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## 22. Fair trade coffee and environmental sustainability in Latin America

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### INTRODUCTION

Certified tropical agricultural products promoting ‘environmentally friendly’ farming practices form a growing part of mainstream markets and international sustainable development investments (Beddington et al. 2012; Herrero et al. 2010; Raynolds et al. 2007). Certified sustainable coffee accounts for more than 9 per cent of international coffee sales and is projected to increase to 18 per cent by 2015 (COSA 2013). Although detailed farm, household, community and value chain-based research continues, it generally lags behind these changing markets, eco-labels and farming practices.

Researchers often analyze the social impacts of fair trade in producer communities (Bacon 2005) or analyze the environmental performance of organic, Rainforest Alliance and Bird Friendly certifications (Rice 2000). Overall, there is a scarcity of ‘methodical environmental assessment’ of fair trade (Nelson and Pound 2009), although a few studies include environmental impacts in their broader analysis of sustainable livelihoods, fair trade and organic production in Latin America (e.g., Bacon et al. 2008; COSA 2013; Jaffee 2007; Lyon 2013). This leaves a gap in the research focused on fair trade and environmental sustainability.

In this chapter we analyze the environmental impacts of fair trade coffee in Latin America and the Caribbean. We focus on coffee, since coffee landscapes account for the largest area in Latin America associated with the certification, and 80 per cent of the world’s fair trade coffee hails from Latin American farms that average 2.6 hectares (Fairtrade International 2012). We identify three environmental impacts: biodiversity conservation, pollution reduction and climate change adaptation. Smallholders manage much, if not most, of Latin America’s biologically diverse shade coffee, and many of them participate in fair trade markets. Fairtrade International’s recently revised environmental standards, which include an expanded list of prohibited agrochemicals and price incentives

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to promote organic production (Fairtrade International 2011a), represent potential direct environmental impacts (Nelson et al. 2010).

In the chapter, we integrate original research, including data gathered from certification agencies, a survey of experts about shade coffee, interviews and informal conversations and a literature review. We build upon a 2013 survey conducted of national and regional experts in Latin America to estimate the percentage change in the area devoted to diverse shade coffee management from 1990 to 2010 (Jha et al. 2014).<sup>1</sup> We also include qualitative data from focus groups, interviews and participant observations. Finally, written consultations with members of Fairtrade International generated information from and links to key documents.

The role of fair trade vis-à-vis coffee has particular environmental salience given the ecological importance of shade coffee (Perfecto et al. 1996) and the threat to biodiversity posed by the possibility of smallholders abandoning this agroforestry crop. Mesoamerican smallholders are frequently associated with the management of these diverse shade grown systems (Rice 2000). Theoretically, fair trade – which emphasizes smallholder market access with stable prices, social development premiums and environmental standards – encourages farm maintenance, soil fertility management and erosion control, thus representing a more sustainable agrifood system. Research also suggests that fair trade's minimum price can partially buffer cooperatives and farmers against commodity coffee price crashes (e.g., Bacon 2005), while shade coffee can reduce on-farm erosion and enable faster recovery following natural hazards, such as hurricanes (Philpott et al. 2008).

The numerous influences on farmers' decisions to adopt environmentally friendly farming practices make it difficult to assess which practices and livelihood outcomes link to fair trade. For the purposes of this chapter, we identify the direct and indirect impacts of participation in fair trade markets and the associated networks that can support international development investments, farmer organizing and more. Direct benefits can be linked to price premiums, changes to certification standards or projects channeled through fair trade networks. Indirect benefits – namely support for democratic smallholder cooperatives, local capacity building (Raynolds et al. 2004) and international development projects funded by non-governmental organizations (NGOs) and coffee companies – are not easily linked to specific standards. Indirect environmental benefits derive from the extent to which fair trade promotes the maintenance of pre-existing sustainable agricultural practices, such as shade coffee, and stimulates the adoption of new ones. Finally, we discuss the persistent challenges of sustainable livelihoods and food

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security among participating producers, describing several challenges and responses to the impacts of climate change.

## DIRECT IMPACTS: FAIRTRADE INTERNATIONAL'S NEW ENVIRONMENTAL STANDARDS<sup>2</sup>

Fairtrade International's environmental standards aim to minimize the risks and negative environmental effects associated with the industrial agriculture model, including, but not limited to, agrochemical pollution, biodiversity loss and increased greenhouse gas emissions. And though much reporting of fair trade organizations includes work on environmental projects, detailed empirical data on the link between Fairtrade certification and reduced environmental damage is minimal.

To become Fairtrade certified a product must undergo auditing and inspection from FLO-Cert, a company owned by Fairtrade International.<sup>3</sup> FLO-Cert certifies Arabica and Robusta coffee production under Small Producer Organization (SPO) standards. The SPO environmental standards for coffee include the required minimum core standards and areas for continued improvement, and they address the following: environmental management, pest management, soil and water, waste, genetically modified organisms (GMOs), biodiversity and energy and greenhouse gas (GHG) emissions (Fairtrade International 2011b, 3.2). The standards also require reporting about biodiversity conservation, buffer zones around water sources and reducing agricultural impacts in areas of high conservation value (as determined by the Forest Stewardship Council) (Fairtrade International 2011b, 3.2). Furthermore, Fairtrade International recognizes and outlines the negative impacts of climate change on agriculture and encourages SPOs to report on carbon sequestration (Fairtrade International 2011b, 3.2.40) and use of renewable energy (Fairtrade International 2011b, 3.2.39).

Fairtrade International's SPO standards for agrochemical use aim to manage pesticide risk. These include the prohibition of aerial spraying and establishing buffer zones around bodies of water and human dwellings (Fairtrade International 2011b, 3.2.39). The Fairtrade Prohibited Materials List (PML) integrates seven international pesticide watch lists and comprises 124 'Red List' (forbidden) agrochemicals and 58 'Amber List' (highly discouraged) agrochemicals (Fairtrade International 2011a). In June 2015, Fairtrade International will release updated lists that may move some Amber List chemicals to the Red List. Several chemicals, namely the organochlorines DDT, hexachlorobenzene, endosulfan and chlordane, are banned, restricted or were voluntarily withdrawn from use

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in the United States (Center for Disease Control and Prevention 2009), Europe and most Latin American countries (United Nations 2001) as they have pledged to reduce use and production by signing the United Nations Stockholm Convention on Persistent Organic Pollutants. The Stockholm Convention may make Fairtrade International's list redundant for Europe and the Americas, but Fairtrade International's list could reduce organochlorine use in the multiple countries in Africa and Asia that have not signed or ratified the Stockholm Convention. Since the Stockholm Convention is a pledge, regulatory procedures are limited, and it is not an immediate phase-out. For instance, members of the Stockholm Convention added endosulfan to the 'banned' list in 2011 (with some agricultural use exceptions) (United Nations 2011), and it will not be phased out by the US Environmental Protection Agency (EPA) until 2016 (EPA 2010). In developing countries, changes are often slower due to weaker government enforcement. Fairtrade International's PML may also contribute to reduced circulation of organochlorine-tainted products, because some pesticide lists are loosely enforced for imports. Furthermore, unlike many government systems, Fairtrade International's standards require annual farm inspections and audits.

In the case of several non-organochlorines, Fairtrade International's PML introduced additional agrochemical restrictions, suggesting that fair trade has reduced agrochemical use beyond the international lists and treaties. For example, Fairtrade International recently tightened restrictions on paraquat dichloride. The 2007 PML permitted paraquat dichloride under exceptional conditions on tea from India and coffee and sugarcane from Costa Rica (Fairtrade International 2007), but the most recent version banned its use (Fairtrade International 2011a). Additionally, a focus group conducted with Nicaraguan farmers in 2013 identified malathion as one of the most widely used agrochemicals in coffee producing areas (Focus group 2013). Malathion first appears as a restricted chemical on the 2011 Amber List.

More stringent environmental standards likely contribute to fair trade's direct environmental benefits, but producers also face increasing monitoring and compliance costs. Coffee agroforestry systems managed according to agroecological principles can limit, avoid and/or possibly eliminate the use of the synthetic agrochemicals (Harvey et al. 2008; Vaast et al. 2005). While such inputs have led to increased yields for farmers generally, they also increased production costs, pest resistance and damage to human and ecological health. For coffee producers, a diverse mix of shade trees can help control disease and pests (Staver et al. 2001). Research suggests that in place of using chemicals, such as endosulfan, an organochlorine insecticide with neurotoxicity to humans,

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to control the Coffee Berry Borer (*Hypothenemus hampei*), managed shade cover can enhance the presence of biocontrol agents like fungi and parasitic wasps (Staver et al. 2001). But in some countries (e.g., Guatemala), where the borer has recently been found to affect up to 80 per cent of the farms including those at higher elevations (potentially due to climatic changes), many coffee producers rely on a 1.7 liters/hectare dose of endosulfan in applications timed to fruit development (Anzueto 2014).

## CERTIFIED FAIR TRADE AND ORGANIC

Another direct benefit of Fairtrade concerns its promotion of organic agriculture and low input agroforestry systems, such as shade grown coffee (Harvey et al. 2008; Perfecto et al. 1996). In 2011 Fairtrade International revised its pricing standards to include a 50 per cent increase in the organic premium (from \$0.20 to \$0.30 USD per pound) paid for Fairtrade coffee. This change sought ‘to account for the higher costs of organic production and provide an incentive to farmers to convert to or maintain organic production’ (Fairtrade International 2011c).

Certified organic coffee production contributes to obvious environmental benefits, but the additional impacts attributed to certification are context dependent. Despite both theoretical and empirical research on the productivity benefits and overall sustainability associated with small-scale agriculture (Moguel and Toledo 1999; Vandermeer et al. 2010) – most shade grown coffee in Latin America, as we argue here, qualifies as small scale – published studies linking fair trade to environmental benefits are scarce. Smallholders in Mexico that sold coffee as Fairtrade and Fairtrade/Organic (FTO, meaning that the coffee was certified against both sets of standards) were more likely to practice a range of soil conservation practices compared to their neighbors, a fact that may stem more from being organic than selling into fair trade (Jaffee 2007). Yet, where fair trade coffee is synonymous with organic and shade coffee, ‘practices that conserve soil fertility, trap organic matter, increase water filtration, enhance bird and wildlife habitat diversity, fix carbon, and keep acidic coffee pulp and water out of local streams’ clearly rank as benefits (Jaffee 2007), an assessment echoed by Fridell (2007). A study comparing conventional and certified organic coffee producers in Costa Rica found that organic producers reported no or significantly lower agrochemical use and were more likely to use environmentally beneficial practices including water collection holes and vegetative barriers to purify water run-off, shade trees, windbreaks and organic fertilizer

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(Blackman and Naranjo 2012). Research in El Salvador and Nicaragua suggests similar trends, but also reveals that many organic producers continue to use agrochemicals in the management of their corn and bean plots, while smallholders in Mexico, Guatemala, El Salvador and Nicaragua linked to FTO reported higher farm gate prices for their coffee (Mendez et al. 2010). A recent study in Peru found that organic producers linked to fair trade markets were more likely to increase their use of organic fertilizers (Ruben and Fort 2012).

From 2009 to 2011, the global volume of doubly certified FTO coffee increased by 17 496 metric tons, equivalent to a 46 per cent increase (Fairtrade International 2014). During this same period, the total volume of all exported Fairtrade certified coffee (including FTO) increased by 31 per cent, expanding to 120 316 metric tons in 2011, while the percentage of Fairtrade coffee that is FTO averaged just below 50 per cent (Fairtrade International 2014). The price differential that the Fairtrade system offers for coffee that is also organically certified (FTO), as well as the fact that many international development agencies (e.g., Catholic Relief Services, Lutheran World Relief, Oxfam) work with fair trade cooperatives to implement projects that promote sustainable agriculture and environmental conservation, have combined to rapidly expand certified organic production in many places.

## INDIRECT IMPACTS: THE GEOGRAPHY OF SHADE COFFEE PRODUCTION

Prior to addressing Fairtrade coffee's indirect impacts it is important to note several observations about how and why smallholders manage their coffee with a diverse shade cover. Our observations in Latin America coffee growing regions suggest that smallholders generally have more diverse shade trees over their coffee system than producers with large estate holdings (though there are exceptions to these patterns).<sup>4</sup> Many of these small producers belong to cooperatives or associations with varying degrees of organizational capacity, market connections and general linkages to the global coffee network. But they have one thing in common: they are peasant producers.

Peasant coffee producers must carefully make decisions about their small parcel(s) of land. They make their living from the land (sometimes working for others as day laborers) and usually reside on the land, often their only valued resource. Given the limited size of peasant holdings (often less than one or two hectares), and the need for peasants to 'thread the needle' each year, as Berger (1979) puts it – that is, survive



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year-to-year on the parcel's production and the minimal cash from off-farm labor – these producers are understandably risk-averse regarding land management. Whereas an unshaded coffee crop might lead to higher yields (albeit with costly agrochemical inputs) and more income, few readily devote their entire holding to a single crop. The vagaries of weather, pests and disease and international prices are beyond a farmer's control and can be devastating. Therefore, peasant producers rarely grow open-to-the-sun coffee systems. Rather, these small holders manage coffee within an agroforestry system, cultivating it beneath a canopy of shade trees. This heterogeneous mix of trees provides an array of 'non-coffee' products: firewood, fruits, construction material, home remedies and so on (Rice 2008; 2011). In short, this 'managed biodiversity' creates a heterogeneous farm that can harbor relatively high levels of associated biodiversity (birds, insects, etc.). Most Fairtrade producers in Latin America (Brazil being an exception, due to its dominant open-sun coffee production practices) manage their lands as such.

#### **Coffee, Biodiversity and Ecosystem Services**

Beyond the sustainability certifications and specific environmental practices (Pimentel et al. 1992), stakeholders are increasingly interested in the analysis of the range of ecosystem services provided by shade coffee systems, including biodiversity conservation, reduced soil erosion, water conservation, microclimate mitigation, pollination, pest control and more (Jha et al. 2014; Klein et al. 2003; Kellerman et al. 2008; Lin 2007). To what extent does certification influence farmer management systems in ways that enhance the flow of ecosystem services from shade coffee landscapes?

#### **Sun versus Shade and the 'Shade Gradient'**

In what is now a familiar characterization of the various management practices in coffee, a gradient ranging from open-sun production to a 'rustic' coffee setting can be described. Moguel and Toledo's (1999) research in Mexico developed this depiction of different coffee-growing systems, offering a gestalt understanding of the range from minimal intervention on the land to an intensified or 'technified' system. This is an effective strategy for characterizing the vegetational complexity that can lead to a host of ecological benefits – including coffee-as-habitat. From the open-sun or scant shade which features a monocultural shade tree pruned to relatively low heights (3–8 meters), the next, slightly more complex, system is the polyculture, which can be either the less diverse



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commercial polyculture or the more diverse traditional version, and could also be classified as a 'coffee garden'. Planted shade trees figure into these four categories. The final and most forest-like category is the 'rustic' system, where natural forest has been cleared enough to insert the coffee beneath towering forest species – a system normally found in remote areas tended by indigenous populations (Nolasco 1985). In general, as this gradient progresses from the scant shade to the rustic system, the canopy height, tree diversity and structural complexity increase, creating a progressively more forest-like setting.

Given the ecological concept that 'diversity begets stability', the species and structural diversity of the shade coffee systems managed by many fair trade producers stands out in stark contrast to an open-sun farm. The unshaded monoculture promoted so strongly in the 1970s and 1980s in Mexico by the now-defunct INMECAFE and throughout Central America and the Caribbean by the United States Agency for International Development (Rice 1999), while touting increased yields, can claim few, if any, ecological benefits. The open, shadeless system puts coffee plants in direct sunlight, an environment counter to coffee's evolutionary center of origin in the forests of East Africa and a situation that can affect bean growth and quality, as well as the overall physiology of the coffee plant itself (Lin et al. 2008). Moreover, this production strategy requires agrochemical inputs in the form of fertilizers to replace the organic matter/leaf litter/mulch that the shaded system would otherwise provide free of charge, pesticides to check the various insect pests no longer controlled (at least partially) by the agroforest's associated biodiversity and herbicides to control the weeds no longer suppressed by the shade and mulch. These same chemicals must be used cautiously to prevent contamination of waterways and people as well. Furthermore, the typical situation of coffee planted in mountainous regions on broken terrain poses additional problems of soil erosion where shade is not present.

We now focus on the indirect impacts that smallholder systems of shade tree management are likely to have upon the conservation of agricultural biodiversity and ecosystems services. We assume here that smallholders manage most diverse shade, and Figure 22.1 shows the management types of coffee from most of Latin American's leading coffee exporters. Latin America's traditional shade coffee agroecosystems conserve high levels of biodiversity, including many tree, bird and arthropod species. Recent research suggests that although the loss of tree diversity associated with the conversion of shade coffee to sun production systems was lower from 1990 to 2010 than from 1970 to 1990, in many

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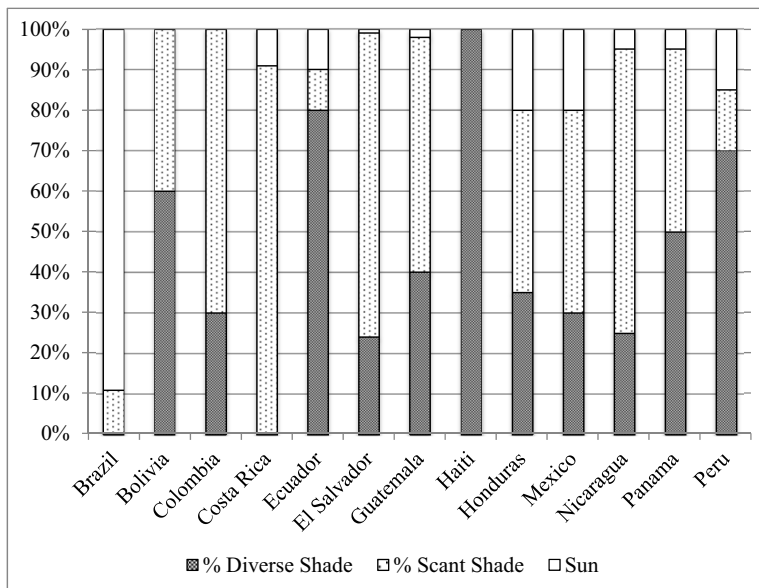
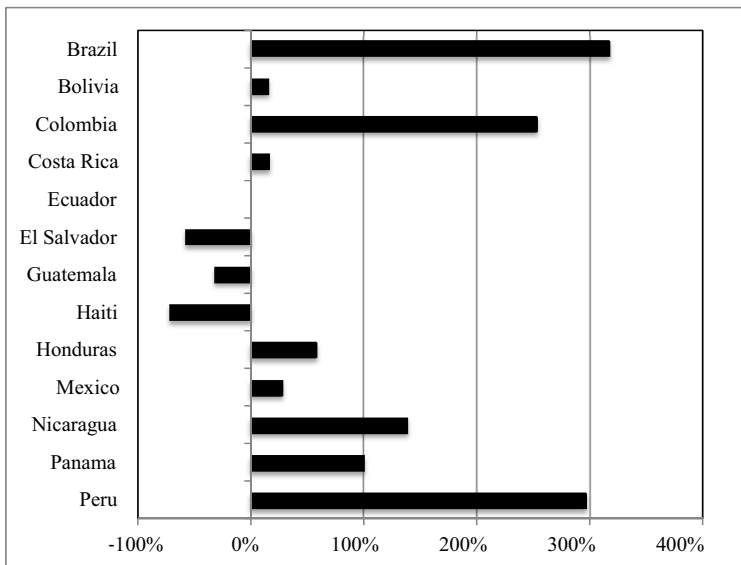


Figure 22.1 *Estimated percentage area of shade management regimes, 2010–2012*

places this biodiversity declined due to intensification of production practices and the thinning of shade trees (Jha et al. 2014; Perfecto et al 1996).

The geography of fair trade coffee production has shifted during the previous five years (see Figure 22.2), as countries with less shade coffee area, such as Brazil and Colombia, emerged as major Fairtrade coffee suppliers (see Figure 22.1). Of particular note is the rapid growth in the number of organizations in Brazil. In 2010, experts estimated that only about 10 per cent of Brazilian coffee had some type of shade cover. However, production has also expanded rapidly in Peru, in which a high percentage of coffee lands are managed under a diverse shade canopy. These sourcing changes could have significant implications for biodiversity and ecosystem service benefits associated with the Fairtrade international system, particularly if more Fairtrade coffee is sourced from coffee growing countries and regions with less shade.



Source: FLO-Cert (2014).

Figure 22.2 Percentage change in certified Fairtrade producer organizations, 2005–2013

### CLIMATE CHANGE, FARMER LIVELIHOODS AND FOOD SECURITY ISSUES

One interesting aspect of an agroforestry system like shade coffee is the general buffering effects it has on a number of climatic and/or weather phenomena. Meteorological models concerned with climate change have predicted that the Central American and Caribbean region will experience a drying trend over the next several decades (Neelin et al. 2006). A shade canopy in an agroforestry system like coffee shows the ability to maintain the ambient temperature of the system within a more narrow range, keeping the environment warmer at night and cooler during the day. As shade cover decreases, the fluctuations in temperature, humidity, moisture availability and solar radiation during the course of the day are greater (Lin 2007), an important consideration in the face of a predicted drying trend. The benefits of shade are directly related to the mitigation of variability in microclimate and soil moisture in coffee systems (Lin 2007).

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Central America and the Caribbean fall within the western Atlantic's region of high hurricane activity, events that can wreak havoc on agricultural areas, with high winds and heavy rainfall. A diverse shade canopy, characteristic of many Fairtrade producers, has been reported anecdotally by two cooperatives (RR communication) after Hurricane Stan crossed the isthmus in October 2005 to have protected those coffee farms from the extensive flooding and landslides experienced by farms with little or no shade. Research after this event concluded that vegetation complexity (like diverse shade coffee systems) tends to protect the land from hurricane-induced landslide events (Philpott et al. 2008). Agroforestry systems have been identified as having great potential in mitigating climate change due to the carbon fixed in the soil and biomass of the trees they contain (Lal 2004; Verchot et al. 2007). A Mexican coffee study comparing various shade levels' ability to sequester carbon found that a polycultural system's biomass fixes 16 metric tons of carbon per hectare on average compared to a monocultural shade's 4.5 tons per hectare. A diverse rustic system fixes more than 42 tons per hectare (Dávalos Sotelo et al. 2008).

To the extent that Fairtrade producers have a diverse, closed canopy production system, we should connect this to the ever-changing climate. At least for Central America, a general drying trend is predicted. Shade would help mitigate that somewhat. Also, even though this drying trend is predicted, a trend towards more late-season hurricanes of greater intensity is also predicted – the same months in which coffee berries are almost ready or are ready for harvest. High winds would be dampened at ground level, thus protecting the harvest more than in unshaded systems. These weather patterns will likely combine to impact agriculture – testing not only cash crops like coffee, but subsistence crops as well.

Aside from the inherent environmental benefits associated with these shaded systems that many fair trade coffee producers in Latin America manage, the larger fair trade network recently started to coordinate several responses to climate change. Fairtrade International currently includes 'climate change adaptation' as one of its targeted goals in aiding producers, with mitigation efforts that address deforestation, water use and shade management. The German grocery chain Lidl and the UK-based Twin Trading, recently helped to train lead farmers (or promoters) in the Sonomoro Cooperative in Pangoa, Peru, in risk assessment. Identifying reforestation as a major challenge for the region, Lidl arranged to plant one tree for every package of Fairglobe coffee sold, pledging to plant a minimum of 40 000 native trees (Fairtrade International 2013). In another tree-planting effort to counteract deforestation and fix carbon, the United Kingdom's Cafédirect worked with

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6600 coffee farmers of the Central Piurana de Cafetaleros cooperative (Cepicafe) in northern Peru. For every ton of carbon sequestered in this reforestation scheme, Cepicafe banks a carbon credit. These credits can then be traded on the global market – to firms like coffee roasters, for example – in order to benefit the producer community (Siegle 2012).

The 2014 Intergovernmental Panel on Climate Change reports that coffee regions do and will have temperature and rainfall changes affecting the coffee sector throughout Central and South America (IPCC 2014). Where drought conditions currently hold, or are expected, water scarcity and quality becomes a central issue for coffee processing, an activity historically quite wasteful and polluting of surface water sources (Schroth et al. 2009). In Nicaragua's department of Estelí, climate experts predict future declines in rainfall and rising temperatures. The PRODECOOP cooperative union has already implemented several adaptations, including the installation of efficient wet processing mills and filtration systems to clean the smaller quantities of water run-off. Similar projects and water filtration pits have been installed to reduce the run-off from nutrient rich water in projects worldwide (Trade Aid 2012).

Farmer food insecurity is a fundamental challenge to the goals of fair trade coffee and other sustainable coffee certification programs (Bacon et al. 2008) and climate change will exacerbate this challenge among participating producers dependent upon rain fed agriculture. In the mid-2000s, marketing campaigns from coffee certification organizations often implied that certified farmers were experiencing considerably improved livelihoods (including food security) due to their participation in fair trade markets (Goodman 2004). The field research conducted at this time showed several livelihood and organizational benefits (Jaffee 2007), but it identified potential limits and trade-offs (Raynolds et al. 2007) and generally found limited evidence for the elimination of poverty among affiliated producers, including those linked to sustainable markets (Ruben and Fort 2012). Another study started with the lived experiences of producer communities and then traced changing livelihoods and power dynamics through time, documenting patterns of household differentiation and diversification in response to multiple forces, opportunities and hazards (Fraser et al. 2014).

## CONCLUSIONS

Fair trade is associated with several understudied, significant and generally beneficial environmental impacts. Direct impacts derived from specific environmental standards include restricted agrochemicals use,

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the recent 50 per cent price premium increase for FTO coffee and the promotion of certified organic agriculture. However, these changes will likely generate additional labor requirements as farmers and coops often scramble to complete reports that document compliance with new regulations (Presa 2013). The indirect benefits of shade grown fair trade coffee include the conservation of biodiversity – both managed (trees) and associated (birds, insects, etc.) – as well as a broad set of ecosystem services, such as water conservation, nutrient cycling, erosion control, pollination and pest control. Recognition that smallholders manage much of Latin America's diverse shade canopy in coffee – and that such shade can provide a host of environmental benefits – is long overdue.

The geographical shift in the fair trade coffee supply is particularly concerning because the fastest-growing supply regions include countries with minimal diverse shade management, such as Colombia and Brazil. Fair trade initially emerged as a relationship linking solidarity-based traders with organized Mesoamerican smallholders who used agroforestry systems to grow coffee beneath a diverse shade canopy. The environmental implications of fair trade production's shifting geographies and exports deserve more attention from researchers. We also should note that even within small producers who manage a diverse shade over their coffee, there undoubtedly exists a range of diversity, both in species composition and structurally. If fair trade standards were to consider incentives for greater environmental benefits, one suggestion would be to create distinct categories for shade management. Finally, research tackling the impact of fair trade producers' projects is sorely needed. We firmly believe that positive benefits are associated with smallholder agroforestry production and links to fair trade networks. Although there are also negative impacts common to most coffee production systems (e.g., water contamination), additional research, extension, incentives and institutional reforms could prevent pollution, maximize environmental benefits and help deliver on the elusive promise of cultivating fair and sustainable coffee.

## NOTES

1. Rice and Bacon consulted coffee and agricultural experts from the top 20 coffee producing countries. Surveys were sent in English and Spanish and phone or Skype calls were often used as a follow-up. The experts included members of national institutes and coffee associations (e.g., the Colombian Coffee Federation), staff from agricultural ministries in coffee producing countries, certification agencies and academics. Experts were selected based on their knowledge of coffee and sustainability

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- issues in specific countries, their reputation as credible sources within the Specialty Coffee Association of America and the existing professional networks of research teams.
2. Given its international scope and depth of experience, we have focused our standards analysis on Fairtrade International's certification system. The systems operated by the Institute for Marketecology's Fair for Life and under development by Fair Trade USA are an important subject for future research.
  3. For more on the organization of certification see the following chapters in this volume: Bradley Wilson and Tad Mutersbaugh; Laura Raynolds and Nicholas Greenfield; and Elizabeth Bennett.
  4. These are personal observations based on frequent travel and ongoing research conducted by Rice and Bacon in Latin America coffee growing regions during the past 20 years.

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