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"Bridging the gap between increasing knowledge and decreasing resources"

A Model for Understanding the Economic Rationality of Agricultural Modernisation of the Mesoamerican Milpa System

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Abstract

Traditional (family, peasant) agriculture is often considered unproductive because of low yields of the main crop. However, many farmers, even in relatively well-communicated areas, do not adopt modern, high-input methods, despite available credits and much promotion. One explanation for non-adoption of modern methods is risk, which is ameliorated by diversity, at an efficiency cost – most traditional farming systems are mixed, either within the field or within the farm. Other explanations are cultural conservatism or lack of schooling. A different reason was suggested by several local studies on the total input and output of maize fields with other cultivated and non-crop species (milpas) in central Mexico; they included labor and energy costs, as well as interviews on decision processes. They showed that maize grain only contributed about 15–30 % of the value of the whole harvest under rain-fed conditions with low-input methods; cultivation for only this product was often not profitable. In contrast, if all inputs and outputs ("secondary" products) were considered, the system was highly profitable, as long as labour/opportunity costs were low. Based on these data, a model is presented that explains and predicts farmer's decisions on modernisation. It is based on a novel classification of agricultural crops (selfconsumption, crops that add value within the farm, locally valuable crop/speciality, regional cash crop, international cash crop) and the cost of inputs, particularly of labour opportunity costs, market access and energy (transport, agrochemicals). Modernisation occurs when opportunity costs rise and/or external energy costs sink. In order for intensive, high-external-input cropping to be an economically rational alternative, farmers would need to value their time at about the level of the salary of a recent university graduate in Mexico, in our milpa example. The model can be applied to other systems, and different scales. This contribution shows that a discussion based only on the yield and economics of the main crop is not adequate for traditional systems.

Keywords: Agricultural modernisation, economic evaluation, intercropping, Mexico, traditional agriculture

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