

Zhan Wang

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Research Interests

Global, national and gridded impacts (e.g. international trade, climate change, transportation infrastructure) on the agriculture-land-environment system with general / partial equilibrium models and geospatial data; innovative approaches to facilitate economic education.

Education

Ph.D. in Agricultural Economics, Purdue University, USA	Aug 2018 – Jul 2023
Master of Environmental Management, Duke University, USA	Aug 2012 – May 2014
Bachelor of Science in Environmental Science	Sep 2008 – Jul 2012
Bachelor of Science in Psychology (Dual degree)	Sep 2009 – Jul 2012
Peking University, China	

Professional Experience

Post-Doctoral Research Associate Department of Agricultural Economics, Purdue University, USA	Aug 2023 – Present
Graduate Research Assistant Department of Agricultural Economics, Purdue University, USA	Aug 2018 – Jul 2023
Research Assistant Global Health Research Center, Duke Kunshan University, China	Dec 2014 – Apr 2017

Job Market Paper

“GTAP-SIMPLEG: Integrating Gridded Land Use, Crop Production and Environment Impacts into Global General Equilibrium Model of Trade”

Abstract: The integration between global and local economic systems has been an increasingly important research topic due to the spatial heterogeneity in data, mechanisms and responses to external shocks. This paper presents GTAP-SIMPLEG, a general-equilibrium framework that extends the existing GTAP model by integrating a gridded partial equilibrium system on land use and crop production. This model framework links global demand and bilateral trade flows with local level crop supply and land use conversion, accounting for spillover effects across land-using sectors and subnational regions. This paper details the structure of GTAP-SIMPLEG model, the development of a gridded database for Brazil, and the calibration of key parameters that govern the land use conversion and multi-crop production. This paper further provides an illustrative example of applying GTAP-SIMPLEG to simulate impacts of China’s retaliatory tariffs on the US’s soybean exports on Brazilian crop production and land use at the local level. Findings show that the tariff shock causes not only the increase in Brazilian soybean production, but also highly heterogeneous responses in crop production and land use, partially due to the varying multi-cropping capacities. Finally, this paper discusses the potential extensions of GTAP-SIMPLEG for future studies and policy assessments on the Global-to-Local-to-Global linkages.

Publications

Peer-reviewed Journal Articles

1. **Wang, Zhan**, Geraldo B. Martha Jr, Jing Liu, Cicero Z. Lima, and Thomas W. Hertel. "Planned expansion of transportation infrastructure in Brazil has implications for the pattern of agricultural production and carbon emissions." *Science of The Total Environment* 928 (2024): 172434. <https://doi.org/10.1016/j.scitotenv.2024.172434>
2. **Wang, Zhan**, and Thomas W. Hertel. "SMART Handout: An Innovative Tool to Empower Applied General Equilibrium Teaching." *Journal of Global Economic Analysis* 9, no. 1 (2024): 45-61. <https://doi.org/10.21642/JGEA.090102AF>
3. Xiong, Shangzhi, Gangjiao Zhu, Rahul Malhotra, Xinyue Chen, Enying Gong, **Zhan Wang**, Jian'An Zhang et al. "Community efficacy for non-communicable disease management (COEN): Conceptualization and measurement." *PLOS Global Public Health* 4, no. 8 (2024): e0003549. <https://doi.org/10.1371/journal.pgph.0003549>
4. Zhu, Gangjiao, Rahul Malhotra, Shangzhi Xiong, Xinyue Chen, Mingyang Zhang, You Wu, Enying Gong, **Zhan Wang**, Xiangyang Tian, Weixia Peng, Truls Østbye, and Lijing L Yan. "Community Efficacy for Non-Communicable Disease Management and Medication Adherence: The Sequential Mediating Role of Self-Efficacy and Depressive Symptoms." *Patient preference and adherence* (2023): 3421-3433. <https://doi.org/10.2147/PPA.S436419>
5. Chen, Shu, Lei Guo, **Zhan Wang**, Wenhui Mao, Yanfeng Ge, Xiaohua Ying, Jing Fang et al. "Current situation and progress toward the 2030 health-related Sustainable Development Goals in China: A systematic analysis." *PLoS medicine* 16, no. 11 (2019). <https://doi.org/10.1371/journal.pmed.1002975>
6. Li, Niying, **Zhan Wang**^{*}, and Keith Dear. "Violence against health professionals and facilities in China: evidence from criminal litigation records." *Journal of forensic and legal medicine* 67 (2019): 1-6. <https://doi.org/10.1016/j.jflm.2019.07.006>
7. **Wang, Zhan**, Enying Gong, Weixia Peng, Jiaying Chen, Xiangyang Tian, Shangzhi Xiong, and Lijing Yan^{*}. "Community empowerment for the prevention and control of non-communicable diseases." (in Chinese) *Chinese General Practice* 22, no. 10 (2019): 1153.
8. **Wang, Zhan**, Niying Li^{*}, Mengsi Jiang, Keith Dear, and Chee-Ruey Hsieh. "Records of medical malpractice litigation: a potential indicator of health-care quality in China." *Bulletin of the World Health Organization* 95, no. 6 (2017): 430. <https://doi.org/10.2471/BLT.16.179143>
9. **Wang, Zhan**, and Keith Dear^{*}. "Region and firm level determinants of environmental regulation violations: An empirical study in Chongqing, China." *Journal of cleaner production* 141 (2017): 1011-1022. <https://doi.org/10.1016/j.jclepro.2016.09.090>
10. Liu, Feifei, Lijing Yan, **Zhan Wang**, Yuanan Lu, Yuanyuan Chu, Xiangyu Li, Yisi Liu, Dongsheng Rui, Shaofa Nie, and Hao Xiang^{*}. "Metformin therapy and risk of colorectal adenomas and colorectal cancer in type 2 diabetes mellitus patients: A systematic review and meta-analysis." *Oncotarget* 8, no. 9 (2017): 16017. <https://doi.org/10.18632/oncotarget.13762>

Conference proceedings

1. Haqiqi, Iman, **Zhan Wang**, Srabashi Ray, Uris Baldos, Jing Liu, and Thomas Hertel. "Market-Mediated Effects: What Are they? And why are They Important for Geospatial Analysis of Sustainability Policies." *I-GUIDE Forum 2023 - Harnessing the Geospatial Data Revolution for Sustainability Solutions* (2023). <https://doi.org/10.5703/1288284317682>
2. Fraysse, Elizabeth A., Thomas W. Hertel, **Zhan Wang**, and Iman Haqiqi. "SIMPLE-G In the Classroom and the Cloud." *I-GUIDE Forum 2023 - Harnessing the Geospatial Data Revolution for Sustainability Solutions* (2023). <https://doi.org/10.5703/1288284317668>

Commentary

1. Dear, Keith*, and **Zhan Wang**. "Climate and health: mortality attributable to heat and cold." *The Lancet* 386, no. 9991 (2015): 320-322. [https://doi.org/10.1016/S0140-6736\(15\)60897-2](https://doi.org/10.1016/S0140-6736(15)60897-2)

Book chapters

1. **Wang, Zhan**. "Chapter 15: The Role of Transportation Infrastructure Expansion in the Transmission of Global Price Shocks to the Brazilian Economy." in *SIMPLE-G: A Gridded Economic Approach to Sustainability Analysis of the Earth's Land and Water Resources*. Haqiqi and Hertel (eds). Springer Publishing, 2024. <https://link.springer.com/book/10.1007/978-3-031-68054-0>
2. **Wang, Zhan**, Jiwei Chen, Yujiao Jiang, Yunyi Li, Lina Song, Yuanqing Zhu, Jialiang Liang. "The life condition of ecological migrants in Ordos, Inner Mongolia." in *Environment Watch: The fifth anniversary collection of students' social practices from the College of Environmental Science and Engineering, Peking University (in Chinese)*, The editorial board of social practices from the College of Environmental Science and Engineering, Peking University (eds). The Publishing House of Electronics Industry, 2013.

Working papers

1. "Impacts of Human Heat Stress on US Agriculture with 3°C warming: Multi-scale Responses and Spillover Effects", with Subhashni Raj, Sukanya Dasgupta, Elaina Gonsoroski, Marija Verner, Andrew Zimmer, Oluwadamilola Salau, Iman Haqiqi, and Thomas Hertel.
2. "Climate Change, Irrigation Expansion and Impacts on Agriculture Production: An Integrated Multi-Scale Analysis of Brazil by 2050", with Geraldo B. Martha Jr., Jing Liu and Cicero Zanetti de Lima
3. "Impacts of China's Grain-to-green Program on Gridded Cropland Supply and Crop Production", with Jing Liu
4. "Nexus between Economic Growth, Pollution Control and Natural Ecosystem: Theory and Empirical Evidence"

Teaching Experience

Teaching assistant

AGEC618 (PhD level) “Applied General Equilibrium Analysis” 2023
Purdue University

Instructor

Short Course in Multi-scale Analysis of Sustainability 2022, 2024
Purdue University

Statistics Lab instructor

Biostatistics and Epidemiology for Global Health (Master level) 2015 – 2017
(on data analysis with STATA), Duke Kunshan University

Conference Presentations

AAEA Annual Meeting, New Orleans, LA	2024
GTAP 27th Annual Conference, Fort Collins, CO	2024
I-GUIDE forum, New York, NY	2023
AAEA Annual Meeting, Washington, D.C	2023
AGU Fall Meeting 2022, Chicago, IL (poster)	2022
AAEA Annual Meeting, Anaheim, CA	2022
GTAP 25th Annual Conference, online	2022
AAEA & WAEA Joint Annual Meeting, Austin, TX and online	2021
GTAP 24th Annual Conference, online	2021
GTAP 23rd Annual Conference, online	2020

Webinar Presentations

GLASSNET Webinar: SIMPLE G Brazil - Transportation Infrastructure Expansion in Brazil.
Online. March 23, 2023.

<https://www.youtube.com/watch?v=qSA31yOgTeg>

GTAP Virtual Seminar Series: SMART Handout: An Innovative Tool to Empower Applied
General Equilibrium Teaching. Online. October 15, 2024.

<https://www.youtube.com/watch?v=IBbsa6mUz50>

Reviewer for Journals and Conferences

Journal of the Agricultural and Applied Economics Association
China Agricultural Economic Review
Global Food Security
Environment, Development and Sustainability
Journal of Forensic and Legal Medicine
Human Resources for Health
GTAP Annual Conferences (25th, 26th, 27th)

Training / Workshops

I-GUIDE summer school, Boulder, CO	2023
NVIDIA Fundamentals of Deep Learning	2022
Trustworthy AI for Environmental Science	2021
Berkeley Sloan Summer School in Environmental and Energy Economics	2021

Awards and Honors

Grad Student Poster Competition (2 nd place) of AgEcon department, Purdue University	2022
Dean's Award for Special Contribution, Duke Kunshan University	2017
Degree Marshal for Nicholas School of the Environment, Duke University	2014
Outstanding Graduate of Beijing, Peking University	2012
Cyrus Tang Scholarship, Peking University	2008 - 2012

Software Skills

R, GEMPACK, QGIS, Python

Language

Chinese (native), English (fluent)

(Last updated: October 2024)