

## CURRICULUM VITAE

**Keith O. Fuglie**

Agricultural & Applied Economist

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**United States Citizen**

## SKILLS SUMMARY

Agricultural and science policy analysis

Agricultural value chain development

Productivity analysis

Economic impact of technological change

## WORK EXPERIENCE

**National Center for Food & Agricultural Policy (NCFAP), Senior Fellow**

**05/2025 to present**

**World Bank, World Bank, Washington, DC**

**05/2025 to present**

**Senior Consultant.** Assessing policies and investments in developing countries to accelerate agricultural growth and value chain development.

**USDA Economic Research Service (ERS), Washington, DC**

**09/2020-04/2025**

**Senior Economist.** Conducted research on the economics of agricultural technical change and science policy; developed public databases of international agricultural total factor productivity and R&D investment; assessed economic impact of international and domestic agricultural research; developed economic models for research prioritization; assessed impacts of agricultural technical change on the environment. Responsibilities included managing and coordinating research projects across teams and multiple institutions; mobilizing research resources; engaging with senior policy makers; communicating results to professional and nontechnical audiences; mentoring early and mid-career research staff.

**USAID Bureau of Food Security, Washington, DC**

**01/2019-08/2020**

**Senior Agricultural Economist.** Evaluated economic implications of agricultural research investments for productivity growth and poverty alleviation in developing countries; institutionalized evidence-based approaches for USAID research prioritization; provided analysis to inform research priorities for CGIAR Crops to End Hunger Initiative; conducted economic impact evaluations of USAID-funded research at land grant universities and CGIAR.

**USDA Economic Research Service (ERS), Washington, DC**

**12/2006-12/2019**

**Senior Economist (10/2014-12/2019).** Led research projects on the economics of agricultural technical change, science policy and international agricultural productivity. Developed collaborative research projects with universities and international organizations, communicated with decision makers, professional and public audiences on implications of research findings for policy.

**Branch Chief (10/2009-09/2014) for Resource, Environmental and Science Policy Branch and Conservation and Environment Branch.** Supervised 15-20 PhD-level research staff conducting studies on economic and policy issues affecting agriculture and the environment. Responsible for strategic planning, recruitment, mentoring, performance evaluation, leading research projects, and communicating research findings to senior government policy makers and other stakeholders.

**Research Economist (12/2006-09/2009).** Led research projects on measurement and analysis of international agricultural productivity and the role of the public and private sectors in U.S. and global agricultural research and development; prepared written and oral policy briefings for senior policy makers; coordinated collaborative research with U.S. universities; produced first global assessment of private agribusiness investment in agri-food research and development.

**Faculty of Economics, University of Indonesia, Jakarta**

**08/1999-07/2002**

**Adjunct Professor.** Taught graduate-level courses in Microeconomics and the Economics of Science & Technology Policy.

**International Potato Center (CIP), Bogor, Indonesia**

**12/1998-11/2006**

**Director of Impact Enhancement Division (2003-2006).** Led CIP's global research program on impact and priority assessment, constraints to technology adoption, and market value-chain development; led study of international potato and sweet potato research priorities for developing countries.

**Regional Representative for East Asia-Pacific (1999-2004).** Led CIP's collaborative research program in the Asia-Pacific region coordinating CIP's research projects with government research institutes; responsible for strategic planning, resource mobilization, managing regional research station, and communicating with policy makers and stakeholders.

**White House Council of Economic Advisers (CEA), Washington, DC**

**06/1997-11/1998**

**Senior Economist** for agriculture and natural resources.

**USDA Economic Research Service (ERS), Washington, DC**

**12/1992-05/1997**

**Research Economist.** Conducted studies on the economics of agricultural technical change and science policy in U.S. and international agriculture.

**Rockefeller Foundation Research Fellow, Tunis, Tunisia**

**09/1989-06/1992**

## EDUCATION

Brookings Institution Executive Education

Certificate of Public Leadership

University of Minnesota

Ph.D. in Agricultural and Applied Economics

M.S. in Agricultural and Applied Economics

Concordia College, Moorhead, Minnesota

B.A. in mathematics and French

President of the Student Association

## PROFESSIONAL AFFILIATIONS AND SERVICE

- Member, Agric. & Applied Econ. Assoc. (AAEA), Int'l Assoc. of Agric. Economists (IAAE)
- White House Executive Order (2022), Lead author of commissioned report on *USDA Agri-Food Supply Chain Assessment: Program and Policy Options for Strengthening Resilience*
- Board for International Food and Agricultural Development (2021), Contributing author to commissioned report on *Agricultural Productivity Growth, Resilience, and Economic Transformation in Sub-Saharan Africa: Implications for USAID*
- FAO Advisory Committee (2022-present), Agricultural Science and Technology Indicators
- National Science Foundation Advisory Board (2019-present), Innovations at the Nexus of Food-Energy Water Systems
- World Bank (2018-2020), Lead author of commissioned report on *Harvesting Prosperity: Technology and Productivity Growth in Agriculture*

- AAEA and IAAE Award Committees (2016-24)
- FAO Expert Panel Member (2016-17), Commission on Agricultural Productivity
- G20 Chief Agricultural Scientists (2014-16), Lead author of commissioned report on *Metrics for Sustainable Agricultural Productivity*
- Editorial Board (2012-14), *Journal of Agricultural and Applied Economics*

### **HONORS AND AWARDS**

- Giovanni Anania Societal Impact Reward for *EuroChoices* best article, EAAE 2025
- Fellow, Agricultural and Applied Economics Association, 2023
- USDA Secretary's Honor Award, 2023
- USDA REE Under-Secretary's Performance Award, 2022
- Alumni Achievement Award, Concordia College, Moorhead, MN, 2022
- Honorary Life Member, International Association of Agricultural Economists, 2021
- USDA REE Under-Secretary's Performance Award, 2018
- Fred Woods Award for Excellence in Public Policy Research and Education, 2017
- ERS Helios Award for Product of Enduring Quality, 2015-2016
- Bruce Gardner Memorial Prize for Applied Policy Analysis, AAEA, 2014
- ERS Excellence Award for Research, 2013
- USDA Secretary's Honor Award for Personal and Professional Excellence, 2012
- John Lee Award for Sustained Excellence in Group Economic Analysis, 2012
- ERS Helios Award for Research and Policy Analysis, 2011-2012
- ERS Helios Award for Research and Policy Analysis, 2009-2010
- Quality of Communication Award, honorable mention, AAEA 2010
- Quality of Communication Award, AARES 2007

### **PROJECT GRANTS DEVELOPED, PROCURED AND MANAGED**

USDA Cooperative Research Agreement on "The R&D Cost of Mitigating GHG Emissions from Agriculture" [02/2021-12/2021]. Awarded \$76,000.

USDA Cooperative Agreement for "Travel Grants for the 31<sup>st</sup> International Conference of Agricultural Economists, New Delhi, India" [10/2020-12/2022]. Awarded \$130,000.

USAID Research Grant for "Foresight Analysis to Inform Agricultural Research Priorities and Decision Making in International Agricultural Research" [9/12020 to 12/2021]. Awarded \$370,000.

USAID Research Grant for "The Economic, Poverty and Environmental Impacts of CGIAR Crop Improvement Research" [7/2020 to 12/2021]. Awarded \$290,000.

ERS Innovation Research Grant for "Productivity Growth and Farm Size: An International Comparison" [4/2015-09/2018]. Awarded \$300,000.

USDA Cooperative Research Agreement on "Private Sector Agricultural Research" [09/2007-12/2018]. Awarded \$207,800.

USAID Feed-the-Future Cooperative Research Agreements on "International Agricultural R&D and Global Futures" [8/2013-3/2016]. Awarded \$125,000.

USDA Cooperative Research Agreement on "Agricultural R&D Investment and Capacity in the Middle East and North Africa" [10/2012-6/2015]. Awarded \$300,000.

USDA Cooperative Research Agreement on "Agricultural Productivity with Emphasis on Water Constraints in the Middle East and North Africa" [10/2012-06/2015]. Awarded \$200,000.

## PUBLICATIONS

**PEER-REVIEWED JOURNAL ARTICLES (number=57)**

- Van Dijk, Michiel, Keith Fuglie, Paul W. Heisey, and Haiyan Deng. 2025. A global database of public agricultural R&D investment: 1960-2022. *Scientific Data* (forthcoming).
- Baldos, Uris Lantz C., Alfredo C. Peneda, Keith Fuglie, and Thomas W. Hertel. 2025. [Adoption of improved crop varieties limited biodiversity losses, terrestrial carbon emissions and cropland expansion in the tropics](#). *Proceedings of the National Academy of Sciences* 122(6):e2404839122.
- Fuglie, Keith, Thomas W. Hertel, David B. Lobell, and Nelson B. Villoria. 2024. [Agricultural productivity and climate mitigation](#). *Annual Review of Resource Economics* 16:21-40.
- Jelliffe, Jeremy, Keith Fuglie, and Stephen Morgan. 2024. [Productivity-led pathways to sustainable agricultural growth: six decades of progress](#). *EuroChoices* 23(3):4-13.
- Fuglie, Keith, and Ruben G. Echeverria. 2024. [The economic impact of CGIAR-related crop technologies on agricultural productivity in developing countries, 1961-2020](#). *World Development* 176:106523.
- Fuglie, Keith, Jan Lewandowski, and Elizabeth Marshall. 2023. [Addressing “leaks” in climate-smart agriculture](#). *Nature Sustainability* 6:885-886.
- Fuglie, Keith, Keith Wiebe, Timothy B. Sulser, Nicola Cenacchi, and Dirk Willenbockel. 2022. [Multidimensional impacts from international agricultural research: Implications for research priorities](#). *Frontiers in Sustainable Food Systems* 6:1031562.
- Dalton, Timothy J., and Keith Fuglie. 2022. [Costs, benefits and welfare implications of USAID investments in agricultural research through U.S. universities](#). *Journal of Agricultural and Applied Economics* 54:461-479.
- Fuglie, Keith, Srabashi Ray, Uris Lantz C. Baldos, and Thomas W. Hertel. 2022. [The R&D cost of climate mitigation in agriculture](#). *Applied Economic Perspectives & Policy* 44:1955-1974.
- Adelaja, Adesoji, Justin George, Louise Fox, Keith Fuglie, and Thomas Jayne. 2021. [Shocks, resilience and structural transformation in Sub-Saharan Africa](#). *Sustainability* 12(24) 13620.
- Fuglie, Keith, Michael Peters, and Stefan Burkart. 2021. [The extent and economic significance of cultivated forage crops in developing countries](#). *Frontiers in Sustainable Food Systems* 5:712136.
- Fuglie, Keith, Boubaker Dhehibi, Ali Ahmed Ibrahim El Shahat, and Aden Aw-Hassan. 2021. [Water, policy and productivity in Egyptian agriculture](#). *American Journal of Agricultural Economics* 103(4):1378-1397.
- Wiebe, Keith, Timothy B. Sulser, Shahnaila Dunston, Mark W. Rosegrant, Keith Fuglie, Dirk Willenbockel, and Gerald C. Nelson. 2021. [Modeling impacts of faster productivity growth to inform the CGIAR initiative on Crops to End Hunger](#). *PLoS ONE* 16(4):e0249994.
- Fuglie, Keith. 2021. [Climate change upsets agriculture](#). *Nature Climate Change* 11:293-299.
- Hertel, Thomas W., Uris Lantz C. Baldos, and Keith Fuglie. 2020. [Trade in technology: A potential solution to the food security challenge of the 21<sup>st</sup> Century](#). *European Economic Review* 127(August):103479.
- Baldos, Uris Lantz C., Keith Fuglie, and Thomas W. Hertel. 2020. [The research cost of adapting agriculture to climate change: A global analysis to 2050](#). *Agricultural Economics* 51(2) 207-220.
- Rada, Nicholas, and Keith Fuglie. 2019. [New perspectives on farm size and productivity](#). *Food Policy* 84:147-152.
- Baldos, Uris Lantz C., Frederi G. Viens, Thomas W. Hertel, and Keith Fuglie. 2019. [R&D spending, knowledge capital and agricultural productivity growth: A Bayesian approach](#). *American Journal of Agricultural Economics* 101(1):291-301.
- Fuglie, Keith. 2018. [Is agricultural productivity slowing?](#) *Global Food Security* 17:73-83.
- Fuglie, Keith. 2018. [R&D capital, R&D spillovers, and productivity growth in world agriculture](#). *Applied Economic Perspectives & Policy* 40(3):421-444.

- Heisey, Paul, and Keith Fuglie. 2018. [Agricultural R&D in high-income countries: Old and new roles in a new funding environment](#). *Global Food Security* 17:92-102.
- Fuglie, Keith, Matthew Clancy, Paul Heisey, and James MacDonald. 2017. [Research, productivity and output growth in U.S. agriculture](#). *Journal of Agricultural and Applied Economics* 40(4):514-554.
- Fuglie, Keith. 2016. [The growing role of the private sector in agricultural research and development world-wide](#). *Global Food Security* 10:29-38.
- Sheng, Yu, Alistair Davidson, Keith Fuglie, and Dandan Zhang. 2016. [Input substitution, productivity performance and farm size](#). *Australian Journal of Agricultural and Resource Economics* 60: 327-347.
- Fuglie, Keith. 2015. [Accounting for growth in global agriculture](#). *Bio-based and Applied Economics* 4(3): 221-254.
- Pray, Carl, and Keith Fuglie. 2015. [Agricultural research by the private sector](#). *Annual Review of Resource Economics* 7:399-424.
- Fuglie, Keith, and Andrew Toole. 2014. [The evolving institutional structure of public and private agricultural research](#). *American Journal of Agricultural Economics* 96(3):862-883.
- Wang, Sun Ling, Paul Heisey, Wallace Huffman, and Keith Fuglie. 2013. [Public R&D, private R&D and U.S. agricultural productivity growth: Dynamic and long-run relationships](#). *American Journal of Agricultural Economics* 95:1287-1293.
- Fuglie, Keith, Paul Heisey, John King, Carl Pray, and David Schimmelpfennig. 2012. [The contribution of private industry to agricultural innovation](#). *Science* 338(23 Nov):1031-32.
- Rada, Nicholas, Steven Buccola, and Keith Fuglie. 2011. [Government policy and agricultural productivity in Indonesia](#). *American Journal of Agricultural Economics* 93:863-880.
- Fuglie, Keith, and David Schimmelpfennig. 2010. [Introduction to the special issue on agricultural productivity growth: a closer look at large, developing countries](#). *Journal of Productivity Analysis* 33:169-172.
- Evenson, Robert, and Keith Fuglie. 2010. [Technology capital: The price of admission to the growth club](#). *Journal of Productivity Analysis* 33:173-190.
- Fuglie, Keith. 2010. [Sources of growth in Indonesian agriculture](#). *Journal of Productivity Analysis* 33:225-240.
- Fuglie, Keith. 2008. [Is a slowdown in agricultural productivity growth contributing to the rise in commodity prices?](#) *Agricultural Economics* 39:431-441.
- Fuglie, Keith. 2007. [Priorities for potato research in developing countries: Results of a survey](#). *American Journal of Potato Research* 84:353-366.
- Fuglie, Keith. 2007. [Priorities for sweet potato research in developing countries: Results of a survey](#). *Horticultural Science* 42:1200-1206.
- Fuglie, Keith, Witono Adiyoga, Rini Asmunati, Sukendra Mahalaya, and Rachman Suherman. 2006. [Farm demand for quality potato seed in Indonesia](#). *Agricultural Economics* 35:257-266.
- Adiyoga, Witono, Keith Fuglie, and Rachman Suherman. 2006. Potato market integration in Indonesia: Correlation and cointegration analysis. *Informatika Pertanian* 15:835-852.
- Fuglie, Keith, Dao Huy Chien, Li Thi Yen, and Rini Asmunati. 2005. Market integration and price stability of vegetables in Vietnam. *Quarterly Journal of International Agriculture* 44:371-379.
- Peters, Dai, Thi Tinh Nguyen, Thach Hoanh Mai, The Yen Nguyen, Ngoc Thach Pham, and Keith Fuglie. 2005. [Rural income generation through improving crop-based pig production systems in Vietnam: Diagnostics, interventions and dissemination](#). *Agriculture and Human Values* 22:73-85.
- Fuglie, Keith. 2004. [Productivity growth in Indonesian agriculture, 1961-2000](#). *Bulletin of Indonesian Economic Studies* 40:209-225.
- Fuglie, Keith. 2004. [Challenging Bennet's Law: The new economics of starchy staples in Asia](#). *Food Policy* 29:187-202.

- Reilly, John, F. Tubiello, B. McCarl, D. Abler, R. Darwin, Keith Fuglie, S. Hollinger, C. Izaurralde, S. Jagtap, J. Jones, L. Mearns, D. Ojima, E. Paul, K. Paustian, S. Riha, N. Rosenberg, and C. Rosenzweig. 2003. [U.S. agriculture and climate change: New results](#). *Climate Change* 57:43-69.
- Fuglie, Keith, and Thomas Walker. 2001. [Economic incentives and resource allocation in U.S. public and private plant breeding](#). *Journal of Agricultural and Applied Economics* 33:459-473.
- Fuglie, Keith, and Catherine Kascak. 2001. [Adoption and diffusion of natural-resource-conserving agricultural technology](#). *Review of Agricultural Economics* 33:385-402.
- Narrod, Clare, and Keith Fuglie. 2000. [Private investment in livestock breeding with implications for public research policy](#). *Agribusiness: An International Journal* 16:457-470.
- Fuglie, Keith, Virenda Khatana, Sarath Ilangantileke, Jagpal Singh, Devendra Kumar, and Gregory Scott. 2000. Economics of potato storage in Northern India. *Quarterly Journal of International Agriculture* 39:131-148.
- Day-Rubenstein, Kelly, and Keith Fuglie. 1999. [Resource allocation in joint public-private agricultural research](#). *Journal of Agribusiness* 17:123-134.
- Fuglie, Keith. 1999. [Conservation tillage and pesticide use in the Cornbelt](#). *Journal of Agricultural and Applied Economics* 31:133-147.
- Reilly, John, and Keith Fuglie. 1998. [Future yield growth in field crops: What evidence exists?](#) *Soil and Tillage Research* 47:275-290.
- Fuglie, Keith, and Darrell Bosch. 1995. [Economic and environmental implications of soil nitrogen testing: A switching-regression analysis](#). *American Journal of Agricultural Economics* 77:891-900.
- Fuglie, Keith. 1995. [Measuring welfare benefits from improved storage technology with an application to potatoes in Tunisia](#). *American Journal of Agricultural Economics* 77:162-173.
- Bosch, Darrell, Zena Cook, and Keith Fuglie. 1995. [Voluntary versus mandatory agricultural policies to protect water quality: Adoption of nitrogen testing in Nebraska](#). *Review of Agricultural Economics* 17:13-24.
- Fuglie, Keith. 1994. [The demand for potatoes in Tunisia: Are they a cereal substitute?](#) *European Review of Agricultural Economics* 21:277-286.
- Ben Salah, H., Keith Fuglie, A. Ben Temime, A. Rahmouni and M. Cheikh. 1994. Utilisation du virus de la granulose de la teigne de la pomme de terre et du *Bacillus thuringiensis* dans la lutte intégrée contre *Phthorimaea Operculella* Zell. (Lepid. Gelechiidae) en Tunisie. *Annals de l'INRAT* 67:1-20.
- Fuglie, Keith, H. Ben Salah, M. Essamet, A. Ben Temime, and A. Rahmouni. 1993. [The development and adoption of integrated pest management of the potato tuber moth, \*Phthorimaea Operculella\* \(Zeller\), in Tunisia](#). *International Journal of Tropical Insect Science* 14:501-509.
- Fuglie, Keith. 1991. [Vent-for-surplus as a source of agricultural growth in Northeast Thailand, 1958-1980](#). *Journal of Developing Areas* 25:331-346.
- Fuglie, Keith, and Vernon Ruttan. 1989. [Value of external reviews of research at the international agricultural research centers](#). *Agricultural Economics* 3:365-380.

## **RESEARCH MONOGRAPHS**

- Fuglie, Keith, Stephen Morgan, and Jeremy Jelliffe. 2024. [World Agricultural Production, Resource Use, and Productivity, 1961-2020](#). Economic Information Bulletin No. 268. Economic Research Service, U.S. Department of Agriculture, Washington, DC.
- MacDonald, James, Xiao Dong, and Keith Fuglie. 2023. [Concentration and Competition in U.S. Agribusiness](#). Economic Information Bulletin No. 256. Economic Research Service, U.S. Department of Agriculture, Washington, DC.
- Fuglie, Keith, Keith Wiebe, Steven Prager, Timothy B. Sulser, Nicola Cenacchi, Camila Bonilla-Cedrez, and Dirk Willenbockel. 2022. [Quantitative Analysis to Inform Priorities for International Agricultural Research](#). IFPRI Discussion Paper 02133. International Food Policy Research Institute, Wash., DC.



- Jayne, T.S., Louise Fox, Keith Fuglie, and Adesoji Adelaja. 2021. [\*Agricultural Productivity Growth, Resilience, and Economic Transformation in Sub-Saharan Africa: Implications for USAID\*](#). Report prepared for the Board for International Food and Agricultural Development (BIFAD), United States Agency for International Development (USAID), Washington, DC.
- Heisey, Paul, and Keith Fuglie. 2018. [\*Agricultural Research Investment and Policy Reform in High Income Countries\*](#). Economic Research Report 249. Economic Research Service, U.S. Department of Agriculture, Washington, DC, May.
- Fuglie, Keith, Matthew Clancy, Paul Heisey, and Kelly Day-Rubenstein. 2016. The US Agricultural Innovation System. Background paper for the OECD Report, *Innovation, Agricultural Productivity and Sustainability in the United States*.
- Fuglie, Keith, Tim Benton, Yu Sheng, Julien Hardelin, Koen Mondelaers, and David Laborde. 2016. [\*Metrics of Sustainable Agricultural Productivity\*](#). White Paper for the G20 Meeting of Agricultural Chief Scientists (MACS), April.
- Rosen, Stacy, Birgit Meade, Keith Fuglie and Nicholas Rada. 2014. [\*International Food Security Assessment, 2014-2024\*](#). GFA-25, Economic Research Service, U.S. Department of Agriculture, Washington, DC, June.
- Fuglie, Keith, and Nicholas Rada. 2013. [\*Resources, Policy and Agricultural Productivity in Sub-Saharan Africa\*](#). Economic Research Report 145, Economic Research Service, U.S. Department of Agriculture, Washington, DC, February.
- Beintema, Nienke, Gert-Jan Stads, Keith Fuglie and Paul Heisey. 2012. [\*ASTI Global Assessment of Agricultural R&D Spending: Developing Countries Accelerate Investment\*](#). International Food Policy Research Institute, Washington, DC.
- King, John, Andrew Toole and Keith Fuglie. 2012. [\*The Complementary Roles of the Public and Private Sectors in U.S. Agricultural Research and Development\*](#). Economic Brief No. 19, Economic Research Service, U.S. Department of Agriculture, Washington, DC, Sept.
- Fuglie, Keith, Paul Heisey, John King, Carl Pray, Kelly Day-Rubenstein, David Schimmelpfennig, Sun Ling Wang and Rupa Karmakar-Deshmukh. 2011. [\*Research Investments and Market Structure in the Food Processing, Agriculture Input and Biofuel Industries Worldwide\*](#). Economic Research Report 130, Economic Research Service, U.S. Department of Agriculture, Washington, DC. [Report Summary also published as ERS Economic Information Bulletin no. 90].
- Heisey, Paul, Sun Ling Wang and Keith Fuglie. 2011. [\*Public Agricultural Research Spending and Future U.S. Agricultural Productivity Growth: Scenarios for 2010-2050\*](#). Economic Brief No. 17, Economic Research Service, U.S. Department of Agriculture, Washington, DC, July.
- O'Donoghue, Erik, Robert Hoppe, David Banker, Robert Ebel, Keith Fuglie, Penni Korb, Michael Livingston, Cynthia Nickerson and Carmen Sandretto. 2011. [\*The Changing Organization of U.S. Farming\*](#). Economic Information Bulletin 88. Economic Research Service, U.S. Department of Agriculture, Washington, DC, December.
- Fuglie, Keith, and Paul Heisey. 2007. [\*Economic Returns to Public Agricultural Research\*](#). Economic Brief No. 10, Economic Research Service, U.S. Department of Agriculture, Washington, DC, September.
- Fuglie, Keith, James MacDonald and V. Eldon Ball. 2007. [\*Productivity Growth in U.S. Agriculture\*](#). Economic Brief No. 9, Economic Research Service, U.S. Department of Agriculture, Washington, DC, September.
- Fuglie, Keith. 2007. [\*Research Priority Assessment for CIP's 2005-2015 Strategic Plan: Projecting Impacts on Poverty, Health, Employment and Environment\*](#). Lima, Peru: International Potato Center.
- Huang, Jikun, Jun Song, Fanbin Qiao and Keith Fuglie. 2003. *Sweet potato in China: Economic Aspects and Utilization in Pig Production*. Bogor, Indonesia: International Potato Center.
- Fuglie, Keith, Do Thi Bich Nga, Dao Huy Chien and Nguyen Thi Hoa. 2001. [\*The Economic Impact of True Potato Seed in Vietnam\*](#). Lima, Peru: International Potato Center.

- Pray, Carl, and Keith Fuglie. 2001. [\*Private Investment in Agricultural Research and International Technology Transfer in Asia\*](#). Agricultural Economics Report 805. Economic Research Service, U.S. Department of Agriculture, Washington, DC, 163 pages.
- Caswell, Margriet, Keith Fuglie, Cassandra Ingram, Sharon Jans and Catherine Kascak. 2001. [\*Adoption of Agricultural Production Practices: Lessons Learned from the U.S. Department of Agriculture Area Studies Project\*](#). Agricultural Economics Report 792, Economic Research Service, U.S. Department of Agriculture, Washington, DC, January.
- Fuglie, Keith, Liming Zhang, Luis Salazar and Thomas Walker. 1999. [\*Economic Impact of Virus-Free Sweet Potato Planting Material in Shandong Province, China\*](#). Lima, Peru: International Potato Center.
- Fuglie, Keith, Nicole Ballenger, Kelly Day, Cassandra Klotz, Michael Ollinger, John Reilly, Utpal Vasavada and Jet Yee. 1996. [\*Agricultural Research and Development: Public and Private Investments Under Alternative Markets and Institutions\*](#). Agricultural Economics Report 735, Economic Research Service, U.S. Department of Agriculture, Washington, DC, May.
- Caswell, Margriet, Keith Fuglie and Cassandra Klotz. 1994. [\*Agricultural Biotechnology: An Economic Perspective\*](#). Agricultural Economics Report 687, Economic Research Service, U.S. Department of Agriculture, Washington, DC, May.

### **BOOKS AND EDITED VOLUMES**

- Fuglie, Keith, Madhur Gautam, Aparajita Goyal, and William Maloney. 2019. [\*Harvesting Prosperity: Technology and Productivity Growth in Agriculture\*](#). Washington, DC: World Bank.
- Fuglie, Keith, Sun Ling Wang and V. Eldon Ball, eds. 2012. [\*Productivity Growth in Agriculture: An International Perspective\*](#). Wallingford, UK: CAB International, 450 pages.
- Setiawan, Asep, and Keith Fuglie, eds. 2005. *Sweet potato Research and Development: Its Contribution to the Asian Food Economy*. Bogor, Indonesia: International Potato Center, 161 pages.
- Fuglie, Keith, and Michael Hermann, eds. 2004. *Sweet potato Post-Harvest Research and Development in China*. Bogor, Indonesia: International Potato Center, 155 pages.
- Fuglie, Keith, ed. 2003. *Progress in Potato and Sweet potato Research in Indonesia*. Bogor, Indonesia: International Potato Center, 242 pages.
- Fuglie, Keith, ed. 2001. *Performance and Prospects of Hybrid True Potato Seed in South and Southeast Asia*. Bogor, Indonesia: International Potato Center, 250 pages.
- Fuglie, Keith, and David Schimmelpfennig, eds. 2000. *Public-Private Collaboration in Agricultural Research: New Institutions and Economic Implications*. Ames: Iowa State University Press, 354 pages.
- Fuglie, Keith. 1989. *The Adoption of New Agricultural Technology in a Rainfed Rice Farming System in Northeast Thailand*. Ph.D. Dissertation, University of Minnesota, St. Paul.

### **BOOK CHAPTERS**

- Fuglie, Keith, Srabashi Ray, Uris Lantz C. Baldos, and Thomas W. Hertel. 2025. The R&D cost of climate mitigation in agriculture. In, [\*SIMPLE-G: A Gridded Economic Approach to Sustainability Analysis of the Earth's Land and Water Resources\*](#) (I. Haqiqi and T.W. Hertel, eds). Cham, Switzerland: Springer Nature, pp. 135-158.
- Fuglie, Keith. 2023. [\*Investing in science, technology, and innovation for sustainable, productivity-led agricultural growth\*](#). In, *African Food Systems Transformation and the Post-Malabo Agenda*, ReSAKSS 2023 Annual Trends and Outlook Report (J. Ulimwengu, E. Kwofie, and J. Collins, eds.). Kigali, Rwanda, and Washington, DC: AKADEMIYA2063 and International Food Policy Research Institute (IFPRI), pp. 210-227.
- Fuglie, Keith, and Claudia Hitaj. 2019. [\*Farming systems in North America\*](#). In: *Encyclopedia of Food Security and Sustainability*, vol. 3 (P. Ferranti, E.M. Berry, and J.R. Anderson, eds.), Elsevier, pp. 81-94.



- Fuglie, Keith, Matthew Clancy and Paul Heisey. 2017. [Private sector research and development](#). In, *From Agriscience to Agribusiness: Theories, Policies and Practices in Technology Transfer and Commercialization* (N. Kalaitzandonakes, E. Carayannis, E. Grigoroudis, and S. Rozakis, eds.). Cham, Switzerland: Springer, pp. 41-74.
- Fuglie, Keith, and Nicholas Rada. 2016. [Economies of size in national agricultural research systems](#). In, *Agricultural Research in Africa: Investing in Future Harvests* (J. Lynam, N. Beintema, J. Roseboom and O. Badiane, eds.). Washington, DC: International Food Policy Research Institute, pp. 59-81.
- Fuglie, Keith, and Jacob Marder. 2015. [The diffusion and impact of improved food crop varieties in Sub-Saharan Africa](#). In, *Crop Improvement, Adoption and Impact of Improved Varieties in Food Crops in Sub-Saharan Africa* (Thomas Walker and Jeffrey Alwang, eds.). Wallingford, UK: CAB International, pp. 338-69.
- Heisey, Paul, and Keith Fuglie. 2014. Agricultural research, education and extension integration for development: Status, elements of successes, issues challenges and prospects – The United States experience. In, *Transforming Agricultural Education for Reshaping India's Future* (R.B. Singh, ed.). Proceedings of the 11<sup>th</sup> Agricultural Science Congress. New Delhi: National Academy of Agricultural Sciences, pp. 363-386.
- Fuglie, Keith, and Alejandro Nin-Pratt. 2013. [Agricultural productivity: A changing global harvest](#). In, *IFPRI 2012 Global Food Policy Report*. International Food Policy Research Institute, Washington, DC, pp. 15-28.
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### **POPULAR MEDIA, EDUCATIONAL MATERIALS, AND BOOK REVIEWS**

- Jeremy Jelliffe, Keith Fuglie, and Stephen Morgan. 2024. [Top 10 Developments in World Agriculture since 1961](#). Infographic. *Amber Waves* 22 (November 25).
- Fuglie, Keith, Stephen Morgan, and Jeremy Jelliffe. 2024. [Global change in agricultural production, productivity, and resource use over six decades](#). *Amber Waves* 22 (September 30).
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### **SELECTED WORKING PAPERS AND PROCEEDINGS**

- Borisova, Tatiana, Keith Fuglie, Sun Ling Wang, and Benjamin Garber. 2024. Funding and resource utilization for Cooperative Extension in the United States. Selected paper at the Agricultural & Applied Economics Association Annual Conference, New Orleans, Louisiana, August 1-3.
- Fuglie, Keith, and Ruben Echeverria. 2023. The economic impact of CGIAR-related crop technologies on agricultural productivity in developing countries, 1961-2020. Conference paper presented at the 24<sup>th</sup> Annual Conference on Global Economic Analysis (virtual conference), Global Trade Analysis Project (GTAP), April 2023 version.
- Tokgoz, Simla, and Keith Fuglie. 2013. Public policy, induced innovation, and private research: The case of agriculture. Conference Poster. Agricultural and Applied Economics Association Annual Meeting, August 4-6, 2013, Washington, DC.
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- Walker, Thomas, and Keith Fuglie. 2006. Prospects for enhancing value of crops through public-sector research: Lessons from experiences with roots and tubers. Social Sciences Working Paper 2006-1. Lima Peru: International Potato Center.
- Fuglie, Keith, and Bharat Ramaswami. 2000. Seasonal price risk and the cost of storage. Discussion Paper 00-19, Indian Statistical Institute, Delhi Centre. New Delhi, India. September.
- Fuglie, Keith, Ruben G. Echeverria, and Carl E. Pray. 1998. Science and technology for agricultural development: New institutions for funding and performance, Conference on The New Strategic Role of the Rural Sector for Latin America’s Development, Cartagena, Colombia.
- Klotz, Cassandra, Keith Fuglie, and Carl Pray. 1995. Private sector agricultural research expenditures in the United States, 1960-1992. Staff Paper AGES-9525, Economic Research Service, U.S. Department of Agriculture, Washington, DC, October.
- Fuglie, Keith, Nicole Ballenger, Kelly Day, Cassandra Klotz, John Reilly, and Jet Yee. 1995. The value and role of public investment in agricultural research. Staff Paper AGES-9510, Economic Research Service, U.S. Department of Agriculture, Washington, DC, May.
- Fuglie, Keith. 1988. Fertilizer Use and the Adoption of Modern Varieties in an Asian Rainfed Rice Farming System. Staff Paper P88-8, Department of Agricultural and Applied Economics, University of Minnesota, St. Paul.
- Fuglie, Keith, and Delane Welsch. 1988. The Performance of Biological Nitrogen Fixation Technology in the Tropics: Evidence from Northeast Thailand. Staff Paper P88-7, Department of Agricultural and Applied Economics, University of Minnesota, St. Paul.

### **INVITED PRESENTATIONS (since 2008)**

- “Measuring International Agricultural Productivity,” OECD Conference on Sustainable Agricultural Productivity to Address Food Systems Challenges, Paris, France, October 24, 2024.
- “Agricultural Innovation, Productivity and Sustainable Growth,” Keynote, 28<sup>th</sup> ICABR Conference, Ravello, Italy, June 10-15, 2024.
- “Agricultural Innovation, Productivity and Sustainable Growth,” Canadian Agrifood Policy Conference, Ottawa, January 25-26, 2024.



- "Incorporating R&D Into Policy Assessments: Climate Mitigation/Greenhouse Gas Reduction," OECD Network on Agricultural TFP and the Environment, Paris, January 18-19, 2024.
- "Economic Impact of Forage Crop Research by the CGIAR," Feed-the-Future Convening on Pathways for Strengthening Quality Forage Systems in Africa, Washington, DC, November 30, 2023.
- "Investing in Science, Technology, and Innovation for Sustainable Productivity-Led Agricultural Growth," 2023 ReSAKSS Conference, Kigali, Rwanda, and Online, November 27-29, 2023.
- "Overview of Agricultural Productivity Growth and the Role of Innovation," Asia-Pacific Economic Cooperation Annual Meeting, Seattle, Washington, August 3, 2023.
- "Agricultural Research, Innovation and Productivity in Argentina," 27<sup>th</sup> ICABR Conference, Buenos Aires, Argentina, July 7, 2023.
- "The Value of Irrigation Water in World Agriculture," ERS-CALS Global-Farm Foundation Conference on Agricultural Productivity, Ballston, Virginia, March 29, 2023.
- "Investing in Research for U.S. Agricultural Productivity and Competitiveness," 8<sup>th</sup> Annual Florida Agricultural Policy Outlook Conference, March 2, 2023.
- "The Role of USDA Research in U.S. Agricultural Trade and Competitiveness," NCFAR Latte-N-Learn on Capitol Hill, Washington, DC, December 16, 2022.
- "The Importance of Agricultural Total Factor Productivity Growth for Global Food and Environmental Security," DEFRA-AES Annual Policy Seminar, London, December 9, 2022.
- "The Value of Irrigation Water in World Agriculture," 7<sup>th</sup> Meeting of the OECD Network on Agricultural TPFEN, Paris, 5-6 December 2022.
- "Agricultural Productivity Growth, Food Security and GHG Emissions," Sustainable Agricultural Growth Coalition: COP27 and Beyond, November 2, 2022.
- "Consequences of Global R&D Spending for Agricultural Productivity, Resource Use and Livelihoods," FAO Science and Innovation Forum, Rome, October 19, 2022.
- "Agricultural TFP: Trends, Drivers and Knowledge Gaps on Impacts," USDA-DG AGRI Workshop on Sustainable Agricultural Productivity Growth, May 3, 2022.
- "Managing Land Use and Soils Towards Net Zero Emissions," 2022 Global Forum for Food and Agriculture, Federal Ministry of Food and Agriculture, Berlin, January 24, 2022.
- "Assessing the Economic Impact of Agricultural Research," National Institute of Agricultural Economics & Policy Research, New Delhi, December 17, 2021.
- "The Role of Agricultural Research in Accelerating Productivity Growth in Africa," RUFORUM Triennial Conference, Dhomey, Benin, December 7, 2021.
- "Agricultural Productivity Growth, Resilience, and Economic Transformation in Africa," World Food Prize Symposium, Des Moines, Iowa, October 22, 2021.
- "Accounting for Missing Outputs in Measures of Farm Productivity: Aquaculture as the New 'Crop'," OECD Agricultural Productivity Network, Paris, May 27, 2021.
- "Agricultural Productivity Growth, Resilience and Economic Transformation in Sub-Saharan Africa: Implications for USAID," BIFAD Public Meeting, October 13, 2020.
- "Trade in Technology: A Potential Solution to the Food Security Challenges of the 21<sup>st</sup> Century," NBER Conference, May 2020.
- "Informing Research Prioritization," CGIAR Big Lift Design Workshop, Eschborn, Germany, February 5, 2020.
- "Assessing the Impacts of Research," USAID Bureau of Food Security Seminar, Washington, DC, October 10, 2019.
- "Harvesting Prosperity: Technology and Productivity Growth in Agriculture," USAID Seminar, Washington, DC, June 2019.
- "Measuring International Agricultural Total Factor Productivity," Virginia Polytechnic Institute and State University. April 8, 2019.

- "Productivity Growth in US and Midwest Agriculture," Federal Reserve Bank of Chicago, November 27, 2018.
- "Sources of Growth in Agriculture," International Consortium on Applied Biotechnology Research Symposium, World Bank, Washington, DC, June 15, 2018.
- "Accounting for Growth in Global Agriculture," IAAE Inter-Conference Symposium, University of Talca, Chile, October 16-22, 2017.
- "Technology Capital and Agricultural Growth," Kellogg Commission, Association for Public-Land Grant Universities, Washington, DC, May 10, 2016.
- "Investing in Innovation to Raise Agricultural Productivity," Jon Brandt Policy Forum, United States Senate, Washington, DC, April 27, 2016.
- "The Role of Productivity," Pre-Conference on Global Food Security Challenges, 29<sup>th</sup> International Conference of Agricultural Economics, Milan, Italy, August 7, 2015.
- "Accounting for Growth in Global Agriculture," Invited Keynote, Italian Agricultural & Applied Economics Association Annual Conference, Ancona, Italy, June 11, 2015.
- "Public and Private Investments in Agricultural Research and Development," National Research Council, Washington, DC, March 19, 2015.
- "Funding Agricultural Research and Development," Farm Foundation Forum, National Press Club, Washington, DC, January 28, 2015.
- "Research Investment and Productivity Growth in Agriculture," IEG-IFPRI International Conference on Innovation in Indian Agriculture: Ways Forward, New Delhi, India, December 4, 2014.
- "Total Factor Productivity in Global Agriculture," USAID BIFAD Annual Meeting, Des Moines, Iowa, October 14, 2014.
- "Resources, Policies and Productivity in African Agriculture," World Bank, Washington, DC, November 21, 2013.
- "Agricultural Productivity Growth in the United States," International Agricultural Trade Research Consortium, Seville, Spain, June 2, 2013.
- "Economic Returns to Agricultural Research," Council on Food, Agricultural and Resource Economics, Washington, DC, May 20, 2013.
- "Recent Developments in Global Agricultural Productivity," Global Harvest Initiative 2012 GAP Report Release, World Food Prize Symposium, Des Moines, Iowa, October 17, 2012.
- "Ex-Ante Impact Assessment for Research Prioritization," Pre-Conference on Impact Assessment of Agricultural Research, 28<sup>th</sup> International Conference of Agricultural Economics, Iguazu, Brazil, August 18, 2012.
- "Global Agricultural Productivity and Innovation Policy," Farm Foundation Forum, National Press Club, Washington, DC, September 19, 2012.
- "Who and How Will Agricultural Science and Technology be Financed?" Farm Foundation Round Table, Burlington, Vermont, June 14, 2012.
- "The Productivity Gap in Global Agriculture," Cooperative Extension Service National Seminar, April 3, 2012.
- "Sources of Growth in Agricultural Productivity," Conference on LAC Foresight in Agriculture, Inter-American Development Bank, Washington, DC, March 21, 2012.
- "Productivity Growth in the Global Agricultural Economy," Global Harvest Initiative 2011 GAP Report Release, World Food Prize Symposium, Des Moines, Iowa, October 12, 2011.
- "Global and Regional Food Productivity and Output Trends," Conference on Agricultural Prices, Institute for International Economic Policy, Washington, DC, September 30, 2011.
- "The Case for Research," USAID-USDA-APLU *Feed the Future* Research Forum, Washington Convention Center, Washington, DC, June 21, 2011.

- "Research and Productivity in the Global Agricultural Economy," Cooperative Extension Service North Central and Southern State Program Leaders Annual Meeting, National Institute for Food and Agriculture, Washington, DC, June 1, 2011.
- "Agricultural Productivity and Returns to Investment in Research," National Agricultural Research, Extension, Education and Economics Advisory Board, Washington, DC, October 27, 2010.
- "Productivity Growth in the Global Agricultural Economy," Global Harvest Initiative 2010 GAP Report Release, World Food Prize Symposium, Des Moines, Iowa, October 13, 2010.
- "Research and Productivity in the Global Agricultural Economy," USDA North Atlantic Area Leadership Conference, Cornell University, Ithaca, New York, April 28, 2010.
- "Opportunities and Challenges to Raising Global Agricultural Productivity," Global Harvest Initiative Symposium, National Press Club, Washington, DC, March 17, 2010.
- "Driving Forces Behind Agricultural Productivity Change in Sub-Saharan Africa," World Bank, Washington, DC, January 22, 2010.
- "Economic Returns to U.S. and Global Public Agricultural Research," Farm Foundation Forum, National Press Club, Washington, DC, April 28, 2009.
- "U.S. Agricultural Productivity and International Comparisons," ABARES 2009 Outlook Conference, Canberra, Australia, March 3, 2009.
- "How Much Private Agricultural R&D is There?" Conference on International Agricultural R&D, Rutgers University, New Brunswick, New Jersey, February 5, 2009.
- "Global Trends in Agricultural Productivity," Economic Growth Center Conference, Yale University, New Haven, Connecticut, May 31, 2008.
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