

Michiel van Dijk

SENIOR RESEARCHER

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Profile

Michiel van Dijk is senior researcher at Wageningen Economic Research, part of Wageningen University and Research (WUR), and a guest research scholar at the International Institute for Applied Systems Analysis (IIASA). His research interest include the analysis of agricultural production, land use change, poverty and food security and how they relate to economic development, technological change and climate change. He favours using multi-disciplinary and integrated approaches, including global simulation models, micro-econometric analysis and GIS in collaboration with scientists from different fields, such as agronomists and hydrologists. His research has been published in a variety of journals, including Nature Food, Global Food Security, Agricultural Systems, World Development, Water and the Review of Income and Wealth. He has been a (lead) researcher in projects funded by CGIAR, DFID/FCDO, USAID, GEF, CGIAR, UNIDO, World Bank and the EU and has extensive working experience in Africa, Asia and Latin America. He holds a PhD in Technology and Development Studies from Eindhoven University of Technology and a MSc. in Quantitative Economics from Maastricht University.

Qualifications

Technology Management, Eindhoven University of Technology

PH.D.

the Netherlands

1999-2004

Economics, Universidad de Zaragoza

ERASMUS EXCHANGE PROGRAMME

Spain

1999

Economics, Maastricht University

M.SC. IN QUANTITATIVE ECONOMICS

the Netherlands

1993-1999

Economics, Maastricht University

PROPEDEUSE IN ECONOMETRICS

the Netherlands

1995

Employment history

Wageningen Economic Research

SENIOR RESEARCHER

the Netherlands

2020-

International Institute for Applied Systems Analysis (IIASA)

GUEST RESEARCH SCHOLAR

Austria

2020-

International Institute for Applied Systems Analysis (IIASA)

RESEARCH SCHOLAR (0.8 FTE)

Austria

2016-2020

Wageningen Economic Research

SENIOR RESEARCHER (0.2 FTE, OUT OF OFFICE)

the Netherlands

2016-2020

Wageningen Economic Research

SENIOR RESEARCHER

the Netherlands

2014-2015

Wageningen Economic Research

RESEARCHER

the Netherlands

2011-2013

Oxfam Novib

WEST AFRICA ADVOCACY OFFICER

the Netherlands

2008-2010

Centre for Research on Multinational Corporations (SOMO)

RESEARCHER

the Netherlands

2006-2008

Technology Management, Eindhoven University of Technology

ASSISTANT PROFESSOR

the Netherlands

2004-2005

Main research projects

Horizon Europe BrightSpace

WP LEAD

- WP7 Just indicators lead
- Development and application of microsimulation model
- PhD supervision

Wageningen Economic Research

2022-2027

CGIAR Sustainable Healthy Diets

WP LEAD

- WP4 trade-off analysis lead
- Development and application of microsimulation model
- Stakeholder engagement

Wageningen Economic Research

2022-2024

Climate Impact on Agricultural Labour Productivity (CIALP)

PRINCIPAL INVESTIGATOR

- Research design
- Construction of database
- Analysis of results

Wageningen Economic Research

2022

Green economy - improvements investment and indicator modules

RESEARCHER

- Development of global agricultural R&D database

Wageningen Economic Research

2022

Multiple scales

LEAD RESEARCHER

- Development of dynamic spatial microsimulation model
- Construction of database
- Analysis of results

Wageningen Economic Research

2021-2024

Rapid landscape analysis of existing food security information and analysis work

LEAD RESEARCHER

- Design of research approach
- Analysis of agricultural information systems

Wageningen Economic Research

2021

Downscaling labour statistics using machine learning

PRINCIPAL INVESTIGATOR

- Research design
- Construction of database
- Analysis of results

Wageningen Economic Research

2021

Food Security Metrics

LEAD RESEARCHER

- Developing an approach to assess impact of fertilizer companies on food security
- Estimation of yield response functions using crop simulation results
- Combining company information with agro-economic analysis

Wageningen Economic Research

2018-2019

Systematic review of global food security scenarios

PRINCIPAL INVESTIGATOR

- Design of research approach
- Systematic review of global food security studies
- Creation and analysis of global food security projections database

Wageningen Economic Research

2017-2018

Integrated Solutions for Water, Energy, and Land (IS-WEL)

International Institute for Applied Systems Analysis

RESEARCHER

2016-2019

- Analyzing large household surveys for Zambezi countries
- Creation of high-resolution crop distribution maps
- Improving land use representation in GLOBIOM

African maize yield gap analysis

Wageningen Economic Research

PRINCIPAL INVESTIGATOR

2015-2016

- Micro-econometric assessment of plot-level yield gaps
- Analyzing large household surveys for Mali, Nigeria and Tanzania

Validation of CGE models

Wageningen Economic Research

LEAD RESEARCHER

2013

- Developing an approach to validate multi-sector, multi-region CGE model results

Review of global food scenario studies

Wageningen Economic Research

PRINCIPAL INVESTIGATOR

2013

- Literature review of global food security scenario literature

Exploring the Future of Global Food and Nutrition Security

Wageningen Economic Research

WORK PACKAGE LEADER

2012-2017

- Managing work package on participatory scenario development
- Translation of stakeholder scenarios into model input
- Preparation of explorative scenario database

Land use optimisation in Viet Nam: from Global to Local

Wageningen Economic Research

PRINCIPAL INVESTIGATOR

2011-2012

- Management of international research team
- Developing a participatory scenario and modelling approach
- Linking of CGE model with spatial land use model

Skills

Data Science	R (advanced, e.g. package development)
Reproducible Research	Markdown/Rmarkdown, R shiny, R Flexdashboard, LaTeX, Git
Software	GEMPACK, GAMS, SPSS, STATA, E-views, C++, ArcGIS, QGIS, Microsoft Office
Languages	Dutch (native), English (fluent), German (good), Spanish (good), French (intermediate), Bahasa Indonesia (Working knowledge)

International working experience

Various

*Bangladesh, Ethiopia, Ghana, Malaysia, Vietnam,
Zambia, Zimbabwe*

RESEARCH PROJECTS

2011-

Various

Nigeria, Mali, Burkina Faso, Ghana and Senegal

COOPERATION WITH LOCAL NGOS

2008-2010

A.C. Portachuelo

Venezuela

ASSISTANT LOAN OFFICER (VOLUNTARY)

2005-2006

Science Policy Research Unit (SPRU), University of Sussex

United Kingdom

EU MARIE CURIE PH.D.

2003-2004

Statistics Finland

Finland

VISITING RESEARCHER

2003

Centre for Strategic and International Studies (CSIS)

Indonesia

VISITING RESEARCHER

2001

Grants

I have acquired (often in collaboration with colleagues) around €2.2 million in external research grants since 2011.

2022–2027	BrightSpace. Funding from <i>Horizon Europe</i> .	€500,000
2022–2026	LAMASUS. Funding from <i>Horizon Europe</i> .	€100,000
2022	Climate Impact on Agricultural Labour Productivity (CIALP). Funding from <i>Wageningen University & Research</i> .	€70,000
2022	EU protein raw materials seed money project. Funding from <i>Topsector Agri & Food</i> .	€39,930
2021–2024	Multiple scales. Funding from <i>Wageningen University & Research</i> .	€300,000
2021	Rapid landscape analysis of existing food security information and analysis work. Funding from <i>FCDO</i> .	€8,800
2021	Downscaling labour statistics using machine learning. Funding from <i>Wageningen University & Research</i> .	€40,000
2021	Research paper fund for paper on MAPSPAM. Funding from <i>Wageningen Economic Research</i> .	€10,000
2020–2022	Technical assistance on the implementation of the provisions on ILUC set out in the recast Renewable Energy Directive (N° ENER/C2/2018-462/LOT I/S12.821933). Funding from <i>EC DG Energy</i> .	€20,000
2020	Research paper fund for paper on food metrics. Funding from <i>Wageningen Economic Research</i> .	€10,000
2018–2019	Food Security metrics, designing innovative research methodology to assess the impact of agri-food companies on sustainable development. Funding from <i>UBS</i> .	€156,000
2018	Spatial Production Allocation Model (SPAM) for country analysis. Funding from <i>IFPRI</i> .	€32,800
2017–2018	Climate Smart Investment Plan Zambia. Funding from <i>World Bank</i> .	€49,200
2017–2018	Systematic review of global food security scenarios. Funding from <i>John Hopkins University</i> .	€41,000
2015–2017	Integrated assessment of the determinants of the maize yield gap in Sub-Saharan Africa (ES/LO12294/1). Funding from <i>DFID/ESRC</i> .	€458,780
2015–2016	African maize yield gap analysis. Funding from <i>CIMMYT</i> .	€123,000
2013	Review of global food scenario studies. Funding from <i>Oxfam Novib</i> .	€4,000
2012	Assessing the impact of climate change strategies on economic development, poverty and food security in Ghana (AID-OAA-A-13-00015). Funding from <i>USAID</i> .	€77,900
2011–2012	Land use optimisation in Viet Nam: from Global to Local (CDKN ALIF 2011-13). Funding from <i>CDKN/DFID</i> .	€135,600

Journal referee

Agricultural Systems, Agronomy, Agronomy for Sustainable Development, eClinicalMedicine, Environmental Research Letters, European Journal of Development Research, Geo-spatial Information Science, Food Security, Global Food Security, Journal of African Economies, Journal of Engineering and Technology Management, Journal of Evolutionary Economics, Journal Royal Statistical Society A, Lancet Planetary Health, Land, Mitigation and Adaptation Strategies for Global Change, Nature Food, Population and Development, Population and Development Review, Scientific Reports, Technology in Society.

PhD supervision

Thijs de Lange (co-supervisor)

NATIONAL AND GLOBAL ASSESSMENT OF TRADE-OFFS IN DIET TRANSFORMATION

Wageningen Economic Research

2023–

Ninke Feenstra (co-supervisor)

SPATIAL MODELLING OF HOUSEHOLD AND FARM INCOME DISTRIBUTION

Wageningen University & Research

2023–

Clark Halpern (co-supervisor)

ECONOMIC ASSESSMENT OF CIRCULAR FOOD SYSTEMS

Wageningen University & Research

2022–

Miriam Makungwe (IIASA PhD summer school supervisor)

ASSESSING LAND SUITABILITY FOR RAINFED PADDY RICE PRODUCTION IN ZAMBIA

University of Zambia

2019

Hao Zhao (IIASA PhD summer school supervisor)

IMPLICATIONS OF CHINA'S FUTURE FOOD DEMAND ON TRADE AND ENVIRONMENT

University of Chinese Academy of Sciences

2018

Peer reviewed publications

- Dijk, M. van, & Geurtsen, S. (2023). Mapping Irrigated Areas in China Using a Synergy Approach. *Water*, 15(9), 1666. <https://doi.org/10.3390/w15091666>
- Joseph, J., Dijk, M. van, & Krisztin, T. (2023). Do Large Estates Benefit Smallholder Neighbours? Evidence from Malawi. *The Journal of Development Studies*, 1–23. <https://doi.org/10.1080/00220388.2022.2147831>
- Dijk, M. van, Lange, T. de, Leeuwen, P. van, & Debie, P. (2022). Occupations on the map: Using a super learner algorithm to downscale labor statistics. *PLOS ONE*, 17(12), e0278120. <https://doi.org/10.1371/journal.pone.0278120>
- Makungwe, M., Chabala, L. M., Van Dijk, M., Chishala, B. H., & Lark, R. M. (2021). Assessing land suitability for rainfed paddy rice production in Zambia. *Geoderma Regional*, 27, e00438. <https://doi.org/10.1016/j.geodrs.2021.e00438>
- Zhao, H., Chang, J., Havlík, P., Dijk, M. van, Valin, H., Janssens, C., Ma, L., Bai, Z., Herrero, M., Smith, P., & Obersteiner, M. (2021). China's future food demand and its implications for trade and environment. *Nature Sustainability*, 4(12), 1042–1051. <https://doi.org/10.1038/s41893-021-00784-6>
- Frank, S., Havlík, P., Tabeau, A., Witzke, P., Boere, E., Bogonos, M., Deppermann, A., Dijk, M. van, Höglund-Isaksson, L., Janssens, C., Kesting, M., Meijl, H. van, Pérez-Domínguez, I., & Valin, H. (2021). How much multilateralism do we need? Effectiveness of unilateral agricultural mitigation efforts in the global context. *Environmental Research Letters*, 16(10), 104038. <https://doi.org/10.1088/1748-9326/ac2967>
- Dijk, M. van, Morley, T., Rau, M. L., & Saghai, Y. (2021). A meta-analysis of projected global food demand and population at risk of hunger for the period 2010–2050. *Nature Food*, 2(7), 494–501. <https://doi.org/10.1038/s43016-021-00322-9>
- Latka, C., Kuiper, M., Frank, S., Heckelee, T., Havlík, P., Witzke, H.-P., Leip, A., Cui, H. D., Kuijsten, A., Geleijnse, J. M., & Dijk, M. van. (2021). Paying the price for environmentally sustainable and healthy EU diets. *Global Food Security*, 28, 100437. <https://doi.org/10.1016/j.gfs.2020.100437>
- Dijk, M. van, Morley, T., Loon, M. van, Reidsma, P., Tesfaye, K., & Ittersum, M. K. van. (2020). Reducing the maize yield gap in Ethiopia: Decomposition and policy simulation. *Agricultural Systems*, 183, 102828. <https://doi.org/10.1016/j.agsy.2020.102828>
- Meijl, H. van, Shutes, L., Valin, H., Stehfest, E., Dijk, M. van, Kuiper, M., Tabeau, A., Zeist, W.-J. van, Hasegawa, T., & Havlik, P. (2020). Modelling alternative futures of global food security: Insights from FOODSECURE. *Global Food Security*, 25, 100358. <https://doi.org/10.1016/j.gfs.2020.100358>
- Dijk, M. van, Gramberger, M., Laborde, D., Mandryk, M., Shutes, L., Stehfest, E., Valin, H., & Faradsch, K. (2020). Stakeholder-designed scenarios for global food security assessments. *Global Food Security*, 24, 100352. <https://doi.org/10.1016/j.gfs.2020.100352>
- Johnson, N., Burek, P., Byers, E., Falchetta, G., Flörke, M., Fujimori, S., Havlik, P., Hejazi, M., Hunt, J., Krey, V., Langan, S., Nakicenovic, N., Palazzo, A., Popp, A., Riahi, K., Dijk, M. van, Vliet, M. T. H. van, Vuuren, D. P. van, Wada, Y., ... Parkinson, S. (2019). Integrated Solutions for the Water-Energy-Land Nexus: Are Global Models Rising to the Challenge? *Water*, 11(11), 2223. <https://doi.org/10.3390/w11112223>
- Wada, Y., Vinca, A., Parkinson, S., Willaarts, B. A., Magnuszewski, P., Mochizuki, J., Mayor, B., Wang, Y., Burek, P., Byers, E., Riahi, K., Krey, V., Langan, S., Dijk, M. van, Grey, D., Hillers, A., Novak, R., Mukherjee, A., Bhattacharya, A., ... Tong, J. (2019). Co-designing Indus Water-Energy-Land Futures. *One Earth*, 1(2), 185–194. <https://doi.org/10.1016/j.oneear.2019.10.006>
- Loon, M. P. van, Adjei-Nsiah, S., Descheemaeker, K., Akotsen-Mensah, C., Dijk, M. van, Morley, T., Ittersum, M. K. van, & Reidsma, P. (2019). Can yield variability be explained? Integrated assessment of maize yield gaps across smallholders in Ghana. *Field Crops Research*, 236, 132–144. <https://doi.org/10.1016/j.fcr.2019.03.022>
- Frank, S., Havlik, P., Stehfest, E., Meijl, H. van, Witzke, P., Pérez-Domínguez, I., Dijk, M. van, Doelman, J. C., Fellmann, T., Koopman, J. F. L., Tabeau, A., & Valin, H. (2019). Agricultural non-CO2 emission reduction potential in the context of the 1.5 C target. *Nature Climate Change*, 9(1), 66–72. <https://doi.org/10.1038/s41558-018-0358-8>
- Meijl, H. van, Havlik, P., Lotze-Campen, H., Stehfest, E., Witzke, P., Domínguez, I. P., Bodirsky, B. L., Dijk, M. van, Doelman, J., Fellmann, T., Humpenöder, F., Koopman, J. F. L., Müller, C., Popp, A., Tabeau, A., Valin, H., & Zeist, W.-J. van. (2018). Comparing impacts of climate change and mitigation on global agriculture by 2050. *Environmental Research Letters*, 13(6), 064021. <https://doi.org/10.1088/1748-9326/aabdc4>
- Smeets Kristkova, Z., Gardebroek, C., Dijk, M. van, & Meijl, H. van. (2017). The impact of R&D on factor-augmenting technical change – an empirical assessment at the sector level. *Economic Systems Research*, 29(3), 385–417. <https://doi.org/10.1080/09535314.2017.1316707>
- Dijk, M. van, Morley, T., Jongeneel, R., Ittersum, M. van, Reidsma, P., & Ruben, R. (2017). Disentangling agronomic and economic yield gaps: An integrated framework and application. *Agricultural Systems*, 154, 90–99. <https://doi.org/10.1016/j.agsy.2017.03.004>
- Smeets Kristkova, Z., Dijk, M. van, & Meijl, H. van. (2017). Impact of agricultural R&D investments on long-term food security– an ex-ante impact assessment. In A. Schmitz (Ed.), *Frontiers of economics and globalization*.
- Smeets Kristkova, Z., Dijk, M. van, & Meijl, H. van. (2016). Projections of long-term food security with R&D driven technical change—A CGE analysis. *NJAS - Wageningen Journal of Life Sciences*, 77(Supplement C), 39–51. <https://doi.org/10.1016/j.njas.2016.03.001>
- Dijk, M. van, & Meijerink, G. (2014). A review of global food security scenario and assessment studies: Results, gaps and research priorities. *Global Food Security*, 3(3-4), 227–238. <https://doi.org/10.1016/j.gfs.2014.09.004>

- Rutten, M., Dijk, M. van, Rooij, W. van, & Hilderink, H. (2014). Land use dynamics, climate change, and food security in Vietnam: A global-to-local modeling approach. *World Development*, 59, 29–46.
- Dijk, M. van, & Szirmai, A. (2011). The Micro-Dynamics Of Catch-Up In Indonesian Paper Manufacturing. *Review of Income and Wealth*, 57(1), 61–83.
- Weyzig, F., & Dijk, M. van. (2009). Incoherence between Tax and Development Policies: the case of the Netherlands. *Third World Quarterly*, 30(7), 1259–1277. <http://www.tandfonline.com/doi/abs/10.1080/01436590903134916>
- Dijk, M. van, & Bell, M. (2007). Rapid growth with limited learning: Industrial policy and indonesia's pulp and paper industry. *Oxford Development Studies*, 35(2), 149–169. <https://doi.org/10.1080/13600810701322017>
- Dijk, M. van, & Szirmai, A. (2006). Industrial Policy and Technology Diffusion: Evidence from Paper Making Machinery in Indonesia. *World Development*, 34(12), 2137–2152.
- Van Dijk, M., & Szirmai, A. (2006). Technical efficiency and embodied technical change in the Indonesian pulp and paper industry. *Journal of International Development*, 18(2), 163–178.
- Dijk, M. van. (2003). South African manufacturing performance in international perspective 1970-1999. *South African Journal of Economics*, 71(1), 119–142. <https://doi.org/10.1111/j.1813-6982.2003.tb00074.x>

Book chapters

- Dijk, M. van, Saghai, Y., Morley, T., & Rau, M. L. (2020). Global food demand projections: A review. In A. Goldberg (Ed.), *Choose food: An ethical basis for food production*. John Hopkins University Press.
- Dijk, M. van, Kroezen, J., & Slob, B. (2018). From Pilsner Desert to Specialty Beer Oasis: The Rise of Microbrewing in the Netherlands. In J. Swinnen & C. Garavaglia (Eds.), *The craft beer revolution: A global economic perspective*. Palgrave Macmillan. <https://www.palgrave.com/gp/book/9783319582344>
- See, L., Fritz, S., Moorthy, I., Danylo, O., Dijk, M. van, & Ryan, B. (2018). Using Remote Sensing and Geospatial Information for Sustainable Development. In R. M. Desai, H. Kato, H. Kharas, & J. W. McArthur (Eds.), *From summits to solutions: Innovations in implementing the sustainable development goals* (pp. 172–198). Brookings Institution Press.
- Dijk, M. van, Moors, E. J., & Singh, T. (2014). Engaging stakeholders in developing food security scenarios. In T. Achterbosch (Ed.), *The food puzzle: Pathways to securing food for all* (pp. 40–42). Wageningen University.

Databases and code

- Dijk, M. van. (2022). *Occupations on the map: Using a super learner algorithm to downscale labor statistics, data*. <https://doi.org/10.5281/zenodo.7413693>
- Dijk, M. van, & Guo, Z. (2022). *mapspamc_db: a database with global spatial datasets to support the implementation of the mapspamc R package*. <https://doi.org/https://doi.org/10.5281/zenodo.7031917>
- Dijk, M. van, Morley, T., Rau, M. L., & Saghai, Y. (2021). *A meta-analysis of projected global food demand and population at risk of hunger for the period 2010–2050, data and scripts*. <https://doi.org/10.5281/zenodo.5076072>
- Dijk, M. van, Gramberger, M., Laborde, D., Mandryk, M., Shutes, L., Stehfest, E., Valin, H., & Zellmer, K. (2019). *FOODSECURE Scenario Driver Database*. <https://doi.org/10.17026/dans-zeh-fd4m>