Review: Agroecology in Action: Extending Alternative Agriculture through Social Networks
By Keith Douglass Warner

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Warner, Keith Douglass. *Agroecology in Action: Extending Alternative Agriculture through Social Networks*. Cambridge, MA: MIT Press, 2007. 273pp. ISBN 0-262-73180-0. US$25.00, paper. Acid-free.

The formation, evolution, and dissolution of social networks remain understudied phenomena. In *Agroecology in Action*, Keith Douglass Warner describes a set of particularly important social networks involved in rethinking industrial agriculture and in bringing to the fore new techniques of environmentally sensitive agricultural practices. These networks—comprised of growers, scientists, federal and state agencies, and various agricultural organizations—emerged in response to significant problems associated with the widespread use of agricultural pesticides, fertilizers, and other agrochemicals.

Public information about practical alternatives to agrochemicals has remained partially hidden, in part because of the structure of institutionalized agricultural science. Agricultural science, Warner argues, has mostly focused on developing and promoting economically valuable technologies to improve farm productivity, such as pesticides and fertilizers. By contrast, alternative farming techniques—which require greater investment in labor, more sophisticated ecological knowledge, and may present heightened economic risk—have been generally ignored.

Warner describes a variety of farming practices that have transcended the conventional, chemical-intensive norm. These include grape, pear, and almond farming in California; rotational grazing in the Midwest; and winter wheat farming in Washington, among others. Farmers became increasingly concerned with the environmental consequences of high chemical use, and sought alternatives. Their quest to develop new agricultural practices required them to forge new social links with other farmers, scientists, and government agencies. Understanding the formation of these new social networks is central to Warner's main thesis: adequate protection of common resources necessitates novel forms of "social learning," defined as the "participation by diverse stakeholders as a group in experiential research and knowledge exchange…" (p. 3).

Knowledge exchange, in Warner's examples, requires social networks whose formation was motivated mostly by farmers unwilling to accept the chemical-intensive status quo. Such networks are varied, and Warner attempts to specify the structural differences among them. To this end he analyzes networks of almond, pear, prune, and winegrape growers. His is a good first step; the sociograms he develops of each network provide points of departure for further research. However, the development and evolution of these networks could be more clearly specified, for example through the application of appropriate graph theoretic mathematical models. Although Warner cites Wasserman and Faust's 1997 *Social Network Analysis*, he does not make use of the mathematical tools presented in that volume. The general point is that the analysis of social networks and knowledge exchange will need to be as detailed and precise as, for example, the analysis of the biology of the naval orange worm (*Amyolois transitella*), an almond pest whose damage to the California almond crop could not be managed with pesticides. Biological analyses remain more sophisticated than social analyses; the latter may eventually catch up with the former. Both, however, are vital in understanding how knowledge exchange functions in evolving networks of farmers engaged in alternative agriculture.

Warner points out that the new criterion for agricultural success is not profitability, or at least not solely profitability. The new criterion for success is sustainability. This requires a clearer recognition of the fact that ecosystems are not simply natural systems. They are also, and simultaneously, social systems. This point is especially apposite for agriculture: nature and culture cannot be clearly separated. Analysis must incorporate elements of both the social and the natural. Studies of soils, nutrients, pests, pesticides, water, and crops—the realm of conventional agricultural science—remain insufficient without concurrent

studies of social networks, policies, laws, and cultural values—the realm of social science. *Agroecology in Action* demonstrates that an adequate understanding of emerging agricultural practices requires both perspectives. It will prove of interest to specialists in the natural and social sciences, and should be read with an eye toward transcending traditional scholarly boundaries.

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