

Guhl, Andrés. *Café y cambio de paisaje en Colombia, 1970-2005*. Medellín: Fondo Editorial Universidad EAFIT, Banco de la República, 2008, 334 p.

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The largest environmental transformation in the coffee farming since 1970 has been the intensification of cultivation. The precise definition of intensification, sometimes known as ‘technification’ in the coffee industry, is usually taken to include the introduction of high-yielding coffee varieties, the reduction or elimination of shade in coffee farms, and the intensive use of chemical fertilizers, fungicides, and pesticides. Intensification was not, of course, limited to coffee cultivation; in the same period farmers intensified the cultivation of many other crops around the world. Andres Guhl’s *Café y cambio de paisaje en Colombia, 1970-2005* is the first book-length study of the intensification of coffee cultivation. Colombia is a particularly important case study for intensification, since it is one of the largest coffee producers in the world, and has long been a center for scientific, technological, and institutional innovation in the coffee industry. Colombian coffee farmers have arguably embraced intensification more completely than their counterparts any other country. While Guhl’s focus is on coffee in Colombia, this work is also explicitly a contribution to the literature on agricultural intensification more generally. As Guhl shows, agricultural intensification is a complex process whose causes and effects are still poorly understood.

Café y cambio de paisaje is at its heart a work of geography, but Guhl has also written it with an eye to researchers in other disciplines. The introduction and the first two chapters explore the theoretical and methodological framework for Guhl’s study, and provide a general overview of the global coffee

industry. Guhl situates the project in the broader theoretical literature on agricultural intensification. He introduces the three basic hypotheses that shape the study, which are worth quoting at length here. The book's main hypothesis is that "in areas where the mechanization of agriculture is difficult, as are the slopes of Colombia's coffee zone, intensification and commercialization allow farmers to produce the same quantity, or more, of a crop in a smaller area, which leaves land available for other products and other uses" (p. 31). The second hypothesis is that "in a given area that is undergoing a process of agricultural intensification and commercialization, not all forms of land use of the land will intensify at the same time" (p. 32). Farmers will intensify some forms of land use and de-intensify others, according to a range socio-economic, political, and environmental circumstances. Finally, the third hypothesis is that "the socio-economic, political, and economic factors most strongly connected to intensification and commercialization will vary from one region to another" (p. 32).

After providing a succinct overview of the global coffee industry, Guhl turns his attention to coffee cultivation in Colombia from its initial introduction in the eighteenth century until 1970. Coffee production in Colombia was volatile and dynamic even before the programs of intensification began in the 1970s. Between 1850 and 1970, coffee frontiers in Colombia shifted constantly, and coffee's role in Colombia's economy expanded and contracted – in part following the cycles of boom and bust in the global coffee industry. It is, in short, a mistake to see 'traditional' coffee cultivation in Colombia (or anywhere else, for that matter) as being static and unchanging. Nonetheless, the pace of change in Colombia's coffee industry accelerated with the intensification programs beginning in the 1970s. Colombia's experience with intensification and intensification was, to a certain extent unique. In many other coffee-producing countries, intensification was a piecemeal process. In those countries, it was usually the larger coffee farmers who intensified their production, while smaller farmers did so only on a limited scale. In Colombia, intensification was guided by the National Federation of Coffee Growers, and its scientific research arm, Cenicafé, the national coffee research center. Scientists at Cenicafé helped design a new coffee ecosystem that was adapted to Colombian environments, resistant to the coffee rust

fungus (which had by then appeared in the Americas and was spreading toward Colombia), and that increased production. The features of this intensified coffee production included the reduction or elimination of shade trees, the replacement of traditional coffee plants with high-yielding dwarf varieties of coffee (which could be planted more densely), and the increased use of agrochemicals – including fertilizers, fungicides, and pesticides.

From this background, Guhl turns his attention to the systematic study of intensification in Colombia since 1970. He devotes a chapter to discussing his sources and methods. His sources include surveys, interviews with farmers and other key informants, and a wide range of secondary data. The project also builds upon the three national coffee censuses conducted by the National Federation of Coffee Growers in 1970 (before the process of intensification began on a large scale), in 1980, and in 1993/7 (by which time intensification was well under way). Collectively these sources allow Guhl to track changes in coffee cultivation specifically, and land use in Colombia's coffee zones more generally, at the level of the municipality across the entire country. Based on these data, he conducts an exploratory analysis of a series of variables that shape agricultural intensification. These variables are drawn from theoretical models of intensification developed by Boserup, Chanaov, von Braun, and others. These include variables such as farm size density of rural population, family size and average age, and access to financial and state institutions. Guhl has produced a series of twelve maps that depict these variable across Colombia; coupled with a further seventeen maps in the next chapter that explore how these variables interact with one another. Collectively, these maps give a compelling overview of the intensification of Colombia's coffee industry since 1960. It is difficult to summarize these results in a short review. Among his key findings is that between 1970s and the mid-1990s, the total area under coffee cultivation decreased significantly, that the total number and average size of coffee farms decreased, but that total coffee production actually increased. By the mid 1990s, some 70% of Colombia's coffee farms had moved to intensified production; ten years later that figure was close to 85%. The heavy involvement of small coffee farmers in intensified production is contrary to the standard

picture of intensification in the coffee industry, which suggests that is large, well-capitalized farms that are most likely to intensify production.

The decline of area in coffee production, argues Guhl, reflects a complex trend toward diversification in land use in the coffee zones. In some cases, coffee farmers simply abandoned their farms to take salaried work elsewhere in the countryside or the cities. But land use has changed significantly even where coffee farmers remained on their land. In 1970, some 37% of agricultural land in the coffee zones was devoted to pasture. By the mid-1990s, that figure had dropped to a quarter. In contrast, secondary forests (where farms had been abandoned) and other cash crops had gained in importance. Coffee farmers began to reduce their economic dependence on coffee by cultivating other cash crops, including cacao, beans, sugarcane, and technified corn, depending on the region. Some coffee farmers also began intercropping their coffee with illicit crops, especially coca (although for obvious reasons these figures are more difficult to quantify). Guhl ponders the future of Colombia's coffee industry, with measured pessimism. He notes the growing popularity of specialty, organic, and fair trade coffees in the global market. While there is some scope for Colombian coffee farmers to produce coffee for these niches, they are so small that they will not offer an economic panacea for Colombia's coffee industry. Agricultural diversification – already underway in Colombia – may provide farmers with their best chance at economic security. But preliminary work shows that agricultural diversification in Colombia has produced significant soil erosion and other ecological damage.

Guhl's exacting quantitative analyses present a nuanced and complex picture of the forces that shaped the intensification of Colombia's coffee industry, and of intensification's environmental and economic consequences. Guhl also acknowledges the limitations of his data and his methods; he recognizes that quantitative analyses alone cannot completely explain the process of landscape change. He points to the many qualitative forces – historical and cultural – that have also shaped the history of coffee cultivation in Colombia, although he does not delve into them in great detail. His brief discussions of these qualitative forces raise many important questions that other researchers should address. The

only major feature missing in the book is a more detailed comparison of the intensification of coffee cultivation in Colombia with intensification in other coffee-producing countries – especially in Central America and Mexico. There are surely some important parallels, but also significant differences – few other countries ever intensified their coffee production to the degree that Colombia has done. Likewise, this book parallels innovative research on coffee farming in other countries – such as Mario Samper Kutschbach’s work on Costa Rica – that situates coffee farming in a broader agricultural context, recognizing that the people characterized as ‘coffee farmers’ often cultivate other crops as well. These small reservations aside, *Café y cambio de paisaje* is a pioneering and innovative study of intensification in coffee agriculture in Colombia, and a model for similar studies elsewhere.