Chinese agriculture-focused provincial multi-region input-output database

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Agriculture plays a pivotal role in food security, poverty alleviation, and economic development. Beyond its socio-economic importance, agriculture also exerts profound environmental pressures, contributing to greenhouse gas emissions, deforestation, soil degradation, and excessive water consumption. China is the world's most populous country and a major agricultural powerhouse. With limited arable land and growing food demand, China faces the challenge of balancing agricultural productivity with environmental sustainability. A detailed understanding of China's agricultural sector is crucial for formulating effective policies that support sustainable agricultural development. However, existing Chinese provincial multi-region input-output (MRIO) models often lack the necessary resolution to capture the full complexity of agricultural supply chains. The aggregation of multiple agricultural activities into a single sector masks crucial differences in resource use, productivity, and environmental impacts across agricultural sub-sectors.

In this context, we introduce Chinese agriculture-focused MRIO tables that cover 91 economic sectors for 31 provinces in 2012, 2015, and 2017. This dataset splits the single aggregated agriculture sector in previous Chinese MRIO tables into 50 new sectors, including granular information on 27 agriculture sectors, 3 forestry sectors, 10 animal husbandry sectors, 9 fishery sectors, and 1 agriculture-related service sector. This refined MRIO framework provides the necessary granularity to identify region- and sector-specific economic trends, trade dependencies, and environmental footprints within China's agricultural system.

We disaggregate all the underlying single-region input-output tables and interregional trade matrices to reach a disaggregated MRIO table. Our disaggregation process begins by splitting the inputs and outputs of these regional tables. We then reconcile competitive and non-competitive input-output structures to achieve harmonized, disaggregated interregional trade flows, ultimately merging all refined tables into a new MRIO system with enhanced granularity. To resolve mismatches between bottom-up and top-down information, we apply tailored reconciliation strategies built on entropy-based nonlinear programming methods. Information for the new sectors is collected from multiple sources. These include Chinese statistical yearbooks, cost-benefit compilations for various agricultural products, the China Health and Nutrition Survey, and product-level trade statistics from China Customs. Our study not only enhances the understanding of China's agricultural economy but also provides reference for improving sectoral disaggregation in MRIO models worldwide, enabling more precise and effective policy interventions for sustainable agriculture.

This agriculture-focused MRIO dataset, featuring unprecedented detail in agricultural sub-sector delineation, has broad applicability for socio-economic research on regional agricultural development in China. Policymakers and researcher can rely on this dataset to simulate policy scenarios related to China's agricultural transition, such as shifts in subsidy allocations or technological upgrades. The expanded resolution supports more precise assessments of production efficiency, labor distribution, and regional trade dependencies, thereby providing critical insights into areas for targeted intervention. Furthermore, these data can serve as a foundational baseline for generating extensive satellite accounts, facilitating in-depth studies of environmental footprints. This includes the analysis of greenhouse gas emissions, air pollutants, land-use changes, and biodiversity loss stemming from interprovincial agricultural supply chains. Our dataset significantly enhances the capacity of researchers and decision-makers to examine and address the complex interplay of economic, social, and environmental factors within China's agricultural sector.