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Identifying Sustainability —The Measurement and Typology of Sustainable Agriculture in the United States*

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Abstract

Sustainable agriculture seeks to create an economically viable, socially supportive, and environmentally sound farming system. However, there is limited empirical research on measuring agricultural sustainability, its components, and spatial distribution. Drawing data from the 2012 Census of Agriculture, a confirmatory factor analysis helps identify a three-factor structure of sustainable farming across counties in the United States: the *environmental* sustainability component refers to practices that reduce environmental degradation; the *economic* dimension highlights the efficiency of agricultural production; and the *social* component

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identifies practices which tend to promote economic viability and social support for communities. A cluster analysis on factor score indexes further indicates that the typology of sustainable agriculture includes: a majority of counties in the *high environment & low economy* and *moderate intensity* categories are widespread in this country; a *low environment & high economy* group is concentrated in the Northern Great Plains and in Iowa and Illinois; a few counties in the *extremely low environment & extremely high economy* cluster are located along the Lower Mississippi Valley, and dispersed throughout the Midwest, California, and Florida; and a small number of counties in the *high social* group are primarily concentrated in the New England, along the Pacific Coast, and around the Northern Great Lakes. In general, an agroecosystem framework that focuses on the interplay between social and ecological process of the agricultural system provides insights at the systems level and explicitly interprets the core attributes of sustainable agriculture, both in definition and measurement.

Key Words: environmental sustainability, economic sustainability, social sustainability, measurement, U.S. county agricultural statistics