

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 and the Review of Income and Wealth. He has been a (lead) researcher in projects funded by CIMMYT, DFID/FCDO, US-AID, GEF, OneCGIAR, 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

Sustainable Healthy Diets Through Food Systems Transformation (SHiFT)

LEAD RESEARCHER

- WUR work package leader
- Development and application of microsimulation model
- Stakeholder engagement

Wageningen Economic Research

2022-2024

Mitigate+

RESEARCHER

- Application of microsimulation model

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

EU protein raw materials seed money project

LEAD RESEARCHER

- Project design
- Company interviews
- Synthesis 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

People on the Map

LEAD RESEARCHER

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

Wageningen Economic Research

2021-2022

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)

RESEARCHER

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

International Institute for Applied Systems Analysis

2016-2019

African maize yield gap analysis

PRINCIPAL INVESTIGATOR

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

Wageningen Economic Research

2015-2016

Validation of CGE models

LEAD RESEARCHER

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

Wageningen Economic Research

2013

Review of global food scenario studies

PRINCIPAL INVESTIGATOR

- Literature review of global food security scenario literature

Wageningen Economic Research

2013

Exploring the Future of Global Food and Nutrition Security

WORK PACKAGE LEADER

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

Wageningen Economic Research

2012-2017

Land use optimisation in Viet Nam: from Global to Local

PRINCIPAL INVESTIGATOR

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

Wageningen Economic Research

2011-2012

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

RESEARCH PROJECTS

Ethiopia, Ghana, Malaysia, Vietnam, Zambia, Zimbabwe

2011-

Various

COOPERATION WITH LOCAL NGOS

Nigeria, Mali, Burkina Faso, Ghana and Senegal

2008-2010

A.C. Portachuelo

ASSISTANT LOAN OFFICER (VOLUNTARY)

Venezuela

2005-2006

Science Policy Research Unit (SPRU), University of Sussex

EU MARIE CURIE PH.D.

United Kingdom

2003-2004

Statistics Finland

VISITING RESEARCHER

Finland

2003

Centre for Strategic and International Studies (CSIS)

VISITING RESEARCHER

Indonesia

2001

Journal referee

Agricultural Systems, Agronomy, Agronomy for Sustainable Development, eClinicalMedicine, Environmental Research Letters, European Journal of Development Research, Geo-spatial Information Science, Global Food Security, Journal of African Economies, Journal of Engineering and Technology Management, Journal of Evolutionary Economics, Land, Nature Food, Population and Development Review, Scientific Reports, Technology in Society.

Grants

I have acquired (often in collaboration with colleagues) around €2.0 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
2021–2022	People on the Map. Funding from <i>Wageningen University & Research</i> .	€168,000
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

Peer reviewed publications

- 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., Heckeleei, 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/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, 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>