



## USDA Economic Research Service GTAP Consortium Agency Report 2021-2022

### 1. GTAP Model and Data Base Usage

USDA's Economic Research Service (ERS) uses resources from GTAP for both data and modeling purposes. The data support two computable general equilibrium (CGE) models used at ERS: MTED-GTAP is used for analysis of trade policy in the Market and Trade Economics Division; the Future Agricultural Resources Model (FARM) is used for long-term scenario analysis in the Resource and Rural Economics Division.

The MTED-GTAP model is based on the GTAP model in GEMPACK. The FARM model is based on GTAPinGAMS software published by Tom Rutherford. Both models have been extended in many ways depending on questions that were addressed.

### 2. Publications

F Baquedano, Jelliffe, J., Beckman, J., Ivanic, M., Zereyesus, Y. and M. Johnson. 2022. "Food Security Implications for Low-and Middle-Income Countries under Agricultural Input Reduction: The Case of the European Union's Farm to Fork and Biodiversity Strategies." *Applied Economic Perspectives and Policy* (forthcoming).

Jafari, Y., Britz, W., Guimbard, H., and J. Beckman. 2021. "Properly Capturing Tariff Rate Quotas for Trade Policy Analysis in Computable General Equilibrium Models." *Economic Modelling* (forthcoming).

Beckman, J., Ivanic, M., and J. Jelliffe. 2021. "Market Impacts of Farm to Fork: Reducing Agricultural Input Usage." *Applied Economic Perspectives and Policy* (forthcoming).

Chepeliev, M., Golub, A., Hertel, T., Saeed, W., and J. Beckman. 2021. "Disaggregating the Vegetables, Fruits and Nuts Sector to the Tariff Line in the GTAP-HS Framework." *Journal of Global Economic Analysis*, 6 (1): 82-127.

Fujimori, S., W. Wu, J. Doelman, S. Frank, J. Hristov, P. Kyle, R. Sands, W. van Zeist, P. Havlik, I. Pérez Domínguez, A. Sahoo, E. Stehfest, A. Tabeau, H. Valin, H. van Meijl, T. Hasegawa, K. Takahashi. 2022. "Land-based climate change mitigation measures can affect agricultural markets and food security," *Nature Food* 3: 110-121.

Rose, S., A. Popp, S. Fujimori, P. Havlik, J. Weyant, M. Wise, D. van Vuuren, T. Brunelle, R. Cui, V. Daioglou, S. Frank, T. Hasegawa, F. Humpenöder, E. Kato, R. Sands, F. Sano, J. Tsutsui, J. Doelman, M. Muratori, R. Prudhomme, K. Wada, H. Yamamoto. 2022. "Global biomass supply modeling for long-run management of the climate system," *Climatic Change* 172 (3).

### **3. Presentations**

Sands, R.D. (2021) “Scenarios of bioenergy and food demand: implications for land use and carbon storage,” 27th Asia-Pacific Integrated Modeling (AIM) International Workshop, September 30 - October 1, 2021 (virtual meeting).

Sands, R.D. (2021) “Net zero CO<sub>2</sub> scenarios for the U.S.: EMF-37 first results,” Integrated Assessment Modeling Consortium (IAMC) Annual Meeting, November 29 - December 3, 2021 (poster – virtual meeting).

Beckman, J. (2022). Briefing to the EU Parliament on Farm to Fork.

Beckman, J. (2022). Briefing to the UK government on Farm to Fork.

### **4. Special Reports**

#### **5. Projects**

Agricultural Model Intercomparison and Improvement Project (AgMIP): Multi-Breadbasket Failures and Shocks to Food Systems. Columbia University provides expertise in crop process models; IFPRI will simulate food shocks using the IMPACT model; ERS will simulate food shocks in the FARM model.

#### **6. Other Activities**