**Balanced Fertilization and Limited Productivity: Evidence from Indian Plots**

Beata Itin-Shwartz

The Hebrew University of Jerusalem

**Abstract**

Input and technology adoption in agriculture has been widely discussed in the literature, specifically addressing issues of input availability, awareness and learning mechanisms, as well as attitudes toward risk, and credit constraints. While fertilizer adoption continues to be a central concern in Sub-Saharan Africa, in Asian agricultural systems adoption is relatively widespread. However, new concerns arise as soil productivity remains low and the response to fertilizer diminishes with time. In this paper, I study unbalanced patterns of fertilization, heavily relying on nitrogen fertilizer, potentially hindering productivity. Using plot level data from around 300,000 plots across India, I estimate crop and soil specific crop-response functions identifying the optimal nitrogen ratio in terms of current-season yield. Cost shifters from the fertilizer industry are used as instruments for the nitrogen ratio. I find that a large share of Indian cultivators overuse nitrogen relative to the other two nutrients. The widespread nitrogen-only fertilization pattern is generally rejected as optimal. A profitability analysis comparing the optimal-ratio practice to the nitrogen-only pattern, confirms that the optimal ratio is more profitable, even under the current nitrogen subsidy policy. An analysis of the nitrogen ratio effect on yield variance does not find a risk-reducing effect.