

Dr Timothy Foster

CONTACT INFORMATION

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APPOINTMENTS

Senior Lecturer in Water-Food Security, University of Manchester (2020–)
Lecturer in Water-Food Security, University of Manchester (2016–2020)
Postdoctoral Research Fellow, Water for Food Global Institute (2015–2016)

EDUCATION

Ph.D., Interdisciplinary Hydrology, Imperial College London (2015)
M.Sc., Hydrology (Distinction), Imperial College London (2011)
B.Sc., Physical Geography (First Class Honours), University College London (2010)

SELECTED PUBLICATIONS

Oldekop, J. A., Horner, R., Hulme, D., ... **Foster, T.**, ... et al. (2020). COVID-19 and the case for global development. *World Development*, 105044.

Parkes, B., Higginbottom, T., Hufkens, K., Ceballos, F., Kramer, B., & **Foster, T.** 2020. “Weather Dataset Choice Introduces Uncertainty to Estimates of Crop Yield Responses to Climate Variability and Change”. *Environmental Research Letters*. 14, 124809.

Rouhi-Rad, M., Brozović, N., **Foster, T.**, Mieno, T. 2019. “Effects of instantaneous groundwater availability on irrigated agriculture and implications for aquifer management”. *Resource and Energy Economics*. 59, 101129.

Foster, T., Goncalves, I.Z., Campos, I., Neale, C.M.U., & Brozović, N. 2019. “Assessing landscape scale heterogeneity in irrigation water use with remote sensing and in-situ monitoring”. *Environmental Research Letters*. 14, 024004.

Hufkens, K., Melaas, E.K., Mann, M.L., **Foster, T.**, Ceballos, F., Robles, M., & Kramer, B. 2019. “Monitoring crop phenology using a smartphone based near-surface remote sensing approach”. *Agricultural and Forest Meteorology*. 265, 327-337.

Foster, T., & Brozović, N. 2018. “Simulating crop-water productions using crop growth models for water policy assessments”. *Ecological Economics*, 152, 9-21.

Foster, T., Speir, C., & Brozović, N. 2017b. “The buffer value of groundwater in conjunctive use systems when well yield is limited” *Journal of Hydrology*, 547, 638-649.

Foster, T., Brozović, N., & Butler, A. 2017a. “Effects of initial aquifer conditions on economic benefits from groundwater conservation” *Water Resources Research*, 53(1), 744-762.

Foster, T., Brozović, N., Butler, A., Neale, C. M. U., Raes, D., Steduto, P., Fereres, E., & Hsiao, T. C. 2016. “AquaCrop-OS: An open-source version of FAO’s crop water productivity model” *Agricultural Water Management*, 181, 18-22.

Foster, T., Brozović, N., & Butler, A. 2015b. “Why well yield matters for managing agricultural drought risk.” *Weather and Climate Extremes*, 10(A), 11-19.

Foster, T., Brozović, N., & Butler, A. 2015a. “Analysis of the impacts of well yield and groundwater depth on irrigated agriculture.” *Journal of Hydrology*, 523, 86-96.

Foster, T., Brozović, N., & Butler, A. 2014. “Modeling irrigation behavior in groundwater systems.” *Water Resources Research*, 50(8), 6370-6389.

SELECTED WORKING PAPERS

Foster, T., Adhikari, R., Urfels, A., Adhikari, S. & Krupnik, T.J. (2019) “Costs of diesel pump irrigation systems in the Eastern Indo-Gangetic Plains: What options exist for efficiency gains?”

Ceballos, F., **Foster, T.**, Hufkens, K., Jahdavi, A., Kannan, S. & Kramer, B. (2018). “Seeing is believing: Using crop pictures in personalized advisory services”.

Higginbottom, T., Adhikari, R., Dimova, R., Redicker, S. & **Foster, T.** “African dams and irrigation schemes have consistently failed to deliver the proposed agricultural benefits”.

Young, R., **Foster, T.**, Valoochi, A. & Brozović, N. “Hard vs soft: effects of groundwater policy design on economic and hydrologic outcomes”

Kelly, T., **Foster, T.**, & Schultz, D. “Does soil moisture information uncertainty lead to less efficient irrigation decisions”.

SELECTED
RECENT GRANTS

Pumpset efficiency and groundwater irrigator livelihoods in Nepal’s Terai, PI, USAID Cereal Systems Initiative for South Asia Program, £79,500, 2019-2020.

Designing Resilient and Adaptable Water management - Integrated & Interactive Tools (DRAW-IT), Co-I, UKRI Strategic Priorities Fund, £306,703, 2019-2020.

Assessing alternative models for irrigation development in Sub-Saharan Africa, PI Research England GCRF QR Pump Priming Fund, £66,701, 2019.

Sustainable intensification of groundwater irrigation in the Nepal Terai, PI, N8 Agri-Food Pump Priming Fund Grant, £16,416, 2018-2019.

Mitigating basis in weather-index crop insurance: : harnessing models and big data to enable climate-resilient agriculture in India, PI, NERC-ESRC-DFID Innovation Grant, £346,999, 2018-2020.

Dams 2.0: Design and assessment of resilient and sustainable interventions in water-energy-food-environment Mega-Systems, Co-I & Agricultural Lead, RCUK - Global Challenges Research Fund Grant, £9,846,866, 2017-2021.

Water Stewardship Portal, Co-I, NERC Innovation Grant, £199,796, 2017-2020.

SOFTWARE AND
DSS DEVELOPMENT

Lead developer of AquaCrop-OS: an open-source crop model for managing water use in agriculture (www.aquacropos.com) developed with U.N. Food and Agriculture Organization.

- 4,000+ downloads by from users in 85+ countries since 2016.
- Training materials developed in Jupyter notebooks with support for on-the-fly integration with cloud computing services
- Capacity development workshops delivered to academics, practitioners and industry

SELECTED
INVITED TALKS

Monitoring irrigation from space: what role for management and policy?, University of Newcastle (April 2019) and Universitat Politècnica de Valencia (October 2019)

Lessons in sustainable agricultural groundwater management, ICID UK Irrigation and Water Forum (February 2019)

How much do we know about agricultural water use?, University of Bristol (July 2018)

Challenges and opportunities for managing agricultural groundwater use, ETH Zurich (April 2018)

Economics of agricultural groundwater management, International Workshop on Modeling Coupled Natural-Human Water Systems, University of Tübingen (May 2017)

Economic value of aquifers for irrigation, Rothamsted Research (March 2017)

Irrigation decision-making and the water-energy-food nexus in the High Plains, U.S. National Science Foundation (March 2016)

AWARDS AND
LEADERSHIP

AquaCrop Development Group, Member of core model development team (2019-)

International Advisory Board Member, Sino-Swiss Project on Rehabilitation and Management Strategy for Over-Pumped Aquifers under Changing Climate (2019-2020)

Top 10 paper - Foster et al. 2016, Agricultural Water Management (2018-2020)

Best Paper Award - Foster et al. 2016, Open Modelling Interface Association (2017)

Visiting Scholar Award, University of Illinois at Urbana-Champaign (2013)