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# THE PAPER TRAIL

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## Complex Landscapes, Big Thinking, and Insects—Agroecology an Evolving Field

**Editor's Note:** In this issue of *The Paper Trail*, an arising and an established agroecologist share a connection through a scholarly paper on biodiversity of agricultural systems by the latter. The arising researcher changes his thinking with regard to individual agroecosystems and landscapes, while his established colleague reflects on a seminal paper that got him interested in trophic interactions.

— Stephen L. Young

### The Arising Researcher

In my first field season of graduate school at the University of Michigan, I dedicated myself to studying a tiny lady beetle in a diverse coffee farm in Chiapas, Mexico. I somehow managed to train my eyes well enough to find it, and in the process made some discoveries about its fascinating behavior and ecology. But for me, there was something missing—I realized that I was wired to study ecosystems at broader scales and to consider the bigger

picture. Thus, after returning from that field season, I began to reconsider my research focus. It did not take me long to find my way to the writings of Dr. Teja Tschardtke and others associated with his laboratory. Nor did it take me long to realize that studying landscape-scale agroecology—the field Teja's laboratory has pioneered—was exactly where I wanted to focus the rest of my dissertation work. At this critical juncture in my ecological trajectory, the paper that most inspired me was Tschardtke's publication, "Landscape perspectives on agricultural



Aaron Iverson in the field in Puerto Rico

intensification and biodiversity – ecosystem service management” (2005, *Ecology Letters* 8:857–874).

This seminal synthesis paper contributed greatly toward uniting the fields of landscape ecology and agroecology and propelled me and many others into a new path of understanding ecosystem services and biodiversity in agricultural landscapes. From our current perspective, it is easy to overlook the significance of this contribution. However, it was a watershed moment for the field, as we realized we could no longer consider individual agroecosystems apart from their landscape context. Indeed, many times the landscape in which a field is embedded is even more important in predicting the community of organisms than is the local management.

I was initially drawn to agroecology due to its applied focus, particularly in relation to the benefits to farmers and to biodiversity. Teja’s paper therefore fell onto fertile ground, as it went on to explain the

nuances of taking a landscape perspective, with clear management implications. For example, they described under what landscape conditions we might expect local management to have the most impact on biodiversity, and how the most influential spatial scale depends on the trophic position, specificity, or body size of the organism in question.

With this paper tucked into my back pocket, I sought to make a contribution to the field on the steep, slippery slopes of the Mexican coffee farms. I quickly learned that the extremely biodiverse tropical backdrop was maybe not the easiest arena to observe landscape effects. But that, in and of itself, was an interesting finding.

The ripples of Teja’s 2005 paper and related research extend across the globe, and fortuitously managed to reach me at a critical point in my academic career. Fittingly, within a couple weeks of earning my doctorate degree, I met Teja for the first time. I was struck by his kindness and approachability, as well as his willingness to invest time in younger, up-and-coming scientists. It seems that his ability to think big extends to scales beyond the ecological realm.

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## The Established Researcher

When I started my Ph.D. in 1981, ecology as a biological discipline in Germany was in its infancy and still stuck in traditional ecophysiology, faunistics/floristics, and phytosociology approaches. While my enthusiasm for insects

and, in particular, parasitic wasps had been aroused by inspiring university teachers, I found the interactions between organisms and their resources to be much more interesting and key to understanding ecosystem functioning than sheer estimates of patterns in species richness and distribution.