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Market Shocks and Climate Variability

The Coffee Crisis in Mexico, Guatemala, and Honduras



As a result of a dramatic decline in world coffee prices and the restructuring of both domestic and international institutions, coffee farmers have been facing one of the most difficult periods in sector history. In 2003, a comparative case study project (supported by the Small Grant Program of the Inter-American Institute for Global Change Research) in Guatemala, Mexico and Honduras explored the experiences and responses of coffee farmers to institutional reforms, market risk, and climate variability. Four communities were selected for study in the 3 countries in which household surveys and interviews were conducted. The impacts of the crisis and farmers' responses illustrate the potential obstacles that farmers confront with sudden and profound changes in production conditions, yet also suggest opportunities for interventions that might help farmers improve their resilience to future risk.

Institutional change and climate shocks in the coffee sector

Coffee is one of the most important cash crops grown in the mountains of Mesoamerica. A labor-intensive crop, coffee grows well on small and steeply sloped parcels of land. Small-scale producers—often with landholdings of 2 ha or less—constitute the majority of coffee farmers in Mexico, Guatemala, and Honduras.



FIGURE 1 Coffee provides important ecological functions such as habitat for animals and protects slopes against erosion. (Photo by C.M. Tucker)

They plant shade-grown Arabica coffee for export markets. In addition to the important economic function that coffee plays in the region, shade-grown coffee systems are recognized for the ecological services they provide (Figure 1). The processing and commercialization of the coffee harvests from thousands of small producers is costly; smallholders have traditionally gained minuscule shares of the final profits generated by the global coffee industry. Ironically, despite the wealth that coffee exports have generated for national economies, coffee-producing areas remain among the poorest and most vulnerable to market and climate shocks (Figure 2).

Diverse factors now challenge the viability of smallholder coffee farming in the region. The International Coffee Agreement (ICA) collapsed in 1989 and, with it, the primary international mechanism for controlling world coffee supplies. Simultaneously, Guatemala, Honduras, and Mexico embarked on market liberalization programs to reduce state intervention in commodity production, markets, and prices. Meanwhile, world coffee supplies increased dramatically in the 1990s with Vietnam's emergence as a major producer. These factors combined to provoke a collapse in coffee prices during the late 1990s, and created a crisis for coffee producers.

In Central America this crisis was complicated by drought conditions in the late 1990s, particularly in 1997–1998 and 1999–2002, when international prices were lowest. Although coffee tolerates a wide range of climatic conditions, yields are sensitive to drought. Many farmers interviewed had perceived climate change, but were not sure of the implications for their coffee trees. Related

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FIGURE 2 Coffee picker measuring out coffee to record his daily harvest for pay. (Photo by C.M. Tucker)



research coordinated by the National Autonomous University of Mexico (UNAM) determined that mean temperatures in Veracruz, Mexico, have risen over the last century and further temperature increases are anticipated by some climate models. This research found that while this trend may diminish frost risk, coffee is now grown at the upper limit of its temperature range and thus the trend may soon have a negative effect on coffee yields. While neither price volatility nor drought are unfamiliar to coffee farmers, the combination of these stressors is particularly severe in a context in which sector reforms have altered farmers' access to the institutional mechanisms to manage market volatility. The longer-term consequences of combined environmental, market, and institutional trends are thus important considerations for the future viability of coffee farming in the region.

It is increasingly clear that the coffee sectors in each country are at a critical junction: the crisis requires new forms of policy intervention, and farmers are exploring diverse opportunities to assure their sustenance. While farmers perceive the risks posed by climate variability as irrelevant compared to those posed by the market, their responses to the current crisis will have ramifications for the sensitivity of their production and livelihoods to future climate stress. The crisis provides a unique opportunity to understand the challenges that smallholders face when adapting their production strategies to exogenous stress, with possible lessons for adaptation to climate change. With coordination, the responses of farmers could enhance the resilience of the coffee sector and livelihoods to future shocks, whether these be due to market volatility or environmental change.

Farmers' responses to the coffee crisis

Case study research in 4 coffee-producing communities revealed that although farmers had witnessed important impacts on coffee yields from drought and other climatic stresses, they ranked climate issues as the least of their concerns when compared to low coffee prices. Many farmers reported reducing investments in coffee as well as production as a result of declining incomes.

In general, the farmers surveyed reported considerable obstacles in adjusting to the crisis. Technical assistance in the communities was inadequate, particularly in the Mexican communities where less than 15% of households had received technical support. In the Guatemalan and Mexican communities, formal credit was also scarce, reflecting in part the lack of farm-level organization as well as the contraction of rural finance in the 1990s. Many farmers, particularly in the Mexican cases, expressed skepticism about the utility of farm organizations, associating farmer groups with fraud and political manipulation.

"I'm not very worried about the climate, although it does affect my harvests, because it is beyond my control." (Smallholder farmer in Guatemala)

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"The climate is a natural phenomenon and there isn't much one can do about it." (Smallholder farmer in Guatemala)

Interviews in these 2 countries suggested that although some farmers had altered their investment in coffee drastically, few had grasped the full extent of the structural changes in the coffee market. Relatively few smallholders, for example, mentioned Vietnam's entry into production. Lacking a formal organizational structure with which to access information, these farmers expected to continue their present livelihood strategies. Many farmers, particularly in Mexico, anticipated that market conditions would improve or that the public sector would intervene to provide solutions to their situation. A few farmers in Guatemala were experimenting with organic coffee, reporting that "organic coffee is better because prices are better when there is an opportunity to negotiate, but production is difficult because organic fertilizer isn't available."



FIGURE 3 Drought-affected coffee in area being cleared for sugar cane in Mexico. (Photo by H. Eakin)

In the areas surrounding the communities surveyed, medium- to large-scale farmers had the most success with alternative cash crops. Farmers who made changes to their production were most frequently returning to planting maize or other subsistence crops to help weather the economic crisis or, in the Mexican case studies, were replacing their coffee orchards with sugar cane, another traditional cash crop in that area. Managers of the local sugar mill reported that the high water consumption of sugar cane and the fact that the crop is sensitive to temperatures above 37°C make climate change a concern for this crop. However at the farm level, neither the impact of past drought events nor climate trends appeared to influence farmers' crop choices.

In contrast, farmers in the Honduras study site participated actively in small rural credit unions. Many farmers reported investing in alternative cash crops, small livestock or pasture, or even expanding coffee in the hope that prices would recover. Coffee is a relatively new crop to the region of western Honduras where the research took place; thus the farmers had entered the coffee crisis from a more diversified livelihood base than was observed in the Guatemalan and Mexican cases (as one farmer reported, the crisis "hasn't affected me much because I don't harvest very much"). This livelihood diversity partially buffered the households from the price collapse, while also providing them with economic resources to maintain their investment in coffee.

In all three cases, the responses of individual farm households to the crisis and to institutional incentives have potential landscape-level consequences. Of particular concern is the conversion of shade coffee to pasture, maize, or sugar cane (Figure 3). Such transformations carry implications for soil erosion, watershed protection and biodiversity. Ongoing research in all three regions is exploring these possible outcomes.

Coffee sector policy and farmers' adaptations

To various degrees, public sector and nongovernmental organizations in each of the

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3 countries have enacted similar policies in response to the crisis. These incorporate economic compensation, the promotion of crop conversion or diversification, encouraging production for niche markets, and reducing the volume of production (particularly at lower altitudes). It is still unclear what impacts these policies will have on the future of coffee production in these nations. There is some indication that in the study regions many smallholders were not able to access economic compensation because of excessive bureaucracy, lack of information, or difficult requisites (eg official receipts for harvest sales).

The promotion of alternatives to coffee, particularly in the lower-altitude regions where the quality is generally inferior, has also met with challenges related to inadequate financial support, price volatility for alternative crops, the absence of risk management mechanisms, and underdeveloped commercial networks. Farmers' options are further limited where slopes are too steep for most other crops. Moreover, many coffee farmers are reluctant to abandon a crop that has strong cultural significance. In cases where land use change has been observed—for example, the conversion of coffee to sugar cane or to urban development in the Mexican cases—farmers are responding to economic incentives independent of coffee sector policy. The migration of the rural labor force, in part driven by the coffee crisis, will also affect the viability of alternative crops and land use in coffee regions. Although interviews in all 3 regions revealed that farmers associate local deforestation with environmental change (eg drought, changes in stream flow, reduced humidity in cloud forests), this concern does not appear to guide their decisions about land use.

Improving coffee quality to increase farmers' access to niche markets and premium prices also entails complex issues. Quality was not a focus of coffee production policy in any of the 3 countries prior to the collapse of the ICA. High-quality coffee production entails resources for labor, financial investment, education, and infrastructure (Figure 4). Although climate is only one of many factors that affect quality, greater consistency will be achieved if farmers can respond flexibly to inter-annual variability in temperatures and rainfall, as well as to any climate trends. Under current production conditions, however, it is difficult for farmers to discern the links among climate variability, coffee yields, and quality. In reducing their harvest volumes because of low prices, farmers were less attentive to the impact of climate factors on their production. Reduced investment in coffee plantations and, in some cases, harvesting firewood from shade trees (Figure 5) may augment the susceptibility of their harvests to pests, water stress and high temperatures, and reduce the quality of harvests.



FIGURE 4 Coffee picker sorting out good beans from the final harvest of the year. (Photo by C.M. Tucker)

"This year I hardly had a harvest because I stopped maintaining the coffee because of the low prices." (Farmer in Guatemala)

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FIGURE 5 Fuelwood collected in a coffee district in Guatemala. (Photo by H. Eakin)



New opportunities, new challenges

"I am doing the same as always, I am not investing in something else, I'll continue with coffee. One day it will be worth something again." (Farmer in Mexico)

There are now opportunities in the markets for gourmet, fair trade and organic coffees. Mexico and Guatemala already have strong cooperatives and private label producers involved in these markets, although they were incipient in the study regions. In Honduras, involvement in these markets has been slower to develop. Farmers in all of the countries expressed interest in expanding these alternatives, but the technical assistance and investment required to meet the higher standards for specialty markets, as well as the capacity to organize cooperatives, remain beyond the reach of many smallholders. Support for cooperatives and farmers' associations has been recommended as an important component of new sectoral policies by international development organizations and coffee experts. Enhanced farm-level organization would conceivably improve farmers' access to niche markets and agricultural services, facilitate their participation in environmental planning initiatives, and increase their access to information on environmental change processes.

Further research is needed to understand farmers' responses, the appropriate institutional mechanisms to improve their livelihood security, and the linkages among environmental change, policy incentives, and farmers' decisions. The results of these case studies suggest that new coffee sector policies should consider farmers' vulnerability to market and climate risk. We know that farmers' livelihood decisions are likely to be made on the basis of strategies that best satisfy their basic needs and address their immediate economic uncertainties. Yet cumulatively, farm households' strategies may have broad environmental and economic implications. These implications are difficult to predict, but may be addressed through expanded farmer participation in policy initiatives and ecological planning.

Enhancing local capacities for risk management should be a central element in the evolution of coffee sector policy. Investment is needed in coffee research to ensure that the technical knowledge is available on the appropriate coffee varieties, shade densities, and other aspects of coffee management under changing climate conditions. Helping farmers overcome their distrust and skepticism of farm organizations is likely to increase their access to information and resources critical for adjusting to changing conditions. It may also provide a context for farmers to address other risks, such as environmental change. Coordination at the regional scale among relevant public and private sector organizations is equally important. Individual farmers may not see the aggregate implications of their decisions, but there may be opportunities for collective decision-making processes in which stakeholders define factors driving land use change, envision possible consequences, and identify scenarios that they wish to avoid. By working backwards from undesired outcomes, it may be possible to devise policies and associated interventions that will lead to more sustainable futures.

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FIGURE 6 Coffee production is part of a complex landscape shaped by diverse land uses that adapt to changing economic, policy, and climate conditions; will farmers' traditional resilience to increasing pressure be enough to maintain this fragile balance? Atitlán, Guatemala. (Photo by H. Eakin)

Following these recommendations, a new research project is being developed in collaboration with the Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias (INIFAP) and the Colegio de la Frontera Sur in Mexico, the Asociación Nacional del Café (Anacafé) and the Universidad del Valle de Guatemala in Guatemala, the University of Indiana, and the Centro Mesoamericano de Desarrollo Sostenible del Trópico Seco, Costa Rica. This project will explore the importance of farm organization in adaptive strategies and the land use consequences of farmers' responses (Figure 6). It is hoped that this project will support sustainable development initiatives in the coffee regions of Mexico, Honduras, Guatemala, and Costa Rica.

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