Dr. rer. agr. Abhijeet Mishra

Land-use modeling | Optimization | Climate change

(+1) 202-677-2589 | A.Mishra@cgiar.org | abhimishr | abhimishr

Experience

Assocaite Research Fellow — *Washington, DC, USA*
International Food Policy Research Institute — *Jan 2023 - Present*

Land-use model developer — *Potsdam, Germany*
Potsdam Institute for Climate Impact Research (PIK) — *Sep 2016 - Present*

- Implemented first of its kind forest land representation in a global land-use optimization model written in GAMS with 42 modules using constrained optimization methods.
- Contributions to decarbonization policy discussions at the German Federal Ministry of the Interior and Community.
- Formalized 2 IPCC accounting guidelines for long-term carbon storage potential in biomass harvested from forests in MAgPIE.
- Quantified and built comprehensive sustainability policy suggestion for urban housing via decarbonization strategy in building sector by leveraging wood as construction material for limiting global warming by 2°C.

Projects

Global land use change modeling — *Potsdam, Germany*
Potsdam Institute for Climate Impact Research (PIK) — *Sep 2016 - Present*

- Contributing developer to MAgPIE - an open source partial equilibrium modeling framework for global land use with 7 different land type representations (coupled with REMIND integrated assessment model).
- Refined and improved modular implementation of 5 different land representations including optimization of timber production and global land use.
- Refined and improved modular implementation of 5 different land representations including optimization of agricultural and timber production and global land use.

Open source analytical package(s) development — *Potsdam, Germany*
Potsdam Institute for Climate Impact Research (PIK) — *Sep 2016 - Present*

- Developed and contributed to 9 data handling packages written in R.
- Automatized handling of data and models via automatized pre-processing, data handling, post-processing and visualization from 3 separate work streams saving 12+ work hours.

Predictive modeling and Business Intelligence — *Ghent, Belgium*
Ghent University — *Sep 2015 - Jun 2016*

- Defined a framework for identifying proposed European policy acceptance in 3000 farms across Belgium based on logistic regression.
- Composed an efficiency framework for USA's aviation industry based on open access data from United States Federal Aviation Administration consisting of 1,000,000 data points using econometric tools.

Education

Humboldt University of Berlin / Technical University of Berlin — *Berlin, Germany*
Ph.D. in Agricultural Sciences — *Sep 2016 - Dec 2022*

- Economic Modelling with the General Algebraic Modeling System (GAMS).
- Applied Computable General Equilibrium Modelling and Mathematical Economics.
- Investigated sustainability of buildings made out of timber in order to decarbonize building sector.
- Geographic Information Systems and spatial data analysis.

Ghent University — *Ghent, Belgium*
M.Sc. in Rural Economics and Management — *Sep 2014 - Sep 2016*

- Minor : Nutrition and Rural Development.
- Delivered location based impact of future climate change on agricultural land values and farm incomes using panel data analysis of European Union's Farm Accountancy Network.

University of Agricultural Sciences — *Bangalore, India*
B.Sc. in Agricultural Marketing and Cooperation — *Aug 2009 - Apr 2013*

Skills

Optimization	GAMS
Statistical programming	R, Python
Geographic information system	QGIS, GeoDa, ArcGIS
Version control	Git, SVN
High performance computing	Cluster, Slurm
Project management	Redmine, Jira

Expertise

Mathematical modeling | GAMS | Land use models | Partial equilibrium modeling | Geo-spatial analysis | Data processing | Data visualization | Scrum | Econometrics | Predictive modeling | Machine learning

Strengths

Critical reasoning | Collaborative development | Empathy | Adaptation | Curiosity

Languages

English	C2 (Professional proficiency)
Hindi	Mother tongue
Kannada	Fluent
German	A2
Spanish	A2

Peer reviewed publications (selected)

Land use change and carbon emissions of a transformation to timber cities
Mishra A, Humpenöder F, Churkina G, Reyer CPO, Beier F, Bodirsky BL, Campen.HLC, Schellnhuber HJ, and Popp A.
Nature Communications
https://doi.org/10.1038/s41467-022-32244-w

The ongoing nutrition transition thwarts long-term targets for food security, public health and environmental protection
Bodirsky BL, Dietrich JP, Martinelli E, Stenstad A, Pradhan P, Gabrysch S, **Mishra A** et al.
Nature Scientific Reports
https://doi.org/10.1038/s41598-020-75213-3

Quantifying synergies and trade-offs in the global Water-Land-Food-Climate nexus using a multi-model scenario approach
Doelman JC, Beier F, Stehfest E, Bodirsky BL, Beusen AH, Humpenöder F, **Mishra A**, Popp A, van Vuuren DP, de Vos L, Weindl I.
Environmental Research Letters
doi.org/10.1088/1748-9326/ac5766

Estimating global land system impacts of timber plantations using MAgPIE 4.3.5
Mishra A, Humpenöder F, Dietrich JP, Bodirsky BL, Sohngen B, Reyer CPO, Campen HLC, and Popp A.
Geoscientific Model Development
doi.org/10.5194/gmd-14-6467-2021

MAgPIE 4–a modular open-source framework for modeling global land systems
Dietrich JP, Bodirsky BL, Humpenöder F, Weindl I, Stevanović M, Karstens K, Kreidenweis U, Wang X,**Mishra A**, Klein D, Ambrósio G.
Geoscientific Model Development
doi.org/10.5194/gmd-12-1299-2019