Anticipating Impacts of Future Agricultural Production in Africa Using Global Physical and Payment Networks

Topic: Addressing Resource Challenges in a Globalized Economy II
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Previous work (Springer and Duchin 2013) quantifies increased agricultural production and resource use to accommodate population growth and enriched diets in developing countries in 2050. This work also shows Africa emerging as a key region of production and exports given its large remaining availability of land and water resources and its high potential for increased agricultural yields. Projected global trade networks are therefore also quite different under the 2050 scenarios compared to the 2000 baseline. In this paper, we apply Duchin and Levine's Absorbing Markov Chain (AMC) method to calculate the physical networks and payment networks for a baseline scenario in the year 2000 and for the 2050 scenarios that correspond to the surge in agricultural production in Africa. We also examine the extent to which wages of agricultural workers in Africa could increase if they benefit from a portion of the scarcity rents on land and water used in agricultural production.