Protensia Hadunka

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Contact Information

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Education

2025	Ph.D., Agricultural and Applied Economics, University of Illinois Urbana-Champaign
2019	M.Sc., Agricultural and Applied Economics, University of Illinois Urbana-Champaign
2015	B.Sc., Agricultural Economics, The University of Zambia, Zambia

Research Areas

Development Economics	Agricultural Economics
Environmental Economics	Machine Learning
Choice models	Remote-sensing

Publications

Mulenga, B. P., **Hadunka, P.,** & Richardson, R. B. (2017) .“Rural householdsâ participation in charcoal production in Zambia: Does agricultural productivity play a role?.” *Journal of Forest Economics* 26, 56-62.

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” *Environmental Research: Infrastructure and Sustainability*

In review

Hadunka, P., & Baylis, K. (2023) “The effects of invasive pests on food security. Evidence from Zambia”*Journal of Environmental Economics and Management.*

Lewin, G., Molitor, C., Cohen, J., Cognac, S., Proctor, J., Baylis, K., **Hadunka, P.,** & Carleton, T. (2024).“Monitoring Maize Yield Variability over Space and Time with Unsupervised Satellite Imagery Features” *Remote sensing.*

Sullivan, J., Baylis, K., **Hadunka, P.,** & Konar, M., (2024).“ Urban Legend: Disparities in Household Diets and Food Security Along a Rural-Urban Continuum” *Global Environmental Change.*

Wang, J., Konar, M., Anderson, P., **Hadunka, P.,** & Mulenga, B.P. (2024).“Weather extremes drive crop diversification in smallholder agriculture in Zambia” *Climate Risk Management.*

Cecil, M., Estes, L., Caylor, K., **Hadunka, P.,** Evans, T., Chilenga, A., Gitonga, J., & Wolf, A. (2024).“ Advantages and Limitations of Multiple Sensors for Smallholder Maize Land Surface Phenology Estimation” *Remote Sensing of Environment.*

Working Papers and Research in Progress

Hadunka, P. (2024) . “Staple crop pest damage and natural resources exploitation: fall armyworm infestation and charcoal production in Zambia” August 2024 draft.

Hadunka, P., Baylis, K., Cardell, L., & Michelson, H. (2024) “What causes adverse outcomes in the maize markets?” March draft 2024 - draft.

Hadunka, P., Baylis, K., & Thornton, R. (2022) “Does the providing efficient transportation improve the price knowledge among rural households? Evidence from Malawi”. March draft 2022

- draft.

Hadunka, P., & Mulenga, B.P. (2024) "Does minimum tillage mitigate the effects of rainfall variability on maize yield? The case of smallholder maize farmers in Zambia" January 2024 - draft.

Relevant Work Experience

2023 - April 2024 Principal Investigator, International Growth Center - FRA project: A think tank supervised by Oxford University and London School of Economics, Remote
2024 - April 2024 Consultant, International Growth Center, Remote
2017 - To date Research and Teaching Assistant, University of Illinois Urbana-Champaign, IL
2021 - 2021 Teaching Assistant (Part-time) - Machine Learning for Applied Economists, University of Bonn, Germany
2017 - 2021 Research and Teaching Assistant, University of Illinois Urbana-Champaign, IL
2019 - 2019 Data Quality Controller, Musika Development Initiative, World Food Program and Business Development Services Africa-SME, Zambia
2016 -2017 Research Intern, Musika, Zambia
2016 - 2016 Research Intern, Indaba Agricultural Policy Research Institute (IAPRI)
2016 - 2016 Field Supervisor, International Maize and Wheat Improvement Center (CYMMIT)

Teaching

Award and Certificate
Applied Microeconomics, Environmental Economics, Applied Statical methods Data Analytics - Undergraduate
University-wide "List of Teachers Ranked as Excellent" (Spring 2021), UIUC
University-wide "List of Teachers Ranked as Excellent" (Spring 2023), UIUC
University-wide "List of Teachers Ranked as Excellent" (Fall 2023), UIUC
University-wide "List of Teachers Ranked as Excellent" (Spring 2024), 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 Zambiaâs Maize Market" University of Illinois at Urbana-Chapaign, 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 Farmersâ 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 — Evaluating the Food and Reserve Agency (Spring 2024)
National Science Fund — University of Illinois (Summer 2023)

Fellowships, Grants and Academic Awards

Jean and John Due Fellowship — University of Illinois (Spring 2020)
University Fellowship — University of Illinois (Fall 2019)
Morgan Endowment — University of Illinois (Summer 2020)
Dunn and Linse Fellowship — University of Illinois (Fall 2017)
Best Undergraduate Thesis (got published after graduation), The University of Zambia (2015)

Presentations

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) - Section leader
2023: Agricultural and Applied Economics Association Annual Meeting (Washington, DC)
2022: Agricultural and Applied Economics Association Annual Meeting (Anaheim, CA) - Section leader
2022: Center for the Study of Africa Economies-University of Oxford (UK) (virtual)
2022: Midwest International Economic Development Conference (Minneapolis, MN) - Section leader
2022: Sustainability and Development Initiative Conference (Virtual)
2019: Agricultural and Applied Economics Association Annual Meeting (Atlanta, GA)

Service and Leadership

Member of the Diversity, Equity, and Inclusion Committee - Student Representative 2024
Member of the University of Illinois Graduate Programs Committee (2018 - Present)
Abstract reviewer - Agricultural and Applied Economics Association - 2022, 2023
Guest Editor - Frontiers in Environmental Economics (special issue)

Additional Information

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
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Hope Michelson, Ph.D.
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Abstracts for Selected Papers

"Rural householdsâ participation in charcoal production in Zambia: Does agricultural productivity play a role?."

The study uses a nationally representative dataset of smallholder farmers in Zambia to determine the effect of agricultural productivity on householdsâ participation in charcoal production. An instrumental variable probit approach is applied to account for the endogeneity of agricultural productivity in household's charcoal participation decision. We find a negative and significant effect of agricultural productivity on household's likelihood of participation in charcoal production. Results also show that higher education, income, asset value, and participation in off-farm employment opportunities reduce the likelihood of participation in charcoal production. Therefore, interventions seeking to reduce charcoal production in rural Zambia could benefit from improving smallholder agricultural productivity, incomes, asset base, and off-farm employment creation. However, interventions need not lose sight of other important macro-level factors.

"Staple crop pest damage and natural resources exploitation: fall army worm infestation and charcoal production in Zambia".

Sub-Saharan Africa (SSA) is home to the highest rates of deforestation in the world, pushing the research community to understand its drivers. One driver may be negative agricultural shocks that drive households to consume natural resources as a coping mechanism. This paper uses primary household panel data from Zambia to estimate the effect of the introduction of an agricultural pest, fall armyworm (FAW) on charcoal production. We exploit exogenous variation in the intensity of exposure to FAW across households and years to identify their effect and find a positive and significant effect of FAW on charcoal production and deforestation. We find that FAW in the village increases the probability of producing charcoal by 3.48 percentage points, from 22 percent to 25 percent. The results also indicate that when methods to mitigate FAW damage such as reducing the share of maize, migration for off-farm employment opportunities and chemical spraying are available, farmers are less likely resort to charcoal production as a coping strategy. Effects are robust to linear including region-specific time trends and instrumental variables for FAW presence. The results suggest that policy interventions to mitigate agricultural production shocks could also have the benefit of reducing charcoal production and deforestation.

"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 almost 40 percent and can increase food insecurity by up to 9 percent, similar in magnitude to a 30-year drought. 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.