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, 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 — *the Netherlands*
Ph.D. — *1999-2004*

Economics, Universidad de Zaragoza — *Spain*
Erasmus exchange programme — *1999*

Economics, Maastricht University — *the Netherlands*
M.Sc. in Quantitative Economics — *1993-1999*

Economics, Maastricht University — *the Netherlands*
Propedeuse in Econometrics — *1995*

Employment history

Wageningen Economic Research — *the Netherlands*
Senior researcher — *2020-*

International Institute for Applied Systems Analysis (IIASA) — *Austria*
Guest research scholar — *2020-*

International Institute for Applied Systems Analysis (IIASA) — *Austria*
Research scholar (0.8 fte) — *2016-2020*

Wageningen Economic Research — *the Netherlands*
Senior researcher (0.2 fte, out of office) — *2016-2020*

Wageningen Economic Research — *the Netherlands*
Senior researcher — *2014-2015*

Wageningen Economic Research — *the Netherlands*
Researcher — *2011-2013*

Oxfam Novib — *the Netherlands*
West Africa Advocacy Officer — *2008-2010*

Centre for Research on Multinational Corporations (SOMO) — *the Netherlands*
Researcher — *2006-2008*

Technology Management, Eindhoven University of Technology — *the Netherlands*
Assistant professor — *2004-2005*

Main research projects

Sustainable Healthy Diets Through Food Systems Transformation (SHiFT)

Wageningen Economic Research

Lead researcher

2022-2024

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

Mitigate+

Wageningen Economic Research

Researcher

2022-2024

- Application of microsimulation model

Climate Impact on Agricultural Labour Productivity (CIALP)

Wageningen Economic Research

Principal Investigator

2022

- Research design
- Construction of database
- Analysis of results

EU protein raw materials seed money project

Wageningen Economic Research

Lead researcher

2022

- Project design
- Company interviews
- Synthesis of results

Green economy - improvements investment and indicator modules

Wageningen Economic Research

Researcher

2022

- Development of global agricultural R&D database

People on the Map

Wageningen Economic Research

Lead researcher

2021-2022

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

Rapid landscape analysis of existing food security information and analysis work

Wageningen Economic Research

Lead researcher

2021

- Design of research approach
- Analysis of agricultural information systems

Downscaling labour statistics using machine learning

Wageningen Economic Research

Principal Investigator

2021

- Research design
- Construction of database
- Analysis of results

Food Security Metrics

Wageningen Economic Research

Lead researcher

2018-2019

- 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

Systematic review of global food security scenarios

Wageningen Economic Research

Principal Investigator

2017-2018

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

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
- Prepartion 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 *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*

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, Lancet Planetary Health, Land, Nature Food, Population and Development, 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 *Horizon Europe*.	€500,000
2022–2026	LAMASUS. Funding from *Horizon Europe*.	€100,000
2022	Climate Impact on Agricultural Labour Productivity (CIALP). Funding from *Wageningen University & Research*.	€70,000
2022	EU protein raw materials seed money project. Funding from *Topsector Agri & Food*.	€39,930
2021–2022	People on the Map. Funding from *Wageningen University & Research*.	€168,000
2021	Rapid landscape analysis of existing food security information and analysis work. Funding from *FCDO*.	€8,800
2021	Downscaling labour statistics using machine learning. Funding from *Wageningen University & Research*.	€40,000
2021	Research paper fund for paper on MAPSPAM. Funding from *Wageningen Economic Research*.	€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 l/S12.821933). Funding from *EC DG Energy*.	€20,000
2020	Research paper fund for paper on food metrics. Funding from *Wageningen Economic Research*.	€10,000
2018–2019	Food Security metrics, designing innovative research methodology to assess the impact of agri-food companies on sustainable development. Funding from *UBS*.	€156,000
2018	Spatial Production Allocation Model (SPAM) for country analysis. Funding from *IFPRI*.	€32,800
2017–2018	Climate Smart Investment Plan Zambia. Funding from *World Bank*.	€49,200
2017–2018	Systematic review of global food security scenarios. Funding from *John Hopkins University*.	€41,000
2015–2017	Integrated assessment of the determinants of the maize yield gap in Sub-Saharan Africa (ES/LO12294/1). Funding from *DFID/ESRC*.	€458,780
2015–2016	African maize yield gap analysis. Funding from *CIMMYT*.	€123,000
2013	Review of global food scenario studies. Funding from *Oxfam Novib*.	€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 *USAID*.	€77,900
2011–2012	Land use optimisation in Viet Nam: from Global to Local (CDKN ALIF 2011-13). Funding from *CDKN/DFID*.	€135,600

Peer reviewed publications

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., Heckelei, 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. (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, 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