Jawoo Koo

- Senior Research Fellow, Natural Resources and Resilience Unit, Transformation Strategies Department
- Lead, CGIAR Initiative on Digital Innovations (https://on.cgiar.org/digital)

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HIGHLIGHTS

- **Publication** | Co-authored 29 peer-reviewed journal articles, 22 book chapters, 6 reports, 48 non-peer-reviewed publications, and 18 datasets, collectively cited more than 6,500 times (h-index: 33)[1].

- **Education** | Received M.S. and Ph.D. degrees at the Agricultural and Biological Engineering Department, University of Florida. Graduate research focused on estimating soil carbon sequestration potential in low-input farming systems in Ghana using crop modeling and data assimilation with satellite remote sensing.

- **Managerial experience** | Served as a Co-PI of the HarvestChoice: Phase II (2013-2016), co-managed 25 staff and 47 collaborators across CGIAR and partner institutions, together with the InSTePP at the University of Minnesota, to develop harmonized, spatially-explicit datasets to support strategic decision-making at BMGF, AGRA, USAID, G8-New Alliance, and SRF. Serves as the Global Coordinator of CGIAR Geospatial Science CoP (2013-present), coordinating pan-CGIAR geospatial data sharing and shared learning activities of >500 members. Co-founded the CGIAR Platform for Big Data in Agriculture (2017-2021), together with Alliance Bioversity-CIAT. Appointed to lead CGIAR Initiative on Digital Innovation (2022-2024).

- **Technical skills** | More than 20 years of experience simulating agriculture and natural resource management using the DSSAT (Decision Support System for Agrotechnology Transfer) Cropping System Model. Co-implemented DSSAT on high-performance computers at IFPRI and helped CGIAR researchers to run grid-based crop modeling analyses in regional and global-scale studies. Uses remote sensing, historical weather, climate projections, and other socioeconomic data to characterize food production systems and parameterize models.

EXPERIENCE

International Food Policy Research Institute (2007-Present)

2023 | Launched the **Generative AI for Agriculture (GAIA)**, aiming to enhance LLM-based advisory services for extension agents in agri-food systems, funded by the Bill and Melinda Gates Foundation, in collaboration with CABI, Digital Green, SCiO, and Hugging Face.

2022 | Launched the **Statistics from Space**, funded by the Government of the Republic of Korea, to provide the Mozambican government agencies with crop production estimates in a timely manner.

2022 | Appointed as the lead of CGIAR Research Initiative on **Digital Innovation** ("Harnessing digital technologies for real-time decision making across food, land, and water systems")

2017-2021 | Co-founded the **CGIAR Platform for Big Data in Agriculture Program**. Led the development of joint-proposal (IFPRI and Alliance Bioversity-CIAT).

2020-2021 | Led the **Enabling Crop Analytics at Scale** project, funded by the Bill and Melinda Gates Foundation, to develop a next-generation crop analytics using smartphone 3D imaging and dynamic area sampling frames.

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[1] Based on the Google Scholar profile at https://scholar.google.com/citations?user=kOgZxxcAAAAJ&hl=en

2013-2016 | Led the **HarvestChoice** project and its biophysical modeling of smallholder farmers' cropping system in Africa South of Sahara by modeling the growth of major staple crops and their yield responses to potential intervention scenarios. Won the **2018 Webby Award** for the development of **Data Africa** (http://dataafrica.io).

2013-2017 | Led the **Technology Platform** Program, providing technical assistance to technical partners in African countries for their geospatial targeting and investment priority setting for improved agricultural technologies.

2000-Present | Contributes to the **DSSAT Foundation** and the **DSSAT Cropping System Modeling Software** as a co-author/developer.

EDUCATION

Ph.D. (2007), Agricultural & Biological Engineering, University of Florida, Gainesville, Florida.
Dissertation Title: Estimating Soil Carbon Sequestration in Ghana

M.S. (2002), Agricultural & Biological Engineering, University of Florida, Gainesville, Florida.
Thesis Title: The Impact of Climate Variability on Tomato Disease Management and Production

B.A. (1998), Agricultural Biology – Plant Pathology & Entomology, Korea University, Seoul, South Korea

RECENT PUBLICATIONS

1. Lecoutere, E., Mishra, A., Singaraju, N., Koo, J., Azzarri, C., Chanana, N., Nico, G., and Puskur, R. "Where women in agri-food systems are at highest climate risk: A methodology for mapping climate-agriculture-gender inequality hotspots." Frontiers in Sustainable Food Systems 7 (2023): 1197809. https://doi.org/10.3389/fsufs.2023.1197809
2. Tzachor, A., Devare, M., Richards, C., Pypers, P., Ghosh, A., Koo, J., Johal, S., and King, B. Large language models and agricultural extension services. Nat Food 4, 941–948 (2023). https://doi.org/10.1038/s43016-023-00867-x
3. Pastor-Escuredo, David; Gardeazabal, Andrea; Koo, Jawoo; Imai, Asuka; and Treleaven, Philip. 2022. Multi-scale governance and data for sustainable development. Frontiers in Big Data 5: 1025256. https://doi.org/10.3389/fdata.2022.1025256
4. Koo, J, Mamun, A, Martin, W. From bad to worse: Poverty impacts of food availability responses to weather shocks. Agricultural Economics. 2021; 1– 15. https://doi.org/10.1111/agec.12657
5. Komarek, A.M., Rahman, N.A., Bandyopadhyay, A., Kizito, F., Koo, J. and Addah, W., 2021. Trade-offs and synergies associated with maize leaf stripping within crop-livestock systems in northern Ghana. Agricultural Systems, 193, p.103206. https://doi.org/10.1016/j.agsy.2021.103206
6. Ramirez-Vallegas, Julian; Milan, Anabel Molero; Alexandrov, Nikolai; Asseng, Senthold; Koo, Jawoo; et al. 2020. CGIAR modeling approaches for resource-constrained scenarios: I. Accelerating crop breeding for a changing climate. Crop Science 60(2): 547-567. https://doi.org/10.1002/csc2.20048
7. Yang, Meijian; Wang, Guiling; Ahmed, Kazi Farzan; Adugna, Berihun; Eggen, Michael; Atsbeha, Ezana; You, Liangzhi; Koo, Jawoo; and Anagnostou, Emmanouil. 2020. The role of climate in the trend and variability of Ethiopia's cereal crop yields. Science of The Total Environment 723(June 2020): 137893. https://doi.org/10.1016/j.scitotenv.2020.137893
8. De Pinto, Alessandro; Cenacchi, Nicola; Kwon, Ho Young; Koo, Jawoo; and Dunston, Shahnila. 2020. Climate smart agriculture and global food-crop production. PLoS ONE 15(4): e0231764. https://doi.org/10.1371/journal.pone.0231764
9. De Pinto, A., Cenacchi, N., Robertson, R., Kwon, H.Y., Thomas, T., Koo, J., Begeladze, S. and Kumar, C., 2020. The role of crop production in the forest landscape restoration approach—Assessing the potential benefits of meeting the Bonn Challenge. Frontiers in Sustainable Food Systems, 4. https://doi.org/10.3389/fsufs.2020.00061
10. Nelson, Andy; Weiss, Daniel J.; van Etten, Jacob; Cattaneo, Andrea; McMenomy, Theresa S.; and Koo, Jawoo. 2019. A suite of global accessibility indicators. Scientific Data 6: 266. https://doi.org/10.1038/s41597-019-0265-5