

# Coffee Production in a Time of Crisis: Social and Environmental Connections

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*The coffee industry rests upon the production of a global commodity that has grown two-fold in volume and 3.5 times in value since the 1960s, generating in the process billions of annual export dollars. This article discusses coffee's history as a global commodity, and its environmental and social implications. Occupying some 10 million hectares globally, millions of small producers and their families depend upon coffee as their major source of income. Their livelihood is threatened today by a price crisis brought on by overproduction. But, innovative market initiatives linked to social equity and ecological or conservation concerns have the potential to lift producers out of the devastation caused by low prices. Government and private sector actors also have a role to play in solving the crisis.*

Few crops provide "windows" into so wide an array of issues as coffee. This shrub of the family *Rubiaceae*, which also contains the ornamental plant *Gardenia spp.*, hails from the mid-elevation region of east Africa, what is now Ethiopia and the Sudan. Its introduction into the Americas in the 1700s provided many countries' national governments with the workable ingredients for developing agricultural export economies. The capital generated by coffee exports since the early to late-1800s also allowed already established local economic interests to accumulate huge fortunes and entrepreneurial initiatives to gain footholds in national and international sectors. Coffee today continues to generate significant private and public revenues, with some 5.5 million metric tons worth \$8.4 billion exported worldwide in 2000 (see Table 1 for country exports), an increase of 101 percent in volume and 356

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**Table 1: Exports, by Country, to All Destinations  
(for dates listed)  
(Units=60 kilo bags)**

	Aug-01 to Jul-02	% World Exports		Aug-01 to Jul-02	% World Exports
World Total	87,053,261	100.0	Zambia	100,198	0.1
<b>Colombian Milds</b>	11,864,306	13.6	Zimbabwe	85,998	0.1
Colombia	10,458,824	12.0	<b>Brazilian Naturals</b>	27,041,237	31.1
Kenya	751,551	0.9	Brazil	25,190,825	28.9
Tanzania	653,931	0.8	Ethiopia	1,839,412	2.1
<b>Other Milds</b>	22,171,935	25.5	Paraguay	11,000	0.0
Bolivia	63,213	0.1	<b>Robustas</b>	25,975,783	29.8
Burundi	275,933	0.3	Angola	10,175	0.0
Costa Rica	1,926,864	2.2	Congo, Dem. Rep. of	213,959	0.2
Cuba	92,686	0.1	Ghana	31,460	0.0
Dominican Republic	91,919	0.1	Guinea	66,690	0.1
Ecuador	653,265	0.8	Indonesia	4,930,780	5.7
El Salvador	1,466,028	1.7	Nigeria	2,368	0.0
Guatemala	3,162,907	3.6	Cameroon	695,116	0.8
Haiti	78,244	0.1	Cent. African Rep.	114,400	0.1
Honduras	2,415,589	2.8	Côte d'Ivoire	4,155,020	4.8
India	3,557,506	4.1	Gabon	272	0.0
Jamaica	24,747	0.0	Madagascar	290,000	0.3
Malawi	58,882	0.1	Togo	127,253	0.1
Mexico	2,986,743	3.4	Philippines	6,035	0.0
Nicaragua	978,869	1.1	Sierra Leone	17,465	0.0
Panama	74,298	0.1	Sri Lanka	2,280	0.0
Papua New Guinea	1,016,970	1.2	Thailand	470,554	0.5
Peru	2,665,138	3.1	Trinidad and Tobago	453	0.0
Rwanda	314,340	0.4	Uganda	3,255,062	3.7
Venezuela	81,598	0.1	Vietnam	11,586,441	13.3

Source: ICO, 2002

percent in value since 1961.<sup>1</sup> Such lofty increases fail to address, however, the social and environmental sides of this globally traded commodity. The production glut of the last few years, for example, has had devastating social consequences for millions of coffee growers, the downstream businesses dependent upon these producers, and countries whose foreign exchange depends upon the crop.

As an agroforestry crop managed mainly by smallholders, coffee provides insight into a number of provoking themes, including the emergence and structure of national political-economic power blocks;<sup>2</sup> uneven development within countries;<sup>3</sup> government control mechanisms for political ends;<sup>4</sup> global movements related to social justice;<sup>5</sup> and the environmental benefits of certain coffee systems.<sup>6</sup> This paper will trace the crisis in coffee, focusing on the social and environmental aspects of its production—particularly at the farm level—to provide a window onto the natural and human landscapes associated with our morning cup of coffee. The first section discusses coffee's development into an international commodity. The second section considers the wide-ranging effects of the crisis—both social and environmental—stemming from current overproduction. The final section explores some positive developments within the coffee industry that can improve coffee's environmental impact and ease the crisis for growers able to take advantage of new markets.

## **Production and Organizational History**

### *Production Development*

As with any crop, coffee's major areas of production have shifted over time. Going back to the twelfth or thirteenth centuries—and some contend to the sixth<sup>7</sup>—the Arabian peninsula was the principal region of commercial coffee production. What is now Yemen then played a central role in supplying the Arabic world with coffee, along with Abyssinia (now Ethiopia). Holland's colonial front-line explorers and entrepreneurs took coffee to Ceylon, Timor, Sumatra, and other Southeast Asian holdings. The Dutch East Indies quickly became the most important region in the world for coffee.<sup>8</sup>

Other colonial powers also introduced coffee into their tropical territories between the sixteenth and nineteenth centuries; coffee arrived in the Americas in the eighteenth century, established by the French on the Caribbean island of Martinique. From this

single source, together with Dutch introduction in South America, sprung much of the New World's coffee industry.<sup>9</sup> Aiding the emergence of the Americas—and especially of Brazil—as a center of production was the appearance of coffee leaf rust (*Hemileia vastatrix*) in the Old World. The rust is a fungal disease that devastated the coffee farms of Ceylon, India, and, subsequently, Indonesia beginning in the late-1800s, making coffees from these areas scarce and costly. The result was that expensive coffee from the Dutch East Indies, which had determined the global price for years, lost out to the increasing supply of cheaper coffee from Brazil.<sup>10</sup>

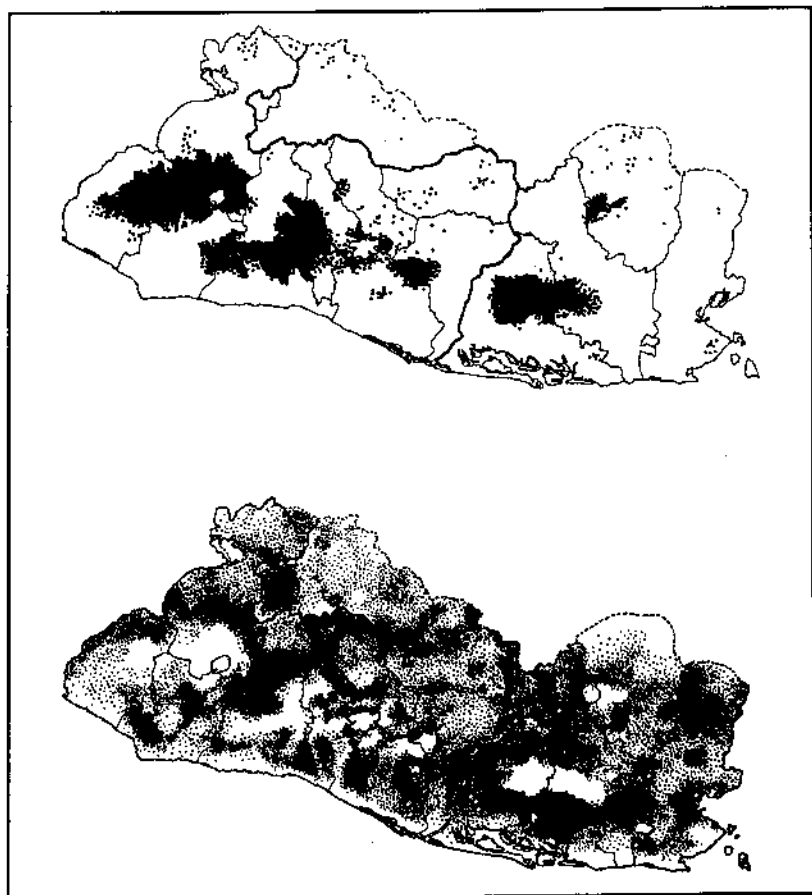
Coffee rapidly displaced other crops in the Americas. El Salvador's coffee boom within the past century and a half illustrates coffee's pervasiveness in driving out other crops. Prior to the expansion of coffee, the slopes of El Salvador's fertile volcanic regions were dotted with subsistence production of corn, beans, fruit trees, and upland rice. With the success of coffee production, large coffee plantations displaced these crops and pushed small holders from their land, creating major food scarcity problems for the rural peasants. An eyewitness account from the late-1920s paints a grim picture of the situation:

The conquest of territory by the coffee industry is alarming. It has already occupied all the high ground and is now descending to the valleys, displacing maize, rice, and beans. It goes in the manner of the conquistador, spreading hunger and misery, reducing the former proprietors to the worst conditions—woe to those who sell out!<sup>11</sup>

Together with pasturelands, coffee ended up removing foodstuff production from the richest areas of El Salvador's landscape (Figure 1). The natural "capital" of the land was skewed in favor of export agriculture. While one might argue that such competitive allocation aids the national balance of payments in terms of world trade, most Salvadorans did not benefit, and domestic food production suffered at the expense of the export crop.<sup>12</sup>

#### *Trade, Institutions, and Geopolitics: Addressing the Crisis of Overproduction*

Like commodities in general, coffee tends towards overproduction, leading, without institutional policies to address this problem, to steep price hikes and nosedives. Historically, attempts to stabilize prices, either by curbing supplies in producing countries or through international trade agreements, have had varying degrees



Coffee growing area (top), where one dot represents 25 hectares, and maize growing area (bottom), where one dot represents 10 hectares.

Source: William H. Durham, *Scarcity and Survival in Central America: Ecological Origins of the Soccer War* (Palo Alto, CA: Stanford University Press, 1979), 37.

of success. Nearly one hundred years ago, Brazil's "valorization" scheme stockpiled coffee to create a market shortage and increase prices; U.S. policymakers responded with sanctions against Brazilian imports and the U.S. broker who helped design the scheme.<sup>13</sup> Despite the U.S. reaction, in the first quarter of the century, Brazil still managed to manipulate its stocks so as to protect not only its own producers, but also those around the world. The maintenance of prices spurred further cultivation in many producing countries—making it more difficult to keep prices at favorable levels, and shrinking Brazil's global market share in coffee. Brazil responded by burning coffee supplies and initiating international conferences with other producing countries to discuss cartel-like solutions.<sup>14</sup>

Twentieth-century trade agreements also aimed, ostensibly, to address the boom-bust problem. Another core rationale, however, seems to have been geopolitical. The 1940 Inter-American Coffee Agreement (IACA), for instance, divided U.S. demand between Brazil and Colombia so that they could coexist as major producers, helping support their resistance to the Axis Powers's program during World War II and binding them to the U.S. strategic political agenda. Twenty years later, the International Coffee Agreement (ICA)—aside from establishing quotas and prices that satisfied both producing and consuming member countries—sought to stem the spread of communism in the Americas, acting as handmaiden to the Kennedy administration's Alliance for Progress.<sup>15</sup>

Regardless of the motives for such agreements, the quota system imposed by the ICA helped to generate substantially higher prices in member markets.<sup>16</sup> Moreover, while not controlling the tendency toward overproduction *per se*, the ICA did regulate coffee trade and allow for a number of tropical nations to hang their hopes on a "coffee-as-development" scheme.<sup>17</sup> But the ICA fell apart in 1989, resulting in a chaotic free-for-all in the global coffee trade. With the ICA's mainstay quotas out of the picture, overproduction has created a coffee glut that is driving world prices down, hurting farmers, and cutting foreign exchange earnings for producing countries to a fraction of historic levels.<sup>18</sup> In the 1980s, end consumers spent \$30 billion on coffee, while producing countries got \$10 billion, a ratio of about 33 percent. Today, best estimates put that ratio at only 15 percent.<sup>19</sup>

Price volatility and overproduction aside, characteristics specific to the coffee industry also play an important role in shaping the market. On the consumer (demand) side, the market is highly price-inelastic—that is, higher or lower prices do not seriously affect coffee demand.<sup>20</sup> This is understandable when we consider coffee's addictive nature and the more intangible mix of prestige and exoticness currently associated with specialty coffee.<sup>21</sup> On the production (supply) side, coffee displays short-run price-elasticity and longer term price-inelasticity. In the short run (roughly one year), producers may be able to increase supply with increased fertilization, intensive harvesting efforts, and other agricultural practices when prices climb. Yet, because coffee is a perennial, there is a built-in lag time averaging three to five years from the time of planting to the time of full production, resulting in prolonged periods of overproduction and price-inelasticity.<sup>22</sup> As witnessed

during the past couple of years, the price of coffee for the end consumer has not decreased, even though world supply has never been so plagued with overproduction and low prices paid to growers.<sup>23</sup>

Bolstering this idea, the International Coffee Organization (ICO) reports that between December 1999 and September 2001, coffee bean prices on the futures market (the "C" price tagged to coffee futures that ultimately controls prices paid to growers) fell by 57 percent due to the current glut. By contrast, U.S. retail prices fell by less than 10 percent during that same period.<sup>24</sup> In wending its way to the customer seated at home or at the café counter, coffee passes through an array of handlers and middlemen, all of whom take their piece of the final price. The ICO's data reveal that prices paid to producers in exporting ICO member countries averaged \$0.45 per pound in 2001—down significantly from prices paid in the late-1990s. Retail prices in importing member countries, by contrast, averaged \$5.66 per pound—showing little change in that same time period.<sup>25</sup> The sustained low prices paid to growers beg the question of why consumers have felt no relief in their cappuccinos and double lattes. The answer, according to industry experts, lies in marketing decisions by coffee outlets not to upset the customer with constantly fluctuating prices.<sup>26</sup>

While the growers are suffering, the large international firms dealing in "industrial" (canned or instant) coffees are reaping record profits today, taking advantage of low prices and a new manufacturing technology that has allowed the substitution of cheaper "robusta" beans in coffee that historically used only "arabica" beans.<sup>27</sup> While large firms are reluctant to divulge profit margins, knowledgeable industry personnel are able to calculate figures believed to be in line with current levels. A roaster's "normal" profit margin hovers around 15 percent; estimates of the "Big Four's" current profits tip the balance at 110 percent.<sup>28</sup>

It is worth recognizing that the coffee industry has not developed monolithically. It includes two very different sectors: industrial coffees (mentioned above) and specialty or gourmet coffees. Industrial manufacturers like Kraft Foods (Maxwell House), Procter & Gamble (Folger's), Sara Lee (Hills Brothers), Nestlé, and Tchibo (a German firm) dominate the global movement of coffee, accounting for up to one-half of all purchases.<sup>29</sup> Specialty coffees, those now firmly established in most urban commercial centers and many neighborhoods, represent a much smaller volume accounting for about 10 percent of all coffee exports. Such coffees represent about 15 percent of the unit volume

of all coffee sold in the United States, 40 percent of gross sales, and about 55 percent of the gross profit dollar sales. Retail estimates in 2001, which combine coffee beverages and coffee bean sales, measure the total U.S. specialty market at nearly \$11 billion.<sup>30</sup>

### The Current Crisis

#### *A Production Glut*

Today, coffee blankets some 10 million hectares of the Earth's tropical landscapes.<sup>31</sup> Main producers include Brazil, Colombia, Vietnam, Indonesia, and Côte d'Ivoire, which, combined, exported some 65 percent of the world's coffee in 2001-2002.<sup>32</sup> Hidden within these figures, however, is a quality question. In terms of production, the last half of the twentieth century saw more than a 150 percent increase in production and a more than 100 percent increase in area devoted to coffee. In northern Latin America alone, where some of the best quality coffees originate, the increase in production and area were 153 percent and 69 percent, respectively.<sup>33</sup> Table 2 provides area and production data for key producing countries.

The area, production, and export figures presented in Tables 1 and 2 translate into heavy dependence upon coffee. Coffee exports weigh in at 79 percent of total exports for Burundi, 54 percent for Ethiopia, 43 percent for Uganda, and 24 percent for Honduras.<sup>34</sup> Even countries with diversified export portfolios have significant populations working in the coffee sector. Mexico's coffee sector has 280,000 producers living in some of its poorest states, and supports about three million people in various steps of the commodity chain. In Brazil, where coffee accounts for less than 5 percent of the foreign exchange, nearly 5 percent of the population (some 3.5 million people, mostly in rural areas) is involved in coffee in some way.<sup>35</sup> Five million people in Indonesia depend upon coffee as a cash crop, producing seven million bags (60 kg each) from small holdings averaging 1.44 hectares.

The past three years have seen a deepening crisis due to record production in Asia, the new powerhouse supplier of cheap coffee. Between 1961 and 2000, Asia increased its coffee exports by 657 percent in volume and nearly sixteen times in value.<sup>36</sup> Vietnam, which produced almost no coffee in the early-1990s, has come out of nowhere in the last five years to settle in as the third-largest producer in the world with about 12 percent of the world



Table 2. Coffee production in the top 25 coffee producing countries in the world, 2000

Country	Area Greater than 1% of World Total	Production Greater than 1% of World Total
Brazil	2302370	1780140
Cameroon	300000	77000
Colombia	850000	560000
Congo	145000	
Costa Rica		181000
Côte d'Ivoire	1000000	280000
Dominican Republic	139372	
Ecuador	368911	146457
El Salvador	162190	112201
Ethiopia	250000	228000
Guatemala	273000	275700
Honduras	216562	205545
India	310000	301200
Indonesia	891000	376800
Kenya	165000	75000
Madagascar	19312	
Mexico	758430	330000
Nicaragua		78000
Papua New Guinea		84000
Peru	228300	158200
Philippines	136000	129790
Tanzania	118000	
Thailand		90000
Uganda	264000	197410
Venezuela	220000	
Viet Nam	450000	800000

Source: FAO Agricultural Production Statistics, 2000

market.<sup>37</sup> Asian overproduction has led to a fall in quality as well as serious price slumps.<sup>38</sup> Lower quality translates quickly into still lower prices, a cycle which, without access to credit, can take farm economies and family budgets in the same direction. The result is bad coffee for everyone.

### *Social Effects: Making Ends Meet*

In today's coffee world, small holders predominate, often supplying the bulk of a producing country's coffee harvest, along with the lion's share of any rural farm labor. Scattered across the rural landscapes of Asia, Latin America, and Africa, more often than not tending plots less than 10 hectares, some 25 million coffee producers work the world's 11 million hectares of coffee land. Together with pickers, processors, and industry workers, these farmers comprise nearly 100 million people whose livelihoods depend on the crop in some way.<sup>39</sup>

Today's crisis is more extreme than prior ones and has depressed prices and farmers' incomes to the point that many are literally facing starvation and the loss of their land. In a market where the international "C" price quoted on the futures market is, say, \$0.85 per pound, the farmer might receive \$0.20 to \$0.40 per pound.<sup>40</sup> When the cost of production is twice the price received, few can remain in business unless they have access to other land to see them through the difficult time. A recent report by the Economic Council on Latin American and the Caribbean focused on Central America's plight related to the global price crisis in coffee. Some 300,000 growers on the isthmus have tried to reduce production costs by cutting back on cultivation practices such as weeding, pruning, and fertilizing normally carried out in the agricultural cycle, a cost-savings strategy that erased \$140 million in wages and 170,000 jobs in 2001.<sup>41</sup> In another response to the low prices, farmers in Central America are turning former coffee fields into coca fields, as has happened in southern Peru's Apurimac Valley. The attraction is obvious. Growers can produce only one coffee crop per year, and currently receive a dismally low price for their efforts. Coffee also requires particular soil conditions, and its cultivation requires focused attention and meticulous care in the timing of specific operations. Harvesters must make two, three, or four passes through the plot, as the berries ripen unevenly over time. The harvested crop must be processed to the point of parchment coffee, which is then delivered to a central buying station, sometimes at quite a distance from the farm. Partial payment is com-

mon, with the balance paid once the coffee is resold—sometimes weeks or months after the actual harvest.

Coca, by contrast, will grow almost anywhere (certainly on soils suited for coffee), producing three and sometimes four crops per year. The price paid per unit area far surpasses that of coffee, often by a factor of four. A few people can harvest a single hectare in one day, drying the coca leaves simply by placing them in the sun for a day or two on plastic sheets. Later, someone drives by in a truck to collect the leaves, delivering full payment at the time of pick up. For a peasant producer faced with crisis-level income and little help from a strapped public sector, the decision to grow coca is an easy choice.

In countries where such choices are not possible, the crisis poses severe dilemmas for growers and their families, as well as for businesses, banks, and institutions. In Nicaragua, 200,000 temporary and 45,000 permanent workers have lost jobs. Families of 30,000 small producers currently suffer chronic hunger, and at least seven banks—potential sources of credit—have gone out of business. The lack of income on the farm has prompted massive rural-to-urban migrations, swelling the poverty belts around Nicaragua's major cities. For those trying to cope in the countryside, the collection and sales of native animal life and plants, as well as firewood, is placing increasing pressure on natural resources.<sup>42</sup>

The worsening poverty in coffee communities as a result of the price crisis has further aggravated child labor problems, which have been a long-term issue in the coffee industry and agriculture more generally. The International Labor Organization (ILO) estimates 250 million children work worldwide, with more of them in agriculture than in any other sector. Payment for the work they do is often a fraction of the legal minimum, as in Kenya, where the "casual" (part-time) worker receives about \$12.00 per month. With the recent sweep of neoliberal economic plans imposed by world lending agencies, the privatization of the educational system in countries like Kenya has only worsened the problem. Parents who would otherwise have children in free schools now cannot afford to pay for their education, so the youngsters are more apt to go to work.<sup>43</sup> These conditions hold even when world coffee prices are relatively high and stable, but the recent crisis has made the problem even more difficult to address. Countries under severe economic stress to maintain foreign exchange are slow to enforce whatever regulations may be on the books to protect

children. On the brighter side, public awareness of coffee tainted with child labor has grown with media reports. Moreover, the ILO created the International Programme on the Elimination of Child Labor in 1998, which has been signed by more than 175 countries worldwide. The U.S. Department of Labor also initiated a program for six countries in Latin America designed to remove children from the workforce, place them in school, and provide health services.<sup>44</sup>

### *Environmental Effects*

Coffee's natural, evolutionary habitat is the understory layer of forests in East Africa, a shady shrub-layer environment. Taken from this setting for commercial production, it is now planted in deep forests, open fields, and every kind of shade condition in between. Coffee experts have long debated the amount of shade and types of trees needed for optimal production.<sup>45</sup> Such discussions, however, have been agronomically focused, and only recently has coffee been seen in the broader picture of conservation biology.<sup>46</sup>

The most obvious environmental consequence of coffee expansion has been forest removal. In much of Latin America, the early establishment of coffee occurred in areas already used as agricultural lands. But as coffee gained a foothold in the global economy, new lands were opened and forested areas fell to make room.<sup>47</sup>

More recent changes in coffee production technology, namely the "technification" of coffee in much of northern Latin America,<sup>48</sup> has resulted in intensifying production. Shade cover normally decreases as production becomes more intense. A host of studies show that significant impacts on local fauna occur along the intensification gradient; in particular, arthropod diversity and ant diversity especially tend to decline as intensification increases.<sup>49</sup>

On balance, the current crisis does not bode well for coffee landscapes. Desperate indebted growers commonly respond to prolonged low prices by cutting down shade trees and selling them as lumber or firewood. In Guatemala and Nicaragua, growers have done exactly that, with an eye toward converting coffee farmland into pastureland—one of the more environmentally damaging land uses in the tropics.<sup>50</sup>

### **Hope for the Future**

Socioeconomically, small coffee growers represent some of the poorest of the poor in their countries. Yet, the prices they have re-

ceived historically, mainly as a result of the ICA, combined with the other activities on the farm, have allowed them to survive. Small farms often have a mix of products within a coffee agroforest, a system that provides growers with alternative and additional income streams across the year. As a group, small producers are well positioned to take advantage of the trend in the specialty coffee industry toward "sustainable" coffees.

With 13,500 retail outlets servicing 27 million specialty coffee drinkers daily, one of the fastest growing markets within specialty coffee is "sustainable coffee." These are coffees that connect consumers directly to the social and ecological aspects of production. Sustainable coffee includes fair trade, certified organic, and shade-grown coffees<sup>51</sup>—products shown to have a marketable connection with environmental protection and social and economic equity.

#### *Fair and Sustainable Coffee*

In the face of this troubling crisis, some producers—particularly those who were already organized into associations or cooperatives prior to the crisis—are finding markets for their coffee at "living-wage" prices. One community in Nicaragua's department of Jinotega spawned the Sociedad de Pequeños Productores Exportadores y Comercializadores de Café, S.A. (SOPPEXCCA). With politically progressive ideals at its core, the group seeks to work toward community development via quality coffee production and diversification into other crops. One central tenet is gender equality, based on economic independence.

Within SOPPEXCCA, which has forged alliances and relationships with international buyers, a group of eighty-five women producers is in its fifth year of production. Known as "Las Hermanas" (The Sisters), they harvest and sell the coffee grown on plots that average just over two hectares. In Nicaragua's recent "Auction of Excellence," in which coffees from around the country were taste-tested and auctioned to international buyers, SOPPEXCCA producers received three of the twenty-three prizes awarded to quality coffees. Of these, two came from "Las Hermanas" farms.<sup>52</sup>

Another survival strategy in the volatile world of coffee prices has been the fair trade (FT) movement. Dedicated to social equity, democratic participation in decision making within communities, and a fair price to farmers, it has spread throughout the coffee world over the past ten to twenty years. The FT movement began

in 1959 in the Netherlands, eventually evolving into the non-charity concept of "trade-not-aid" with a number of goods from the developing world.<sup>53</sup> Coffee was incorporated into the FT movement in 1988, when Guatemalan coffee entered Europe. Today, fair trade coffees have made significant inroads into the specialty coffee industry.<sup>54</sup> The cornerstone philosophy of fair trade coffee is four-fold:

- direct relationship with the roaster;
- a price minimum of \$1.26 per pound;
- pre-financing by the roaster of up to 66 percent of the value of the coffee;
- agricultural sustainability.

Within the U.S. market, FT coffee currently includes 550,000 producers in twenty-two countries, involving 150 businesses (roasters and importers), along with 10,000 store outlets. Its first three years of existence, as TransFair USA, generated \$10 million, making FT coffee one of the growth leaders within specialty coffee in the United States. Moreover, 85 percent of all FT coffee sold in the United States over the past four years has also been certified organic, indicating an overlap in social and environmental ties provided by coffee.<sup>55</sup>

#### *Environmental Conservation: Coffee as Habitat*

Coffee production does not necessarily have a negative effect on the physical landscape. For example, it can conserve soil. Over an eight-year period in Chinchiná, Colombia, the soil lost in a traditional cultivation coffee system "similar to a forest" was 240 kilograms per hectare,<sup>56</sup> compared with 23 tons of soil per hectare lost in a hayfield and 860 tons per hectare in a basic grain system with two corn harvests per year. In the northeastern Ecuadorian Amazon, coffee cultivation actually acts as "brake" on further forest clearing for families of small farmer settlers.<sup>57</sup> Much more needs to be understood about the connections between labor demands, fluctuating international prices, plot size, and forest clearing, but policymakers may need to reinforce what settlers are already doing in that area to stem deforestation.

The appearance of shade grown coffee among the products offered by roasters represents a positive development in terms of coffee's environmental impact, by giving environmental and conservation benefits a market role. Conservation biologists have become intrigued in recent years with the environmental benefits of

traditional shade coffee systems.<sup>58</sup> Most of the science supporting the connections has been done in Latin America, the bulk of the field studies in Mexico. A number of those studies show that traditional shade coffee systems harbor a diverse collection of plants,<sup>59</sup> insects and other arthropods,<sup>60</sup> birds,<sup>61</sup> mammals,<sup>62</sup> and, though little work has addressed them, reptiles and amphibians.<sup>63</sup> Shade systems also appear to facilitate coffee pollination by bees,<sup>64</sup> which can result in yields up to 36 percent greater than normal.

Agroforestry systems that produce shade-grown coffee and other products in an integrated system can also have positive environmental benefits. An agroforest is, as the name implies, a mix of agriculture and forest-like conditions and products. In the case of coffee, the shade trees associated with the production plot are often used by growers for an array of purposes. Non-coffee products from the shade component in small holdings represent 19 percent and 28 percent of the total value derived from holdings in Guatemala and Peru, respectively.<sup>65</sup>

Trees provide firewood in rural areas that would undoubtedly be taken from whatever forests are present. Therefore, in some cases, the coffee agroforestry might help to relieve pressure on natural resources. Where deforestation has altered landscapes drastically, such agroforestry systems can act as refuges for a number of taxa.<sup>66</sup> Even in areas with intact and protected natural forested zones, these shaded systems can act as complementary sites for conservation purposes. As "managed forests" with a complex structure and diverse biological profile, such systems may actually display a certain degree of ecological equilibrium. Natural predators can keep populations of potentially harmful pests down to levels tolerable for production without using costly chemical pesticides,<sup>67</sup> and the price crisis might push more growers to look into such biological control methods. In Guatemala, a parasitic wasp controls the coffee bean borer, one of coffee's most damaging pests. By rearing and releasing the wasps from 1996-2000, pest infestation declined from 21 percent to 2 percent, while the use of insecticide (the previous method of control) went from 60 liters to zero. Production increased nearly three-fold, while the percentage of processed bean damaged by the beetle at the mill stage went from 21 percent to less than 1 percent.<sup>68</sup>

In what can only be characterized as "making do with what you have," a recent encounter in Nicaragua illustrates a positive outcome of the crisis within coffee communities. Growers in remote areas share information about traditional ways to make com-

post, control disease and pests, and other cultivation practices that do not require costly inputs. They use mixtures of native plant derivatives to control certain insect pests, and the general feeling within the zone is that by sharing such information, producers might be able to survive the current crisis.<sup>69</sup>

Farm abandonment as a result of the price crisis may also have environmental benefits, though these do not outweigh the social costs. A farm left untended for a year or two can be renovated back to productive status by eliminating unwanted weeds and "volunteer" trees (those that appear through natural means), and pruning the coffee plants. On the other hand, a farm left to its own devices for three or more years requires more drastic action, such as completely removing all coffee and shade trees—a less costly practice than attempting to renovate what is there. But a farm simply abandoned with no plans for future attention poses some interesting environmental possibilities—albeit at high social and economic cost for the grower and his family.

Data related to the environmental consequences of the crisis are sparse to nonexistent, therefore the proposed environmental outcomes of farm abandonment are speculative. Nonetheless, the potential connections warrant exploring. Low prices in the past have usually meant a halt in opening new areas to coffee and "hunkering down" by growers to wait out the crisis. However, today's prolonged crisis has brought world prices to their lowest level in real terms in more than fifty years, so that growers cannot recover their costs of production even in a quality coffee region like Central America,<sup>70</sup> and have abandoned farms as never before. Agronomically, abandoned farms act as reservoirs for insects, pests, diseases, and weeds, threatening nearby farms at a time when prices do not allow for costly attention to such problems.

On the positive side, abandoned farms might well act as relatively healthy habitats for a number of taxa such as arthropods, birds, and small mammals. As long as they are not converted to other land use, the "wild and woolly" nature of the neglected farm acts more and more like a forest as the natural regeneration and succession of the plant community takes place within the coffee holding. Shade trees grow taller. Foliage becomes more dense. Volunteer species appear that would otherwise be eliminated by the grower, increasing the overall tree diversity. And, in regions already suffering deforestation (e.g., El Salvador and Haiti), a "coffee forest" can supplement the natural forest remnants. All in all, a coffee farm left abandoned, even if it is a shaded one to begin with,



might with time transform itself into a more suitable habitat for a number of organisms. Such an environmental tradeoff, however, is unacceptable considering the cost for the farmer formerly making a living from the holding. A better situation all around, of course, would be one in which farmers reap fiscal gains expressly *because of* their land stewardship practices.

### *The Market Connection*

An intriguing feature of the fair trade and coffee-as-habitat concepts is the force and rapidity with which the consumer end of the coffee industry—at least the specialty coffee industry—has embraced them. A 1996 meeting in Washington, DC, organized and hosted by the Smithsonian Migratory Bird Center, brought 260 people from nineteen countries together for three days.<sup>71</sup> Growers, traders, roasters, retailers, development workers, and scientists working with coffee discussed its environmental and social aspects at this First Sustainable Coffee Congress (FSCC). The issue of sustainable coffee—defined by participants as a product resting upon the three concepts of long term ecological, sociocultural, and economic viability—caught the attention of roasters and marketers immediately. They saw unexploited niche markets into which they could launch coffees purported to support the social and environmental benefits to producers and the environment. The issue of shade came to replace “sustainability” in the marketplace initially, to the extent that today a search on the internet for “shade grown coffee” yields more than 6,500 hits.

A working group at the FSCC defined “sustainable coffee” as coffee

produced on a farm with high biological diversity and low chemical inputs. It conserves resources, protects the environment, produces efficiently, competes commercially and enhances the quality of life for farmers and society as a whole.<sup>72</sup>

Trade magazines over the past five to ten years have published a number of articles on the environmental and social aspects of coffee.<sup>73</sup> And a 2001 survey conducted for the World Bank, The Specialty Coffee Association of America (SCAA), The North American Commission for Environmental Cooperation, and others revealed that the sustainable coffee segment of the specialty coffee industry is growing fast. Moreover, the industry realizes the importance of these coffees for future sales.<sup>74</sup> Such articles and reports indicate that certain growers can take advantage of the current conjuncture.<sup>75</sup>

Small growers, those historically most marginalized with a production strategy of simply making it through another year, may be the best positioned to benefit from these growing consumer interests in sustainability. As peasant producers, small coffee growers often manage their tiny holdings with an array of diverse trees scattered among the coffee. The varied products from the holding help in avoiding risk; if the coffee fails to generate enough income, other products can be consumed or sold locally to help make it through the year. Though their motivation is not to protect the planet, the ecological results are the same: a highly diverse agroforestry system that serves as habitat for birds and other organisms. Since small producers often belong to cooperatives or grower associations, these social arrangements allow them to join the fair trade movement. Moreover, as they do not use agrochemicals, cooperative members can band together to apply for organic certification (provided they adhere to the basic principles of organic production). As long as the coffee quality is high, the profile of certified organic, fair trade, and shade coffee offers growers an avenue to better prices.

But the market can only address so much of the current crisis. The problem has not proven temporary as in times past; it is a structural crisis based on tremendous oversupply and new technologies in production and manufacturing, requiring the action and dedication of governments and international lending agencies if any solution is to be found. Every government in Central America, as well as that of Colombia, has taken steps to alleviate the problems facing growers.<sup>76</sup> Coffee trade organizations such as the ICO and the SCAA have also weighed in on the crisis, making public statements in support of needed changes.<sup>77</sup> Both houses of the U.S. Congress passed resolutions in November 2002, calling for government action to "adopt a global strategy to respond to the coffee crisis with coordinated activities in Latin America, Africa, and Asia" that can address short-term humanitarian and long-term rural development needs of those areas affected by the crisis.<sup>78</sup> Also in November, a communiqué by Belgium's Foreign Minister to the European Union's Council of General Affairs and External Relations officially brought the issue to the attention of Europe's leaders.<sup>79</sup> These statements by developed world leaders came a full year after "a special declaration on the worsening world coffee crisis" was made in Lima, Peru at the 11<sup>th</sup> Latin American Summit Conference by thirteen producing countries.<sup>80</sup>

A key ingredient to the solution lies with the private sector. In particular, the large international roaster firms—Kraft, Nestlé, Procter & Gamble, and Sara Lee—can play a central role in alleviating the pain felt throughout the coffee producing world.<sup>61</sup> With the dissolution of the ICA and many developing countries' governments weakened by global trade agreements, international firms' role may become one of (unwelcomed) responsibility for the future of a healthy coffee market.<sup>62</sup> The international development and relief organization Oxfam has proposed a "coffee rescue plan" designed to realign supply and demand, reinvigorate farmer livelihoods via a Commodity Management Initiative, and secure fair prices for producers. Recommendations for action to realize such a plan rely upon the good faith efforts of large roasters, retailers, governments (both producing and consuming), investors, and institutions.<sup>63</sup>

### Conclusion

As a commodity, coffee historically has exhibited fewer problems environmentally than socially. With the current sustained crisis in prices being paid to growers, however, the resulting social and economic problems can sometimes translate into environmental challenges. On the other hand, depending upon growers' reaction and decisions in the face of plummeting prices, certain scenarios may enhance environmental health—as when abandoned coffee lands are left alone and natural regeneration of the plant community proceeds unhindered, or when growers and roasters connect to offer environmentally sound coffees to consumers. The social, economic, and cultural costs of the price squeeze, however, cannot be dismissed. The crisis currently confronting growers all over the world is deep and structural. Short of a renewed agreement by producing and consuming countries to forge ICA-like price controls at a global level, the biggest hope for producers lies in niche markets. The initiatives now associated with fair trade, organic, and shade coffees offer hope for those growers positioned to take advantage of these new markets. Consumers, spurred by marketer educational programs, may be able to link up with growers and "do the right thing" through their morning cup of coffee.

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