

# Patrick S. Ward, Ph.D.

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Assistant Professor of Environmental Economics and Policy  
[Master of Environmental Policy \(iMEP\) Program](#)  
[Duke Kunshan University](#)  
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## Research Interests:

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Sustainable agricultural development, environmental economics, environmental policy, technology adoption, behavioral economics, risk and uncertainty, production economics, information economics.

## Education:

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- Ph.D. Agricultural Economics, Purdue University (2011).
- M.A. Economics, Indiana University (2007).
- B.S. Financial Counseling and Planning, Purdue University (2002).

## Affiliations:

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### **Duke Kunshan University, Kunshan, Jiangsu Province, China**

*Assistant Professor of Environmental Economics and Policy: 2018–present*

*Affiliate, Environmental Research Center: 2018–present*

### **International Food Policy Research Institute, New Delhi, India (2012–2016); Washington, DC (2016–2018)**

*Non-resident Fellow, Environment and Production Technology Division: 2020–present*

*Research Fellow I/II, Environment and Production Technology Division: 2014–2018*

*Postdoctoral Fellow/Associate Research Fellow, Environment and Production Technology Division: 2012–2014*

### **International Center for Climate Governance, Venice, Italy**

*Postdoctoral Visiting Researcher: 2011–2012*

## Teaching:

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**AGEC 217:** Economics (Purdue University: Summer 2010)

**PUBPOL 871K:** Environmental policy analysis (Duke Kunshan University: Fall 2018, 2019)

**PUBPOL 872K:** Environmental economics and policy practicum (Duke Kunshan University: Spring 2019, 2020)

**PUBPOL 631K:** Research methods for environmental sciences (Duke Kunshan University: Fall 2019)

**ENVIRON 806K:** Environmental economics II – Environmental issues in developing economies (Duke Kunshan University: Spring 2020)

## Graduate student supervision:

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### Duke Kunshan University

#### *Master of Environmental Policy (MEP) Masters Project*

Xiaolin Xie (2018–2019)

Songjia Zhang (2019–2020)

Tianqi Wu (2019–2020)

Upeksha Hettiarachchi (2020–2021)

Xin Li (2020–2021)

## Research:

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### Publications

#### *Refereed journals*

1. Bell, Andrew R., **Patrick S. Ward**, Muhammad Ashfaq, and Stephen Davies. “[Valuation and aspirations for drip irrigation in Punjab, Pakistan](#),” *Journal of Water Resources Planning and Management* 146(6): 04020035; [Corresponding author]
2. **Ward, Patrick S.**, Simrin Makhija, and David J. Spielman (2020). “[Drought-tolerant rice, weather index insurance, and comprehensive risk management for smallholders: Evidence from a multi-year field experiment in India](#),” *Australian Journal of Agricultural and Resource Economics* 64(2): 421–454.
3. **Ward, Patrick S.**, Shweta Gupta, Vartika Singh, David L. Ortega, and Shriniwas Gautam (2020). “[What is the intrinsic value of fertilizer? Experimental value elicitation and decomposition in the hill and terai regions of Nepal](#),” *Food Policy* 20: 101809.
4. **Ward, Patrick S.**, David L. Ortega, David J. Spielman, Neha Kumar, Sumedha Minocha (2020). “[Demand for complementary financial and technological tools for managing drought risk](#),” *Economic Development and Cultural Change*, 68(2): 607-653.
5. Ortega, David L., **Patrick S. Ward**, and Vincenzina Caputo (2019). “[Evaluating producer preferences and information processing strategies for drought risk management tools in Bangladesh](#),” *World Development Perspectives* 15: 100132.

6. Tamal, Md. Ehsanul Haque, Andrew R. Bell, Mary Killilea, and **Patrick S. Ward** (2019). [“Social dynamics of short term variability in key measures of household and community wellbeing in Bangladesh,”](#) *Scientific Data* 6: 125.
7. Bell, Andrew R., **Patrick S. Ward**, Mary E. Killilea, and Md. Ehsanul Haque Tamal (2019). [“Assessing recall bias and measurement error in high-frequency social data collection for human-environment research,”](#) *Population and Environment* 40(3): 325–345.
8. Arora, Anchal, Sangeeta Bansal, and **Patrick S. Ward** (2019). [“Do farmers value rice varieties tolerant to droughts and floods? Evidence from a discrete choice experiment in Odisha, India,”](#) *Water Resources and Economics* 25: 27–41.
9. Gars, Jared, and **Patrick S. Ward** (2019). [“Can differences in individual learning explain patterns of technology adoption? Evidence on heterogeneous learning patterns and hybrid rice adoption in Bihar, India,”](#) *World Development* 115:178–189; [Corresponding author].
10. Hill, Ruth Vargas, Neha Kumar, Simrin Makhija, Nicholas Magnan, Francesca de Nicola, David J. Spielman, and **Patrick S. Ward** (2019). [“Ex ante and ex post effects of hybrid index insurance in Bangladesh,”](#) *Journal of Development Economics* 136:1–17; [Corresponding author].
11. Bell, Andrew, Tim Benton, Klaus Droppelmann, Lawrence Mapemba, Oliver Pierson, and **Patrick S. Ward** (2018). [“Transformative change through Payments for Ecosystem Services \(PES\): A conceptual framework and application to conservation agriculture in Malawi,”](#) *Global Sustainability* 1 (e4): 1–8.
12. Bell, Andrew R., **Patrick S. Ward**, Lawrence Mapemba, Zephaniah Nyirenda, Wupe Msukwa, and Edwin Menamu (2018). [“Smart Subsidies for Catchment Conservation in Malawi,”](#) *Scientific Data* 5, article 180113.
13. **Ward, Patrick S.** and Simrin Makhija (2018). [“New modalities for managing drought risk in rainfed agriculture: Evidence from a discrete choice experiment in Odisha, India,”](#) *World Development* 107:163–175.
14. Bell, Andrew R., Jennifer Zavaleta, Frazer Mataya, and **Patrick S. Ward** (2018). [“Do as they did: peer effects explain adoption of conservation agriculture in Malawi,”](#) *Water* 10(51):1-16.
15. **Ward, Patrick S.**, Andrew R. Bell, Klaus Droppelmann, and Tim Benton (2018). [“Early adoption of conservation agriculture practices: Understanding partial compliance in programs with multiple adoption decisions,”](#) *Land Use Policy* 70: 27–37.
16. Spielman, David J., **Patrick S. Ward**, Deepthi E. Kolady, and Harun-Ar-Rashid (2017). [“Public incentives, private investment, and outlooks for hybrid rice in Bangladesh and India,”](#) *Applied Economics and Policy Perspectives* 39(1): 154–176.
17. **Ward, Patrick S.** and Gerald E. Shively (2017). [“Disaster risk, social vulnerability and economic development,”](#) *Disasters* 41(2): 324–351.
18. Bell, Andrew Reid, **Patrick S. Ward**, Mary E. Killilea, and Md. Ehsanul Haque Tamal (2016). [“Real-time social data collection in rural Bangladesh via a ‘microtasks for micropayment’ platform on Android smartphones,”](#) *PLoS ONE* 11(11): e0165924.
19. Bell, Andrew R., **Patrick S. Ward**, and Md. Azeem Ali Shah (2016). [“Increased water charges improve efficiency and equity in an irrigation system,”](#) *Ecology and Society* 21(3): 23.
20. **Ward, Patrick S.**, Andrew R. Bell, Gregory M. Parkhurst, Klaus Droppelmann, and Lawrence Mapemba (2016). [“Heterogeneous preferences and the effects of incentives in promoting conservation agriculture in Malawi,”](#) *Agriculture, Ecosystems & Environment* 222: 67–79.
21. **Ward, Patrick S.** (2016). [“Transient poverty, poverty dynamics and vulnerability to poverty: An empirical analysis using a balanced panel from rural China,”](#) *World Development* 78: 541–553.

22. Ortega, David L. and **Patrick S. Ward** (2016). "Information processing strategies and the effects of framing in developing country choice experiments: Results from rice farmers in India," *Agricultural Economics* 47: 493–504.
23. **Ward, Patrick S.** and Vartika Singh (2015). "Using field experiments to elicit risk and ambiguity preferences: Behavioral factors and the adoption of new agricultural technologies," *Journal of Development Studies* 51(6): 707–724.
24. **Ward, Patrick S.** and Valerien O. Pede (2015). "Capturing social network effects in technology adoption: The spatial diffusion of hybrid rice in Bangladesh," *Australian Journal of Agricultural and Resource Economics* 59(2): 225–241.
25. **Ward, Patrick S.** and Gerald E. Shively (2015). "Migration and land rental as responses to income shocks in rural China," *Pacific Economic Review*, 20(4): 511–543.
26. Bell, Andrew Reid, M. Azeem Ali Shah and **Patrick S. Ward** (2014). "Reimagining cost recovery in Pakistan's irrigation system through willingness-to-pay estimates for irrigation water from a discrete choice experiment," *Water Resources Research* 50(8): 6679–6695.
27. **Ward, Patrick S.**, David L. Ortega, David J. Spielman, and Vartika Singh (2014). "Heterogeneous preferences for drought-tolerant rice: Evidence from Bihar, India," *World Development* 64: 125–139.
28. **Ward, Patrick** (2014). "Measuring the level and inequality of wealth: An application to China," *Review of Income and Wealth* 60(4): 613–635.
29. **Ward, Patrick S.**, Raymond J.G.M. Florax and Alfonso Flores-Lagunes (2014). "Climate change and agricultural productivity in Sub-Saharan Africa: A spatial sample selection model," *European Review of Agricultural Economics* 41(2): 199–226.
30. Spielman, David J., Deepthi E. Kolady and **Patrick S. Ward** (2013). "The prospects for hybrid rice in India," *Food Security* 5(5): 651–665.
31. **Ward, Patrick** (2013). "On the use of tradable development rights for reducing flood risk," *Land Use Policy* 31: 576–583.
32. **Ward, Patrick** and Gerald Shively (2012). "Vulnerability, income growth and climate change," *World Development* 40(5): 916–927.

*Submitted or under final preparation for submission to refereed journals*

1. Gulati, Kajal, **Patrick S. Ward**, Travis J. Lybbert, and David J. Spielman. "Intrahousehold preference heterogeneity and demand for labor-saving technology: The case of mechanical rice transplanters in India," *under review*.
2. **Ward, Patrick S.**, Muzna Alvi, Simrin Makhija, and David J. Spielman. "Cooperation and the provision of local public goods in remote rural communities," *under review*.
3. Ranjan Kumar Ghosh, Shweta Gupta, Vartika Singh, and **Patrick S. Ward**. "Demand for multi-peril crop insurance in developing countries: Fresh evidence from India," *revise and resubmit*.
4. Alvi, Muzna, **Patrick S. Ward**, Simrin Makhija, and David J. Spielman. "Does identity affect aspirations in rural areas? An examination from the lens of caste and gender," *under review*.
5. Alvi, Muzna, **Patrick S. Ward**, Simrin Makhija, and David J. Spielman. "Do grassroots interventions relax behavioral constraints to the adoption of nutrition-sensitive food production systems?" *under review*.
6. Fishman, Ram, Jared Gars, Avinash Kishore, Yoav Rothler, and **Patrick S. Ward**. "Confidence and information usage: Evidence from soil testing in Bihar, India," *under final preparation for submission*.

*Electronic datasets*

1. International Food Policy Research Institute (IFPRI); Master of Environmental Policy Program (iMEP), Duke Kunshan University; Department of Environmental Studies, New York University; University of Agriculture-Faisalabad, Pakistan (2018). "[Experiences with and preferences for drip irrigation systems in Punjab, Pakistan.](#)" Published electronically. IFPRI Dataverse.
2. International Food Policy Research Institute (IFPRI); Department of Environmental Studies, New York University; Duke Kunshan University (2018). "[Social dynamics of short-term variability in key measures of household and community wellbeing in rural Bangladesh.](#)" Published electronically. IFPRI Dataverse.
3. Department of Environmental Studies, New York University; International Food Policy Research Institute; Lilongwe University of Agriculture and Natural Resources (2018). "[Smart subsidies for catchment conservation in Malawi.](#)" Published electronically. IFPRI Dataverse.
4. IFPRI (2014). "[Farmers' preferences for abiotic stress tolerance in hybrid versus traditional rice.](#)" Published electronically. IFPRI Dataverse.
5. Pede, Valerien O., Vijesh Krishna, Nils Teufel, **Patrick S. Ward**, Takashi Yamano, Arindam Sammadar, David J. Spielman, Surabhi Mittal, Thelma Paris, Dhiraj Singh, Vartika Singh, Subhash Ghimire, and Meerah Mehrotra (2013). "[Cereal Systems Initiative for South Asia \(CSISA\) Baseline Household Survey \(2010-2011\).](#)" Published electronically. IFPRI Dataverse.

**Research in progress**

1. "Understanding the barriers to agricultural credit for women farmers" (with Berber Kramer).
2. "Leveraging network externalities to promote soil conservation and ecosystem services: A randomized evaluation of the impacts of agglomeration payments on the diffusion of conservation agriculture in the Shire River Basin in southern Malawi" (with Andrew R. Bell, Lawrence Mapemba, Klaus Doppelpmann, and Tim Benton).
3. "Improving access to rural credit by alleviating credit rationing" (with Apurba Shee, Liangzhi You, and Yanyan Liu).
4. "Market acceptance of gene editing food biotechnology in China: Applications to cadmium contamination in rice and African Swine Fever" (with David L. Ortega and Wen Lin).
5. "Bundling technology with insurance: Evidence from a randomized evaluation in Odisha, India" (with David J. Spielman and Simrin Makhija).
6. "Environmental impacts of crop insurance: Evidence from a randomized experiment in Bangladesh."
7. "Environmental conditions and students' cognitive functioning and academic performance" (with Junjie Zhang and John Ji).
8. "Remote sensing and detection of heavy metal pollution in soil and water" (with Songjia Zhang).
9. "Conditional cooperation and voluntary contributions to public goods: Evidence from herders' contribution preference to ecological protection in nature reserves in China" (with Tianqi Wu).
10. "Biodiversity and human health impacts of farmer decision-making" (with Randy Kramer and others).
11. "FarmScore: A cluster randomized trial on the impacts of using digital technologies to unlock risk-contingent credit for marginal farmers in Odisha" (with Berber Kramer).

## Conference, Seminar, and Webinar Presentations (2018-2019):

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1. "Confidence and information usage: Evidence from soil testing in India." Duke Kunshan University Economics Workshop (Kunshan, Jiangsu, China), November 2019 (Invited presentation).
2. "Confidence and information usage: Evidence from soil testing in India." Macro Agricultural Research Institute (MARI) Seminar, Huazhong Agricultural University (Wuhan, Hubei, China), October 2019 (Invited presentation).
3. "Cooperation and the provision of local public goods in remote rural communities." Agricultural & Applied Economics Association Annual Meeting (Atlanta, GA, USA), August 2019 (Selected presentation). 2019 China Agricultural Economics Review (CAER) - International Food Policy Research Institute (IFPRI) Annual Conference (Hangzhou, Zhejiang, China), October 2019 (Selected presentation).
4. "Cooperation and the provision of local public goods in remote rural communities." Agricultural & Applied Economics Association Annual Meeting (Atlanta, GA, USA), July 2019 (Selected presentation).
5. "Optimizing crop insurance to satisfy the demands of farmers: Evidence from four states in India." Agricultural & Applied Economics Association Annual Meeting (Atlanta, GA, USA), July 2019 (Selected presentation).
6. "Ex ante and ex post effects of hybrid index insurance in Bangladesh." 2018 China Agricultural Economics Review (CAER) - International Food Policy Research Institute (IFPRI) Annual Conference (Guangzhou, Guangdong, China), November 2018 (Selected presentation).
7. "Addressing Environmental Challenges for Sustainable Agricultural Development and Food Security." Annual Conference of Environmental Economics (Quzhou, Zhejiang, China), October 2018 (Invited presentation, moderator).
8. "[Helping smallholder farmers manage risks: Innovations to improve agricultural insurance.](#)" CGIAR Research Program on Policies, Institutions, and Markets Webinar, September 2018 (with Berber Kramer).
9. "Addressing Environmental Challenges for Sustainable Agricultural Development and Food Security." Sichuan University (Chengdu, Sichuan, China), September 2018.
10. "Addressing Environmental Challenges for Sustainable Agricultural Development and Food Security." Duke Kunshan University iMEP Faculty Lecture (Kunshan, Jiangsu, China), August 2018 (Invited presentation).
11. "The psychology of environmental and natural resource management: Insights on policy design from behavioral economics." Duke Kunshan University iMEP Seminar (Kunshan, Jiangsu, China), March 2018 (Invited presentation).
12. "The psychology and natural resource management: Insights from behavioral economics." CGIAR Standing Panel on Impact Assessment Workshop on Natural Resource Management (Washington, DC, USA), February 2018 (Invited presentation).

## Professional Activities:

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### Service

Review editor: *Frontiers in Environmental Science – Environmental Economics and Management*.

Reviewer for: *Agricultural Economics*, *Agricultural and Applied Economics Association* (2014–2019 AAEA Annual Meetings), *Agricultural and Resource Economics Review*, *American Journal of Agricultural Economics*, *Australian Journal of Agricultural and Resource Economics*, *China Economic Review*, *Climatic Change*, *Ecological Economics*, *European Review of Agricultural Economics*, *Food Policy*, *Food Security*, *HarvestPlus Working Paper Series*, *International Association of*

Agricultural Economists (2015 Triennial International Conference of Agricultural Economists), *Journal of Agricultural Economics*, *Journal of Development Studies*, *Journal of Environmental Economics and Management*, *Journal of Environmental & Policy Planning*, *Journal of South Asian Development*, *Land Economics*, *Land Use Policy*, *Natural Resources Forum*, *Population and Environment*, *Resource and Energy Economics*, *Review of Income and Wealth*, *Sustainability*, and *World Development*.

Local Organizing Committee–IVth World Conference of the Spatial Econometrics Association, 2010.

Agricultural and Applied Economics Association (AAEA) Employment Services Committee, 2010–2013 (3 yr. appointment)

Cereal Systems Initiative for South Asia (CSISA) India Management Team and Country Coordinating Committee, 2012–2018.

International Food Policy Research Institute (IFPRI) Workplace Committee, Member, 2016–2018.

International Food Policy Research Institute (IFPRI) Institutional Review Board (IRB), Member, 2016–2018.

Duke Kunshan University Research Policy Committee, Member, 2018–present.

Duke Kunshan University Standing Committee on Misconduct in Research, Member, 2018–present.

Duke Kunshan University Faculty Council, Member, 2018–present.

### Association memberships

Member: Agricultural & Applied Economics Association (AAEA), International Association of Agricultural Economists (IAAE), Agricultural Economics Society (AES).

## Honors, Awards, & Fellowships:

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### Internal and external research awards

#### *Principal investigator or investigator*

1. 2019: Center for Effective Global Action (CEGA) Digital Credit Observatory (DCO): \$49,932.39 (Lead-PI).
2. 2017: International Initiative for Impact Evaluation (3ie): \$435,708 (Co-PI).
3. 2014: International Growth Centre (IGC) India Program: \$50,000 (Co-I).
4. 2013: International Food Policy Research Institute (IFPRI) Strategic Innovations Fund: \$50,000 (Co-PI).

#### *Contributor on multi-institutional collaborative research program grants*

1. 2015: Cereal Systems Initiative for South Asia (CSISA) Phase III (Bill and Melinda Gates Foundation and United States Agency for International Development): ~\$30 million.
2. 2015: Technical Assistance and Research for Indian Nutrition and Agriculture (TARINA) (Bill and Melinda Gates Foundation): \$13,464,674.

#### *Travel grants*

1. 2011: Purdue Climate Change Research Center (PCCRC) Travel Grant.
2. 2011: AAEA Young Professional and Graduate Student Travel Grant.
3. 2010: AAEA Young Professional and Graduate Student Travel Grant.

### **Fellowships**

2011–2012: Visiting Research Fellowship, International Center for Climate Governance (ICCG), Venice, Italy.

### **Other awards**

Selected Participant–American Enterprise Institute (AEI) Emerging Scholars Workshop in the area of agriculture and food economics, 2015 (Washington, DC).

Selected Participant–Belpasso International Summer School in Environmental and Resource Economics, 2011 (Belpasso, Sicily, Italy).

Recipient of N.J. Yasaswy Memorial Best Paper Award at the 4th International Conference on Applied Econometrics (ICAE-IV) organized by IBS Hyderabad in collaboration with the Indian Econometric Society, 2014.

Committee for the Education of Teaching Assistants (CETA) Teaching Award, Purdue University, 2011.

### **Computer Skills:**

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Expertise in R, Stata, NLOGIT,  $\LaTeX$

Proficiency in LIMDEP, Matlab, ArcMap

Familiarity with GAMS, GEMPack (GTAP)

### **References:**

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Available upon request

Last updated: June 26, 2020