bank, and the IMF.<sup>31</sup>

At the FAO annual summit in Rome in June 2008, world leaders and experts from a wide array of fields considered possible reasons for the price spikes and how to address the ensuing hunger and political instability. Among the medium- and long-term solutions embraced by participants were policies to help restore the viability of subsistence farming in cases where the market-based trading system cannot deliver food to where it is needed. The summit’s formal declaration also called for more concerted action to respond to challenges presented by climate change, and a focus on maintaining biodiversity through wise stewardship of fisheries and forests. Participants also called for increased investment in science and technology for food production, as well as reductions in trade barriers and market-distorting policies.<sup>32</sup>

On the issue of biofuels, the Rome declaration acknowledged the competing international goals and urged in-depth studies on ways to ensure that production and use of biofuels is sustainable. These recommendations tracked closely with a ten-point proposal World Bank President Robert Zoellick put forward on the eve of the Rome summit. Specifically, he called for lifting of export bans and cutting tariffs on ethanol imported into U.S. and European Union markets to encourage the output of more efficient sugarcane biofuels, which do not compete directly with food production and expand opportunities for poorer countries.<sup>33</sup>

Meanwhile, WTO Director General Pascal Lamy also urged a successful conclusion to the WTO Doha Round and stressed the importance of improving the trade capacity of developing countries. He noted that of twenty-two countries listed as most vulnerable to food insecurity, many were also among the least integrated economies in terms of their assimilation into global agriculture markets. These countries lack the adequate roads, ports, and administrative infrastructure needed to import and export goods; countries often import food from a country on another continent instead of a country next door.<sup>34</sup>

Later on in the summer, the members of the G8 major economic powers met in their annual meeting and spent a significant portion of time discussing the dire effects of the global food crisis worldwide. They emerged with pledges for cash assistance and commitments to work to find long-term solutions to the crisis.<sup>35</sup>

Sustained attention at the highest levels of government and international organizations will be needed as the food

crisis continues, and there have been encouraging steps in recent months to suggest that international leaders are taking the matter seriously.

For example, the World Bank has moved forward on its \$1.2 billion rapid financing program—the Global Food Resource Program (“GFRP”). As of October, the GFRP had dispersed \$193 million in twenty at-risk countries. One project worth \$7 million was awaiting approval and an additional \$651 million had been earmarked for projects in eleven countries. The money is to be used for feeding the most vulnerable groups (such as children and pregnant women), obtaining food imports, and purchasing seeds for the upcoming planting season.<sup>36</sup>

In July 2008, the FAO approved a series of projects in forty-eight countries with a total value of \$21 million to help farmers and needy people in those countries. The chief goal of these efforts is to ensure the success of the next planting season. Over the longer term, the expectation is to demonstrate how better access to seeds and fertilizers can increase food production where it is needed most.<sup>37</sup>

In addition to these actions by multinational institutions, in May 2008 three dozen countries, in every part of the world,

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*Countries lack the adequate roads, ports, and administrative infrastructure needed to import and export goods.*

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unilaterally adopted policies to try to feed their populations for the short-term and develop approaches for food security needs for the future. For example, Guyana began distributing seeds for free while Ghana eliminated all export duties on rice, wheat, yellow corn, and vegetable oil.<sup>38</sup> India removed an export ban on non-basmati rice and other products for shipment to Bhutan, while China made diesel fuel more readily

available for farm vehicles during the cereal harvest season.<sup>39</sup> In addition, Ukraine lifted export quotas on grains and cancelled restrictions on grain imports it had put in place when the crisis first manifested itself.<sup>40</sup> These examples show that individual countries are beginning to shift their policies in response to the global food crisis. Governments realized that restricting or banning exports of key food staples to ensure domestic supplies and reduced prices would only bring short-term relief. However, these practices would eventually cause long-term harm by creating disincentives for domestic production and constraining global supply, which would raise costs to consumers around the world. These changes in agricultural and trade policies manifested by numerous countries this year show that individual governments are not solely relying on the work of multilateral institutions to temporarily solve the food crisis—they are also taking the initiative to protect their future food security.

The focus by governments and international organizations has also served to underscore the need for creative and diligent work by the private sector, whether corporations or charitable organizations. There are complex political, economic, and social

relationships at stake for policy makers to consider. At a development conference in September 2008, Zoellick renewed calls to lift export bans and restrictions on humanitarian food aid as these “harm the most vulnerable.” He acknowledged that it is not always easy for countries that are concerned about having enough to feed their population and suggested possible solutions including, “sharing the management of physical reserves, creating regional information systems for early detection of supply shocks, and establishing networks of virtual grain reserves.”<sup>41</sup>

The food crisis has also created new challenges and opportunities for the public and private sector to address broader goals for sustainable development. For example, the UN HLTF issued a paper urging public/private actions that would engage and aide smallholder farmers in rural areas of developing nations. It promotes ensuring farmers’ access to seeds and fertilizers, opportunities to reduce post harvest losses, and rehabilitation of infrastructure.<sup>42</sup>

The meeting of the UN General Assembly in September 2008 provided a forum for showcasing some of the private sector initiatives and highlighting the need for even more action. For example, the Bill & Melinda Gates Foundation, the Howard G. Buffett Foundation, and the government of Belgium unveiled a \$76 million initiative called Purchase for Progress (“P4P”), which is designed to help hundreds of thousands of small farmers access reliable markets so that they can sell their surplus crops at competitive prices. P4P will bolster fragile local economies, particularly in Sub-Saharan Africa and Central America.<sup>43</sup>

The General Assembly also saw the convening of chief executives representing leading corporations from all continents for the first UN Private Sector Forum on Food Sustainability and the Millennium Development Goals (“MDGs”). At the opening meeting UN Secretary General Ban Ki-moon told business leaders, “We need to bring knowledge, resources and innovation together in a way that links sustainability with opportunities for growth.”<sup>44</sup>

To be sure, there are many private sector initiatives directed toward the eradication of hunger. For example, during the General Assembly meeting, the WFP welcomed a private sector commitment under the auspices of the Clinton Global Initiative (“CGI”) to support improved food and nutrition for millions of schoolchildren in the world’s least developed countries. The leading corporate supporter of this initiative, YUM! Brands, offered an \$80 million cash pledge to WFP and other hunger-related organizations.<sup>45</sup> Earlier in the year, Kemin Industries announced

it will help the WFP improve the quality and nutritional impact of the food it distributes to the hungry poor throughout the world by providing its technical expertise in the field of food quality maintenance and quality assurance systems.<sup>46</sup> This example shows how a company can connect its unique capabilities to specific needs—it is an example that should be duplicated.

## CONCLUSION

The causes of the food crisis are numerous, complicated, and interconnected, so designing mechanisms for addressing the current emergency and preventing a future catastrophe will take time, resources, and political will.

While the price of some commodities has come down slightly, the factors that have contributed to this crisis remain. According to the FAO, by 2030 world agricultural production will have to increase by fifty percent to feed an additional 1.6 billion people and world food production will need to double to feed 9 billion people by 2050. Concerted public and private investment is crucial for boosting agricultural production and spurring sustainable development.<sup>47</sup>

Nations and multilateral institutions have begun to sort out how issues from trade to biofuels to investment in agricultural research can be part of a long-term solution. Of course, it is a daunting challenge to create solutions that suit political, economic, social, and environmental considerations all at once.

Creative philanthropy by the private sector will also be integral to sustainable and environmentally sound development. Businesses, large and small, with a wide variety of tools, know how, and financial resources might be in the best position to tackle discrete challenges in isolated corners of the world.

For individuals and companies, there are many ways to contribute to the alleviation of hunger and starvation in the short run and prevent future catastrophes. This will require people to remain aware of the issue. Every day a myriad of tragedies, crises, and important “normal” events compete for our attention—the plight of disabled veterans and homeless people, global financial panics, elections, wars, and weather-related calamities, such as tsunamis. Many of these issues explode onto the front page. But others, like the silent tsunami of the food crisis, wreak havoc every day in places where people are voiceless and powerless. In a world ever more interconnected, we must remain vigilant in our attention to the silent tsunami because it affects all of us. Nothing is so fundamental to human existence as a sustainable supply of affordable food.



## Endnotes: The Global Food Crisis

<sup>1</sup> See U.N. World Food Programme, WFP Crisis Page: High Food Prices, <http://wfp.org/english/?ModuleID=137&Key=2853> [hereinafter WFP Crisis Page] (last visited Oct. 31, 2008) (explaining that high food prices have put up to 130 million people deeper into poverty and have caused social unrest in countries around the world).

<sup>2</sup> Kent Garber, *The Food Crisis Hits the U.S.*, U.S. NEWS & WORLD REPORT, May 1, 2008, <http://www.usnews.com/articles/news/national/2008/05/01/the-food-cost-crisis-hits-the-us.html> (last visited Oct. 31, 2008).

# ADDING BIOFUEL TO THE FIRE: A SUSTAINABILITY PERSPECTIVE ON ENERGY POLICY IN THE 2008 FOOD, CONSERVATION, AND ENERGY ACT

by Jeni Lamb, Andrew Rogers & L. Leon Geyer\*

## INTRODUCTION: POSITIONING BIOFUEL PRODUCTION IN THE LATTER HALF OF THE TWENTIETH CENTURY

There is little doubt that the world is in the midst of a food and fuel crisis. Among developed nations, the United States finds itself in the particularly precarious position of maintaining both a strong domestic economy and a positive reputation abroad. Domestically, 39.8% of total energy consumption comes from petroleum,<sup>1</sup> 22.8% from coal,<sup>2</sup> 23.6% from natural gas,<sup>3</sup> 8.4% from nuclear power,<sup>4</sup> and 6.8% from renewable energy (including conventional hydroelectric power, wood, alcohol, geothermal, solar, and wind).<sup>5</sup> The frightening reality is that 98.4%<sup>6</sup> of the world's oil is largely located in nations characterized by political instability and/or tense relations with the United States, such as Venezuela, Iran, Iraq, Saudi Arabia, and Nigeria.<sup>7</sup> Some have characterized this geopolitical situation as allowing the above mentioned nations' political leaders to ensconce themselves from democratic reforms and "insulate themselves from international and domestic pressures."<sup>8</sup> Many also allege that the United States' interest in oil has led to unnecessary engagement in foreign conflict. The current energy crisis has come with equally troublesome record-increases in the cost of agricultural products and foodstuffs. Rising food and fuel prices are driving record enrollment in food nutrition assistance programs in the United States<sup>9</sup> and threatening to return some 100 million individuals to poverty abroad.<sup>10</sup> This situation has left Americans searching for a means of securing energy independence and restoring affordability to the global and national food supply.

In this context, the rapid expansion of renewable biofuels has been simultaneously viewed as a culprit and solution. Biofuel production has been consistently indicted as a major contributor to increasing food prices in multiple dimensions. This includes the direct competition of food crops being diverted for production of biofuels, as well as the more indirect competition for land and resources to grow fuel versus food crops.<sup>11</sup> Alternatively, some stress that biofuels are not to blame for rising global food prices, adding that biofuels have had a greater impact in keeping transportation costs as low as they are.<sup>12</sup> As a substitute for gasoline, it is argued that biofuels have played a critical role

in adding stability to energy prices and assuring that they do not climb higher than their recent record levels.<sup>13</sup>

Before delving extensively into the role of biofuels in the modern food and fuel crisis, it is important to remember that the modern experience of "agflation"<sup>14</sup> and energy dependence is not unlike other points in U.S. history. As Federal Reserve Chairman Ben Bernanke recently recalled, in the mid-seventies "oil price shocks" were also accompanied by "rapidly rising prices of agricultural products."<sup>15</sup> Then, just as now, the United States turned to domestic avenues for diversifying the energy

economy. For example, in 1978, Congress passed its first version of the ethanol blenders' credit as an incentive to begin blending their gasoline with home grown ethanol.<sup>16</sup> Powerful corn advocates were among the first to push for a corn ethanol industry, and this initial support secured their dominance in the U.S. biofuel industry.<sup>17</sup> Interestingly enough, exactly thirty years later, another convergence

of food and fuel crises along with the dominance of the corn ethanol industry and its controversial environmental impacts, has placed the United States at a critical juncture in regards to future importance and sustainability of biofuels policy.

With the leg up in the seventies, corn ethanol was best situated to take advantage of a number of recent market and political trends. The widespread state bans on the gasoline additive MBTE created a significant opportunity for ethanol to be combined with gasoline in order to obtain a desired consistency and quality at the pump.<sup>18</sup> More recently, record high and rapidly increasing oil prices have made corn-based ethanol competitive with gasoline.<sup>19</sup> In recognition of the rapidly increasing importance of biofuels, an energy title was added to the Farm Security and Rural Investment Act<sup>20</sup> (the previous farm bill) for the first time in 2002. The passage and implementation of the first Renewable Fuels Standard ("RFS") in 2005<sup>21</sup> provided the first mandated level of ethanol production as an opportunity for

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*Expansion of renewable biofuels has been simultaneously viewed as a culprit and solution.*

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the United States to “grow its way” out of a dependence upon foreign oil.<sup>22</sup> Between 2005 and November of 2007, production nearly doubled from four billion gallons to 7.6 billion gallons.<sup>23</sup> Moreover, it is estimated that another 4.9 billion gallons of production capacity is under construction.<sup>24</sup> This increase has not occurred without significant secondary impacts in agriculture and the greater environment. Increased ethanol production has substantially raised livestock feed prices,<sup>25</sup> eroding profit margins for poultry, swine, and cattle producers. Also, expanded production has brought increased inquiry into ethanol’s actual ability to deliver on its promise as a climate mitigating strategy. Current research is focusing on the secondary costs associated with biofuel expansion.<sup>26</sup> These costs include carbon deficits created by drawing new lands into production for biofuels in developing nations, the impacts of drawing down major aquifers for the planting of corn,<sup>27</sup> and, most importantly as of late, the cost of diverting land from the production of food crops to the production of fuel.<sup>28</sup>

With production for 2008 expected to well out-pace the mandate of the 2005 Renewable Fuels Standard<sup>29</sup> and growing concern over corn ethanol’s impact on environmental and food policy, the 2007 Energy Independence and Security Act (“EISA”) both revised and expanded the standard in light of the modern food and fuel controversy.<sup>30</sup> Beginning in 2009, the EISA will require increasing portions of the renewable fuels mandate to be derived from “advanced biofuels,” or biofuels derived from sources other than corn.<sup>31</sup> While the EISA outlines a skeletal framework for the future of domestic biofuel production, the recently passed 2008 Food, Conservation, and Energy Act (“2008 Farm Bill”)<sup>32</sup> requires fleshing out the policy incentives to facilitate such a transition.

Through the lens of the most recent farm bill, this paper investigates the content and implications of a dramatically altered renewable fuel policy in the context of the modern food and fuel crisis. After establishing this basic understanding, we argue that the renewable biofuels industry is at an important juncture as the transition is made from corn ethanol towards advanced biofuels. We offer a preliminary assessment of the sustainability of biofuels as a component of the U.S. energy policy transition from “monosource” petroleum dependence to a “multisource” production scheme.

### **2008 FARM BILL ENERGY PROVISIONS**

The 2008 Farm Bill occupies the unique position of generating active policies for energy production incentives and reactionary policies which must account for higher food costs and negative environmental impacts associated with biofuel

production. It also carries the responsibility for creating the programs that will make the goals set by the EISA attainable over the five-year horizon.

The 2008 Farm Bill marks a major transition in renewable biofuels policy by moving away from the dominant corn-based industry.<sup>33</sup> The Farm Bill’s programs are directed towards the development of “advanced biofuels.” The “advanced biofuels”

terminology was adapted by the Congress in the 2007 EISA, but loosely aligns with what the scientific community has termed “second generation” biofuels.<sup>34</sup> The primary emphasis is placed on cellulosic ethanol, which is derived from cellulose, hemicelluloses, or lignin,<sup>35</sup> and includes fuels that are produced primarily from a variety of crops, crop residues, forest sources, waste streams, and other cellulosic sources.<sup>36</sup>

However, the term “advanced biofuels,” as utilized by the Congress in the 2007 EISA<sup>37</sup> and in the 2008 Farm Bill, covers a much broader range of technologies than solely cellulosic ethanol. These include commercially scaled technologies such as biodiesel and sugar ethanol. In reality, the modified definition of advanced biofuels can include any non-corn source.<sup>38</sup> Programs with specific reference to “advanced biofuels” terminology include the authorization and appropriation of mandatory funds for a loan guarantee program and an energy payments program.<sup>39</sup> General programs incorporating advanced biofuels promotion establish a controversial sugar-to-ethanol program and reauthorize federal programs to give preference to bio-based products.

The 2008 Farm Bill’s Energy Title addresses the concept of “advanced biofuels.” In § 9003, a \$320 million loan guarantee program offers up to a ninety percent guarantee on loans up to \$250 million for the construction of advanced biofuel infrastructure and demonstration scale projects.<sup>40</sup> The other major program addressing advanced biofuels, outlined in § 9005,<sup>41</sup> builds off of the Commodity Credit Corporation bio-energy program, created by executive order of President Clinton in 1999.<sup>42</sup> The program previously provided incentives and payments for biofuels producers.<sup>43</sup> Although the bioenergy program was extremely popular, no funding was appropriated in fiscal year 2007.<sup>44</sup> Now the second largest provision of the title in terms of mandatory money at \$300 million, the Farm Bill has revived the program with a focus on moving away from corn-based ethanol.<sup>45</sup> The program “directs the USDA to make payments to support and ensure an expanding production of advanced biofuels.”<sup>46</sup> In addition to these funding incentives, § 9002 commissions a biofuel infrastructure study that directs the Secretary of Agriculture to look into infrastructure needs associated with the expanding production and use of advanced biofuels.<sup>47</sup> The Department of Energy and the Transportation and the Environmental Protection Agency will also assist in the study.<sup>48</sup>

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## *The United States stands at a critical juncture in the implementation and acceptance of biofuels policy.*

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More targeted programs that begin to address the needs of cellulosic ethanol are also present in the energy provisions of Tax Title XV, § 15321. However, none of the programs likely to see the level of funding promised in the general advanced biofuels provisions.<sup>49</sup> The first targeted program is the Biomass Crops Assistance Program (“BCAP”).<sup>50</sup> According to the Statement of the Managers, the “primary focus of the BCAP will be promoting the cultivation of perennial and annual bioenergy crops that show exceptional promise for producing highly energy-efficient bioenergy or biofuels, that preserve natural resources, and that are not primarily grown for food or animal feed.”<sup>51</sup> This program is granted no mandatory funding under the Energy Title, but the Congressional Budget Office (“CBO”) scores the program to cost some \$70 million.<sup>52</sup>

Cellulosic ethanol production is also being supported through additional funding for research and development initiatives.<sup>53</sup> Tax Title XV creates a \$1.01 per gallon tax credit for producers of cellulosic ethanol.<sup>54</sup>

The CBO scores the program at a cost of \$403 million over the ten-year budget window,<sup>55</sup> which is likely the single largest flow of funds to the commercialization of cellulosic ethanol.<sup>56</sup>

Working from the opposite side of active advanced biofuels programming is the effort to reduce the incentive for corn ethanol production. Section 15331 of the Trade and Tax Title reduces the Volumetric Ethanol Excise Tax Credit (“VEETC”) for ethanol blended into gasoline from fifty-one cents per gallon to forty-five cents per gallon starting in 2009.<sup>57</sup> More popularly known as the ethanol blenders’ credit,<sup>58</sup> the tax credit is an incentive for blenders to purchase ethanol and has been a powerful tool for expanding the ethanol market since it was established in the 1978 Energy Tax Act.<sup>59</sup> The 2008 Farm Bill reduces the ethanol blenders’ credit in reference to projections that ethanol production will soon outpace the 2005 RFS mandate.<sup>60</sup>

The sugar loan program appears in the Commodities Title and confronts increased competition from trade liberalization.<sup>61</sup> The U.S. sugar loan policy consistently maintained sugar prices at levels two to four times higher than world markets through managed trade.<sup>62</sup> These circumstances, which allowed the USDA to operate the sugar policy at “no cost,” are quickly eroding.<sup>63</sup> An increasing number of free trade agreements coming online and, most significantly, the phase-out of tariff quotas in the North American Free Trade Agreement,<sup>64</sup> will make it harder for the USDA to recoup all losses from sugar forfeitures. In light of the celebrated success of the Brazilian sugar ethanol program, the USDA began considering the possibilities of sugar-to-ethanol production. In 2006, the USDA released an economic analysis concluding that with high oil prices, it would be cost effective for the United States to produce sugar ethanol.<sup>65</sup> With the added

push of the U.S. market opening up to sugar inputs from Mexico, the sugar-to-ethanol program was added to both the House and Senate versions of the Farm Bill.<sup>66</sup> The final product is the establishment of the Farmer Feedstock Flexibility Program.<sup>67</sup> Building on the Commodities Title three quarters of a cent per pound raise of the loan rate for sugar, this Title IX program requires the USDA to buy up surplus sugar for sale to ethanol producers.<sup>68</sup> Additional sugar-related programs include the extension of the sugar ethanol tariff until 2011.<sup>69</sup>

## EVALUATING THE FUTURE OF BIOFUELS

We argue that the successful transition of U.S. biofuel production from corn to a broader-based system will require the convergence of a number of factors. First, the modern debate over the causes of the food and fuel crisis has significantly damaged the public perception of biofuels. While ethanol is most often recognized as a one element of a “perfect storm” of a number of

factors influencing prices of food and fuel, it has been consistently indicted as a primary contributor in analyses from politically powerful organizations,<sup>70</sup> with estimates ranging between ten and thirty percent regarding its role in driving record prices.<sup>71</sup> The role of biofuels in driving agricultural prices needs to be clearly addressed through reforms that reduce the competition between uses of food crops and production lands.

Second, the corn ethanol industry has the advantage of already having advanced along a substantial commercial learning curve.<sup>72</sup> Thus, policies must also address means to “level the playing field” by increasing the competitiveness of advanced biofuels along the production chain and reducing supports that encourage the dominance of corn in the industry. Recognizing that the United States stands at a critical juncture in the implementation and acceptance of biofuels policy, this section assesses the progress of the 2008 Farm Bill towards meeting these goals.<sup>73</sup>

While the “advanced biofuels” terminology of the farm bill allows for a transition away from the corn based system, it fails to hold United States policy accountable to a food and fuel hypothesis. This is because sugar ethanol, biodiesel, and cellulosic ethanol present different obstacles to sustainability.<sup>74</sup> In particular, sugar and biodiesel face a similar problem as corn in requiring the diversion of a food crop to fuel production.<sup>75</sup> Furthermore, a scarcity of land resources available to be brought into production limits the potential of either biodiesel or sugar ethanol to expand to occupy a dominant position in the market relative to corn.<sup>76</sup>

By contrast, cellulosic ethanol avoids many of the pitfalls associated with commercially available technologies. It can be produced from almost any plant source, including plant waste

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*Cellulosic ethanol avoids many of the pitfalls associated with commercially available technologies.*

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and dedicated energy crops that may not be as competitive for land and resources with food crops. By assessing the current level of existing activities, some studies estimate that the United States has the capacity to produce enough raw materials for cellulosic ethanol production to offset sixty percent of domestic oil consumption.<sup>77</sup> Cellulosic ethanol further promises to be more energy efficient in life cycle costing measures, and is more regionally diverse in its applicability when compared to corn ethanol.<sup>78</sup> However, because the technology has not been commercialized, there is no way to truly know what its actual potential is. Farmers do not want to grow dedicated energy crops that have never been grown on a commercial scale,<sup>79</sup> investors do not want to invest in cellulosic ethanol production plants until a crop is in the ground, and banks do not want to offer reasonable loan rates until the technology is proven.<sup>80</sup> Clearly the obstacles to cellulosic production are very distinct from the sugar or biodiesel industries. However, with cellulosic ethanol placed under the same umbrella as the previously mentioned problems with commercially available technologies, it is very possible that the infant industry's particular needs will be neglected as policy makers grasp for a short-term solution.

Despite its far less commercialized position, cellulosic ethanol is not given near the prioritization, in terms of overall funding or triangulation, as programs dedicated to other advanced biofuels. While the Bill earmarks substantial funding for research, the most actively praised program by farmers<sup>81</sup>—the BCAP program—receives no mandatory money.<sup>82</sup> Yet this is the program most likely to begin solving the problem of “who goes first”<sup>83</sup> in terms of growing cellulosic ethanol production on a commercial scale. Cellulosic ethanol, clearly distinct from corn-based ethanol, sugar ethanol, and advanced biofuels, needs to be discussed as an alternative to those fuels. The current inclusion of cellulosic ethanol with advanced biofuels has great potential to be misleading in the context of the food and fuel debate.

In terms of leveling the commercial playing field, the 2008 Farm Bill does offer incentives to expand the commercialization of advanced biofuels. Existing ethanol plants or new plants looking to produce sugar ethanol can apply for a loan guarantee through the loan guarantee program. Those plants can expect a steady stream of supply as trade in sugar opens and the USDA has to both accept and sell more sugar forfeitures to ethanol processors.<sup>84</sup> Moreover, while small producers can take advantage of producer credits, distributors can take advantage of the now reduced, but still significant, ethanol blenders' credit.<sup>85</sup> All the while, the domestic production system is protected from direct competition against the more efficiently produced sugarcane ethanol from Brazil.<sup>86</sup>

Regardless of these advancements, recent research suggests that the 2008 Farm Bill's ethanol blenders' credit reduction will not decrease the competitiveness of corn ethanol in the biofuels market. While the six cent reduction in the tax credit is certainly significant as the greatest reduction in the blenders' credit in nearly twenty years,<sup>87</sup> recent studies conclude that the reduction will have very little impact in the short run. Research from Iowa State University suggests that even the entire repeal

of the blenders' credit would not result in a major transition away from corn ethanol as ethanol plants will continue to operate in the short-run as long as production covers their variable cost.<sup>88</sup> If the price of gasoline remains high, there will be sufficient demand for corn ethanol even with higher costs of inputs and reductions in credit.<sup>89</sup>

### EXPANDING THE HORIZON: SUSTAINABILITY IMPACTS OF BIOFUELS IN THE CONSERVATION, NUTRITION, AND TRADE TITLES AND FOOD AID PROVISION

There is more to the sustainability of advanced biofuels than can be demonstrated through the specific energy provisions alone. Placed in the broader context of the 2008 Farm Bill, biofuels policy conflicts with the principles of environmental stewardship through land pressures in the Conservation Title,<sup>90</sup> and with social equity through disproportionate distribution of the burden of higher food costs compensated for in the Nutrition and Trade Titles and Food Aid Provision.<sup>91</sup> Despite the fact that the energy and tax portions (discussed above) are the primary actors in shaping the active policies regarding the future of domestic biofuels, the funding priority overwhelmingly targets programs that must react to the secondary effects created by continued and increased ethanol production.<sup>92</sup> Specifically, the Conservation Title takes a new direction based on increasing land availability, land values, and the drive to bring more acres under production due to greater aggregate demand for food and fuel production.<sup>93</sup> The Nutrition and Food Aid provisions work even further down the line, ultimately accounting for the increased end cost of food that has been linked to ethanol.<sup>94</sup> Figure 1 provides a rough picture of the distribution of funding in the 2008 Farm Bill based on the scores offered by the Congressional Budget Office.<sup>95</sup>

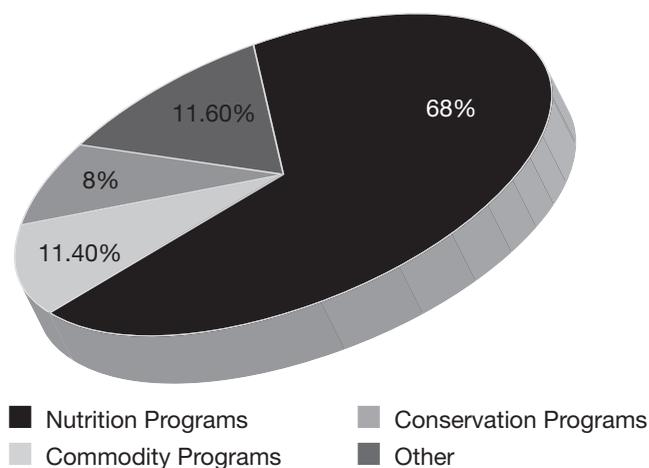


Figure 1: Farm Bill Spending 2008-2012

#### CONSERVATION

In the range of opinions on the role of ethanol in food to fuel policy, there is broad recognition of the fact that biofuel crop production creates significant pressure to bring more lands into production.<sup>96</sup> In the Farm Bill, this trend collides directly with the Conservation Title. Established in 1985 under the Conservation

Reserve Program,<sup>97</sup> the funding for the Conservation Title now feeds into a number of programs which promote environmental sustainability for both “retired” and working lands.<sup>98</sup>

Concern in the 2008 Farm Bill focused on the original Conservation Reserve Program (“CRP”). CRP is a land retirement program that offers farmers a paid option to enter into a ten year contract to reduce environmental and income risk by removing highly erodible and marginal lands from production while encouraging environmental stewardship; CRP is popular with farmers, environmentalists, and the hunting community.<sup>99</sup> Despite its popularity, vast increases in crop prices have offered farmers a powerful incentive to not reenroll their lands in the program and to return many of these marginal lands to production.<sup>100</sup> These concerns elicited several proposals from academia, and even the Secretary of Agriculture, with the objective of making more effective use of the land.<sup>101</sup> In response to these proposals, the CRP will gradually reduce its enrollable acreage from the current 36 million acre cap to a 32 million acre cap in 2010.<sup>102</sup> Because of reduction in CRP acreage, funding increases in the Farm Bill will now go to programs focused on the regeneration and environmental sustainability of working lands.<sup>103</sup> This includes substantial increases for the Environmental Quality Incentives Program (“EQUIP”)<sup>104</sup> and the Conservation Security Program (“CSP”).<sup>105</sup> Managers announced in a May press conference that a funding agreement focusing on EQUIP and CSP would assure the sustainability of agriculture in light of increased land demand from biofuel producers and increases in crop production.<sup>106</sup>

#### NUTRITION, TRADE, AND FOOD AID

Whatever the exact role of ethanol in the food and fuel crisis, its effects bear primarily on the poor—both in the United States and abroad. The poor spend the greatest proportion of their income on food and transportation.<sup>107</sup> The U.S. scenario, where the average American still spends less than ten percent<sup>108</sup> of his income on food, is a rosy one in the global context where the poor spend approximately seventy-five percent of their incomes on food.<sup>109</sup> The administration of the food stamp program, renamed the Supplemental Nutrition Assistance Program in the 2008 Farm Bill, and the delivery of international food aid are the government’s primary mechanisms for ensuring that hard economic times and high commodity prices do not translate to hunger at home and abroad.

In 1996, steep cuts made to the food stamp program meant a drastic decline in the purchasing power of food stamps.<sup>110</sup> The 2008 Farm Bill sought to correct this by linking the asset deduction of the eligibility formula to inflation. Moreover, the minimum benefit had not been indexed in over thirty years, meaning that food stamp participants could only purchase one third of the amount purchased in 1979.<sup>111</sup> The 2008 Farm Bill raises the minimum benefit by almost one-third and then indexes the minimum benefit to future inflation in hopes of preventing this problem in the future.<sup>112</sup> In terms of more macro interventions, the Nutrition Title doubles assistance to food banks for a total of \$1.256 billion.<sup>113</sup>

Indeed, to some extent the funding dedicated to nutrition and food aid objectives in the Farm Bill can be seen as a transfer payment for the relative inefficiency of the U.S. government to ensure an affordable food supply. Although seventy percent of the Farm Bill spending (\$10.3 billion) goes towards nutrition programs,<sup>114</sup> rising agricultural prices have eroded the strides made by the Farm Bill. Reflecting these concerns, the House Agriculture Committee held hearings this summer to review the extent of “hunger in America” and international development assistance in agriculture.<sup>115</sup>

#### CONCLUSION

Given the dualistic position of biofuels as both a potential mechanism for reducing energy dependence and a source of food and environmental stress, it is vitally important that the policy and scientific community “get it right” in order for biofuels to remain an important aspect of the domestic energy portfolio. In the recent example of the rise and decline of public favor for King Corn,<sup>116</sup> “history tells us that public opinion will latch onto the first standard issued, and if the number is inaccurate, the public may . . . withdraw their support [from] renewable biofuels because of concerns about environmental impact.”<sup>117</sup>

In terms of offering a sustainable solution, cellulosic ethanol may present the greatest biomass opportunity for a mutually agreeable solution to the reduction of dependence on petroleum in our current energy crisis. The Senate Committee report recognizes this premise stating, “for bioenergy, the most important need is to support and accelerate the development and commercialization of technologies for producing biofuels and biobased products from cellulosic biomass feedstocks.”<sup>118</sup> Yet, despite lip service to the importance of cellulosic ethanol, the 2008 Farm Bill obfuscates its definition through inclusion in the general category of advanced biofuels. It also fails to provide adequate incentives along the production chain for either commercialized cellulosic production to come to fruition or for adequate removal of support for corn ethanol production to promote the opening of an opportunity in the market.

This failure to deliver a systematic approach to bring a more sustainable biofuels production becomes all the more devastating when viewed in light of the downstream effects on the environment and the poor, most threatened by the rising cost of food. Such impacts come at great economic and moral expense. In the Nutrition and Trade Titles and the Food Aid Provision, rising food costs create a double bind in which more people are made food insecure while it costs substantially more to provide a safety net. As showcased in the section on Conservation, land pressures have forced the issue of increased conservation spending as more marginal lands are brought into production. Yet the moral implications of our failed biofuels policy are truly the most profound, illustrating that we have yet to find an engine to our modern way of life that does not thrive at the expense of our natural environment, food affordability, food availability, or common humanity. 

**Endnotes:** Adding Biofuel to the Fire  
*continued on page 72*

# THE WTO, AGRICULTURE, AND DEVELOPING COUNTRIES: THE NEED FOR TRADE REFORMS

by Melissa Blue Sky\*

The most recent collapse of World Trade Organization (“WTO”) negotiations occurred in July 2008 because countries were unable to reach an agreement on how to protect farmers in developing countries from the negative effects of greater trade liberalization.<sup>1</sup> Although an attempt was made to restart talks in September 2008, little progress was made, and if talks are to continue, it will not likely be until 2009.<sup>2</sup> The current round of negotiations, titled the Doha Development Agenda (“DDA”), began in 2001 and included an emphasis on the needs of developing countries.<sup>3</sup> However, subsequent negotiations have raised many questions about the commitment of developed countries to the DDA goals and highlighted the increasingly central role of agriculture in the WTO.

The Uruguay Round of negotiations, which continued from 1986 until 1994, created both the WTO and the Agreement on Agriculture (“AoA”). Prior to the Uruguay Round, it was commonly believed that the international trade regime did not include agriculture. This can be traced to a 1955 waiver on agricultural import restrictions granted to the United States, which resulted in global disregard of trade rules.<sup>4</sup>

The AoA firmly returned agriculture to the WTO trade regime with specific binding commitments regarding market access, domestic support, and export competition.<sup>5</sup> Yet it does not take into consideration non-market aspects of agriculture and food markets, such as the relatively inelastic supply and demand in agriculture, the lack of political and economic power of farmers, and the fact that corporations rather than countries or farmers are the actors who engage in agricultural trade.<sup>6</sup>

The agricultural trade rules of the WTO have required liberalization of developed country access to developing countries’ markets, but developed countries have not reciprocated by opening their markets to agricultural products from developing countries. Tariffs levied by developed countries on products from developing countries increase the final product price, making it more difficult for developing countries to sell their agricultural products.<sup>7</sup> Nor have developed countries sufficiently decreased their trade-distorting agricultural subsidies, which provide additional income to agricultural producers and allow them to sell their products for a lower price.<sup>8</sup> As a result of these types of policies, developing country farmers are forced to compete with subsidized, larger foreign producers who may cause local producers to go out of business, increasing urban emigration, vulnerability of food-importing nations to swings in global commodity markets, and food insecurity.<sup>9</sup>

Commodity prices, which were quite low until relatively recently, coupled with the AoA’s unfair trade rules, have significantly affected the ninety-six percent of the world’s farmers who live in developing countries and approximately 2.5 billion people who are dependent on agriculture as their main source of income.<sup>10</sup>

Farmers in developing countries are negatively impacted when prices for their crops decline, which can result from trade liberalization.<sup>11</sup> Conversely, consumers in developing countries generally benefit from lower food prices, because a large percentage of their income is spent on food.<sup>12</sup> However, in many developing countries, households are both producers and consumers of agricultural products and lower prices simultaneously lead to negative and positive effects.<sup>13</sup> In subsistence farming households, the benefits of reduced food prices for consumption may not outweigh the losses of decreased profits from sale of their crops.<sup>14</sup>

Increased food prices have the greatest negative effects on people who spend a substantial portion of their incomes on food. When prices in staple food crops go up these people are forced to reduce either their food consumption or their purchases of other essentials. The recent food crisis has increased the number of people living in poverty by an estimated 100 million and led to widespread food riots.<sup>15</sup> The number of people suffering from malnutrition increased by 119 million in 2007 and 2008, bringing the worldwide total to nearly one billion.<sup>16</sup> Although increased food prices should lead to increased incomes for farmers in developing countries, for the most part this has not occurred because of increases in input prices, limited access to markets, and the fact that the minority of household producers are net sellers.<sup>17</sup>

At the July 2008 WTO negotiations, parties reached an impasse because developing countries refused to move forward with an agreement that would deepen the inequities exacerbated by agricultural trade. Developing countries want to protect their farmers and their populations from poverty and hunger. The agricultural sector within developing countries is important for ensuring food security and for employment. In India, for example, two-thirds of the population is supported by agriculture.<sup>18</sup>

At the July negotiations, Susan C. Schwab, the U.S. Trade Representative, stated that the developing countries wanted an agreement that would take the global trading system back thirty

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years.<sup>19</sup> While this may be true in some respects, it ignores the fact that developing countries are not now industrialized to the degree that the United States was thirty years ago. Developed countries, like the United States, have demonstrated a continued unwillingness to recognize the role that protection played in their own economic development and to extend similar protections to developing countries.

Developing countries' concerns regarding unfair rules of trade in agriculture must be incorporated into any future WTO negotiations in order to contribute to rather than detract from progress on long-term development goals. Developed countries should reduce the subsidies given to domestic agricultural producers, as well as the tariffs on agricultural imports from developing countries. It is also essential that countries recognize that trade may lead to food insecurity in developing countries and take measures to support both subsistence farmers and consumers there.<sup>20</sup>

Since the Doha Round began, developed countries have proposed some reductions in their subsidies and to allow some of the poorest developing countries to maintain tariffs on a limited number of products.<sup>21</sup> However, the developing country proposals do not go far enough to fulfill the objectives outlined by the Doha Ministerial Declaration, such as taking into account the development needs of non-industrialized nations, including food security and rural development.<sup>22</sup> Developing countries should continue to work together to build agreements and power blocks to ensure that any future trade agreement embodies the original intent of the Doha Development Agenda. 

## Endnotes:

<sup>1</sup> Stephen Castle & Mark Lander, *After 7 Years, Talks Collapse on World Trade*, N.Y. TIMES (July 30, 2008), available at [www.nytimes.com](http://www.nytimes.com) (search for article title) (last visited Nov. 5, 2008).

<sup>2</sup> See Anne-Laure Constantin, Institute for Agriculture and Trade Policy, October 01, 2008: WHERE NEXT? Questions and answers about Doha after the July collapse (Sept. 29, 2008), <http://www.tradeobservatory.org/geneva/update.cfm> (last visited Nov. 5, 2008).

<sup>3</sup> Ved. P. Nanda, *Selected Aspects of International Trade and the World Trade Organization's Doha Round: Overview and Introduction*, 36 DENV. J. INT'L L. & POL'Y 255, 257 (2008).

<sup>4</sup> JOHN H. JACKSON, *THE WORLD TRADING SYSTEM: LAW AND POLICY OF INTERNATIONAL ECONOMIC RELATIONS* 57-58 (2d ed. 1997).

<sup>5</sup> *Id.* at 315-16.

<sup>6</sup> SOPHIA MURPHY, INSTITUTE FOR AGRICULTURE AND TRADE POLICY *MANAGING THE INVISIBLE HAND: MARKETS, FARMERS AND INTERNATIONAL TRADE* 2-3 (April 2002), available at <http://www.tradeobservatory.org/library.cfm?RefID=25497> (last visited Nov. 5, 2008).

<sup>7</sup> Nanda, *supra* note 3, at 259-60.

<sup>8</sup> *Id.* at 258.

<sup>9</sup> FRANCES MOORE LAPPÉ ET AL., *WORLD HUNGER: TWELVE MYTHS* 120 (2d ed. 1998).

<sup>10</sup> CELINE CHARVERIAT & RIAN FOKKER, OXFAM, *BOXING MATCH IN AGRICULTURAL TRADE: WILL WTO NEGOTIATIONS KNOCK OUT THE WORLD'S POOREST FARMERS?* 7 (Nov. 2002) available at [http://www.oxfam.org.uk/resources/policy/trade/downloads/bp32\\_agric\\_trade.pdf](http://www.oxfam.org.uk/resources/policy/trade/downloads/bp32_agric_trade.pdf) (last visited Nov. 5, 2008).

<sup>11</sup> Jacinto F. Fabiosa, *Effect of Free Trade in Agriculture on Developing Countries*, 16 MICH. ST. J. INT'L L. 677, 687.

<sup>12</sup> *Id.* at 685.

<sup>13</sup> *Id.* at 687.

<sup>14</sup> *Id.* at 690.

<sup>15</sup> TERESA CAVERO & CARLOS GALIAN, OXFAM, *DOUBLE-EDGED PRICES, LESSONS FROM THE FOOD PRICE CRISIS* 9 available at <http://www.oxfam.org/files/bp121-double-edged-prices-lessons-from-food-price-crisis-0810.pdf> (last visited Oct. 21, 2008).

<sup>16</sup> *Id.* at 6.

<sup>17</sup> *Id.* at 10-11.

<sup>18</sup> Heather Timmons, *A Voice of Developing Nations Asks the West for Compromise on Trade*, N.Y. TIMES (July 13, 2007), available at [www.nytimes.com](http://www.nytimes.com) (search for article title) (last visited Nov. 5, 2008).

<sup>19</sup> Castle, *supra* note 1.

<sup>20</sup> Carmen G. Gonzalez, *Institutionalizing Inequality: The WTO Agreement on Agriculture, Food Security, and Developing Countries*, 27 COLUM. J. ENVTL. L. 433, 490 (2002).

<sup>21</sup> Press Release, Oxfam, *Outline WTO Deal Has Major Flaws for Poor Countries* (July 26, 2008), available at <http://www.oxfam.org/en/pressroom/pressrelease/2008-07-26/outline-wto-deal-has-major-flaws-poor-countries> (last visited Nov. 5, 2008).

<sup>22</sup> Gonzalez, *supra* note 20 at 490.

# RISING GLOBAL FOOD PRICES: THE NEED FOR RE-REGULATING COMMODITY FUTURES

by Megan S. Chapman\*

The sharp rise in the price of basic foodstuffs in the last year has impacted consumers around the globe, but the ill effects are disproportionately felt in developing countries. The UN Food and Agriculture Organization (“FAO”) reports seventy-five million more people living below the hunger line in 2007, raising the number of undernourished to 923 million worldwide; these numbers are likely to increase even more sharply in 2008.<sup>1</sup> Food prices for staples such as flour, corn, and rice have risen fifty-two percent on average from 2007 to 2008.<sup>2</sup> In developing countries, where families may spend as much as fifty to seventy percent of their daily budget on food, these price increases translate into poorer nutrition and loss of purchase power; in other words, these families must make devastating trade-offs: paying for food instead of essential utilities, education, or basic health care.<sup>3</sup> Food prices have triggered protests in thirty-six countries, twelve of them violent.<sup>4</sup>

Economists and food policy experts cite a variety of factors that have most likely contributed to the price rise of commodities. Demand-side fundamentals include the increased demand for commodities due to new investment in biofuels, which now for example use one third of U.S. corn production,<sup>5</sup> and the changing diet of the world’s growing middle class, requiring more land- and water-intensive production of meat, dairy, fruits, and vegetables.<sup>6</sup> Supply-side fundamentals include weather and natural disasters affecting crop yields, such as Cyclone Nargis in Burma, droughts in Java, stem rust disease affecting wheat crops in East Africa;<sup>7</sup> food and water shortages effecting agricultural production; and generally lagging agricultural productivity that fails to keep up with worldwide population and economic growth.<sup>8</sup>

Many experts agree, however, that the fundamentals alone do not explain the dramatic rise in commodity prices. Outside of the fundamentals, there are old culprits: inefficient trade policies, such as tariffs, subsidies, and export restrictions, some of which have been raised or reinstated as countries attempt to protect their domestic food supplies. And there is a relatively new culprit: the direct and indirect impacts of speculative investment in commodity futures. Within this market, as the International Food Policy Research Institute (“IFPRI”) reports, “rising expectations, speculation, hoarding, and hysteria are among the additional factors that have played a role in the increasing level and volatility of food prices.”<sup>9</sup>

Investment in the commodity futures market has increased from roughly \$13 billion in 2003 to \$250 billion this year.<sup>10</sup>

Much of the increase has come through the introduction of new investors, index funds, and other noncommercial traders who seek profits through speculation, using largely unregulated over-the-counter swaps.<sup>11</sup> Commodity futures were originally designed to protect farmers and commercial investors, for example grain elevators, with some physical interest in the underlying commodity market.<sup>12</sup> Until the 1990s, the distinction between these commercial hedgers and non-commercial speculators was clear—and both were regulated. In the United States, the Commodity Futures Trade Commission (“CFTC”) regulates the activities of the commercial hedgers, for example, by imposing position limits and capital stock requirements.<sup>13</sup> Beginning in 1991, recognizing that non-commercial swaps dealers were playing an important role in providing liquidity in the market, the CFTC granted them exemptions from these limits. With deregulatory legislation of the late 1990s, additional regulatory loopholes were deliberately left for commodity swaps, which allowed for more speculation by commercial hedgers and the entrance of more noncommercial speculators into the market.<sup>14</sup>

Speculation in commodities futures involves both benefit (liquidity) and risk (price destabilization). There is little doubt that speculation is tied to rising food prices, whether as a cause, a symptom, or both.<sup>15</sup> The causal effects are both direct, as a flood of investment further drives up already rising prices, and indirect, since the price of oil, a non-food commodity, invariably affects the prices of other commodities through transportation and fertilizer inputs.<sup>16</sup>

By spring 2008, international organizations, think tanks, and politicians began to call for regulatory reform in the commodity futures market. The IFPRI called for “a resilience package” of policy measures, the first of which was to “calm markets with the use of market-oriented regulation of speculations” in May.<sup>17</sup> On July 10, 2008, Senators Joe Lieberman, Susan Collins, and Maria Cantwell introduced in the Senate the Commodity Speculation Reform Act (“S. 3248”).<sup>18</sup> The bill was referred to the Senate Committee on Agriculture, Nutrition, and Forestry, where it has languished ever since.<sup>19</sup>

Meanwhile, political pressure and charges that the Commission was neglecting its regulatory duties spurred a response from the CFTC. In September 2008 it published the preliminary results of a broad survey of all U.S. swap dealers and index funds. In the introduction to the preliminary report the CFTC

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wrote, “this type of a compelled survey relating to off-exchange activity is unprecedented, but the growth and evolution in futures market participation and growing public concern regarding off-exchange activity supported the need for this extraordinary regulatory inquiry.”<sup>20</sup> The recommendations mostly called for further investigation. For example, a review was recommended as to whether “swap dealers would maintain their exemptions in exchange for them to report when their clients reach certain position levels and provide ‘certification’ that none of their speculative clients exceed position limits.”<sup>21</sup> One of the four CFTC commissioners, Bart Chilton, said the recommendations did not go far enough. As he colorfully put it, “We need a sheriff in the saddle, to make sure these markets are honest.”<sup>22</sup>

Regulation is also being addressed internationally. On October 1, 2008 the CFTC announced that it will co-chair the International Organization of Securities Commissions’ newly-created Task Force on Commodity Markets (“TFCM”), alongside the United Kingdom Financial Services Authority, with the participation of both developed and developing member countries. The TFCM is charged with “examining the current supervisory approaches for overseeing commodity markets worldwide” given the “profound changes” these markets have recently undergone.<sup>23</sup>

If not for the latest wave of the financial crisis, including the near failure of American International Group, the prospect of legislative change in the United States on these issues may have died with S. 3248. Instead, in mid-October various committees of the both the House and the Senate have held hearings on credit-derivatives and credit-default swaps. As these committees debate whether the CFTC, the Security Exchange Commission, or private sector clearinghouses are better suited to regulate credit swaps,<sup>24</sup> the hope is that whatever the legislative outcome may be, it does not allow the gaping loopholes in commodity futures regulation to persist.



## Endnotes:

<sup>1</sup> Press Release, UN Food and Agriculture Organization, *Hunger on the Rise: Soaring Prices Add 75 Million People to the Global Hunger Rolls* (Sept. 18, 2008), available at <http://www.fao.org/newsroom/en/news/2008/1000923/> (last visited Nov. 2, 2008).

<sup>2</sup> See *id.*

<sup>3</sup> JOACHIM VON BRAUN ET AL., INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE, *HIGH FOOD PRICES: THE WHAT, WHO, AND HOW OF PROPOSED POLICY ACTIONS*, (May 2008) at 6-7, available at <http://www.ifpri.org/PUBS/ib/FoodPricesPolicyAction.pdf> (last visited Nov. 2, 2008).

<sup>4</sup> TODD BENSON ET AL., INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE, *GLOBAL FOOD CRISES: MONITORING AND ASSESSING IMPACT TO INFORM POLICY RESPONSES*, (Sept. 2008), at 35-37, available at <http://www.ifpri.org/pubs/fpr/pr19.pdf> (last visited Nov. 2, 2008).

<sup>5</sup> VON BRAUN, *supra* note 3, at 3 (compared to 5% a decade ago).

<sup>6</sup> *Id.* at 4.

<sup>7</sup> See Chris Hogg, *Burma’s Rice Harvest Under Threat*, BBC NEWS, Oct. 22, 2008, available at <http://news.bbc.co.uk/1/hi/world/asia-pacific/7405414.stm> (last visited Nov. 2, 2008); Agus Maryono and Yuli Tri Suwarni, *Drought*

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<sup>8</sup> VON BRAUN, *supra* note 3, at 4.

<sup>9</sup> *Id.* at 5-6.

<sup>10</sup> Diana B. Henriques, *Commodity Policies Set for Revision*, N.Y. TIMES, May 31, 2008, available at <http://www.nytimes.com/2008/05/31/business/31cftc.html> (last visited Nov. 2, 2008).

<sup>11</sup> See generally COMMODITY FUTURES TRADING COMMISSION, STAFF REPORT ON COMMODITY SWAP DEALERS AND INDEX TRADERS WITH COMMISSION RECOMMENDATIONS (Sept. 2008), available at <http://www.cftc.gov/stellent/groups/public/@newsroom/documents/file/cftcstaffreportonswapdealers09.pdf> (last visited Nov. 2, 2008) [hereinafter CFTC].

<sup>12</sup> Diana B. Henriques, *Price Volatility Adds to Worry on U.S. Farms*, N.Y. TIMES, Apr. 22, 2008, available at <http://www.nytimes.com/2008/04/22/business/22commodity.html> (last visited Nov. 2, 2008).

<sup>13</sup> CFTC, *supra* note 11, at 1.

<sup>14</sup> See VON BRAUN, *supra* note 3, at 5-6; see also Diana B. Henriques, *Commodity Regulators Vow Stricter Oversight*, N.Y. TIMES, June 3, 2008, available at <http://www.nytimes.com/2008/06/03/business/03cftc.html?fta=y> (last visited Nov. 2, 2008); Henriques, *supra* note 12; CFTC, *supra* note 11, at 1.

<sup>15</sup> See VON BRAUN, *supra* note 3, at 5-6; see also UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT, *TRADE AND DEVELOPMENT REPORT 2008 22* (Sept. 2008), available at [http://www.unctad.org/en/docs/tdr2008\\_en.pdf](http://www.unctad.org/en/docs/tdr2008_en.pdf) (last visited Nov. 2, 2008).

<sup>16</sup> VON BRAUN, *supra* note 3, at 5; see also Interview with Egon Guttman, Professor Emeritus, American University Washington College of Law, in Washington, D.C. (Oct. 17, 2008).

<sup>17</sup> *Id.* at 9.

<sup>18</sup> Joe Lieberman, et al., *Commodity Speculation Must Be Curbed*, FIN. TIMES, July 25, 2008, available at [http://www.ft.com/cms/s/0/1a083616-5a3a-11dd-bf96-000077b07658.html?nclink\\_check=1](http://www.ft.com/cms/s/0/1a083616-5a3a-11dd-bf96-000077b07658.html?nclink_check=1) (last visited Nov. 2, 2008).

<sup>19</sup> Open Congress, Bills, Tracking S. 3248, available at <http://www.opencongress.org/bill/110-s3248/show> (last visited Nov. 2, 2008).

<sup>20</sup> CFTC, *supra* note 11, at 1.

<sup>21</sup> Javier Blas, *CFTC Moves to Curb Commodity Speculation*, FIN. TIMES, Sept. 11, 2008, available at <http://www.ft.com/cms/s/0/25869288-8025-11dd-99a9-000077b07658.html> (last visited Nov. 2, 2008).

<sup>22</sup> *Id.*

<sup>23</sup> Press Release No. 5561-08, CFTC, CFTC to Co-Chair International Task Force on Commodities Markets (Oct. 1, 2008), available at <http://www.cftc.gov/newsroom/generalpressreleases/2008/pr5561-08.html> (last visited Nov. 2, 2008).

<sup>24</sup> David Cho & Zachary A. Goldfarb, *3 Agencies Vie for Oversight of Swaps Market*, WASH. POST, Oct. 21, 2008, at D1.

# CONSERVING FARMLAND IN CALIFORNIA: FOR WHAT AND FOR WHOM? HOW AGRICULTURAL CONSERVATION EASEMENTS CAN KEEP FARMLAND FARMED *by Kendra Johnson\**

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## INTRODUCTION

California farmland is disappearing.<sup>1</sup> As farmers age<sup>2</sup> and their heirs move to other lines of work, the agricultural land traditionally making up small- and medium-sized farms is being consolidated by large-scale agribusiness or, increasingly, moving out of production.<sup>3</sup> Although smaller farmers have never been responsible for a majority of California's agricultural production, they do offer important social, economic, and environmental benefits to their local communities. They also contribute to local and national food security by improving crop diversity and lessening dependence on imports.

The shift away from productive agricultural use is largely related to the sprawling development that consumes valuable farmland: about fifty thousand acres of farmland in California are paved over annually.<sup>4</sup> Land values in California have skyrocketed in recent years and as cities sprawl farther beyond traditional suburbs, formerly rural agricultural land has increased dramatically in value. As a result, small farm owners find it more profitable to subdivide, develop, or simply sell their land than keep it in production—even on land producing some of California's most profitable crops. Farmland along the expanding urban fringe is often purchased by wealthy suburbanites who crave open space and country estates but not necessarily agriculture.<sup>5</sup>

One relatively recent and innovative solution to preserving productive agricultural land is the Agricultural Conservation Easement (“ACE”). Generally, an easement is a legal tool that gives one person or entity an interest or right in another person's property. Frequently easements give the third party the right to restrict the owner's use of his or her property in a specific way. Conservation easements encourage land conservation by restricting development. Often the party with the interest in the land is a municipal government or land protection organization known as a land trust.<sup>6</sup> California state law<sup>7</sup> provides for conservation easements and federal tax law provides for substantial tax benefits to donors of conservation easements.<sup>8</sup>

Agricultural conservation easements, in particular, have emerged as a popular tool in protecting not only “open space,” but also top-quality soils in productive farming areas or working

landscapes. This is a significant step, however many ACE programs do not go far enough when they merely set aside valuable land. Protecting open spaces preserves the inherent value of nature and ecosystems but stops short of boosting rural economies, maintaining domestic food production as a societal asset, and protecting our food independence and security. ACEs can

be used to achieve the dual goals of protecting open space and ensuring that productive land is actually farmed.<sup>9</sup>

This paper discusses the challenges of maintaining the benefits of ACEs in California where land value has increased so drastically that even the encumbered property is worth more than the potential agricultural productivity of the land. It then explores three tools used by other states' easement programs that, if adopted by California

land trusts, could improve the tools available to preserve California's working agricultural landscapes.

## ACEs IN CALIFORNIA: THE CHALLENGE OF LAND VALUE & KEEPING LAND IN PRODUCTION

“It's Not Farmland Without Farmers,” cautions a bumper sticker put out by American Farmland Trust. Even so, would-be farmers are dissuaded by competitive global markets, industry consolidation, and rising land prices. Open space and farmland conservationists, ‘Locavores’ promoting regional food economies, rural sociologists, Farm Bill reform groups, and agricultural industry representatives are all concerned that young and incoming farmers are becoming scarce. While the consolidation of big agriculture diminishes the need for new farmers, those small- and medium-scale farmers intrepid enough to enter the business need a leg up. These smaller farms often provide

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Photo courtesy of Yolo Land Trust

ecological, social, and even economic benefits to the public that industrial agriculture does not provide.<sup>10</sup> Lack of access to affordable farmland is a real barrier to new-entry farmers that must be addressed to keep farms farmed.

Due to unprecedented residential development pressures, especially the proliferation over the past twenty-five years of “rural sprawl,” agricultural land prices throughout much of California have climbed well out of reach of new farmers.<sup>11</sup> Increased demand for rural ranchettes, for example, is having a grave impact on land prices. For example, recently land values in the San Joaquin Valley increased from ten thousand dollars per acre for agricultural land to upwards of two hundred thousand dollars per acre when that land was re-zoned and sold for development. The result is that ranchettes are “pricing bona fide commercial farmers out of the market for the most productive agricultural land.”<sup>12</sup>

Small farms, defined for our purposes as those agricultural parcels at or near their zoned minimum parcel size (or usually ten to eighty acres), present a particularly difficult conservation challenge. The value of a parcel of land as a home site consistently overshadows its agricultural production value. Though these farms may play a valuable part in an area’s agricultural economy, ecological resilience, and rural culture, conservation easements may not successfully preserve them as working landscapes. Non-farmers who buy these properties but do not need agricultural income may let production lapse. Moreover, non-farm buyers are often willing to out-bid farmers on such properties, establishing an “after-value” which outstrips agricultural income potential.

For example, consider a forty acre farm property with a modest house within an hour and half driving distance of the San Francisco Bay area valued at one million dollars. A standard agricultural conservation easement, prohibiting further subdivisions, residential buildings, and location of farm buildings, is appraised at \$300,000, bringing the easement-encumbered property value down to \$700,000. Based on local crop production data and a thorough farm business plan, an organic farmer calculates that she could only afford to buy the farm for five hundred thousand dollars.

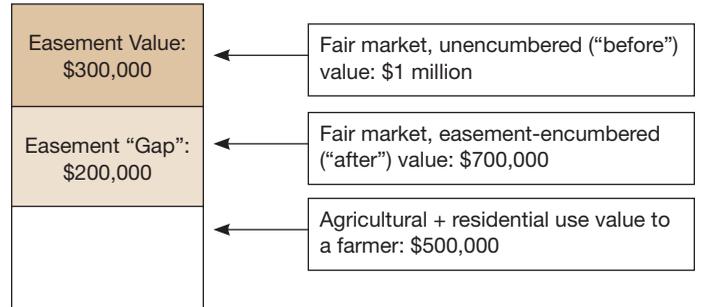


Figure 1: Easement “Gap”

As you can see, standard agricultural conservation easements often do not yield enough easement value to bring properties into a price range affordable by farmers. The difference between easement-encumbered estate home value and agricultural use value results in the “gap” shown in this example.

This lack of affordable access and the increased likelihood that parcels owned by non-farmers will fall out of production are

creating a stir in the farmland conservation community. Of twenty-five easement programs surveyed nationally in 2005, only five reported that average prices of easement-protected parcels were still affordable for buyers seeking to continue farming on those parcels. Thirteen said land resale prices in their areas had clearly become unaffordable to farmers; and

only nine said a majority of their protected parcels are purchased by farmers. Only one of these easement programs is in California; the Marin Agricultural Land Trust reported that easement-protected rangeland is only marginally affordable for ranchers there.<sup>13</sup>

A more recent series of interviews with thirteen easement programs in California revealed that fewer than forty percent of properties under an agricultural easement were under production by their owners.<sup>14</sup> Since most of these properties are still in their first generation of ownership under the easements, there is concern that the number of owner-operators of preserved farmland will diminish further after these parcels are sold.<sup>15</sup> Some land trusts are also beginning to see small farms as an important part of agricultural economies and local communities.<sup>16</sup> Since small

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*Ranchettes are  
“pricing bona fide  
commercial farmers out  
of the market.”*

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farms are especially vulnerable to the “easement gap” problem, these land trusts ask how to make rural housing more affordable and avoid further farmland conversion to non-farmer ownership as they strive to protect working landscapes.<sup>17</sup>

### CREATIVE EASEMENT ALTERNATIVES: ENCOURAGING LAND-OWNERSHIP BY FARMERS

A number of land trusts and farmland conservation programs in the Northeast have adopted farmland conservation tools to directly address the related goals of ensuring continued farming and land-affordability for farmers. Similar to the earliest conservation easements, these tools have lacked precedent and sometimes been controversial. However, in two decades of use, a great deal has been learned.

Bringing down the market values of smaller farms in California to affordable prices for farming families requires these types of legal tools that are not currently part of standard conservation easement transactions in the state. As discussed below, these may include increased residential building restrictions, requirements that limit an owner’s right to sell his or her farm, or affirmative mandates of agricultural use.

#### EXCLUSION OF RESIDENCES AND OTHER INFRASTRUCTURE

Some easement programs exclude residences and other infrastructure in order to eliminate the disproportionate value they add to whole farms. As authorized by its state law, the Massachusetts Agricultural Preservation Restriction (“APR”) does this as a matter of course, carving out homesites and even agricultural buildings from APR-protected parcels.<sup>18</sup> Similarly, Vermont law permits the carve-out of residential and farm buildings and the majority of Vermont Land Trust (“VLT”) conservation easements do so.<sup>19</sup> This tool results in bare land easement valuation remaining unaffected by increasing residential values. It also eliminates difficult appraisal issues, instead allowing the land to be transferred for its agricultural value alone. Meanwhile, it effectively creates small residential parcels surrounded by agriculture, which can be sold separately from the farmland. In both states, while the majority of these building areas or “farmsteads” have been purchased by the owners of adjacent farmland, there is an emerging concern that their exclusion from agricultural easements will encourage consolidation of smaller farms into fewer, larger farms while the residential parcels become expensive, thus reducing opportunities for entering farmers to live where they farm.<sup>20</sup> Some land trusts adhere to the principle that farmsteads are integral as housing for farmer-owners and as infrastructure for continued farming operations, and would not choose to separate them.

Practically speaking, the exclusion of several-acre farmsteads from greater acreages of “bare land” would not be possible in California. This is because local zoning ordinances for minimum parcel sizes, as enabled by state law,<sup>21</sup> require that farmland not be carved up into parcels below that minimum—often 40, 80, or even 160 acres in agriculturally-zoned areas. However, the California Farmland Conservation Program and the federal Farm and Ranch Lands Protection Program do fund

conservation easements which include design controls commonly limiting building location (or “envelope”), and allowable size (usually to a range of 1,500 to 4,000 square feet). Sometimes the right to secondary or additional dwellings and certain nonagricultural infrastructure—equestrian arenas, for example—is eliminated as well.<sup>22</sup> However, farm employee housing is allowed under California State Code<sup>23</sup> and should not be extinguished by agricultural easements. By restricting “rural estate” or “trophy home” use, easements can weed out some of the non-farmers bidding on farm properties. More research is needed to determine whether such restrictions actually dissuade a substantial number of non-farmer buyers and how they impact property values.

#### AFFIRMATIVE OBLIGATION TO FARM

Standard agricultural easements give up or restrict development rights; few require that the land be actively farmed. A requirement to farm, usually in the form of an “affirmative covenant,” defines agricultural use and establishes remedies, then consequences, for failure to comply. The Massachusetts Agricultural Preservation Restriction, administered by the Commonwealth of Massachusetts, may be the only easement program to currently include the agricultural use requirement, in the form of an affirmative covenant, in *all* of its easements.<sup>24</sup>

Affirmative covenants are additional restrictions on the land and obligations on the landowner that reach beyond a standard conservation easement. A covenant requiring the landowner to farm the property makes it considerably less appealing to any buyer other than a farmer. Limiting the pool of potential buyers only to farmers further reduces the value of the encumbered land while correspondingly increasing the cost of the easement.<sup>25</sup> Again, more data is needed to determine the real impact of affirmative language on market value.

While the Massachusetts Code specifically authorizes this affirmative farming requirement,<sup>26</sup> the legal viability of such language in California is uncertain. The California Code<sup>27</sup> does not explicitly provide for affirmative easement language; instead it defines easements, in the negative, as limitations. It does, however state the goal of the “preservation of land in its natural, scenic, agricultural, historical, forested, or open-space condition.”<sup>28</sup> It is not clear whether affirmative language is enforceable in California courts. Because of this concern and in order to reduce the risk that affirmative wording results in termination of the conservation easement, strong “backup” language should be incorporated, stating that in case the affirmative clause is ever found unenforceable, the remainder of the easement is to remain in effect.<sup>29</sup>

There is some precedent for affirmative covenants in California ACEs. In some cases, such as in easements held by the Brentwood Agricultural Land Trust and at least one easement of the Marin Agricultural Land Trust (“MALT”), the land trust requires submission and approval of an agricultural management plan.<sup>30</sup> If the owner fails to comply with that plan, the land trust may require the landowner to lease the land out for farming. Tougher enforcement mechanisms reserve the right of the land



Photo by Bob Nichols, USDA Natural Resources Conservation Service



Photo courtesy of Kendra Johnson

trust to collect “damages” or exercise an option to purchase the farm.<sup>31</sup>

On Live Power Farm in Covelo, California, for example, the Equity Trust, a nonprofit organization based in Massachusetts, holds the first known affirmative easement in the state, and one of the very first in the nation.<sup>32</sup> Equity Trust distributed a sample easement document with affirmative language along with a related commentary<sup>33</sup> for the benefit of land conservation groups interested in doing similar work. MALT and the Monterey County Agricultural and Historic Land Conservancy both hold easements with affirmative use language, as does the Land Trust for Santa Barbara County on an urban farm called Fairview Gardens. The Tri-Valley Conservancy’s South Livermore Valley easements require agricultural production, but for only eight years. Sample affirmative agricultural use language, legally reviewed for use in California but not yet exercised, can be found in a California FarmLink model affirmative easement.<sup>34</sup>

#### OPTION TO PURCHASE AT AGRICULTURAL VALUE

In response to the concern that protected farms are purchased by non-farmers at prices higher than farmers can afford, legislation in two states established innovative farmland conservation programs that now authorize Options to Purchase at Agricultural Value (“OPAV”) in their agricultural conservation easements.<sup>35</sup> An OPAV allows the easement holder to step in any time a farm property threatens to sell for estate value and, as such, provides a substantial deterrent to non-farm buyers.<sup>36</sup>

OPAVs were adopted by the Commonwealth of Massachusetts in 1992 and by the VLT in 2003.<sup>37</sup> Whereas the Massachusetts program requires an OPAV, the Vermont program offers landowners a choice to relinquish the OPAV to the VLT.<sup>38</sup> Most do so for the additional easement value it provides, as well as assurance that the land will continue to be transferred to other farmers. Equity Trust includes an OPAV in its model agricultural easement as well. Based on its use in Massachusetts and Vermont, an OPAV can be a strong deterrent to non-farmer buyer and an essential component to preserving farmland.

An OPAV can be exercised at time of sale or assigned to another farmer. In over fifteen years, an option has not yet been exercised in Massachusetts, and was exercised only once by the VLT when a clearly non-farm buyer made a purchase offer on an easement-encumbered farm. To save paperwork and government involvement and thereby appeal to a broader group of farm owners, Vermont waives OPAV when a farm is transferred within a family or to a qualifying farmer as defined by the IRS.<sup>39</sup>

Vermont appraiser Justus DeVries estimates that there is roughly a twenty to thirty percent increase in standard easement value with an OPAV, for a total easement value of up to sixty to seventy percent of a property’s fair market value.<sup>40</sup> In contrast to the Massachusetts APR, the VLT has begun using easements with OPAVs for whole farms, including farm buildings and residences. This approach is supported by Equity Trust and is gaining popularity in Vermont, as it protects affordable housing as an integral part of these agricultural areas. Homes and home sites, however, confound so-called “agricultural value” and present significant appraisal challenges. Specific appraisal methodology must be prescribed to arrive at a mutually acceptable property valuation.

In the VLT and Massachusetts APR models, the OPAV is triggered by a proposal or attempt to sell the property. The Equity Trust document includes an additional “triggering event”—the failure to maintain “qualified owner status.”<sup>41</sup> It becomes, in effect, an enforcement mechanism for the affirmative agricultural language also included in that easement. Each model addresses the setting of the option/purchase price differently. If the owner has already entered into a purchase and sale agreement with a third party, the OPAV holder may match that amount. The Equity Trust model and the Massachusetts standard OPAV present two valuation methods for determining the purchase price. The first approach is a standard appraisal of “As-Restricted Value” (Equity Trust) or “Fair Market Agricultural Value” (Massachusetts APR) value as determined by comparable sales and other standard appraisal methods.<sup>42</sup> “Agricultural value” is an adequate description in Massachusetts projects, as

residences and buildings are not included in these easements. The second approach offered by these similar documents is to assess the land and improvements according to the previous “governing appraisal” and augment with an inflation rate index. These methods are problematic when home sites are included because home values have, until recently, increased faster than the inflation rate. The VLT model OPAV for “Operating Farms” uses a similar approach to assess agricultural value, but adds the value of farm structures and improvements, as well as any residence and appurtenant structures/improvements according to the replacement cost approach to valuation.<sup>43</sup>

OPAV restricts resale values to a “farm supportable price.” While an OPAV increases the original easement cost expended by the land trust, it also gives the organization a measure of control over future land transactions and deters non-farm buyers. Furthermore, it creates an opportunity for land trusts to help farmers purchase these farms each time land is transferred. Drawbacks are that an OPAV may limit the ability of new buyers to obtain financing, and land trusts may not have cash or financing available to properly exercise the option.

An OPAV has not yet been used in California. In the absence of authorization by statute, such an option may not be enforceable by California easement programs: challenges to the “triggering” of an OPAV, for example, and to appraisal methodologies such as the VLT method described above, might be expected. Before deciding to use this concept, the legal issues should be explored and addressed.

### CONCLUSION: POTENTIAL FOR CALIFORNIA?

California’s farmland protection policymakers, land trusts, and supporters have a tough row to hoe in coming years. If farmland conservation efforts do not begin to include access and affordability strategies, farmers will not experience the benefits of farmland protection and California’s agriculture will not be protected. The list of tools described in this article is not exhaustive; there are many other ways to support the use and ownership of farmland by farmers. Non-easement tools for example, such as land trust ownership with lifetime leases to farmers, collaboration with affordable housing programs or community land

trusts, purchase of farming rights by farmers needing land security but not all the residential value, and other forms of creative or cooperative ownership, deserve further attention.

California land trusts who wish to further the use in ACEs of building and parcel restrictions, or be state leaders in the adoption of affirmative use requirements or OPAVs, will face a number of financial and legal barriers. At least at first, these new legal tools will require higher per-acre easement acquisition costs as well as greater staff resources dedicated to transactions, monitoring, and stewardship than they do currently. Improved support and funding for these innovative projects will therefore be key to their applicability and success in California. The tools yet untested in California courts (again, affirmative covenants and OPAVs) may also subject land trusts to increased legal scrutiny and the risk of expensive court battles. If, on the other hand, land trust leaders can begin to set precedent for the use of easement tools benefiting smaller farmers, amendments to State Civil Code, and other relevant statutes may more easily follow.

If California’s fertile agricultural lands are threatened by urban and rural ranchette development, its farmers are also threatened by intense competition for control over farmland. If the State’s land trusts and policymakers decide to protect not only farmland but the myriad social, economic, and environmental public benefits offered by our small farmers, they will find that their eastern counterparts have already set important examples. Agricultural landscapes are, by definition, working landscapes and will be best conserved if the livelihoods which define them are supported as well. 

*Thanks to Debbie North and the Yolo Land Trust for asking the right questions and making possible the report upon which much of this article is based. Thanks to Conservation Partners for thoughtful review and comments. Thanks to California Farm-Link for working on behalf of beginning farmers, and first bringing this question to my attention. Finally, thanks to the many other land trusts, both California and Northeastern, whose staff and associates provided information about small farm easement tools and challenges.*

## Endnotes: Conserving Farmland in California

<sup>1</sup> See CAL. DEP’T OF FOOD & AGRIC., CALIFORNIA AGRICULTURAL RESOURCE DIRECTORY 2006 1, 28 (2006), available at <http://www.cdfa.ca.gov/files/pdf/card/AgResDirEntire06.pdf> (explaining that there were a reported 144,000 farms in California in 1950; the number plummeted by more than half by 1970, climbed to a consistent ~85,000 for most of the 1990s. However from 1999-2005, the number of reported farms in California dropped alarmingly — from 85,000 to 76,500 farms statewide).

<sup>2</sup> CALIFORNIA FARMLINK, A FARMER’S GUIDE TO SECURING LAND (2008).

<sup>3</sup> See CAL. DEP’T OF FOOD & AGRIC., *supra* note 1 (explaining that there were 144,000 farms in California in 1950 and only 76,500 in 2005).

<sup>4</sup> See EDWARD J. THOMPSON, AM. FARMLAND TRUST, PAVING PARADISE: A NEW PERSPECTIVE ON CALIFORNIA FARMLAND CONVERSION 1, 3 (2007), available at

[http://www.farmland.org/programs/states/ca/Feature%20Stories/documents/PavingParadise\\_AmericanFarmlandTrust\\_Nov07.pdf](http://www.farmland.org/programs/states/ca/Feature%20Stories/documents/PavingParadise_AmericanFarmlandTrust_Nov07.pdf) (last visited Oct. 10, 2008).

<sup>5</sup> See generally Greg Kirkpatrick, *Case Study 20: Fresno County California*, in UNDER THE BLADE: THE CONVERSION OF AGRICULTURAL LANDSCAPES (Richard Olson & Thomas Lyson eds., 1999).

<sup>6</sup> See Adina Merenlender et al., *Land Trusts and Conservation Easements: Who is Conserving What for Whom?*, 18 CONSERVATION BIOLOGY 65, 68 (2004) (quoting The Land Trust Alliance’s definition of a land trust as “any organization that acts directly to conserve land”).

**Endnotes: Conserving Farmland in California**  
*continued on page 74*

# THREE KEYS FOR REHABILITATING AND STABILIZING HAITI

by Chris Logan\*

Haiti faces many challenges due to the current global food crisis that are exacerbated by the nation's lack of an effective government and the devastation wrought by four hurricanes in one month. In order to rebuild the country's infrastructure, combat hunger, and promote good governance, Haiti must rehabilitate basic infrastructure, expand existing microfinance institutions ("MFI"), and reestablish functioning government institutions. This article will discuss three essential objectives for short- and long-term recovery and advancement in Haiti.

Today's global food crisis is affecting hundreds of millions of poor people around the world who live with hunger and instability on a daily basis. The reasons for the crisis are many. Global agriculture commodity prices have reached their highest level in thirty years<sup>1</sup> and worldwide decreased supply and increased demand create a situation where the world's poor must use more of their incomes to purchase food.<sup>2</sup>

Haiti is a prime example of an impoverished, fragile country that struggled under the weight of the food crisis even before natural disaster struck. Seventy-six percent of Haitians live on less than two dollars per day and fifty-five percent on less than one dollar per day.<sup>3</sup> Daily food insecurity affects forty percent of Haitian homes.<sup>4</sup> In April 2008, the government was ousted following food insecurity riots.<sup>5</sup> A functioning government has yet to be reestablished while Haitians are burdened by rebuilding after four hurricanes ravaged the country leaving coastal cities under water and people stranded on their roofs. The hurricanes wiped away food reserves, flattening crops and farmland, killing livestock, and creating a desperate situation in a country beholden to foreign aid and relief.<sup>6</sup>

To improve Haiti's immediate welfare funding and resources are necessary to rehabilitate the country's weak infrastructure so food aid and emergency relief can reach those in need. As of September 26, 2008, the United Nations ("UN") reported that road travel remained disrupted due to collapsed bridges, damaged dykes, flooded roads, and landslides.<sup>7</sup> The UN Development Programme is leading an interagency effort to strengthen Haiti's dyke system and several NGOs are willing to implement cash-for-work programs to assist with infrastructure repair.<sup>8</sup> The United States Agency for International Development ("USAID") has 7,000 metric tons ("MT") of food aid in Port au Prince and 10,000 MT in regional warehouses ready for distribution to affected areas, but washed out roads and bridges hinder its distribution.<sup>9</sup>

Basic infrastructure rehabilitation will ease immediate suffering in Haiti, but is not enough to mitigate long-term food

resources inadequacies. One option is increased access to microfinance, which contributes to poverty reduction, especially at the local level where it bolsters the economy.<sup>10</sup> MFIs, such as Haiti's Fonkoze, provide a safety net and help establish the economic foundation for a democratic government.<sup>11</sup> Throughout the food crisis, MFIs have worked with borrowers to provide flexible loan policies tailored to each client.<sup>12</sup> MFIs empower ordinary people to secure food, housing, and medical care by providing small business loans, increasing agricultural investment, and coordinating trainings on literacy, women's health, and environmental protection.<sup>13</sup> Expanding Haitian MFIs through increased funding will allow more people to receive loans, feed their families, and climb out of poverty.

To begin climbing out of poverty and creating long term stability, Haiti's government with international organizations and the private sector must respond to the needs of its people. However, its institutions are weak or inactive, so the government cannot "hear or represent citizens' interests, render justice, achieve consensus, or effectively provide public goods and services."<sup>14</sup> One promising program is *Kombit Ak Tèt Ansanm* [Working Together in Haiti] which facilitates the creation of immediate, durable jobs through infrastructure development and maintenance.<sup>15</sup> A Haitian government will succeed when its people have enough food and are empowered to control their own economic situation.

Coordinated infrastructure rehabilitation and increased investment in Haitian MFI's are necessary components for improving Haiti's immediate welfare. Long-term stabilization will come when the Haitian population is free from hunger and worry, and when a government is in place that responds to needs of the people.



## Endnotes:

<sup>1</sup> SOPHIA MURPHY, INST. FOR AGRIC. AND TRADE POL'Y, THE GLOBAL FOOD PRICE CRISIS (2008), available at <http://www.tradeobservatory.org/library.cfm?RefID=104147> (last visited Nov. 13, 2008).

<sup>2</sup> *Id.* (outlining current decreased supply from factors such as halved world food stocks, drought affecting exporters of major staple crops, diminishing water supplies, climate change affecting rainfall and temperatures, and production costs alongside increased demand from factors such as an increasing world population, changing diets, and exponential growth in biofuel use).

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# THE CASE FOR GREEN FOOD LABELS

by Emily Alves & Mark Edwards\*

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## INTRODUCTION

Presidential debates, headlines, and magazine covers demonstrate a dramatic rise in environmental consciousness, especially associated with global climate change, carbon emissions, oil independence, and human health. While global warming, the need to cap carbon emissions, and oil independence dominate the public arena, the food industry must also be scrutinized for its energy and carbon emissions. In the United States, food production consumes nineteen percent of our energy and contributes thirty-seven percent of our carbon emissions.<sup>1</sup>

In the absence of a systematic strategy by the U.S. government, many consumers are searching for ways to make a positive environmental impact while, at the same time, improving their personal and family's food consumption and lifestyle. This trend, termed "green consumerism," leads people to purchase products with limited or positive environmental impacts, especially foods that have been produced in an environmentally sensitive manner. Green consumerism has led to a very lucrative industry,<sup>2</sup> which is indicative of the appeal of green credentials to consumers. Companies embracing green consumerism advertise their products' benefits through eco-labels which are "label[s] placed on a product to inform consumers that the product is less environmentally harmful than similar products."<sup>3</sup>

The green food industry is currently devoid of any meaningful system of making or verifying these claims, which creates several problems. Many claims may be intentionally or accidentally misleading as to their actual environmental benefits.<sup>4</sup> Without any standards set to define what certain environmental terms mean, the use of this terminology can either render a consumer clueless or simply confused over the true impact of their purchases. Many label claims address only one environmental issue, which may or may not be relevant. A label of organic indicates that a product was probably made from an entirely natural process (although the organic claim can be misleading<sup>5</sup>), but ignores other important information contributing to the environmental impact of a food product such as the amount of energy, water, and land used in production and the resulting carbon emissions. This kind of single attribute labeling is not an ideal method for green consumers who are concerned with the broader state of the environment, not solitary issues, and would like to utilize more comprehensive information. A uniform, comprehensive system of environmental labeling for food production is needed to inform green consumers

Developing and implementing a comprehensive and comprehensible information labeling system will achieve the dual purpose of increasing consumer satisfaction and meaningful environmental progress. While this appears to be a daunting task considering all the criteria that would need to be evaluated, it

could be accomplished in a manner that is easy for consumers to use to make informed, environmentally conscious decisions. A useful example that eco-labels could emulate is already in place: nutrition labels on food have been a regular aspect of food packaging for over a decade.<sup>6</sup> Nutrition labels have been successful primarily because they take information about the ingredients and nutritional value of a food and disseminate it in a consistent, user-friendly manner that enable consumers to decide which foods offer the best dietary choice.<sup>7</sup> Experience with food labels should provide the foundation for the development of environmental information labels.

Another method to pursue could be integrating eco-information into the current nutrition labeling system instead of developing an entirely separate enterprise. This path would, perhaps, be the most comprehensive because nutrition labels and potential environmental labels share a common purpose—to improve human health. Information relevant to the environmental footprint of a food product—disclosure of pesticides and other chemicals used on the product, the amount of energy used for the entire production process, the effects of the manufacturing process on natural resources such as air and water quality—are equally relevant to maintenance of human health. Given their common purpose and audience, combining the two information systems may be the more efficient, successful system to achieve both goals of improving the environment and human health.

This article will discuss why food labels should be expanded to include important environmental information about products to allow consumers to make educated decisions regarding their impact on both human and environmental health. The first section of this article examines the history and demand for green product information. A discussion of the development and lessons from nutrition labels follows, and includes an overview of potential legal questions that may arise from eco-labeling. Lastly, the article proposes recommendations for a path forward on eco-labeling.

## GREEN CONSUMERISM

There is a well-documented demand for green products.<sup>8</sup> A surge in green products produced for a growing demographic of environmentally conscious consumers began in the 1990s and continues to this day with a wide variety of green promotions.<sup>9</sup> Consumers seek green products for many reasons, motivating marketers to create vigorous product campaigns promoting eco-

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friendliness.<sup>10</sup> In response to these diverse motivations and broad spectrum of products, an enormous range of labels exists currently in stores, from prominent displays of government certified organic to third-party certification to a company's own stamp of environmental approval. This confluence of often competing claims does little to actually achieve the goals of eco-consumers.<sup>11</sup>

#### INDEPENDENT LABELS

Two types of labels have emerged that do not require government regulation. One is awarded by an independent third-party certifier that grants products permission to use their logo indicating their approval of environmental credibility.<sup>12</sup> An example of this is the well-known "Fair Trade" line of products. The appearance of a Fair Trade logo on coffee, tea, or other product indicates that it was made by a farmer who will not only receive a fair wage for their work, but also did not use any genetically modified organisms ("GMO") or agrochemicals in the process.<sup>13</sup> A second type of green labeling not regulated by the government is done by companies themselves. A company may choose to label a food as "natural" with no indication of the company's definition of the word.<sup>14</sup>

There are numerous problems with allowing these practices. The lack of transparency and sheer volume of claims do not soundly educate the consumer.<sup>15</sup> There is no easy manner for a consumer to differentiate between credible and less than credible claims.<sup>16</sup> Terms such as "natural," "environmentally friendly," and "green" are vague and non-definitional and do not indicate what environmental benefit the product offers.<sup>17</sup> Without more specific terminology and explanations, there's no way for the consumer to determine what specifically about the product will help them be eco-friendly,<sup>18</sup> be it reducing their carbon footprint or protecting a certain animal species. These labels frequently address only one issue and ignore other critical eco-attributes. For example, a "bird friendly" label does not give any insight into the carbon footprint of producing the product, and a stamp of "carbon neutral" does not indicate what, if any, pesticides were used on the product. Likewise, a "natural" label with no indication of the word's definition, gives the consumer essentially no valuable information. This convoluted system does little to assist consumers seeking to have the greatest impact on overall environmental health.

#### STATE, FEDERAL, AND INTERNATIONAL STATUTES AND GUIDELINES

Governments at all levels have engaged in sorting through the environmental claims of products, particularly for the food industry. The federal government has a variety of programs and labeling schemes to benefit the environmentally conscious consumer. The most well known is the U.S. Department of Agriculture ("USDA") organic certified labels program, effective since 1990.<sup>19</sup> This program came to fruition as a result of the growing demand for chemical-free foods and the stunting of that market's expansion due to a hodgepodge of state regulations.<sup>20</sup> Originally a primarily small-farm technique, large industrial farms came to dominate the organic market and demanded federal regulation to enhance their growth.<sup>21</sup> Therein lies one of several problems

with this certification program. Large scale farmers drove the stakeholder process of creating the food labels, tilting the definitions in their favor.<sup>22</sup> For the consumer purchasing organic products because of their desire to support small, natural farm practices, the USDA organic label can be misleading.<sup>23</sup> Additionally, a lax and underfunded inspection process cannot completely guarantee that all organically labeled products are free of synthetic fertilizers or agricultural chemicals.<sup>24</sup> More recent federal labeling schemes include labels issued to differentiate between livestock that had been raised on a purely grass-fed diet<sup>25</sup> and requirements for labels regarding the country of origin of certain food products.<sup>26</sup>

The Federal Trade Commission ("FTC") is also engaged in disseminating production information and issued guidelines in 1992 for proper green advertising of products.<sup>27</sup> While not labels *per se*, these guidelines do represent "a framework for voluntary compliance with standards for environmental marketing."<sup>28</sup> However, these are merely guidelines and do not have the force of law behind them, and thus are somewhat meaningless.<sup>29</sup> What's more, the FTC does not have the scientific expertise of the issues that are present at other agencies such as the Environmental Protection Agency ("EPA"), making the well-intentioned guidelines considerably less effective than they could be.<sup>30</sup>

The states got an early lead in regulating environmental marketing of products. After a mid-1990s "Green Report" by ten state Attorneys General about rampant abuses in the green marketing industry regarding claims of the environmental credentials,<sup>31</sup> several states passed statutes with stipulations defining what standards products must meet in order to advertise their environmentally friendly status. The most publicized of these was a statute in California that regulated the use of the terms "ozone friendly," "biodegradable," "photodegradable," "recycled," and "recyclable."<sup>32</sup> In addition, Indiana and Rhode Island passed similar definitional statutes regulating environmental marketing.<sup>33</sup> New York, Connecticut, and New Hampshire have enacted statutes promoting logos to advertise environmental attributes, and Maine has codified the FTC guidelines.<sup>34</sup> What is problematic about this patchwork approach is that it can be confusing and stifling to manufacturers, who may decide not to sell their products as expansively to avoid having to meet such a variety of criteria.<sup>35</sup> This denies opportunities to consumers to choose from a wider array of products.<sup>36</sup>

Eco-food labels are gaining prominence on the international regulatory scene.<sup>37</sup> Perhaps due to the high-profile issue of reducing carbon emissions, the most publicized labeling scheme in recent years has been UK-based supermarket Tesco's decision to begin listing the carbon footprint on approximately seventy thousand of its products in-store.<sup>38</sup> This will allow consumers the opportunity to reduce these harmful emissions.<sup>39</sup> Japan recently announced plans to begin its own carbon labeling scheme in the next few years, and several EU countries are exploring carbon labeling options as well.<sup>40</sup> This trend further supports the proposition that comprehensive action is needed to label products at the U.S. federal level, not only for domestic consumers but also for trade reasons.<sup>41</sup>

## THE EXPERIENCE WITH NUTRITION LABELS

Assessing the development and execution of nutrition labels is a useful prototype for implementing a green foods labeling system because it has, by and large, been successful. An examination is also inevitable if only for the fact that both would have to co-exist on food packaging.

Although food regulation existed much earlier, the first food labels were established in 1907 to distinguish between “suitable” food colors.<sup>42</sup> Nutrition labeling began gaining notoriety in the late 1980s out of concern over the American diet and the idea was codified in the Nutrition Labeling and Education Act (“NLEA”) of 1990.<sup>43</sup> Administered by the Food and Drug Administration (“FDA”) and the USDA Food Safety Inspection Service, the Act was intended to provide the American consumer with reliable and informative data regarding the content of their food purchases and hopefully encourage healthful nutrition decisions.<sup>44</sup> Mandatory labeling became effective in 1992,<sup>45</sup> with a re-examination of the guidelines every five years to ensure that they reflect the current knowledge and values in the American diet.<sup>46</sup> For example, following an increased awareness of trans-fats’ detriment to cardiovascular health, the labels were updated in 2006 to indicate whether a product includes the ingredient.<sup>47</sup> Today, nutrition labels are designed to carry the most essential nutritional value of a food product, listed in order to reflect the level of importance to a daily diet in an easy-to-read format.<sup>48</sup> Studies indicate that consumers view the labels favorably and often use them to base their decisions over purchases to improve their diets.<sup>49</sup>

The flexibility component in updating the labels every five years to reflect nutritional values would be a useful aspect to integrate into a potential eco-food label. New research indicating which environmental threats are more precarious than others is continuously published and changes would be made to reflect new realities in any potential scheme. Another positive attribute is the comprehensive, consistent dissemination of nutrition information. As demonstrated above, a severe handicap behind the current eco-labeling system is that there are no clear standards as to what certain terms mean, which can lead to consumer confusion over the veracity of the environmental claims.

## POTENTIAL LEGAL OBSTACLES

The major legal challenges to date against either nutrition or potential environmental labels regard the First Amendment implications of requiring food producers to display this information on their products. The two most prominent cases concerned allegations of violations of commercial free speech. In each case, the courts found that such a violation was not in play.

*Nutritional Health Alliance v. Shalala* addressed the question of the authority of the FDA to limit the health claims that may be made on dietary supplements under the NLEA.<sup>50</sup> The plaintiff contended that: (1) the NLEA imposed an impermissible ban on truthful, non-misleading constitutional speech, and (2) that the preauthorization scheme to label the products was an unconstitutional prior restraint on commercial speech.<sup>51</sup>

*Association of National Advertisers v. Lungren* involved the California statute discussed above that required compliance with state standards when advertising a product in environmentally friendly ways<sup>52</sup> such as declaring the product as ‘biodegradable’ or made of ‘recycled’ material. The plaintiff also alleged violations of commercial speech and non-speech.<sup>53</sup> In both cases the courts relied on a four-step test from *Central Hudson Gas & Electric Corp. v. Public Service Commission* to determine if the speech qualified as commercial, and could therefore be subject to regulation.<sup>54</sup> The test for determination considers the following factors:

- 1) Whether the speech is misleading or does not “concern lawful activity,” in which case no further inquiry is needed and the speech may be restricted;
- 2) Whether the government’s asserted interest in regulating the speech is substantial;
- 3) Whether the restraint directly advances the government’s interest; and
- 4) Whether the legislation is no more extensive than necessary to serve the government’s interest.<sup>55</sup>

In both cases, the courts found that the speech in question qualified as commercial and was subject to regulation under this test.<sup>56</sup> If *Shalala* and *Lungren* serve as indicators, it is likely that eco-food labels will be subject to the *Central Hudson* test described above. Given the similar First Amendment violations alleged in both cases, it is plausible that free speech implications may arise in the implementation of environmental food labeling. Food producers may argue that restricting their current unbridled use of environmental terms denies them free speech, and, simultaneously, that requiring them to provide certain information is unjustified regulation. Therefore, those tasked with drafting potential regulations must take care to remain within the confines of the *Hudson* test. While eco-labeling is clearly a vital government interest in line with *Hudson*’s second and third criteria, the parties involved will have to find a balance to ensure that the policies are carried out in a reasonable manner to be consistent with the last criterion.

First Amendment implications are not the only legal issues that will arise in the drafting process. Another potential legal concern could be over the roles of different agencies in implementing this system. Since green labels involve issues falling under at least two different agencies jurisdictions—for instance, the EPA monitors environmental issues while FDA regulates food—green food labeling would probably necessitate a jointly regulated process where the specific roles and jurisdiction of each agency may be called into question. Other legal issues that will probably arise and could face legal challenge include the metrics used for reporting, thresholds for agricultural chemical content, and even reporting formats.

## RECOMMENDATIONS

The following recommendations may serve as a foundation for implementing a labeling system that would indicate the environmental content of a food product and its production process.

## NEW OR EXPANDED LABEL?

It must be decided whether to simply expand nutrition labels to include environmental information or to have a separate label. Several factors favor expanding the existing nutrition label. Because nutrition labels are easy to read and valuable,<sup>57</sup> including the environmental information of a food would instantly reach that same level of credibility and wide audience. The necessity of involving the FDA in this regulation invokes a need for efficacy in regulating both labels. It would be easier for the FDA to continue evaluating only one, comprehensive label.

The overlap in aspirations behind green food labels and nutrition labels make integration of the two a natural fit. Both sets of data strive to inform consumers about the best food available for their health. In fact, it could be argued that in neglecting to list environmental considerations on the current nutrition labels, the information provided is severely lacking a vital component to the consumer's health and well-being. Knowing how one's food is produced and its potential contents resulting from production allow consumers to make important health-related purchasing decisions. Therefore, including the environmental impact and make-up of a food on nutrition labels would simultaneously assist the consumer in improving their health, well-being, and the environment.

However, adding another label would increase the FDA's workload and perhaps compromise the integrity of both sets of information as a result. Furthermore, a second label may be overwhelming for packaging, particularly for compact food packets, and potentially either confuse consumers or risk neglecting vital information.

## PUBLIC-PRIVATE PARTNERSHIP

An efficient way to carry out this potentially complex data-processing is to engage in a public-private partnership, with the government setting up a private entity to administer the environmental information necessary to be placed on the labels. Such models have been implemented in other countries to great success. The Carbon Trust is a private corporation created by the British government to assist UK businesses in lowering their carbon footprint.<sup>58</sup> The organization worked with the Tesco supermarket chain to develop its food carbon labeling system.<sup>59</sup> The Canadian government has licensed a company called Terrachoice to award eco-labels.<sup>60</sup> While the government has primary responsibility for the overall program, Terrachoice is tasked with its day-to-day operation.<sup>61</sup> A similar relationship would be very useful in the United States as a good counterbalancing mechanism. Without a private partner to assume daily responsibilities, the government runs the risk of including too many competing interests in the program's development and not executing it as effectively as necessary. A private company, however, needs some degree of government oversight to ensure that the needs of the public health and environmental conservation remain its primary goals.

## AGENCY COORDINATION

The EPA, FDA, and possibly USDA should be the agencies charged with the primary responsibilities in any eco-labeling

program. There ought to be a proper balance struck between EPA's expertise over the environmental impacts of various foods with FDA's jurisdiction of food regulation. Consideration must also be given to USDA's oversight of agriculture. The FCC may also have a stake in the process and may be able to offer valuable insight from the guidelines protecting against erroneous environmental marketing. While it is important to ensure that the labels aren't bogged down in administrative quagmire, the program's credibility depends on having all appropriate experts involved.

## ECO-DIMENSIONS

Specific criteria would need to be laid out concerning the terms used in measuring a food product's environmental impact. A major drawback of any environmental labeling currently on the market is a lack of definitional meaning behind its terminology. The public does not have a concrete idea as to what a term really means in regards to a product's environmental impact. Therefore, there would need to be explicit definitions laid out, followed by a vigorous public education campaign to ensure that the public is using the information properly. To illustrate what such a scheme may look like, an example set of ten eco-dimensions are shown in Table 1.

**Table 1: Green Tag 10 Ecological Footprint Food Label**

Parameter	Description	Score (▼◆▲)
Water footprint	Water use for production	▼
Earth footprint	Cropland used for cultivation	◆
Ecological footprint	Risk of erosion & fertilizer, pesticide, and herbicide run-off	▲
Carbon footnote	Carbon emitted during production	▲
Imported energy	Imported energy used during production	▼
Biodiversity	Impact on biodiversity	▼
Sustainable	Consumption of non-renewable inputs	◆
Air pollution	Greenhouse gases emitted during production	◆
Chemical input	Chemicals, toxins, of heavy metals used for production	▼
Waste	Landfill waste created by packaging	▼

Key: ▼ = low; ◆ = medium; ▲ = high (low being smallest ecological footprint).

A new labeling system such as this would provide consumers with valuable information on the sustainability of each food product. Reporting the water footprint alone would be astonishing to many consumers who have no idea that it takes approximately 147 liters (thirty-seven gallons) of water to produce just one cup of coffee.<sup>62</sup>

To build on the example above, the Green Tag 10 Ecological Footprint label could be scored with a simple low, medium and high in relation to its impact on that particular category. A more sophisticated version might score on a ten point scale for each factor and provide a grand total out of 100. For example, under such a system, red meat might score 100, poultry 70, bread 40, vegetables 20, and algae 10. Consumers could then use these scores to make decisions based on credible information regarding the product's true environmental impact.

## CONCLUSION

Expanding food labeling to include eco-consumption dimensions will provide consumers with critical information enabling them to make better choices for their personal health and vitality, their families, and our collective environment. Moving forward on eco-labeling is important to consumers and supports the national interests of reducing consumer addiction to oil, carbon emissions, and pollution by highlighting product footprints on the label. Eco-labeling supports sustainable eating and lifestyles that green consumers want and need. Most importantly, eco-labeling will serve to educate consumers about personal and family well-being issues to enhance health, avoid obesity and diabetes, and reduce health care costs. How a food is produced and what resources were required to put it on the store shelf is directly related to these issues, and having easy, comprehensible access to this information through labels will allow the consumer to make sound decisions. All of these are vital interests that the federal government should seek to address by implementing a comprehensive, national eco-label system without delay. 

## Endnotes: The Case for Green Food Labels

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- <sup>2</sup> Alex William, *Buying Into the Green Movement*, N.Y. TIMES, July 1, 2007, at <http://www.nytimes.com/2007/07/01/fashion/01green.html?n> (last visited Oct. 1, 2008).
- <sup>3</sup> Matthew Connolly, *Thinking Globally, Acting Locally: Cleaning Up Global Aquaculture Through Eco-Labeling in the United States*, 26 PUB. LAND & RESOURCES L. REV. 121, 130-31 (2005).
- <sup>4</sup> Brett Coffee, *Environmental Marketing After Association of National Advertisers v. Lungren: Still Searching for an Improved Regulatory Framework*, 6 FORDHAM ENVTL. L. J. 297, 299 (1995).
- <sup>5</sup> Kate Harrison, *Organic Plus: Regulating Beyond the Current Organic Standards*, 25 PACE ENVTL. L. REV. 211, 222 (2008).
- <sup>6</sup> U.S. Food and Drug Administration, FDA Backgrounder: Milestones in U.S. Food and Drug Law History (Aug. 2005) <http://www.fda.gov/opacom/backgrounders/miles.html> (last visited Oct. 1, 2008) [hereinafter FDA Milestones Backgrounder].
- <sup>7</sup> U.S. Food and Drug Administration, FDA Backgrounder: The Food Label (May 1999) <http://cfsan.fda.gov/~dms/fdnewlab.html> (last visited Oct. 1, 2008) [hereinafter FDA Food Label Backgrounder].
- <sup>8</sup> CONSUMER REPORTS, *Food Labeling Poll* (July 11, 2007) at 4, available at [http://greenerchoices.org/pdf/Food%20Labeling%20Poll-final\\_rev.pdf](http://greenerchoices.org/pdf/Food%20Labeling%20Poll-final_rev.pdf) (last visited Nov. 3, 2008).
- <sup>9</sup> See Ass'n of Nat'l Advertisers, Inc. v. Lungren, 44 F.3d 726, 727 (9th Cir. 1994); see also Lauren C. Avallone, *Green Marketing: The Urgent Need for Federal Regulation*, 14 PENN. ST. ENVTL. L. REV. 685, 687 (2006).
- <sup>10</sup> Coffee, *supra* note 4, at 298-99.
- <sup>11</sup> David Granatstein, Center for Sustaining Agriculture and Natural Resources, Washington State University, *Emerging Ecolabels for Food Products 3-4* (unpublished manuscript), available at <http://organic.tfrec.wsu.edu/OrganicIFP/Marketing/bcecolabel.pdf>.
- <sup>12</sup> Avallone, *supra* note 9, at 694.
- <sup>13</sup> See Fair Trade Labeling Organizations International Producer Standards, [http://www.fairtrade.net/producer\\_standards.html](http://www.fairtrade.net/producer_standards.html) (last visited Nov. 11, 2008).

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# PREPARING FOR THE UNKNOWN: THE THREAT OF AGROTERRORISM

by Matthew Padilla\*

Beneath multi-hued trees lie expanses of arable land, where various crops are grown in order to feed our hungry society. In the United States many farms are so large that they resemble an industrial operation, with concentrations of crops and animals that increase the risk of large scale infection or disease. These characteristics make our agricultural landscape a unique target for bioterrorism.<sup>1</sup>

In October 2008, the Agroterrorism Assault on Chester County (“ATAC 08”) coordinated efforts between federal and local officials in Pennsylvania to test “the region’s response to an intentional dissemination of a foreign animal disease into the region’s livestock population.”<sup>2</sup> The exercise put agro-terrorism on the forefront of the security agenda and brought to light the problem of tracing and combating diseases which could be introduced into the food system.

A well-planned attack against agriculture would be detrimental to the United States because of its potential to disrupt a fundamental portion of the nation’s economic system.<sup>3</sup> Farming and related economic sectors account for sixteen percent of the United States’ workforce.<sup>4</sup> The farm sector, while contributing less than one percent of total Gross Domestic Product (“GDP”), indirectly has a much greater impact on the national economy as it contributes, via related economic sectors, to eleven percent of GDP.<sup>5</sup> And although only one percent of GDP comes directly from farming, 100% of the U.S. population is nourished and clothed by farming-related industries originating in the United States and abroad.

Some scholars cite General Sherman’s attack on the American south’s agricultural system during the Civil War as an example of how greatly an attack on foodstuffs may impact a population.<sup>6</sup> There are countless examples of attacks on agriculture throughout history, from Rome’s salting of Carthage, to Japan’s World War II Unit 731 in Manchuria, which conducted numerous biological tests, including many on human subjects.<sup>7</sup> The United States’ use of Agent Orange during the Vietnam War, while not directed at farmland, did damage “some crops.”<sup>8</sup> The Soviet Union is also alleged to have used glanders, a disease which causes death in horses and mules, during their 1980s war in Afghanistan.<sup>9</sup> Furthermore, multiple nations have programs that could be used to disrupt agriculture.<sup>10</sup>

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The likelihood of a full-scale attack by another nation against the United States is small. The possibility of a terrorist attack on the United States, using asymmetric tactics targeting agriculture, is greater and could have a substantial and detrimental psychological impact on the country.<sup>11</sup> Recent food scares, which were not terrorist-related, were caused by jalapeños and tomatoes (infected with salmonella) in summer 2008. The FDA was forced into an expensive investigation to determine the origin of the infected tomatoes and jalapeños. The scare caused many restaurants and grocers to stop selling the produce, and affected both suspect and non-suspect farms alike, while sickening and frightening consumers.<sup>12</sup>

Several contemporary examples of agroterrorism have been documented overseas. The Arab Revolutionary Council used mercury to poison oranges in Israel in 1978, causing orange exports to decline significantly.<sup>13</sup> In 1997 Israeli settlers used pesticides to spray Palestinian grapevines, causing the loss of seventeen thousand metric tons of produce.<sup>14</sup> In 1952, a Kenyan insurgent group, the Mau Mau, used the African milk bush to poison and kill thirty-three head of cattle.<sup>15</sup>

Terrorist attacks are not limited to foreign and non-state actors. For example, the Rajneeshee Cult poisoned Oregon salad bars in 1984 with salmonella.<sup>16</sup> In addition, the largest terrorist attacks conducted in the United States prior to 9/11 were perpetrated by fringe right-wing domestic groups.<sup>17</sup> In fact, the Ku Klux Klan has reportedly resorted to agroterror in the past, in an effort to intimidate minority farmers.<sup>18</sup> An area of concern today is the possibility of increased right-wing violence through agroterror. The Southern Poverty Law Center has reported increased rhetoric from right-wing racist groups who believe that an Obama presidency would be good for them because it could “drive millions to their cause.”<sup>19</sup>

Amplified racist sentiments, coupled with violence, may present a daunting challenge for law enforcement authorities because of the potential for a non-organized amateur terrorist attack. Mere “curiosity and fascination” may lead resurgent members of right wing groups to acquire nuclear, chemical, or biological weapons for multiple uses including agroterrorism.<sup>20</sup> Furthermore, extremists of all varieties—whether or not they are affiliated with an organized group—pose a significant problem, and according to the FBI, have represented “the most difficult international terrorist challenge to the law enforcement and intelligence communities.”<sup>21</sup> An amateur terrorist could use simple technologies to spread fear among the masses, attacking relatively unprotected areas like agricultural products.<sup>22</sup>

If farm products are to be protected, both federal and local governments will have to continue exercises such as ATAC 08. There is no way to ensure that food will be completely protected. However, preparing localities and strengthening pertinent legislation will help authorities deal with such an exigency, and could help prevent a panic among the populace.<sup>23</sup> Agriculture Secretary Ed Schafer, realizing the problem, has stated that the “USDA has to think of how we are vulnerable to terrorists and strengthen protective measures against terrorism.”<sup>24</sup> In addition,

diversifying the food supply, by strengthening local farms, can help offset the vulnerability and impact of an attack on a large farm. Acknowledgement of the vulnerability is a good step, and measures such as the ATAC 08 exercise is a sound second step, but it will take vigilant action at all levels to ensure that the food supply remains safe.



## Endnotes:

<sup>1</sup> JIM MONKE, AGROTERRORISM: THREATS AND PREPAREDNESS 1-2 (Congressional Research Service Report for Congress No. RL32521, 2004), available at <http://www.fas.org/sgp/crs/terror/RL32521.pdf> (last visited Nov. 1, 2008) (listing the characteristics that make agriculture a unique subset of bioterrorism, such as the geographical distribution of agriculture and livestock that is “frequently concentrated in confined locations”).

<sup>2</sup> Penn Veterinary Medicine, Penn Vet Hosts FBI Agroterrorism Exercise at New Bolton Center (Oct. 17, 2008), <http://www.vet.upenn.edu/PennVet/News/PennVetIntheNews/tabid/286/Default.aspx> (follow hyperlink to title of article) (last visited Nov. 13, 2008).

<sup>3</sup> MONKE, *supra* note 1, at 5-6.

<sup>4</sup> *Id.*

<sup>5</sup> *Id.*

<sup>6</sup> See Barry S. Zellen, *Preventing Armageddon II: Confronting the Specter of Agroterror*, STRATEGIC INSIGHTS, Dec. 2004, at 1-2, available at <http://www.ccc.nps.navy.mil/si/2004/dec/zellenDec04.pdf> (last visited Oct. 22, 2008).

<sup>7</sup> See RICHARD A. FALKENRATH, ROBERT D. NEWMAN, & BRADLEY A. THAYER, AMERICA'S ACHILLES' HEEL 76 (Teresa J. Lawson ed., MIT Press 2001) (1998) [hereinafter FALKENRATH, ET AL.] (outlining the history of Japanese biological programs from 1932-45; “Unit 732 studied diseases including anthrax, glanders, and plague by infecting prisoners.” Furthermore, Japan conducted small scale operations by preparing and distributing “chocolates filled with anthrax spores to youngsters. On another occasion 3,000 Chinese prisoners of war were given a “holiday treat” of dumplings injected with typhoid or paratyphoid...”); see also MONKE, *supra* note 1, at 12 (stating in a “Brief History of Agricultural Bioweapons” that “[d]uring the Vietnam War, the U.S. used agent orange to destroy foliage, affecting some crops”).

<sup>8</sup> See MONKE, *supra* note 1, at 12.

<sup>9</sup> *Id.* at 11.

<sup>10</sup> See Joseph P. Dudley & Michael H. Woodford, *Bioweapons, Biodiversity, and Ecocide: Potential Effects of Biological Weapons on Biological Diversity*, BIOSCIENCE, July, 1 2002, at 585.

<sup>11</sup> See generally Jason Pate & Gavin Cameron, *Covert Biological Weapons Attacks Against Agricultural Targets: Assessing the Impact against U.S. Agriculture*, at 5-7 (BCSIA Discussion Paper 2001-9, John F. Kennedy School of Government, Harvard University) (stating that there are a variety of costs that may arise from agroterrorism; economic, political, direct and indirect, and “[s]ome of these costs apply to any act of terrorism: the loss of confidence and credibility stemming from a government’s inability to protect the country”).

<sup>12</sup> Karen Grigsby Bates, *Salmonella Scare Hurts California Tomato Growers*, NATIONAL PUBLIC RADIO, July 9, 2008, available at <http://www.npr.org/templates/story/story.php?storyId=92371196> (last visited Nov. 4, 2008).

<sup>13</sup> MONKE, *supra* note 1, at 12.

<sup>14</sup> *Id.* at 12.

<sup>15</sup> *Id.* at 12.

<sup>16</sup> *Id.* at 12 (discussing the Cult’s attempt to influence an election).

**Endnotes:** Preparing for the Unknown  
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# COMMENTARY

## GENETICALLY MODIFIED ORGANISMS AND GLOBAL HUNGER: A REAL SOLUTION?

by Simon Nicholson\*

### INTRODUCTION

Over recent months, sharply rising global food prices have increased chronic hunger, exacerbated poverty, and sparked political unrest around the world.<sup>1</sup> In the midst of this crisis a controversial agricultural technology has been receiving renewed attention: the genetic modification of food crops.<sup>2</sup> This renewed attention comes after a period of muted consolidation by the food biotechnology industry. The spread of genetically modified (“GM”) foods has advanced steadily in recent years, but in the face of widespread public protest and other forms of political contestation in many countries, this has been taking place with little fanfare.<sup>3</sup>

Now, GM foods are once again in the headlines. Proponents of the technology have seized on the global food price crisis as evidence that we need wider acceptance of food biotechnology. In the process, we are seeing the recycling of arguments that were first rolled out with the commercial debut of GM foods in the mid 1990s.<sup>4</sup> We are being told now, as we were told then, that unless we wholeheartedly embrace the biotechnological manipulation of the global supply, there is no way that we will be able to feed an expanding human population without overstressing an increasingly fragile environment.<sup>5</sup> The argument, in other words, is that GM foods must be at the heart of the sustainable food systems of the future.<sup>6</sup>

What are we to make of this renewed call for the more widespread development and deployment of GM foods? In this article, I will make the case that GM foods in their current guise actually offer very little to help us overcome the current food crisis, and even less to help us with long-term hunger and poverty. In fact, by affording greater and greater power to fewer and fewer seed and chemical conglomerates, GM foods threaten to worsen our long-term food prospects. This is because GM foods further entrench the very political dynamics that are currently producing global hunger and a range of other food-related challenges. Our food systems must undergo revolutionary change if we are to eradicate hunger and ensure sustainability. Unfortunately, GM foods fail to offer this revolutionary change, but instead lead us further down our present, deeply problematic path.

### MAKING SENSE OF THE GM FOODS DEBATE

There is no question that since the introduction of commercial GM food products in 1994, the food biotechnology industry has seen extraordinary growth.<sup>7</sup> The reach of GM crops has expanded rapidly to the extent that they now blanket more than 57 million hectares (140 million acres) of farmland in the United States alone,<sup>8</sup> with the result that between seventy and seventy-five percent of all processed foods now in U.S. supermarkets contain genetically engineered ingredients.<sup>9</sup> In 2007, worldwide plantings of GM foods covered as much as 114 million

hectares (280 million acres), and GM crops were grown by an estimated 12 million farmers across twenty-three countries.<sup>10</sup> Regarding the area planted with GM crops and the number of farmers who are now using them, many claim that GM foods have been the most rapidly spread and adopted agricultural technology in all of human history.<sup>11</sup>

Nevertheless, the technology’s spread has not been a smooth one. The concerns and

actions of a diverse and committed worldwide network of opponents have greatly impacted the biotechnology industry’s expansion plans.<sup>12</sup> Certainly, there is little question that GM foods are one of the most contentious and contested technologies to have been developed in recent times.<sup>13</sup> They have sparked protest in every place they have been introduced, and have proved a lightning rod for those with wider concerns about corporate control of the food supply and the harms associated with the practices of industrial agriculture.<sup>14</sup>

The debate over GM foods has been wide-ranging, built around several recurring themes and arguments. On one side of the debate, supporters claim that genetically modified plants produce, or have the potential to produce, higher crop yields while

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reducing the use of agricultural chemicals, making for more efficient and more environmentally-friendly farming.<sup>15</sup> In addition, proponents claim the technology will both provide more food for the world's hungry and increase on-farm profits by reducing the work that farmers need to perform.<sup>16</sup> With future generations of transgenic technologies, we are told we can expect foods with higher concentrations of micronutrients, crops that thrive in drought-stricken or saline-saturated soils, resistance to a wider range of damaging pests and diseases, plants that act as incubators and delivery systems for vaccines and other pharmaceutical products, and much more.<sup>17</sup>

Yet such claims and promises have done little to convince the anti-GM crowd. Some are opposed to this new technology on the grounds that its likely benefits have been inflated by the biotechnology industry and that its risks have been inadequately considered. These opponents are worried, in other words, that GM foods have already caused harm, or might prove to be harmful, to people or to the environment.<sup>18</sup> Others are concerned about the principles at stake in the production of these novel organisms, arguing that they are “unnatural” or “against God.”<sup>19</sup> A third line of opposition focuses on the beneficiaries of GM technologies. These opponents suggest that expanded use of GM foods relies on deeply problematic assumptions about the causes of hunger and the plight of the environment, and claim that we should be wary of the further consolidation of power in industrial agriculture, and of the interests of the biotech companies that are pushing and patenting their creations.<sup>20</sup>

### THE DEBATE'S TECHNOLOGICAL ROOTS

At the root of this debate lie some vastly different understandings of technology. A simplistic reading of the debate pigeonholes it as a disagreement between “technophiles” and “technophobes.”<sup>21</sup> Proponents of GM foods often cast themselves in the technophile role, as pro-technological problem solvers, striving to find real, practical solutions to the world's pressing agricultural challenges.<sup>22</sup> By contrast, those who raise questions about GM foods are pegged as anti-technological Luddites—“skeptics” who are intent on halting even the most beneficial uses of all new technologies.<sup>23</sup>

There is a grain of truth to this reading. Those who are strongly for the use of GM foods tend to be optimistic about the ability of new technologies to resolve complex problems, while those who argue against GM foods tend to be pessimistic about such claims.<sup>24</sup> However, this caricature of the debate, though widespread, actually obscures more than it reveals. This is because it would have us believe that there are only two technological paths open to us: either we wholeheartedly embrace our present technological trajectory, or we turn our backs on all technology and wander back into the Stone Age. In this

sense, both the technophilic and technophobic positions are “deterministic”—they imagine technology in the driver's seat, and assume that we are simply mute passengers along for the ride.<sup>25</sup>

These two extreme options, though, are not our real alternatives at all. There are a wide range of possible technological futures available to us, beyond moving ever forward on our present

track or turning our backs on all forms of technological progress. Those who argue against GM foods are not really railing against all technology; they are simply pointing out problems with *this* technology (or, more broadly, with the technological system of which GM foods are a part). And they are suggesting that rather than blindly accepting all technological innova-

tions as right and good, we must develop more sophisticated forms of technological analysis.

Too often our technological trajectory and the impacts of particular technological developments go largely unquestioned. The most common way to think about technology is, after all, to give it very little thought at all. Most of us are guilty of what Langdon Winner once termed “technological somnambulism”<sup>26</sup>—we are content to sleepwalk our way through technological decision-making. Of course there is always some general stir when a truly remarkable new technology finds its way into the global marketplace or imagination, as we have seen with GM foods. Once we become accustomed to any new technology, however, it is apt to become naturalized and reified through its use, such that it becomes largely immune to interrogation. The remarkable soon becomes mundane in our fast-paced world.

In part, this is because the technologies in our lives are so ubiquitous, and by now we are so used to even sweeping technological change and upheaval, that only rarely is our collective attention held for any length of time. This also reflects the immense hold of the idea of “progress” and the technophilic orientation on contemporary social thought. By this view, technology is at the forefront of the quest for steady improvement of the human condition.<sup>27</sup> As such, we largely take it on faith that technology has a positive or, at least, benign influence on our lives (often despite mounting environmental and other evidence to the contrary). All of this leaves little scope for raising real questions about our technologies and for the creation of alternative technological directions, since, as Andrew Feenberg characterizes this position, we tend to believe that “technology's advance is the advance of the human species.”<sup>28</sup>

Those arguing against GM foods are asking us to question these assumptions. They are pointing out, first of all, that the idea that all technologies must be essentially good or essentially bad is a myth without foundation. Rather than adopt the technophilic assumption that every new technology is a positive thing, we should instead understand that different technologies can

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have different effects and implications. At the same time, the critics of GM foods are arguing that technological artifacts are not merely neutral tools. Moving away from food for a moment, take the old adage, a favorite of the National Rifle Association, that “guns don’t kill people; people kill people.” This entirely misses the fact that guns are designed with killing in mind, that the availability of guns gives power to some and takes it from others, and that their widespread availability makes purposeful and accidental death more likely. Another way to say this is that guns, like every other technology, have political and social effects built into their very fabric. GM foods are no different.

To look at a technology like a GM seed through the limited technophilia vs. technophobia debate ultimately does not get us very far. We are much better off considering and judging each technology within its social and historic context, as both a product and purveyor of politics. This means considering where a particular technology comes from, whom and what ends it benefits, and what kinds of social and ecological relations it produces or holds in place.

### GM FOODS AND GLOBAL HUNGER

For those who raise questions about GM foods, then, truly understanding this novel technology requires thinking about things like the context from which it has emerged, and the type of agricultural system that its use promotes. With this in mind, let us consider in more detail the arguments currently being made in favor of GM foods. Remember, we are being told that we need biotechnology to feed the world and slow the environmental degradation caused by mainstream industrial farming.<sup>29</sup> The implication is that the few multinational companies that largely control the development of GM seeds and the chemicals that they require are best situated to lead us out of our current predicament, and that hunger is at base a technical problem to be resolved by the deployment of technological fixes.<sup>30</sup>

In the wake of the recent food price increases, there are now more than 920 million people around the world who are chronically hungry.<sup>31</sup> The proximate causes of this recent spike in hunger are now well known, and can be recited briefly. In our highly industrialized global food system, crop prices are closely tied to oil prices, and with the price of a barrel of oil recently topping out at close to \$150 per barrel, the fossil-fuel energy price surge has placed significant upward pressure on food costs.<sup>32</sup> Another factor contributing to high food prices has been the near-drought conditions seen in Australia and much of Europe over recent growing seasons.<sup>33</sup> These abnormal weather patterns have dramatically suppressed crop yields, particularly for wheat and rice.<sup>34</sup> Since commodity crops like these are now sold on global markets, a significant food production shortfall in one region has worldwide implications.<sup>35</sup>

At the same time, increased demand for meat in China and a handful of other rapidly expanding economies have driven up demand for grains, while the collapse of home equity markets in the United States and elsewhere has driven speculative capital into food commodities markets, inflating the value of food in futures exchanges.<sup>36</sup> Biofuels policies in Europe and the United

States have also played a significant part in recent food price hikes by siphoning off increasing amounts of corn and other food crops for use in gas tanks.<sup>37</sup>

GM foods are supposed to help alleviate all of these pressures, principally by raising grain yields. If GM crops could consistently produce increased grain yields (itself a questionable assumption) then this would presumably help us overcome the relative food shortages produced by the drought, demand for meat, corn-hungry biofuels mandates, and other factors outlined above.<sup>38</sup>

However, there is a serious flaw in this argument. To imagine that hunger is a short-term problem, and to focus solely on technological responses to the proximate drivers of the recent food price crisis, is to miss a big part of the story. Hunger is hardly a new thing. Even in the few years before the 2008 price hikes, when food was cheap and the global food system was widely thought to be working effectively, there were an estimated 850 million chronically hungry people around the world.<sup>39</sup> This is something that tends to be lost and forgotten in current coverage of the food crisis. Yet try as we might to attribute conditions of hunger to short-term factors, this is clearly a long-term, structural problem.

People have been going hungry in recent years despite the fact that we have a food system that produces roughly two pounds of grain per person each day.<sup>40</sup> This is 3,000 kilocalories of food for each individual on the planet—more than enough to meet every person’s energy requirements, even before we take into account all of the nuts, fruits, and vegetables that our food system also provides.<sup>41</sup> We live in a world of abundant food, yet millions go without adequate nutrition. How can this be?<sup>42</sup>

Here’s the punch-line, and it’s one that, thanks principally to the work of Amartya Sen, we have known for some time: in our age of abundance, hunger is ultimately not a function of a lack of food, but rather a function of a lack of *access* to food.<sup>43</sup> To push this argument further, framing hunger as something technical—to be resolved by the application of a simple technological fix—obscures the hidden workings of the global industrial food system, drawing our attention away from the means by which our food system operates to *produce* hunger. Through the dominant technophilic lens, we tend to view hunger as something short-term and inadvertent. This is a mistake. It makes more analytic sense to see hunger as something that is a *natural product of our organization of food production*.<sup>44</sup> When the food system produces hunger it is not failing, it is operating precisely as it has been developed to operate.

This is not to say that the people and organizations that have the most power in our contemporary food system go out of their way to create hunger and suffering. Yet in the push for profit and control that the industrial food system demands, some people win big and some people lose. The technologies we have developed to grow, process, package, and distribute food are a big part of why the food system now looks the way it does, and why its benefits accrue disproportionately to a shrinking number of large corporate actors. Certain Green Revolution technologies—combine harvesters, hybrid seeds, and chemical fertilizers

## UNDERSTANDING TECHNOLOGY

and pesticides, for instance—in combination with rich-country government policies and a range of other factors have helped to create our modern system of food production, and function now to hold it in place.<sup>45</sup> With these technologies and in this environment a few farmers in rich countries are now able to produce truly extraordinary quantities of food. And yet the style of farming it encourages has had tragic environmental, economic, and social consequences.<sup>46</sup> Intractable chronic hunger is but one product of this system—a product that GM foods can never hope to magically abolish.

Viewing the food crisis through this lens raises big questions about the claim that spreading biotechnology will feed the hungry and spur development in the world's poorest regions. Instead, this analysis suggests that the

more widespread use of GM foods *may actually make things worse*. Even should GM foods raise levels of food production, the structures and dynamics of food production and consumption that are currently producing hunger go unchecked, and will in fact receive a boost from biotechnology. How will GM foods tackle the political roots of hunger and underdevelopment if through their development and deployment they serve to further entrench the very industrial food system that is giving rise to these problems?

Some officials and commentators have described the recent food price hikes as a “silent tsunami.”<sup>47</sup> There is some truth in this description. For one thing, the manner in which rising food costs have decimated lives and livelihoods calls to mind a marauding natural disaster.<sup>48</sup> And, like the Indian Ocean tsunami of 2004, the tragedy of global food riots has temporarily refocused attention on some of the world's poorest regions.<sup>49</sup>

After that, though, the metaphor breaks down. The global hunger and economic inequality that the food price crisis has exacerbated are not new things, brought on by a sudden catastrophe. Rather, they are old things made worse by new circumstances. Further, these recent food price increases are not acts of God. Instead, they represent a human-made tragedy. What I mean is that blame for the food price crisis lies not with nature or with other forces beyond our control, but ultimately with the constitution of our political and economic systems. Through political choices, institutional development, and technological design, we have developed a global food system that provides bountiful food to some while condemning others to lives of suffering and deprivation. In this sense hunger is not natural; hunger is *always* political. GM foods ultimately do nothing to address these political roots of our food crisis.

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Let me try to be clear that this is *not* meant to be an anti-technology commentary. I think it's abundantly obvious that for humanity to thrive in ways that respect the rest of the natural world, we need a widespread technological revolution. In industrialized countries and around the globe, we must find or recover more effective ways to produce and use energy, land, water, and the earth's other scarce resources and sinks, in agriculture and in all other areas of life. The myriad challenges we face demand technological transformation on scales never before seen and experts and innovators to develop and distribute these new systems. Technology will always be front and center in any action to create a better world.

However, *our current forms of technological engagement are insufficient to achieve global sustainability*. The notion that there are just two extreme options open to us—unhindered technological development along our present path or a retreat into our ancestral caves—is a dangerous misinterpretation of what technology is, how technological change works, and what our options really look like. Instead of perpetuating this notion, we need to craft forms of technological engagement that are at once receptive to the promises of technological development and cognizant of challenges. This starts with understanding technology as an object not just of technical but of political study. It then means asking tough questions about contemporary technological life, and developing institutions that support such questioning. At the broadest level this means asking, what kind of world are we trying to create? What kinds of technologies will best help us create that world?

There is no such thing as a one-shot, sacrifice-free solution to the food crisis, environmental crisis, or to any of the myriad other crises that contemporary life throws at us. And if the technological horrors of the twentieth century, from nuclear accidents and the proliferation of weapons of mass destruction, to genocide and environmental devastation, have taught us anything, it is that with technological promise often comes great peril. Self-professed technophiles promise that through the application of technological fixes we can consistently overcome ecological limits.<sup>50</sup> A far more promising tack, though, may be to appreciate ecological limits and strive for rich lives within them. This is not an argument against technology and “progress,” as much as technophiles may wish to paint it in those terms. Rather, it's a reiteration of an old environmental argument for technology in the service of a progress differently defined.<sup>51</sup>

This means that instead of employing technologies to work against natural processes and bring them under a human yoke, we

## CONCLUSION

can and must strive to develop technologies that help us engage with natural processes in ways that are productive and restoring. Consider that the fastest-growing segment of the food economy in the United States is farmers' markets, and particularly those markets that support local and regional organic produce.<sup>52</sup> The farmers who grow food for these local organic markets are not scratching in the ground with sticks. Many of these operations are incredibly high-tech.<sup>53</sup> However, rather than depending on industrial technologies like GM crops, successful farms in this ilk depend on a mastery of the local, and on the development of technologies that accommodate cooperation with the land.<sup>54</sup>

Some of this growing movement relies on the rediscovery of technologies and techniques from long ago. Intercropping different plant species and their successful rotation, managing the interplay between different aspects of the farm, drawing on local resources to develop and sustain the fertility of land through time—all are basic to the organic farmer's tool kit.<sup>55</sup> These are things that were known by the successful societies that came before our own, but have been largely lost in an age of industrial farming. These are lessons that are slowly being relearned, as a new wave of eager farmers taps into knowledge from a disappearing breed, and the repositories of knowledge that exist in other places.<sup>56</sup>

Much of the success of this emerging food system, though, depends not on the recovery of older farming forms, but on entirely new research. Finding alternatives to rampant industrialism is not just about turning backwards, but looking forwards along a new path. For instance, Wes Jackson and his team at the Land Institute in Kansas have developed highly productive perennial crop growing systems that provide a host of ecological benefits, without fostering a dependence on irreplaceable fossil fuels.<sup>57</sup> Urban farmers across the United States are discovering new ways to grow food on roof-tops, on fire escapes, and on abandoned lots, and in the process are revitalizing neighborhoods and transforming communities.<sup>58</sup> More and more consumers are discovering new connections to other people and to the environment through the simple act of eating delicious foods light on processing. This is a set of technologies—indeed, an expanding technological system—turned to a very different set of ends than that suggested by GM foods. This is technology in the service of human well-being, rather than a dangerous, short-sighted industrial ideology.

We are, as Harriett Friedman has reminded us, eating animals.<sup>59</sup> The search for sustainability is rooted in our food system. With that in mind, our goal should not just be short-term fixes via an entrenchment of industrial farming methods. Rather, we should be striving to build an agricultural economy that gives us abundant healthful food while creating meaningful jobs, respects the land and the human and non-human organisms that depend on it, and views food as sustenance rather than simply as a collection of nutrients. To achieve this goal requires a technology-based revolution that, at the same time, considers the deep contradictions in our social and economic condition. GM foods, in their present guise, as products of expanding corporate power, offer nothing of this sort. Rather, GM foods promise to further the present industrial food system, by affording more and more control to fewer and fewer players, by increasing the dependencies of farmers and consumers, and by further clouding the relationships we have with our food and those who grow it.

The GM foods debate reminds us that all technologies are ultimately products of political contestation, operating to the benefit of some and the exclusion and detriment of others. The more particular lesson is that hunger and the other problems that characterize the industrial food system are not the products of a shortage of food production, but rather a shortage of prudent, democratic engagement with the technological systems that comprise modern life. To build a sustainable food system, we need to find wiser ways to engage with our technological systems. Wisdom demands that we appreciate and work within the conflict between the contradictions of modernity and the comforts that it affords.<sup>60</sup> There is no benefit in turning away from all of technology and all of the wonders that technological life provides us with. Nor is there real benefit in uncritically accepting all technological developments. Either option is to deny our ability to shape our technological future.

Transformation of our food system is basic to the revitalization of our material economy, and of our moral sensibilities. Technology must be at the heart of this transformation, but the form that this technology will take is not set in stone. The choice is not between bioengineering or mass starvation. Instead, there is a rich array of options open to us, ours for the making. 

## Endnotes: Genetically Modified Organisms and Global Hunger

<sup>1</sup> See generally Donald Mitchell, *A Note on Rising Food Prices* (World Bank Policy Research, Working Paper No. 4682, July 2008).

<sup>2</sup> See, e.g., Owen Hembry, *Stopping the World From Starving*, N.Z. HERALD, Apr. 26, 2008, available at [http://www.nzherald.co.nz/nz/news/article.cfm?c\\_id=1&objectid=10506292](http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10506292) (last visited Oct. 24, 2008).

<sup>3</sup> See Brian Tokar, *Resisting the Engineering of Life*, in REDESIGNING LIFE? THE WORLDWIDE CHALLENGE TO GENETIC ENGINEERING (Brian Tokar ed., 2001) (discussing global resistance to GM crops).

<sup>4</sup> See David Barboza, *Monsanto Faces Growing Skepticism on Two Fronts*, N.Y. TIMES, Aug. 5, 1999, at C1.

<sup>5</sup> See, e.g., Andrew Pollack, *Resistance Relaxes to Modified Wheat*, INT'L HERALD TRIB., Apr. 21, 2008, <http://www.iht.com/articles/2008/04/21/business/crops.php> (last visited Oct. 26, 2008).

**Endnotes: Genetically Modified Organisms and Global Hunger**  
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# LEGISLATIVE UPDATE

## COUNTRY-OF-ORIGIN LABELING

by Anastasia Lewandoski\*

Since 1949, the Farm Bill has been updated every four to six years to reflect the evolving needs of the nation, addressing various topics from food stamps to agricultural subsidies to natural disaster insurance. Section 11002 of the 2008 Farm Bill mandates country-of-origin labels for certain food products. This section amends the Agricultural Marketing Act of 1946, which gave prerequisites for producers of certain products only if they chose to put a USA label on their product.<sup>1</sup> The 2008 amendments to § 11002 now require country-of-origin labels on goat meat, chicken, ginseng, pecans, and macadamia nuts. These are additions to the products which were already required to have country-of-origin labels. This prior list contained beef, lamb, pork, fish, peanuts, and perishable agricultural commodities such as fruits and vegetables.<sup>2</sup> Although these labels provide useful information to consumers, they come at a heavy price and still have loopholes allowing many food products to remain unlabeled.

Country-of-origin labels will help consumers make informed decisions about the products they buy. Many consumers prefer American over foreign products. Also, in the event that foreign food products become somehow tainted, country-of-origin labels could reassure worried consumers. A good illustration of the utility of country-of-origin labeling comes from past outbreaks of *bovine spongiform encephalopathy*, commonly called “mad cow disease,” which may be present in cattle from England and Ireland.<sup>3</sup> Outbreaks 1992 and 1993, where almost one thousand cases of mad cow disease were diagnosed in Great Britain each week,<sup>4</sup> caused great fear among consumers of beef in the United States.

Some producers will enjoy decreased competition as a result of the 2008 amendment to § 11002. For example, the amendment adds macadamia nuts which are domestically grown in Hawaii.<sup>5</sup> They have also been imported from Australia—where they are more cheaply produced—and then packaged in Hawaii and sold as Hawaiian macadamia nuts for a lower price than those actually grown in Hawaii.<sup>6</sup> Under the new law, these producers will have to market their nuts as products of Australia because nuts can only be labeled as American if they were produced *exclusively* in the United States.<sup>7</sup>

While the amendment will give consumers new knowledge, the substantial costs of the labeling program will likely be passed on to consumers. The Office of Information and Regulatory Affairs estimates that labeling will cost producers, retailers, and packers anywhere from \$500 million to \$4 billion during the first year of implementation, and cost between \$100 million and \$600 million per year after the practice has been in place for ten years, making this “one of the most burdensome rules to be reviewed by the Administration.”<sup>8</sup> The U.S. Department of Agriculture, which underestimated costs when country-of-origin labels for fish were implemented in 2005, estimated a cost of \$2.52 billion for producers, packers, and retailers during the first year.<sup>9</sup> These costs come from producing new labels for all the products, segregating American from Canadian cattle in slaughterhouses where they would otherwise be grouped together, and costs for some producers to find new domestic sources.<sup>10</sup> Furthermore, food retailers will face an estimated \$952 million expense during the first year of implementation.<sup>11</sup> When this price is handed down to consumers, this equates to an increase of seven cents a pound for beef and four cents a pound for pork, lamb, and goat.<sup>12</sup>

Although it is more comprehensive, the amendment does contain holes. For instance, labels do not apply to all food products. Processed foods are exempted,<sup>13</sup> removing a huge portion of the overall food consumed in the United States. The exemption uses a broad interpretation of what is “processed,” and includes foods that have been cooked, cured, smoked, or restructured.<sup>14</sup> The processed food exemption is also nonsensical as applied to certain products, like vegetables, which need labels when sold in separate packages but not if sold in a mixed bag.<sup>15</sup> It only seems logical that if a consumer is entitled to know the origin of a bag of peas *or* carrots, the consumer should also be entitled to know the origin of a bag of peas *and* carrots. Other exemptions undermine the intended purpose of the rule. Roasted products, for example, are exempt from labeling, and as many nuts are sold roasted, this exemption will remove foods that the

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bill otherwise purports to regulate. Finally, restaurants and cafeterias are not required to inform their customers where their food originated.<sup>16</sup>

With these large exceptions, the country-of-origin requirement cannot be completely effective in informing American consumers of the origin of their food. Consumers are left guessing the origin of many products. Additionally, the costs to consumers may be larger than the value of the information. In short, although the amendment is a step in the right direction for consumer information and food safety, it remains severely flawed.



## Endnotes: Legislative Update

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<sup>1</sup> Food, Conservation, and Energy Act of 2008, 7 U.S.C.S. § 1638 (2008).

<sup>2</sup> *Id.*

<sup>3</sup> See generally GREG LARDY ET AL., N.D. ST. U. EXTENSION SERVICE, BOVINE SPONGIFORM ENCEPHALOPATHY, (Apr. 2004) available at <http://www.ag.ndsu.edu/pubs/ansci/beef/as1206.pdf> (last visited Nov. 13, 2008).

<sup>4</sup> *Id.*

<sup>5</sup> 7 U.S.C.S. § 1638(2)(A)(xi).

<sup>6</sup> Mike Adams, *Hawaiian Macadamia Nut Farmers Face Economic Devastation Due to False Labeling of Imported Mac Nuts as "Hawaiian,"* NATURAL NEWS, April 23, 2007, available at <http://www.naturalnews.com/021805.html> (last visited Nov. 10, 2008).

<sup>7</sup> 7 U.S.C.S., § 1638a(a)(4)(B).

<sup>8</sup> Letter from John Graham, Adm'r of the Office of Info. and Regulatory Affairs, to William Hawks, U.S. Dep't of Agric. (Oct. 27, 2003), available at [http://www.reginfo.gov/public/postreview/ltr\\_to\\_william\\_hawks\\_on\\_cool.pdf](http://www.reginfo.gov/public/postreview/ltr_to_william_hawks_on_cool.pdf) (last visited Nov. 10, 2008).

<sup>9</sup> Karen Talley, *Label Change to Hit Grocery Bills,* WALL STREET JOURNAL (Aug. 27, 2008), available at [http://online.wsj.com/article\\_email/SB121980900189375853-1MyQjAxMDI4MTI5NzgyMdc5Wj.html](http://online.wsj.com/article_email/SB121980900189375853-1MyQjAxMDI4MTI5NzgyMdc5Wj.html) (last visited Nov. 10, 2008).

<sup>10</sup> Dan Ikenson, *Uncool Rules: Second Thoughts on Mandatory Country of Origin Labeling,* FREE TRADE BULLETIN (Jan. 16, 2004), available at <http://www.freetrade.org/node/101> (last visited Nov. 10, 2008).

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*

<sup>13</sup> Food, Conservation, and Energy Act of 2008, 7 U.S.C.S. § 1638 (2)(B) (2008).

<sup>14</sup> Mandatory Country of Origin Labeling, 73 Fed. Reg. 149 (Aug. 1, 2008) (to be codified at 7 C.F.R. pt. 65), available at <http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5070926> (last visited Nov. 10, 2008).

<sup>15</sup> *Id.*

<sup>16</sup> 7 U.S.C.S. § 1638a(a)(4)(B).

# BOOK REVIEW

## EARTH: THE SEQUEL

### THE RACE TO REINVENT ENERGY AND STOP GLOBAL WARMING

by Fred Krupp and Miriam Horn

Reviewed by John R. Shackelford\*

**E**arth: *The Sequel* is an optimistic attempt at invigorating the debate over a cap-and-trade system for green house gas emissions. The book could not have come at a better time.

Surging oil prices brought energy consumption and production to the forefront of the presidential election campaign this summer, resulting in proposals for gas tax holidays and increased domestic production. Deregulation and the once-venerable free market are now slandered daily after the big business bailouts on Wall Street. A prevailing consensus of sorts has emerged about the need to invest in alternative energy, thereby creating millions of high-wage “green collar” jobs.<sup>1</sup> It’s not surprising, however, that doubts remain about exactly where those millions of jobs will come from, and whether alternative fuels can rival their conventional fossil-based counterparts, or even whether it is advisable to place the future of the environment in the invisible hands of the free market.

This book seeks to alleviate those types of doubts. For authors Fred Krupp and Miriam Horn, the goal is stopping global warming. They see innovation and capitalism as the means to that end. They contend that the free market, along with a “technology neutral” price on carbon, is the fastest and most efficient tool for weaning ourselves off an unhealthy reliance on petroleum and diversifying our energy portfolio with clean, renewable resources. Krupp and Horn do not rely on graphs and spreadsheets to support their thesis. Instead, they provide anecdotal evidence drawn from the whole of the United States, from the sun-drenched west, to coal-rich Appalachia, to the dauntless Silicon Valley. To demonstrate that the country lacks appropriate policy, not capable technology, the authors survey state-of-the-art energy production in the fields of solar, tidal, geothermal, biofuels, and, yes, even coal. They argue that policy and not technology is holding back meaningful progress in the fight against global warming.

The protagonists in Krupp and Horn’s stories are the engineers, venture capitalists, and oilmen-turned-environmentalists that are on the verge of kick-starting a “new industrial revolution.” One colorful example is the story of Bernie Karl, of Chena Hot Springs, Alaska, whose ice hotel was dubbed “the dumbest business idea of the year” by Forbes Magazine when it melted

in 2004. Just two years later, Karl and the United Technologies Corporation opened a successful geothermal plant powered by water at temperatures so low that experts had previously written the source off for geothermal use. This renewable energy source now keeps Karl’s ice museum frozen during the summer, and it powers the rest of his resort all year long.

Importantly, Krupp and Horn do not get lost in their descriptions of science fiction-like technology or ignore the potential contribution in the fight against global warming from developing countries. Perhaps the most inspirational story comes from the edge of the Brazilian Amazon, where an illiterate farmer named Herculano Porto rallied his neighbors to stand up to the loggers, ranchers, and armed gangs that raze the rainforest. His defiance led to the creation of “extractive reserves,” which eliminate the economic incentives behind rampant deforestation while allowing those who rely on the forest to continue to use it sustainably.

*Earth: The Sequel* only dabbles in the macroeconomic concerns that pose a challenge to a national cap and trade system and does not devote much attention to the short-term effects such a policy might have on the deficit, the employment rate, or the prices of goods and services. It does, however, answer the fundamental underlying question driving the debate—whether we have the capacity and scientific know-how to combat global climate change—with an emphatic “yes!” This answer is both informative and inspiring. All that is left to be seen is whether the United States has the political will to implement a cap and trade system and the good sense to stop holding the green revolution back.

## Endnote: Book Review

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## ENDNOTES: BIOFUEL, THE ENVIRONMENT, AND FOOD SECURITY *continued from page 11*

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<sup>26</sup> See COLCHESTER, *supra* note 15, at 21 (describing palm oil as one of the main sources of food items such as cooking oil and margarine, and household items such as detergents, soaps, and shampoos). Palm oil is also used as a lubricant in industrial processes and yields oleins used in chemical processes to produce esters, plastics, textiles, emulsifiers, explosives, and pharmaceutical products.

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<sup>27</sup> FITRIAN ARDIANSYAH, WORLD WILDLIFE FUND [WWF], ENVIRONMENTAL PERSPECTIVE ON THE DEMAND OF PALM OIL FOR FOOD AND ENERGY 2 (2007), available at [http://alumni.adsindonesia.or.id/articleattachment/article\\_fitriandriansyah06.pdf](http://alumni.adsindonesia.or.id/articleattachment/article_fitriandriansyah06.pdf) (last visited Oct. 16, 2008).

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- <sup>38</sup> ERIC WAKKER, FRIENDS OF THE EARTH: UNITED KINGDOM, GREASY PALMS: THE SOCIAL AND ECOLOGICAL IMPACTS OF LARGE-SCALE OIL PALM PLANTATION DEVELOPMENT IN SOUTHEAST ASIA 21 (2005), available at [http://www.foe.co.uk/resource/reports/greasy\\_palms\\_impacts.pdf](http://www.foe.co.uk/resource/reports/greasy_palms_impacts.pdf) (last visited Oct. 14, 2008) [hereinafter GREASY PALMS].
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- <sup>46</sup> Greenpeace.org, *How the Palm Oil Industry is Cooking the Climate*, (Nov. 8, 2007), <http://www.greenpeace.org/international/press/reports/cooking-the-climate-full> (last visited Oct. 22, 2008) [hereinafter *Cooking the Climate*].
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- <sup>56</sup> Adianto P. Simamora, *Palm Oil Firms Reject Forest Moratorium*, JAKARTA POST (Aug. 27, 2008), available at <http://www.thejakartapost.com/news/2008/08/27/palm-oil-firms-reject-forest-moratorium.html> (last visited Oct. 14, 2008).
- <sup>57</sup> GREASY PALMS, *supra* note 38, at 21.
- <sup>58</sup> *Id.*
- <sup>59</sup> CONVENTION ON BIOLOGICAL DIVERSITY, *supra* note 35, at 11.
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- <sup>61</sup> These canals often cut through rivers and streams, interrupting water flow.
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- <sup>75</sup> Faisal Kasryono, *Anatomi Masalah Perberasan Nasional Indonesia*, quoted in WATCH S. KEHATI, *INDONESIAN PATH TOWARD SUSTAINABLE ENERGY: A CASE STUDY OF DEVELOPING PALM OIL AS BIOMASS IN INDONESIA* 29 (2006) [hereinafter KEHATI].
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- <sup>78</sup> KEHATI, *supra* note 75, at 29.
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- <sup>88</sup> In 2006, a World Bank study estimated that 42% of Indonesians live between the USD 1 and USD 2 dollars a day poverty line. WORLD BANK, MAKING THE NEW INDONESIA WORK FOR THE POOR OVERVIEW XI (2006), available at [http://siteresources.worldbank.org/INTINDONESIA/Resources/Publication/280016-1152870963030/2753486-1165385030085/Overview\\_standalone\\_en.pdf](http://siteresources.worldbank.org/INTINDONESIA/Resources/Publication/280016-1152870963030/2753486-1165385030085/Overview_standalone_en.pdf) (last visited Oct. 15, 2008). The Indonesian government uses an even lower definition. In 2006, it was Rp.152,847 (USD 16.80) a month or around 56 cents a day. This is less money than is needed to afford a diet of 2,100 calories a day. *Always with Them*, ECONOMIST, Sept. 14, 2006, available at [http://www.economist.com/world/asia/displaystory/cfm?story\\_id=7925064](http://www.economist.com/world/asia/displaystory/cfm?story_id=7925064) (last visited Oct. 15, 2008).
- <sup>89</sup> Indonesia and Biofuel Fever, *supra* note 86.

<sup>90</sup> Figures supporting this include 2006 USAID figures that show every hour, 24 children under the age of 5 die in Indonesia; 54% from malnutrition and 19% from diarrhoea and respiratory illness. In 2006, UNICEF estimated that 2.3 million children under the age of 5 suffer from poor nutrition and that around 20-40% of children under the age of 5 in 72% of the provinces in Indonesia suffer from malnutrition. See SRI PALUPI, PROBLEM PELAKSANAAN DAN PENANGANAN PELANGGARAN HAK ATAS PANGAN DI INDONESIA [THE PROBLEMS OF IMPLEMENTING AND HANDLING VIOLATIONS OF THE RIGHT TO FOOD IN INDONESIA] (2007).

<sup>91</sup> Multa Fidrus, *Minister Lobbies EU Over Palm Oil Restrictions*, JAKARTA POST, Sept. 19, 2008, available at <http://www.thejakartapost.com/news/2008/09/19/minister-lobbies-eu-over-palm-oil-restrictions.html> (last visited Oct. 15, 2008).

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<sup>93</sup> The Roundtable on Sustainable Palm Oil (RSPO) is an association created by organizations carrying out their activities in and around the entire supply chain

for palm oil to promote the growth and use of sustainable palm oil through cooperation within the supply chain and open dialogue with its stakeholders. ROUNDTABLE ON SUSTAINABLE PALM OIL [RSPO], PRINCIPLES AND CRITERIA FOR SUSTAINABLE PALM OIL PRODUCTION (2007) available at [http://www.rspo.org/resource\\_centre/RSPO%20&%20Criteria%20Document.pdf](http://www.rspo.org/resource_centre/RSPO%20&%20Criteria%20Document.pdf) (last visited Oct. 15, 2008).

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<sup>4</sup> ASCHE & TVETERÅS, *supra* note 1. at 3.

<sup>5</sup> See generally Charles Fishman, *Global Fishiness*, SALON, (Jan. 23, 2006), available at [http://www.salon.com/tech/books/2006/01/23/walmart\\_effect/](http://www.salon.com/tech/books/2006/01/23/walmart_effect/) (last visited Nov. 11, 2006).

<sup>6</sup> UNCTAD, *supra* note 2, at 2.

<sup>7</sup> *Id.* at 22.

<sup>8</sup> Fishman, *supra* note 5.

<sup>9</sup> UNCTAD, *supra* note 2, at 2.

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<sup>11</sup> SalmonChile, Salmon Industry Profile, Slide No. 9 (June 6, 2008) <http://www.salmonchile.cl/frontend/seccion.asp?contid=397&secid=33&secoldid=33&subsecid=117&pag=1> (then follow "descargar" link next to Salmon Industry Profile) (last visited Nov. 11, 2006).

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<sup>13</sup> See generally UNCTAD, *supra* note 2, at 25.

<sup>14</sup> *Id.* at 27.

<sup>15</sup> *Id.* at 30.

<sup>16</sup> Pure Salmon Campaign, Labor Practices in the Farmed Salmon Industry, <http://www.puresalmon.org/pdfs/labor.pdf> (last visited Oct. 30, 2008).

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<sup>18</sup> Alexei Barrionuevo, *Safeway Restricts Purchase of Chilean Salmon, Citing Fish Virus*, N.Y. TIMES (Apr. 18, 2008), available at <http://www.nytimes.com/2008/04/17/world/americas/17chile.html?scp=3&sq=chile%20salmon&st=cse> (last visited Nov. 11, 2008).

<sup>19</sup> See *Marine Harvest Reports Chile Production Drop*, THE PATAGONIA TIMES (July 18, 2008), available at <http://www.patagoniatimes.cl/index.php/News/Salmon-News/MARINE-HARVEST-REPORTS-CHILE-PRODUCTION-DROP.html> (last visited Nov. 11, 2008).

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## ENDNOTES: TWO GLOBAL CRISES BRING OPPORTUNITY IN INTERNATIONAL TOBACCO CONTROL *continued from page 18*

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<sup>36</sup> *Id.*

<sup>37</sup> CAMPAIGN FOR TOBACCO-FREE KIDS, GOLDEN LEAF, BARREN HARVEST: THE COSTS OF TOBACCO FARMING (2001), available at <http://tobaccofreekids.org/campaign/global/FCTCreport1.pdf> (last visited Nov. 2, 2008) [hereinafter GOLDEN LEAF].

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<sup>40</sup> *Id.*

<sup>41</sup> World Health Organization, Tobacco and Poverty: A Vicious Circle (2004), available at [http://www.who.int/tobacco/resources/publications/en/poster\\_public\\_en.pdf](http://www.who.int/tobacco/resources/publications/en/poster_public_en.pdf) (last visited Nov. 2, 2008).

<sup>42</sup> Thomas A. Acury et al., *High Levels of Transdermal Nicotine Exposure Produce Green Tobacco Sickness in Latino Farm Workers*, 5 NICOTINE & TOBACCO RES. 315-21 (2003).

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<sup>47</sup> See GOLDEN LEAF, *supra* note 37.

<sup>48</sup> BurningBrain.org, Article 17 – FCTC Submission, <http://www.burningbrain.org/tobacco/brazilsubmission.htm> (last visited Nov. 2, 2008).

<sup>49</sup> See *List of decisions*, *supra* note 19.

<sup>50</sup> Second Meeting, *supra* note 20.

<sup>51</sup> See *id.*

<sup>52</sup> Conference of the Parties to the WHO FCTC, 3d Session, Durban, S. Afr., Nov. 17-22, 2008, *Provisional Agenda Item 4.8: Study Group on Economically Sustainable Alternative to Tobacco Growing*, FCTC/COP/3/11 (Sept. 4, 2008), available at [http://www.who.int/gb/fctc/PDF/cop3/FCTC\\_COP3\\_11-en.pdf](http://www.who.int/gb/fctc/PDF/cop3/FCTC_COP3_11-en.pdf) (last visited Oct. 15, 2008) [hereinafter *Study Group*].

<sup>53</sup> *Id.* at 5.

<sup>54</sup> FCTC, *supra* note 7, at 7.

<sup>55</sup> *Id.* at 4.

<sup>56</sup> *Id.*

<sup>57</sup> See John Hopkins School of Public Health, The Bloomberg Initiative, [http://www.jhsph.edu/global\\_tobacco/bloomberg\\_initiative/index.html](http://www.jhsph.edu/global_tobacco/bloomberg_initiative/index.html) (last visited Nov. 2, 2008) [hereinafter Bloomberg Initiative].

<sup>58</sup> Conference of the Parties to the WHO FCTC, 2d Session, *Consideration of a Budget and Program of Work for the Conference of Parties for the Financial Period 2008-2009*, Doc. A/FCTC/COP/2/13 Add.1 (June 27, 2007) available at [http://www.who.int/gb/fctc/PDF/cop2/FCTC\\_COP2\\_13Add1-en.pdf](http://www.who.int/gb/fctc/PDF/cop2/FCTC_COP2_13Add1-en.pdf) (last visited Nov. 2, 2008).

<sup>59</sup> Bloomberg Initiative, *supra* note 57.

<sup>60</sup> FCTC, *supra* note 7.

<sup>61</sup> See, e.g., Golden LEAF Foundation Website, <http://www.goldenleaf.org/> (last visited Nov. 2, 2008). North Carolina's Golden LAEF Foundation has allocated hundreds of millions of dollars for research and development of North Carolina's biotechnology industry and viable crop substitutes for tobacco farmers.

<sup>62</sup> Phillip Rucker, *End of an Era for Maryland Tobacco*, WASH. POST, Mar. 1, 2007, at SM1, available at <http://www.washingtonpost.com/wp-dyn/content/article/2007/02/28/AR2007022800006.html> (last visited Oct. 16, 2008).

<sup>63</sup> Maryland Department of Agriculture, Tobacco Transition Program (State-wide), Analysis of the FY 2005 Maryland Executive Budget (2004) 1, available at [http://mlis.state.md.us/2004rs/budget\\_docs/All/Capital/LA00\\_-\\_Tobacco\\_Transition\\_PAYGO.pdf](http://mlis.state.md.us/2004rs/budget_docs/All/Capital/LA00_-_Tobacco_Transition_PAYGO.pdf) (last visited Nov. 2, 2008).

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<sup>65</sup> *Id.* at 6.

<sup>66</sup> The World Bank, *Global Trends in Tobacco Use, in CURBING THE EPIDEMIC: GOVERNMENTS AND THE ECONOMICS OF TOBACCO CONTROL* (1999).

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<sup>10</sup> HENNING STEINFELD ET AL., FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, LIVESTOCK'S LONG SHADOW: ENVIRONMENTAL ISSUES AND OPTIONS 112 (2006), available at <ftp://ftp.fao.org/docrep/fao/010/A0701E/A0701E00.pdf> (last visited Nov. 13, 2008).

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<sup>12</sup> David Pimentel et al., *Environmental, Energetic, and Economic Comparisons of Organic and Conventional Farming Systems*, 55 *BIO SCIENCE* 7, 579 (2005), available at [http://www.ce.cmu.edu/~gdr/readings/2007/02/20/Pimental\\_EnvironmentalEnergeticAndEconomicComparisonsOfOrganicAndConventionalFarmingSystems.pdf](http://www.ce.cmu.edu/~gdr/readings/2007/02/20/Pimental_EnvironmentalEnergeticAndEconomicComparisonsOfOrganicAndConventionalFarmingSystems.pdf) (last visited Nov. 13, 2008) [hereinafter Pimental et al., *Farming Systems*].

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<sup>14</sup> David Pimentel et al., *Reducing Energy Inputs in the US Food System*, 36 *HUM. ECOLOGY* 459 (2008). See also U.S. GEN. ACCOUNTING OFFICE, AGRICULTURAL PESTICIDES: MANAGEMENT IMPROVEMENTS NEEDED TO FURTHER PROMOTE INTEGRATED PEST MANAGEMENT (2001), available at <http://www.gao.gov/new.items/d01815.pdf> (last visited Nov. 13, 2008) (noting that chemical pesticides account for three-fourths of pesticides used in the United States) [hereinafter Pimentel et al., *Reducing Energy Inputs*].

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<sup>21</sup> *Id.* at 575.

<sup>22</sup> *Id.* at 573.

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- <sup>112</sup> *Id.* at 1.
- <sup>113</sup> 2008 Farm Bill, Office of Senator Crapo, [http://crapo.senate.gov/issues/ag/farm\\_bill.cfm](http://crapo.senate.gov/issues/ag/farm_bill.cfm) (last visited Nov. 13, 2008).
- <sup>114</sup> David Herszenhorn & David Stout, *Defying President Bush, Senate Passes Farm Bill*, N.Y. TIMES, May 15, 2008, available at <http://www.nytimes.com/2008/05/15/washington/15cnd-farm.html?ref=business> (last visited Nov. 13, 2008).
- <sup>115</sup> See generally House Agriculture Committee, Hearings and Opening Statements, <http://agriculture.house.gov/hearings/statements.html> (follow hyperlinks below "To review the short- and long-term costs of hunger in America") (last visited Nov. 13, 2008).
- <sup>116</sup> KING CORN: YOU ARE WHAT YOU EAT (Mosaic Films 2007).
- <sup>117</sup> *Public Hearing to Review Renewable Fuels Standard Implementation and Agriculture Producer Eligibility: Hearing Before the Subcomm. on Conservation, Credit, Energy and Research of the H. Comm. on Agriculture*, 110th Cong. 3 (2008) (statement of Dr. Kenneth G. Cassman, Director, Nebraska Center for Energy Sciences Research and Professor of Agronomy, University of Nebraska).
- <sup>118</sup> S. REP. NO. 110- 220 (2008), available at [http://www.congress.gov/cgi-bin/cpquery/?&sid=cp11037JhW&refer=&r\\_n=sr220.110&db\\_id=110&item=&sel=TOC\\_48046&](http://www.congress.gov/cgi-bin/cpquery/?&sid=cp11037JhW&refer=&r_n=sr220.110&db_id=110&item=&sel=TOC_48046&) (last visited Nov. 2, 2008).

## ENDNOTES: CONSERVING FARMLAND IN CALIFORNIA *continued from page 49*

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- <sup>8</sup> See I.R.C. § 170 (2000).
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- <sup>11</sup> Stephen M. Wheeler, *The Evolution of Built Landscapes in Metropolitan Regions*, 27 J. OF PLAN. EDUC. & RES. 400, 405 (2008).
- <sup>12</sup> Edward Thompson Jr., California State Director, American Farmland Trust, Annual Legislative Symposium of the Planning & Conservation League (Jan. 12, 2008).
- <sup>13</sup> ALVIN D. SOKOLOW, AM. FARMLAND TRUST, A NATIONAL VIEW OF AGRICULTURE EASEMENT PROGRAMS: MEASURING SUCCESS IN PROTECTING FARMLAND — REPORT 4, at 35-37 (2006), available at <http://www.farmland.org/resources/reports/NationalView.asp> (follow "Read the Report" hyperlink below report 4, the follow "Report 4.pdf" hyperlink under "download report") (last visited Nov. 10, 2008).
- <sup>14</sup> See Kendra Johnson, *Preserving Farmland, But For Whom?* 31 (Mar. 2008) (unpublished Master's Thesis, UC Davis Community Development Graduate Group, on file with author).
- <sup>15</sup> Valerie Cotsalas, *Preserving Land, but Not for Famers*, N.Y. TIMES, Aug. 5, 2007, available at <http://www.nytimes.com/2007/08/05/realestate/05lizo.html> (last visited Oct. 15, 2008). See DVD: *Farmers & Farmland for the Future: Beyond Conservation Easements* (Equity Trust, Inc. 2005). See also EQUITY TRUST, MODEL AGRICULTURE CONSERVATION EASEMENT WITH OPTION TO PURCHASE (2005), <http://equitytrust.org/ModelDocs.html> (follow hyperlink to title) (last visited Oct. 10, 2008); Adina Merenlender et al., *Land Trusts and Conservation Easements: Who is Conserving What for Whom?*, 18 CONSERVATION BIOLOGY 65 (2004); Jeff Pidot, *Reinventing Conservation Easements*, LAND LINES, Oct. 2005.
- <sup>16</sup> JOHNSON, *supra* note 14, at 11-12.
- <sup>17</sup> JERED LAWSON, COMMUNITY ALLIANCE WITH FAMILY FARMERS, THIS LAND SHALL BE FOREVER STEWARDED (1997), available at <http://www.caff.org/publications/Thislandshallbeforeverstewarded-screen.pdf> (last visited Oct. 15, 2008).
- <sup>18</sup> MASS. GEN. LAWS ANN. CH. 184, § 31 (West 2008).

- <sup>19</sup> VT. STAT. ANN. tit. 10 § 6303 (2008).
- <sup>20</sup> Charles A. Francis, *Greening of Agriculture for Long-Term Sustainability*, 96 AGRONOMY J. 1211, 1214 (2004) (stating that the trend toward more federal and state regulation of property may lead to farm consolidation to the detriment of the owners of small farms).
- <sup>21</sup> CAL. CIV. CODE § 815 (West 2008).
- <sup>22</sup> See generally CAL. FARMLAND CONSERVANCY PROGRAM, MODEL EASEMENT (2006), [http://www.conservation.ca.gov/dlrp/cfcp/overview/Pages/cfcp\\_model\\_easement.aspx](http://www.conservation.ca.gov/dlrp/cfcp/overview/Pages/cfcp_model_easement.aspx). See also Farm and Ranch Lands Protection Program, <http://www.nrcs.usda.gov/programs/frpp/> (last visited Oct. 15, 2008).
- <sup>23</sup> CAL. HEALTH & SAFETY CODE § 17008 (West 2008).
- <sup>24</sup> MASS. GEN. LAWS ANN. CH. 184, § 31 (West 2008). See also Mass. Dep't of Agric. Res., <http://www.mass.gov/agr/landuse/APR/index.htm> (last visited Oct. 15, 2008).
- <sup>25</sup> SOKOLOW, *supra* note 13, at 13-14.
- <sup>26</sup> Mass. Dep't of Food & Agric., *Legislation Filed to Keep Protected Mass. Farmland Affordable for Farmers*, 78 FARM & MARKET REPORT 1, 1 (2001).
- <sup>27</sup> CAL. CIV. CODE §§ 815-816 (West 2008).
- <sup>28</sup> CAL. CIV. CODE § 815 (West 2008).
- <sup>29</sup> See, e.g., Lawrence R. Kueter & Christopher S. Jensen, *Conservation Easements: An Underdeveloped Tool to Protect Cultural Resources*, 83 DENV. U. L. REV. 1057, 1065 (2005).
- <sup>30</sup> See generally Brentwood Agric. Land Trust, Land Conservation, How Does BALT Protect Precious Farmland, <http://www.brentwoodaglandtrust.org/page/page/4271814.htm> (last visited Oct. 22, 2008).
- <sup>31</sup> See discussion *infra*.
- <sup>32</sup> See generally, LAWSON, *supra* note 17, at 2-3.
- <sup>33</sup> EQUITY TRUST, *supra* note 15; see also EQUITY TRUST, COMMENTARY ON MODEL AGRIC. CONSERVATION EASEMENT WITH OPTION TO PURCHASE (2005), <http://equitytrust.org/ModelDocs.html> (follow hyperlink to title) (last visited Oct. 10, 2008).
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- <sup>35</sup> MASS. GEN. LAWS ANN. CH. 184, § 31 (West 2008); see also VT. STAT. ANN. tit. 10 § 6303 (2008).
- <sup>36</sup> Interview with Christine Chisolm, APR Program Planner, Agricultural Development, Massachusetts Department of Agricultural Resources, in Boston, Ma. (2008); Interview with Lorraine O'Connor, Chief Veterinarian Health Officer, Animal Health, Massachusetts Department of Agricultural Resources, in Boston, Ma. (2008); Interview with Carol Szocik, APR Senior Land Use Planner, Massachusetts Department of Agricultural Resources, in Boston, Ma. (2008) (citing generally positive statements by the interviewees agreeing that OPAV is a strong deterrent to non-farm buyers).
- <sup>37</sup> MASS. GEN. LAWS ANN. CH. 184, § 31 (West 2008). See also VT. STAT. ANN. tit. 10 § 6303 (2008).
- <sup>38</sup> EQUITY TRUST, *supra* note 15.
- <sup>39</sup> VT. STAT. ANN. tit. 10 § 6303 (2008).
- <sup>40</sup> Personal Communication with Justus DeVries, Appraiser (2008).
- <sup>41</sup> EQUITY TRUST, *supra* note 15, at 8.
- <sup>42</sup> See *id.* See also MASS. GEN. LAWS ANN. CH. 184, § 31 (West 2008).
- <sup>43</sup> Vermont Land Trust Memo to landowners entitled "Operating Farms: Vermont Land Trust Option to Purchase" (2006).

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## ENDNOTES: THREE KEYS FOR REHABILITATING AND STABILIZING HAITI *continued from page 50*

- <sup>3</sup> World Food Programme, *Where We Work-Haiti, Food Security Overview*, [http://www.wfp.org/country\\_brief/indexcountry.asp?country=332#Facts%20&%20Figures](http://www.wfp.org/country_brief/indexcountry.asp?country=332#Facts%20&%20Figures) (last visited Nov. 1, 2008).
- <sup>4</sup> *Id.* (adding that food supply in Haiti covers only fifty-five percent of the population).
- <sup>5</sup> Joseph Guyler Delva & Jim Loney, *Haiti's Government Falls After Food Riots*, REUTERS UK, Apr. 13, 2008, available at <http://uk.reuters.com/article/topNews/idUKN1228245020080413> (last visited Nov. 13, 2008).
- <sup>6</sup> Marc Lacey, *Meager Living of Haitians Is Wiped Out by Storms*, N.Y. TIMES, Sept. 11, 2008, available at [http://www.nytimes.com/2008/09/11/world/americas/11haiti.html?\\_r=1&scp=6&sq=Haiti&st=cse&oref=slogin](http://www.nytimes.com/2008/09/11/world/americas/11haiti.html?_r=1&scp=6&sq=Haiti&st=cse&oref=slogin) (last visited Nov. 13, 2008).
- <sup>7</sup> USAID, HAITI - STORMS (Sept. 29, 2008), available at [http://www.usaid.gov/our\\_work/humanitarian\\_assistance/disaster\\_assistance/countries/haiti/template/fs\\_sr/fy2008/haiti\\_st\\_fs12\\_09-29-2008.pdf](http://www.usaid.gov/our_work/humanitarian_assistance/disaster_assistance/countries/haiti/template/fs_sr/fy2008/haiti_st_fs12_09-29-2008.pdf) (last visited Nov. 1, 2008).
- <sup>8</sup> *Id.*
- <sup>9</sup> *Id.*
- <sup>10</sup> SHAHIDUR R. KHANDKER, THE WORLD BANK ECONOMIC REVIEW, MICROFINANCE AND POVERTY: EVIDENCE USING PANEL DATA FROM BANGLADESH (2005), available at <http://wber.oxfordjournals.org/cgi/content/abstract/19/2/263> (last visited Nov. 13, 2008).
- <sup>11</sup> Fonzoze, *Our Mission*, <http://www.fonkoze.org/aboutfonkoze/whoweare/ourmission.html> (last visited Nov. 1, 2008).
- <sup>12</sup> Anne Hastings, *Fonzoze, The Global Food Crisis: Its Impact on Micro-finance Institutions and Their Clients*, Sept. 4, 2008, <http://www.fonkoze.org/publications/videos/7-educational/86-anne-hastings-on-the-global-food-crisis-impact-on-microfinance-institutions-and-their-clients.html> (last visited Nov. 1, 2008).
- <sup>13</sup> *Id.*
- <sup>14</sup> USAID/HAITI, GOVERNING JUSTLY & DEMOCRATICALLY FACT SHEET (Sept. 2008) available at [http://www.usaid.gov/ht/gjd\\_factsheet.html](http://www.usaid.gov/ht/gjd_factsheet.html) (last visited Nov. 1, 2008).
- <sup>15</sup> CHF INTERNATIONAL, HAITI KATA FACTSHEET, available at <http://www.chfinternational.org/files/Haiti%20-%20KATA-%20July%202007.pdf> (last visited Nov. 13, 2008) (explaining that the KATA initiative is implemented by Cooperative Housing Foundation International, funded by USAID, and developed in accordance with the GOH).

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## ENDNOTES: THE CASE FOR GREEN FOOD LABELS *continued from page 55*

- <sup>14</sup> See Coffee, *supra* note 4, at 298.
- <sup>15</sup> Avallone, *supra* note 9, at 694.
- <sup>16</sup> *Id.*
- <sup>17</sup> Coffee, *supra* note 4, at 298-99.
- <sup>18</sup> *Id.*
- <sup>19</sup> Harrison, *supra* note 5, at 216-17.
- <sup>20</sup> *Id.* at 215-16.
- <sup>21</sup> *Id.* at 216.
- <sup>22</sup> *Id.* at 217-18.
- <sup>23</sup> *Id.* at 224-25.
- <sup>24</sup> *Id.* at 221-23.
- <sup>25</sup> Press Release, Union of Concerned Scientists, *New USDA Grass-fed Rules will Benefit Consumers and the Environment* (Oct. 16, 2007), [http://www.ucsusa.org/news/press\\_release/rules.html](http://www.ucsusa.org/news/press_release/rules.html) (last visited Nov. 14, 2008).
- <sup>26</sup> Mandatory Country of Origin Labeling of Muscle Cuts of Beef (Including Veal), Lamb, Chicken, Goat, and Pork; Ground Beef, Ground Lamb, Ground Chicken, Ground Goat, and Ground Pork, 73 Fed. Reg. 50,701, 50,703 (Aug. 28, 2008) (to be codified at 9 C.F.R. pts. 317, 318).
- <sup>27</sup> Avallone, *supra* note 9, at 688.
- <sup>28</sup> *Id.*
- <sup>29</sup> *Id.* at 686, 689.
- <sup>30</sup> *Id.* at 692.
- <sup>31</sup> Coffee, *supra* note 4, at 302.
- <sup>32</sup> See *id.* at 306.
- <sup>33</sup> *Id.* at 338.
- <sup>34</sup> *Id.*
- <sup>35</sup> Avallone, *supra* note 9, at 695.
- <sup>36</sup> *Id.*
- <sup>37</sup> Granatstein, *supra* note 11, at 1-3.
- <sup>38</sup> Judy Finch, *Tesco Labels Will Show Products' Carbon Footprints*, THE GUARDIAN (London), Apr. 16, 2008, UK News 6, available at <http://www.guardian.co.uk/environment/2008/apr/16/carbonfootprints.tesco>.
- <sup>39</sup> *Id.*
- <sup>40</sup> Justin McCurry, *Japan to Launch Carbon Footprint Labelling Scheme*, THE GUARDIAN (London) (Aug. 20, 2008), <http://www.guardian.co.uk/environment/2008/aug/20/carbonfootprints.carbonemissions>
- <sup>41</sup> Granatstein, *supra* note 11, at 3-4.
- <sup>42</sup> See FDA Milestones Backgrounder, *supra* note 6.
- <sup>43</sup> *Id.*
- <sup>44</sup> FDA Food Label Backgrounder, *supra* note 7.
- <sup>45</sup> FDA Milestones Backgrounder, *supra* note 6.
- <sup>46</sup> American Heart Association, Nutrition Labeling, <http://www.americanheart.org/presenter.jhtml?identifier=4631> (last visited on Oct. 1, 2008).
- <sup>47</sup> *Id.*
- <sup>48</sup> FDA Food Label Backgrounder, *supra* note 7.
- <sup>49</sup> *Id.*
- <sup>50</sup> Nutritional Health Alliance v. Shalala, 144 F.3d 220, 223 (2d Cir. 1998).
- <sup>51</sup> *Id.* at 225.
- <sup>52</sup> Ass'n of Nat'l Advertisers v. Lungren, 44 F.3d 726, 727, 727 (9th Cir. 1994).
- <sup>53</sup> *Id.* at 728.
- <sup>54</sup> See Central Hudson Gas & Elec. Corp. v. Public Serv. Comm'n, 447 U.S. 557 (1980).
- <sup>55</sup> *Nutritional Health Alliance*, 144 F.3d at 225, n. 10; *Lungren*, 44 F.3d at 729.
- <sup>56</sup> *Nutritional Health Alliance*, 144 F.3d at 228; *Lungren*, 44 F.3d at 736-37.
- <sup>57</sup> FDA Food Label Backgrounder, *supra* note 7.
- <sup>58</sup> See generally, Carbon Trust, <http://www.carbontrust.co.uk/default.ct> (last visited Nov. 16, 2008).
- <sup>59</sup> Food, Nutrition & Science, Carbon Footprint Food Labels, <http://www.foodnutritionscience.com/index.cfm/do/monsanto.article/articleId/91.cfm> (last visited Oct. 15, 2008).
- <sup>60</sup> Connolly, *supra* note 3, at 136-37.
- <sup>61</sup> *Id.* at 136.
- <sup>62</sup> Water Footprint Network, Water Footprint Product Gallery: Coffee, <http://www.waterfootprint.org/?page=files/productgallery&product=coffee> (last visited November 16, 2008).

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## ENDNOTES: PREPARING FOR THE UNKNOWN *continued from page 56*

- <sup>17</sup> See FALKENRATH ET. AL., *supra* note 7, at 194 (giving the example of the 1995 bombing of the Alfred P. Murrah Federal Building as the largest domestic terror attack prior to 9/11, which "resulted from extreme right-wing anti-government sentiment").
- <sup>18</sup> See Pate & Cameron, *supra* note 11, at 7 (noting that in the U.S. "members of the Ku Klux Klan supposedly poisoned the water supply of cattle owned by a group of Black Muslims in Ashville, Alabama, in March 1970").
- <sup>19</sup> See Mark Potok, *President Obama? Many White Supremacists Are Celebrating* (Jun. 11, 2008), <http://www.splcenter.org/blog/2008/06/11/president-obama-many-white-supremacists-are-celebrating/> (quoting former KKK leader David Duke that "Obama will let the American people know that there is a real cancer eating away at the heart of our country . . . [Whether he] wins or loses in November, millions of European Americans will inevitably react with new awareness of their heritage and the need for them to defend and advance it."); see also Michel Martin & Dina Temple-Raston, *Former Skinhead on Alleged Plot to Kill Obama*, NATIONAL PUBLIC RADIO (Oct. 29, 2008) available at <http://www.npr.org/templates/story/story.php?storyId=96257563> (last visited Oct. 30, 2008).
- <sup>20</sup> See generally FALKENRATH ET. AL., *supra* note 7, at 210 (stating that "innate curiosity, fascination, or the need to demonstrate their competence and worth to society is [an additional] possible reason why individuals or groups might attempt to acquire and even use weapons of mass destruction.").
- <sup>21</sup> FALKENRATH ET. AL., *supra* note 7, at 200.
- <sup>22</sup> See generally *id.* at 200-211.
- <sup>23</sup> See generally MONKE, *supra* note 1, at 47-54 (detailing laws, regulations, and appropriations which support federal and local agencies in their efforts to prevent agroterrorism).
- <sup>24</sup> See Matthew Harwood, *USDA Working Hard to Prevent Agroterrorism, Secretary Says*, SECURITY MANAGEMENT, Apr. 25, 2008, available at <http://www.securitymanagement.com/news/usda-working-hard-prevent-agroterrorism-secretary-says> (last visited Oct. 18, 2008).

- <sup>6</sup> See e.g., Carmel Crimmins, *Food Crisis May Open Door to Genetically Modified Rice*, REUTERS, June 3, 2008, <http://www.reuters.com/article/reutersEdge/idUST22496920080603> (last visited Oct. 26, 2008); see also Raphael Minder et al., *Nestlé Asks Europe to Soften Line on GM*, FIN. TIMES, June 22, 2008, [http://us.ft.com/figateway/superpage.ft?news\\_id=fto062220081843076240](http://us.ft.com/figateway/superpage.ft?news_id=fto062220081843076240) (last visited Oct. 26, 2008); Ian Sample, *Hunger in Africa Blamed on Western Rejection of GM Food*, GUARDIAN, Sept. 8, 2008, at 9, available at <http://www.guardian.co.uk/environment/2008/sep/08/gmcrops.food> (last visited Oct. 26, 2008).
- <sup>7</sup> See generally Clive James, *Global Status of Commercialized Biotech/GM Crops: 2007*, INT'L SERVICE FOR ACQUISITION OF AGRICULTURE BIOTECH APPLICATIONS, available at [www.isaaa.org/resources/publications/briefs/37/executivesummary](http://www.isaaa.org/resources/publications/briefs/37/executivesummary) (last visited Oct. 24, 2008) (providing figures on GM crop use and spread).
- <sup>8</sup> See *id.*
- <sup>9</sup> Linda Bren, *Genetic Engineering: The Future of Foods?*, FDA CONSUMER MAG., Nov.-Dec. 2003, available at [http://www.fda.gov/fdac/features/2003/603\\_food.html](http://www.fda.gov/fdac/features/2003/603_food.html) (last visited Oct. 24, 2008).
- <sup>10</sup> James, *supra* note 7.
- <sup>11</sup> International Service for the Acquisition of Agri-Biotech Applications [ISAAA], ISAAA Brief 37-2007: Global Status of Commercialized Biotech (2007), available at <http://www.isaaa.org/resources/publications/briefs/37/executivesummary/default.html> (last visited Oct. 27, 2008).
- <sup>12</sup> Tokar, *supra* note 3.
- <sup>13</sup> *Id.*
- <sup>14</sup> See *Id.*; see generally Rachel A. Schurman & William A. Munro, *Making Biotech History: Social Resistance to Agricultural Biotechnology and the Future of the Biotechnology Industry*, in ENGINEERING TROUBLE: BIOTECHNOLOGY AND ITS DISCONTENTS 111 (Dennis Doyle et al. eds., 2003).
- <sup>15</sup> See generally RONALD BAILEY, LIBERATION BIOLOGY: THE SCIENTIFIC AND MORAL CASE FOR THE BIOTECH REVOLUTION (2005). See also AM. ENTER. INST., LET THEM EAT PRECAUTION: HOW POLITICS IS UNDERMINING THE GENETIC REVOLUTION IN AGRICULTURE (Jon Entine, ed., 2006); JENNIFER A. THOMSON, GENES FOR AFRICA: GENETICALLY MODIFIED CROPS IN THE DEVELOPING WORLD (2004).
- <sup>16</sup> See BAILEY, *supra* note 15.
- <sup>17</sup> See VANDANA SHIVA, STOLEN HARVEST: THE HIJACKING OF THE GLOBAL FOOD SUPPLY (2000).
- <sup>18</sup> See generally JEFFREY M. SMITH, GENETIC ROULETTE: THE DOCUMENTED HEALTH RISKS OF GENETICALLY ENGINEERED FOODS (2007).
- <sup>19</sup> BILL MCKIBBEN, ENOUGH: STAYING HUMAN IN AN ENGINEERED AGE (Henry Holt & Co. 2003).
- <sup>20</sup> See generally CLAIRE HOPE CUMMINGS, UNCERTAIN PERIL: GENETIC ENGINEERING AND THE FUTURE OF SEEDS (2008).
- <sup>21</sup> See Lee M. Silver, *Challenging Nature: The Clash of Science and Spirituality at the New Frontiers of Life*, N.Y. TIMES, July 4, 2006, <http://www.nytimes.com/2006/07/04/science/04books-excerpt.html> (last visited Oct. 27, 2008).
- <sup>22</sup> See *id.*
- <sup>23</sup> See GUY COOK, GENETICALLY MODIFIED LANGUAGE (2004) (providing an account of this and other rhetorical struggles in the politics of GM foods).
- <sup>24</sup> BAILEY, *supra* note 15.
- <sup>25</sup> See generally ANDREW FEENBERG, QUESTIONING TECHNOLOGY (1999).
- <sup>26</sup> LANGDON WINNER, THE WHALE AND THE REACTOR: A SEARCH FOR LIMITS IN AN AGE OF HIGH TECHNOLOGY 10 (1986).
- <sup>27</sup> FEENBERG, *supra* note 25, at 2.
- <sup>28</sup> *Id.*
- <sup>29</sup> Kevin Keener, et al., *Biotechnology and its Applications*, available at <http://www.ces.ncsu.edu/depts/foodsci/ext/pubs/bioapp.pdf> (last visited Oct. 27, 2008).
- <sup>30</sup> Colin Trudge, *The Truth About GM*, NEW STATESMAN, Aug. 28, 2008, <http://www.newstatesman.com/food/2008/08/technology-feed-crops-farming> (last visited Nov. 10, 2008).
- <sup>31</sup> See FOOD AND AGRICULTURE ORGANIZATION [FAO], BRIEFING PAPER: HUNGER ON THE RISE (2008), available at <http://www.fao.org/newsroom/common/ecg/1000923/en/hungerfigs.pdf> (last visited Oct. 24, 2008) [hereinafter FAO].
- <sup>32</sup> See Jad Mouawad, *Oil Prices Take a Nerve-Rattling Jump Past \$138*, N.Y. TIMES, June 7, 2008, <http://www.nytimes.com/2008/06/07/business/07oil.html?scp=2&sq=oil%20prices%20%24150&st=cse> (last visited Oct. 27, 2008) (“Oil prices have doubled in the last 12 months, and are up 42 percent since the beginning of the year”).
- <sup>33</sup> See BLOOMBERG NEWS, *Drought in Australia Helps Push Wheat Prices to a 10-Year High*, N.Y. TIMES, Oct. 12, 2006, available at <http://www.nytimes.com/2006/10/12/business/worldbusiness/12wheat.html> (last visited Oct. 27, 2008).
- <sup>34</sup> See *id.*
- <sup>35</sup> THE ECONOMIST, *The New Face of Hunger* (Apr. 17, 2008), available at [http://www.economist.com/world/international/displaystory.cfm?story\\_id=11049284](http://www.economist.com/world/international/displaystory.cfm?story_id=11049284) (last visited Oct. 26, 2008) [hereinafter *New Face of Hunger*].
- <sup>36</sup> *Id.*
- <sup>37</sup> *Id.*
- <sup>38</sup> See e.g., Jeremy Cook, *GM Food: Monster or Saviour*, BBC NEWS, May 29, 2008, <http://news.bbc.co.uk/2/hi/7426054.stm> (last visited Oct. 27, 2008).
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