

Sergio Puerto

Email: sap257@cornell.edu
Phone: (607) 280 9423
Website: sergiopuerto.com
Nationality: Colombia
Office: Warren Hall 410,
Cornell University, Ithaca, NY

Fields Primary: Development, Agriculture
Secondary: Innovation, Sustainability, and Labor

Education **Cornell University** Ithaca, NY
PhD in Applied Economics 2018 – Present

Dissertation Committee:

Miguel Gómez – Cornell University, mig7@cornell.edu

Christopher Barrett – Cornell University, cbb2@cornell.edu

Brian Dillon – Cornell University, bmd28@cornell.edu

Universidad de los Andes Bogotá, Colombia

BA in Economics 2008 – 2012

BA in Management 2009 – 2013

Publications **The role of collective action in the cacao sector in enhancing sustainability, market upgrading and agro-biodiversity conservation**

with Ximena Rueda and Romaike Middendorp

Environmental Research Letters, 2023

Regrouping to reduce overfishing: Evidence from a Series of Experiments in Mexico

with Andreas Leibbrandt and Maria Alejandra Vélez

Marine Resource Economics, 2021

Blood β -hydroxybutyrate concentrations and early lactation management strategies on pasture-based dairy farms in Colombia

with Francisco Leal-Yepes *et al.*

Preventive Veterinary Medicine, 2020

Testing the Alchian–Allen theorem for three goods using the pseudo-Poisson model

with Dragan Miljkovic, Miguel I. Gómez, and Anupa Sharma

Agricultural Economics, 2019

Leadership, entrepreneurship, and collective action: A case study from the Colombian Pacific Region

with Ivan Lobo and Maria Alejandra Vélez
International Journal of the Commons, 2016

Working
papers

Innovation and Technological Mismatch: Experimental Evidence from Improved Crop Seeds (*Job Market Paper*)

Biases in research and development create a mismatch between the attributes of agricultural technology and farmers' preferences. Using a randomized controlled trial in Costa Rica, I estimate the impact of this mismatch on farmers' adoption of new drought-resistant seeds. The experiment simulated counterfactual scenarios for innovators' seed development decisions by offering some farmers seed matching their preferences and others a seed variety chosen by crop scientists as a blanket recommendation. Results show that mismatch has a significant impact on adoption and productivity, with 41% lower uptake among farmers who were offered the recommended seed. This gap was larger for farms located farther from the research lab where the new seeds were developed, and persisted even in areas with drought exposure. To explain these findings, a model is proposed where research constraints limit innovators' ability to account for farmer heterogeneity. Therefore, matching new seeds to farmer preferences improves productivity by enabling better adaptation to specific farm-level conditions, which are usually private information unknown to innovators. These findings highlight that innovation is often shaped by innovators' priorities rather than demand-side signals, especially in developing countries' agriculture.

Trait prioritization in crop breeding programs: a scoping review on tools and methods

Revise and Resubmit to Nature Plants.

With Martina Occelli, Hale Ann Tufan, Rishabh Mukerjee, Christian Miller, Jaron Porciello, Elisabeth Garner, Mauricio Guerra, and Miguel Gómez.

Trait prioritization studies have guided research, development, and investment decisions for public sector crop breeding programs since the 1970s, but the research design, methods and tools underpinning these studies are not well-understood. We used PRISMA-ScR (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) to evaluate research on trait ranking for major crops over the past forty years. Data extraction and descriptive analysis on 331 papers show uneven attention of crops, lack of systematic sex-disaggregation, and regional bias. The lack of standardized trait data taxonomy across studies, inconsistent research design, and data collection practices make cross comparison of findings impossible. In addition, network mapping of authors and donors shows patterns of concentration and presence of silos within research areas. This study contributes to the next generation of innovation in trait preference to produce more inclusive, demand-driven varietal design that moves beyond trait prioritization focused on productivity and yield.

Risk-reducing incentives and preventive technologies in pasture-based dairy farming

Revise and Resubmit to the American Journal of Agricultural Economics.

With Miguel I. Gómez, Francisco Leal-Yepes, Sabine Mann, and Jessica McArt.

Many of the world's low-income farmers are vulnerable to uncertain productive conditions but have limited options to manage risk. This paper studies the relationship between risk aversion and ketosis, a metabolic disorder that negatively affects dairy farming. We identified farmers' risk preferences and their willingness to pay for information about cows' health status (WTP) using a lab-in-the-field experiment in Colombia. We also collected blood samples from dairy cows to test for the prevalence of the disease. Results show a lower likelihood of ketosis in cows managed by risk-averse farmers, which is consistent with a self-protection strategy under uncertainty. Further, experimental data show a positive relationship between risk aversion and WTP, which is comparable to investments in animal health diagnostic equipment. Moreover, we find no significant differences in management across farmers' risk profiles, with the exception of some heterogeneous effects of concentrate feed and preventative care, consistent with a self-protection strategy to mitigate productivity risk.

Labor rationing under non-separation: Examining the impacts of Ethiopia's travel ban on rural workers

I study the impact of labor supply shocks on rural markets. Using a natural experiment in Ethiopia, I show that a travel ban on migrant workers pushed rural labor markets to reallocate on- and off-farm labor.

Measuring the Heterogeneous Effects of Input Subsidies on Household Outcomes: Evidence from Malawi

With Christone Nyondo, Maggie Munthali, Zephania Nyirenda, and Brian Dillon.

We studied the effect of a nation-wide input subsidy program on the productivity and income of rural households. Our findings suggest that while older farmers are more likely to receive inputs, younger farmers are relatively more productive as a consequence of the program.

Other publications

How can economic incentives designed for environmental conservation support a transition to sustainable and equitable agriculture?

with Lina Moros, Dayron Monroy and Ximena Rueda

Report: Commission on Sustainable Agriculture Intensification, 2022

U.S. Agricultural Exports to Colombia: Rising Sales in Response to Trade Liberalization and Changing Consumer Trends

with Miguel Gomez, Steven Zahniser and Jie Li

Report: U.S. Department of Agriculture, Economic Research Service, 2021

El rol del Estado en la gobernanza social y ambiental privada

with Maria Alejandra Vélez and Ximena Rueda

Book Chapter in *Gestión del Desarrollo Sostenible*, Edited by Manuel Rodríguez Becerra and Maria Alejandra Vélez, Ediciones Uniandes, 2018

Grants and awards

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|---|------|
| Cornell University , GRA Fellowship | 2023 |
| Marine Resource Economics , Outstanding Article Award | 2022 |
| ILCI , Research Project Charter Grant (\$192,328) | 2022 |
| NSF , Doctoral Dissertation Improvement Grant (\$32,075) | 2021 |

Research experience

Researcher, Feed the Future - Innovation Lab for Crop Improvement
Priority Setting Area 2019 – Present

Graduate Research Assistant, Cornell University
Mentor: Miguel I. Gómez 2017 – 2019

Consultant, Environmental Defense Fund
Oceans Program 2016 – 2017

Research Assistant, Universidad de los Andes
Mentors: Maria Alejandra Velez and Ximena Rueda 2014 – 2016

Teaching experience

Instructor of Record, Cornell University Spring 2023
ECON 3550: Economics of Developing Countries

Teaching assistant, Cornell University Fall 2022
AEM 4111: Introduction to Econometrics

Teaching assistant, Universidad de los Andes Spring, Fall 2016
Environmental and Natural Resources Economics

Presentations

2023 AAEA Annual meeting, Washington, DC.
2022 ILCI Annual Meeting, Dakar, Senegal.

Skills

Programming
Proficient in: STATA, R, Latex
Familiar with: Matlab, Python, HTML

Languages
Spanish (Native), English (fluent)

Service and outreach

Referee: Food Policy

Mentoring: (i) Proposals reviewer and co-mentor to a MwAPATA Team from Malawi; (i) Capacity building and research advise to INTA and the National Breeding Program in Costa Rica