Aniket Deo, Ph.D.

Bio-economic Modeler

Borlaug Institute for South Asia (BISA),
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SUMMARY

Data scientist and geospatial modeler with expertise in agriculture analytics, climate impact modeling, machine learning, water-balance models and land use optimization. Experienced in integrating GCMs-SSPs climate projections with crop, water, and land use models (INFOCROP, DSSAT, APSIM) to assess climate impacts and adaptation pathways. Published researcher within CGIAR ecosystem, with strong skills in geospatial analytics, predictive modeling, and decision-support systems for policy and climate-smart agriculture

EMPLOYMENT RECORD

- **Bio-economic modeler – BISA, CIMMYT, New Delhi, India** *July 2022 – Present*
  - Design and develop spatial crop simulation models (INFOCROP, DSSAT, APSIM) for climate adaptation modeling, high-resolution data sets for model inputs and land use optimization models
  - Currently working on climate adaptation atlas (ACASA - https://acasa-bisa.org/#/viewer) in collaborations with national agricultural research centers of Bangladesh, India, Nepal and Sri Lanka and University of Florida, Columbia University and University of Washington
  - Conduct climate risk assessment and yield predictions using multi-model GCMs ensembles and SSP scenarios
  - Employ machine learning tools such as Random Forest, XGBoost, SHAP for yield predictions linked to spatial crop models
- **Project Manager – IIT Bombay, Project on Climate Resilient Agriculture in Maharashtra (PoCRA)** *Jul 2021 – Jun 2022*
  Develop crop matrix to identify the potential of value addition for different geographies and scales in Maharashtra. PoCRA is a Govt. of Maharashtra project funded by World Bank

EDUCATION

MTech + Ph.D., Indian Institute of Technology Bombay, Mumbai, India *March 2022*
Thesis title: *Micro-planning of farm resources: Multi-stage model to support crop planning and improve farmer's incentives*
Thesis theme: *Operations research in Agriculture*

MAJOR PEER-REVIEWED PUBLICATIONS (*Corresponding author)

- A. Deo, S. Karmakar*, A. Arora "**Rainwater harvesting and water balance simulation-optimization scheme to plan sustainable second crop in small rain-fed systems**." *Journal of Environmental Management, Elsevier* (2022): 116135.
- A. Deo, PB. Shirsath*, PK. Aggarwal "**Identifying resource-conscious and low-carbon agricultural development pathways through land use modeling"** *Land Use Policy, Elsevier* (2024): 107208.
- A. Deo*, A. Arora, S. Karmakar "**Decision support algorithm to revamp homestead vegetable production for climate resilience and nutrition security**", *Smart Agricultural Technology, Elsevier,* (2023): 100340.
- Jain, N., Verma, H., Deo*, A. et al. **Effect of climate change adaptation options on maize yield across different agro-climatic zones in South Asia. A meta-analysis**. Agron. Sustain. Dev. 45, 78 (2025).
- V.V. Kumari, A. Deo*, K.Bora, C.A.R.Rao, B. M. K. Raju, MAS Chandran, K. Sriram, V. K. Singh, PK. Aggarwal. "**Adapting sorghum and other millets to climate challenges: An integrated bibliometric and meta-analysis of global literature**." *Journal of Agriculture and Food Research, Elsevier* (2025): 101987.

TECHNICAL SKILLS

- **Data Science/AI/Geospatial & Remote sensing**: Machine learning (Random Forest, Gradient Boosting, SHAP), Predictive analysis, Geospatial analysis (QGIS, ArcGIS, Google Earth Engine)
- **Modeling & Simulation**: INFOCROP, DSSAT, APSIM, climate-impact modeling, R programming, MATLAB
- **Optimization & OR**: Linear/Non-linear programming, Genetic algorithms, Heuristic modeling, TOPSIS, AHP
- **Other tools:** High-performance computing, Meta-analysis, LaTeX, CiteSpace, VOSviewer, Scopus, WoS