

CONTACT INFORMATION	<p>Department of Agricultural and Consumer Economics (ACE) University of Illinois at Urbana-Champaign 414 Mumford Hall Urbana, IL 61801</p> <p>Phone: +1(312) 804-8550 hadunka2@illinois.edu website</p>
EDUCATION	<p>Ph.D., Agricultural and Applied Economics, University of Illinois Urbana-Champaign May 2025 (Expected) M.Sc., Agricultural and Applied Economics, University of Illinois Urbana-Champaign 2019 B.Sc., Agricultural Economics, The University of Zambia, Lusaka, Main campus, Zambia 2015</p>
RESEARCH AREAS	<p>Environmental Economics Agricultural Economics Development Economics</p>
PUBLICATIONS	<p>Wang, J., Konar, M., Anderson, P., Hadunka, P., & Mulenga, B.P. (2025). “Exploring the Impact of Short-Term and Long-Term Climate Shocks on Crop Diversification in Zambia: Insights from Household- and District-Level Observations” <i>Climate Risk Management</i>.</p> <p>Wang, J., Konar, M., Baylis, K., Estes, L., Hadunka, P., Caylor, K., & Xiong, S. (2023). “Potential impacts of transportation infrastructure improvements to maize and cassava supply chains in Zambia” <i>Environmental Research: Infrastructure and Sustainability</i></p> <p>Mulenga, B. P., Hadunka, P., & Richardson, R. B. (2017) .“Rural households’ participation in charcoal production in Zambia: Does agricultural productivity play a role?” <i>Journal of Forest Economics</i> 26, 56-62.</p>
IN REVIEW	<p>Ordonez, O., Hadunka, P., Rossi, G., & Baylis, K. (2025).“When crops fail, forests follow: Agricultural shocks and deforestation in Zambia” - Co-first author <i>Proceedings of the National Academy of Sciences (PNAS)</i> - R & R.</p> <p>Cecil, M., Estes, L., Caylor, K., Hadunka, P., Evans, T., Chilenga, A., Gitonga, J., & Wolf, A. (2025).“ Advantages and Limitations of Multiple Sensors for Smallholder Maize Land Surface Phenology Estimation” <i>Remote Sensing of Environment</i>.</p> <p>Sullivan, J., Baylis, K., Hadunka, P., & Konar, M., (2024).“ Urban Legend: Disparities in Household Diets and Food Security Along a Rural-Urban Continuum” <i>Global Environmental Change</i>.</p>
WORKING PAPERS AND RESEARCH IN PROGRESS	<p>Hadunka, P., Baylis, K., Green, R & Zimmer, A. (2025) “The effect of invasive pests on food security: An understudied effect of climate change” - Almost ready for submission.</p> <p>Xiong, S., Hadunka, P., Estes, L., Mulenga, B. P., & Estes, L (2025) “Evaluating the Relationship Between Farm and Field Sizes in Sub-Saharan Africa: Multi-Year Insights from Zambia’s National Surveys. - Co-first author”.</p> <p>Xiong, S., Wanjing, L., Hadunka, P., Estes, L., Khallaghi. S., Abedi. R., Yao-Ting. Y., Chilenga. A., Khan. A., Potapov. P.,& Estes, L (2025) “High spatial and temporal resolution analyses reveal the changing characteristics of African croplands”.</p> <p>Wang, J., Konar, M., Baylis, K., Hadunka, P., & Mulenga, B.P. (2025) “Dietary Transitions and Nutritional Dynamics in Zambia and Tanzania under Urbanization”.</p> <p>Hadunka, P. “The Impact of Pest Shocks on Charcoal Production and Deforestation in Zambia”.</p>

Lewin, G., Molitor, C., Cohen, J., Cognac, S., Proctor, J., Baylis, K., **Hadunka, P.**, & Carleton, T. (2025). “Monitoring Maize Yield Variability over Space and Time with Unsupervised Satellite Imagery Features”.

Hadunka, P., & Mulenga, B.P. (2025) “Climate Resilience in Agriculture: Can Minimum Tillage Counteract Rainfall Shocks?”

Hadunka, P., Baylis, K., Cardell, L., & Michelson, H. (2025) “What causes adverse outcomes in the maize markets?”.

Hadunka, P., Baylis, K., & Thornton, R. (2025) “Does the providing efficient transportation improve the price knowledge among rural households? Evidence from Malawi”.

RELEVANT WORK EXPERIENCE

Co-Principal Investigator, International Growth Center - Climate change and deforestation : A think tank supervised by the University of Oxford and London School of Economics - To date

Principal Investigator, International Growth Center - FRA project: A think tank supervised by the University of Oxford and London School of Economics, Remote Dec 2023 - Jun 2024

Consultant, International Growth Center, Remote Jan 2024 - Apr 2024

Research and Teaching Assistant, University of Illinois Urbana-Champaign, IL Jul 2017 - To date

Teaching Assistant (Part-time) - Machine Learning for Applied Economists, University of Bonn, Remote Aug 2021 - Sept 2021 (20 PhD students)

Data Quality Controller, Musika Development Initiative, World Food Program, and Business Development Services Africa - SME, Zambia Oct 2016 - Nov 2019

Research Intern, Musika, Zambia Dec 2016 - May 2017

Research Intern, Indaba Agricultural Policy Research Institute (IAPRI) Sep 2016 - Dec 2016

Field Supervisor, International Maize and Wheat Improvement Center (CYMMIT) Oct 2015 - Dec 2015

TEACHING

Applied Microeconomics (90 Undergraduates), Environmental Economics (70 Undergraduates), Applied Statical methods & Data Analytics (90 Undergraduates)

University-wide “List of Teachers Ranked as Excellent” (Spring 2024), UIUC

University-wide “List of Teachers Ranked as Excellent” (Fall 2023), UIUC

University-wide “List of Teachers Ranked as Excellent” (Spring 2023), UIUC

University-wide “List of Teachers Ranked as Excellent” (Fall 2020), UIUC

POLICY REPORTS

Hadunka, P & Teschemacher, C. (2024) “[The effect of Zambia’s Food Reserve Agency on agricultural market outcomes](#)” International Growth Center, Project report.

Hadunka, P & Janzen, J. (2023) “[Weather Shocks and Seasonal Commodity Market Returns: Evidence from Zambia’s Maize Market](#)” University of Illinois at Urbana-Champaign, farmdoc.

Kasanda, E., **Hadunka, P.**, Lubinga, F., Mumba, K., Sakala, M., Arneson, S., Harper, T & Sichilima, T. (2017) “[A Needs Assessment of Rural Agribusinesses: The Commercial Viability of SMEs](#)” Musika Development Initiatives, Zambia.

Kasanda, E., Chanda, J, **Hadunka, P** & Sichilima, T. (2017) “[The Status of Smallholder Dairy Markets and Farmers’ Perceptions of Formal Markets in Western Province](#)” Musika Development Initiatives, Zambia.

Chela, J & **Hadunka, P.** (2017) “[A Qualitative Needs Assessment of Village Chicken Producers in Southern Province](#)” Musika Development Initiatives, Zambia.

EXTERNAL GRANTS	International Growth Center	Climate change and deforestation (Fall 2024)
	International Growth Center	Evaluating the Food and Reserve Agency (Spring 2024)
	National Science Foundation	University of Illinois Urbana-Champaign (Summer 2023)
	Travel Grant	Agricultural and Applied Economics Association Annual Meeting (Summer 2022)
	Travel Grant	Agricultural and Applied Economics Association Annual Meeting (Summer 2023)
FELLOWSHIPS, GRANTS AND ACADEMIC AWARDS	Travel Grant	University of Illinois Urbana-Champaign (Summer 2023)
	Travel Grant	University of Illinois Urbana-Champaign (Spring 2023)
	Travel Grant	University of Illinois Urbana-Champaign (Summer 2022)
	Jean and John Due Fellowship	University of Illinois Urbana-Champaign (Spring 2020)
	University Fellowship	University of Illinois Urbana-Champaign (Fall 2019)
	Morgan Endowment	University of Illinois Urbana-Champaign (Summer 2020)
	Dunn and Linse Fellowship	University of Illinois Urbana-Champaign (Fall 2017)
PRESENTATIONS	Best Undergraduate Thesis (got published after graduation), The University of Zambia (2015)	
	2024: Led a discussion with senior officials from the Presidential Delivery Unit, Ministry of Agriculture, International Growth Center, and Food and Reserve Agency (FRA) on reforming the FRA (Lusaka, Zambia).	
	2023: Association of Environmental and Resource Economists (Portland, ME)	
	2023: Agricultural and Applied Economics Association Annual Meeting (Washington, DC)	
	2022: Agricultural and Applied Economics Association Annual Meeting (Anaheim, CA)	
	2022: Center for the Study of Africa Economies-University of Oxford (UK) (virtual)	
	2022: Midwest International Economic Development Conference (Minneapolis, MN)	
	2022: Sustainability and Development Initiative Conference (Virtual)	
SERVICE AND LEADERSHIP	2019: Agricultural and Applied Economics Association Annual Meeting (Atlanta, GA)	
	Member of the University of Illinois Urbana-Champaign Graduate Programs Committee (2018 - Present)	
	Abstract reviewer - Agricultural and Applied Economics Association (Annual meetings) - 2022, 2023	
ADDITIONAL INFORMATION	Guest Editor - Frontiers in Environmental Economics (special issue)	
	Software proficiency:	Stata, R, python, LATEX, GIS, GAMS, Microsoft Office
	Languages:	English, Tonga (native), Bemba, Lozi, Nyanja, and Shona (Basic)
PROFESSIONAL REFERENCES	Kathy Baylis, Ph.D. (Chair) Professor University of California, Santa Barbara Dept. of Geography baylis@ucsb.edu	Hope Michelson, Ph.D. Associate Professor University of Illinois Urbana-Champaign Dept. of Agriculture and Consumer Economics hopecm@illinois.edu
	Shadi Atallah, Ph.D. Associate Professor University of Illinois Urbana-Champaign Dept. of Agriculture and Consumer Economics satallah@illinois.edu	Nicholas Paulson, Ph.D. Professor University of Illinois Urbana-Champaign Dept. of Agriculture and Consumer Economics npaulson@illinois.edu

The Impact of Pest Shocks on Charcoal Production and Deforestation in Zambia.

Sub-Saharan Africa (SSA) is home to some of the highest rates of deforestation in the world. One driver may be negative agricultural shocks that lead households to consume natural resources as a coping mechanism. This paper uses the introduction of a novel agricultural pest to estimate the effect of a negative agricultural shock on charcoal production and deforestation, and to test whether adaptation strategies mitigate this effect. Using four years of primary household panel data from across Zambia I find a positive and significant effect of FAW on charcoal production and deforestation. The estimates indicate that as the FAW intensity increases from 0 to the median level the probability of a farmer producing charcoal by 16 %, leading to an increase in deforestation of 13.6 %. When methods to mitigate FAW damage are available, farmers are less likely to resort to charcoal production as a coping strategy. Having the ability to reduce the share of maize, diversify the crops produced, use pesticides, or migrate for off-farm employment are associated with a lower propensity to switch to charcoal production in response to FAW. I find that households cut 13 additional trees due to FAW, but this increase is reduced by 4 - 5 trees when coping strategies are implemented.

The effect of invasive pests on food security: An understudied effect of climate change.

Insect pest invasions have been exacerbated by climate change, threatening global agricultural production and food security. While the direct effect of climate change on agricultural production has received a lot of attention in the literature, less work estimates the indirect effect of climate change on agricultural production and food security through insect pests. In this paper, we use the example of the introduction of Fall armyworms (FAW) to Africa to study the effect of insect pests on agricultural production and food security in the face of climate change. We use a panel of primary farmer data to evaluate the effect of this pest and analyze which characteristics make farmers more vulnerable to food insecurity in the face of an FAW invasion. We find that an increase in FAW severity decreases maize yield by 43.3 percent and can increase food insecurity by up to 9 percent, similar in magnitude of a drought in a 30 year time period. Further, we find that increased temperatures are related to a higher incidence of FAW. When we include this effect, we find that increased pest pressure magnifies the effect of climate change on yield by 5.4 percent. Farmers can mitigate the effects of both FAW and higher temperatures associated with climate change by using early maize varieties and hybrids. Our work points to the importance of considering the indirect effect of climate change on agriculture through insect pests when evaluating both the costs of and adaptation to climate change.

Negative returns to storage in the maize markets? Evidence from Zambia.

Recent research shows that around 16 % of grain markets in Sub-Saharan Africa (SSA) experience negative returns, discouraging storage. This paper explores the unexpected negative storage returns in Zambia's staple grain markets, where prices are often lower during the lean season than at harvest, contradicting traditional beliefs. Using panel data from district markets, I analyze how factors like rainfall, transport costs, and government policies—such as grain purchases and export bans—affect these negative returns. My findings indicate a significant correlation between rainfall variability and negative returns, particularly after favorable rainfall seasons. Additionally, maize purchases and stock releases by the Food Reserve Agency (FRA) during the lean season lower prices and reduce returns. Export bans further exacerbate negative returns, especially in isolated markets, which account for 48 % of those reporting negative outcomes. The study demonstrates that isolated markets are more vulnerable to negative returns due to thin market conditions, with rainfall shocks and FRA interventions having a more pronounced effect compared to non-isolated markets. Interestingly, while export bans mitigate negative returns in isolated markets, their impact varies in non-isolated ones. These findings emphasize the role of market isolation and policy interventions in understanding storage returns in Zambia's grain markets.