USDA Economic Research Service
GTAP Consortium Agency Report 2018-2019

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**

   Jafari, Y., Britz, W., and J. Beckman. 2019. "The Impacts to Food Consumers of a Transatlantic Trade and Investment Partnership." Bio-based and Applied Economics (forthcoming).

   Beckman, J., Estrades, C., and A. Aguiar. 2018. "Export Taxes, Food Prices and Poverty: A Global CGE Evaluation." Food Security (forthcoming).

   Beckman, J., and S. Zahniser. 2018. "The Importance of NAFTA's Market Access Provisions to Intraregional Agricultural Trade." Canadian Journal of Agricultural Economics, 66(4): 599-612.

   Ruane, AC, J Antle, J Elliott, C Folberth, G Hoogenboom, D Mason-D'Croz, C Müller, C Porter, MM Phillips, R Raymundo, R Sands, RO Valdivia, JW White, K Wiebe, and C Rosenzweig (2018) "Biophysical and economic implications for agriculture of +1.5° and +2.0°C global warming using AgMIP Coordinated Global and Regional Assessments," Climate Research 76: 17-39.

   Bauer, N, SK Rose, S Fujimori, DP van Vuuren, J Weyant, M Wise, Y Cui, V Daioglou, M Gidden, E Kato, A Kitous, F Leblanc, R Sands, F Sano, J Strefler, J Tsutsui, R Bibas, O Fricko, T Hasegawa, D Klein, A Kurosawa, S Mima, and M Muratori (2018) "Global energy sector emission reductions and bioenergy use: overview of the bioenergy demand phase of the EMF-33 model comparison," Climatic Change (published online).

3. **Presentations**

Sands, RD (July 2018) "Large-Scale Carbon Management via Bioenergy with Carbon Capture and Storage (BECCS)," Summit on Realizing the Circular Carbon Economy: Charting a Course for Innovations in Agriculture and Energy, Golden, Colorado.

Sands, RD (September 2018) "Challenges for Modeling Net-Zero Carbon Emissions," Forestry and Agriculture Greenhouse Gas Modeling Forum, Shepherdstown, West Virginia.

Sands, RD (November 2018) "Implications for agriculture of +1.5° and +2.0°C global warming," 24th Asia-Pacific Integrated Modeling (AIM) International Workshop, National Institute for Environmental Studies, Tsukuba, Japan.

Sands, RD (May 2019) "Global Economics and Food Demand," Next-Generation Food Shock Modeling workshop, Aspen Global Change Institute, Aspen, Colorado.

4. Special Reports

5. Projects
1. Scenarios of Global Diets and the Impact on Land and Water Resources: This project extends capabilities of the ERS FARM model to simulate long-run effects of alternative diets on land use and water resources globally. The study has three primary objectives: (1) improve the representation of consumer food demand in global economic models, especially in regions with rapidly increasing incomes; (2) better represent interindustry linkages from food consumed to derived demand for land; and (3) evaluate alternative frameworks for constraints imposed by water availability.

2. Stanford Energy Modeling Forum: EMF-32 is a study of potential U.S. carbon taxes at various levels and alternative ways to recycle carbon tax revenue. The FARM paper highlights the role of bio-electricity with carbon dioxide capture and storage. EMF-33 is a study on global land use and biomass, with participation of ten modeling teams, including FARM.

3. Agricultural Model Intercomparison and Improvement Project (AgMIP): The FARM model is used for ERS participation in the AgMIP global economics group. AgMIP multi-model comparisons typically simulate economic responses to multiple drivers such as growth in population, growth in per-capita incomes, and changes in agricultural productivity due to climate change.

4. The MTED-GTAP model is currently being used to inform U.S. policy makers on impacts of free trade agreements or modifying existing agreements. This work is using the pre-release version 10 data base.

5. The Global Landscape of Agricultural Trade (GLAT) is a project that began with an ERS qualitative study of trends in trade and trade policy. The next step (ongoing for 2018) is to use MTED-GTAP to provide a quantitative analysis of topics described in the ERS report. These include: increasing market access, removing export interventions, changing global agriculture domestic support, and evaluating non-tariff measures.

6. Other Activities