

Dr.ir. Sibel Eker



sibeleker@gmail.com



[sibeleker.github.io](https://github.com/sibeleker)



[Google Scholar](https://scholar.google.com/citations?user=sibeleker)



[ORCID](https://orcid.org/sibeleker)



[@sibel_eker](https://twitter.com/sibel_eker)



[LinkedIn](https://www.linkedin.com/in/sibeleker)

Experienced scientific researcher in interdisciplinary systems analysis for the management of environmental socioeconomic systems, synthesizing knowledge and applications of model-based analytical methods

EXPERIENCE

- Aug 2021 – Present** **Assistant Professor**
Nijmegen School of Management, Radboud University, Netherlands
Assistant professor of system dynamics
- Jul 2019 – Present** **Research Scholar**
International Institute for Applied Systems Analysis (IIASA), Austria
Empirical and model-based research to support long-term planning on sustainable lifestyles and negative emission technologies; training stakeholders and researchers on participatory modelling for climate resilience in a Climate-KIC project
- Aug 2020 – Jul 2021** **Senior Researcher**
Climate Interactive, Washington DC, USA
Led research and model development on economic impacts of climate change and land use change and terrestrial carbon cycle for the extension of global system dynamics models of climate economy and environment (integrated assessment models). Public engagement using interactive online simulators.
- Jul 2017 – Jun 2019** **Postdoctoral Research Fellow**
International Institute for Applied Systems Analysis (IIASA), Austria
Text-mining and participatory research on validation of resource management models; extension of FeliX integrated assessment model to explore lifestyle change and land use scenarios; systems mapping of national wellbeing policies
- Jan 2017 – July 2017** **Postdoctoral Researcher**
Faculty of Technology, Policy and Management, Delft University of Technology, Netherlands
Developing a decision support tool for the World Bank using network modelling methods for the Bangladesh's multi-modal transport network; software and scenario development, methodological development for decision-making under deep uncertainty, geospatial data analysis
- Feb 2016 – Nov 2016** **Research Associate**
UCL Institute for Environmental Design and Engineering, University College London, UK
Participatory system dynamics modelling for integrated decision-making about housing, energy and well-being; stakeholder engagement; facilitation of a systems mapping workshop at UK DBEIS

EDUCATION

- Sep 2011-Mar 2016** **PhD in Policy Analysis**
Faculty of Technology, Policy and Management, Delft University of Technology, Netherlands
- Jun – Jul 2013** **Visiting student**
Engineering Systems Division, Massachusetts Institute of Technology (MIT), USA
- 2009 – 2011** **MSc in Systems Engineering, Policy Analysis and Management**
Faculty of Technology, Policy and Management, Delft University of Technology, Netherlands
- 2004 – 2009** **BSc in Industrial Engineering**
Faculty of Engineering, Bogazici University, Turkey
- Jan – July 2008** **Exchange student**
Industrial Eng. and Innovation Sciences (formerly Operations Management), Eindhoven University of Technology, Netherlands

GRANTS AND FELLOWSHIPS

2022	Work package leader in <i>WorldTrans</i> funded by HORIZON-CL5-2022-D1-02-03: Improvement of Integrated Assessment Models in support of climate policies (~550K)
2017	IIASA Postdoctoral Fellowship for the research proposal titled “Validation of uncertainty-oriented systems models” (~85K EUR)
2016	Policy Engagement Grant by UCL Public Policy (10K GBP)
2016	Career Development Fund by UCL Bartlett School (1K GBP)
2011	Travel grant by TU Delft (~1K EUR)

SCIENTIFIC SERVICE

2022	Special issue co-editor for the journal <i>Frontiers in Sustainability</i>
2022 - 2027	Selected Member of Global Young Academy
2021	Scientific Advisory Committee reviewer, Nijmegen School of Management/ Netherlands
2021	Expert reviewer for the fellowships of the H2020 SEAS project
2021	Outstanding reviewer award by <i>Environmental Research Letters</i> (IOP Publishing)
2021	Topic editor of <i>Sustainability</i> (MDPI)
2021 – Present	Contributor to IMAGE Sustainable Lifestyles project co-coordinated by Utrecht University and One Earth
2020 – Present	Associate Editor of <i>Humanities and Social Sciences Communications</i> by Springer Nature
2020	Reviewer for ERC Consolidator Grant Panel SSH2
2017 - 2018	Contributor to and reviewer of a global foresight study by Institute for Global Environmental Strategies (IGES) and UN Environment, titled “Society and Lifestyles in 2050: Insights from a Global Survey of Experts”
2016 - Present	Reviewer for the journals <i>Nature Climate Change</i> , <i>Nature Sustainability</i> , <i>Nature Food</i> , <i>One Earth</i> , <i>Interface Focus</i> (Royal Society), <i>Journal of Cleaner Production</i> , <i>Palgrave Communications</i> , <i>Mitigation and Adaptation Strategies for Global Change</i> , <i>Environmental Research Letters</i> , <i>Global Environmental Change</i> , <i>Appetite</i> , <i>Energy Policy</i> , <i>Science of the Total Environment</i> , <i>Sustainability</i> , <i>Environmental Innovation and Societal Transitions</i> , <i>Environmental Modelling and Software</i> , <i>Energy</i> , <i>Applied Sciences</i> , <i>International Journal of Environmental Research and Public Health</i>
2014 - Present	Reviewer for the annual International System Dynamics Conference

ORGANIZATIONAL ROLES

2022 - present	Board Member of Halkes Women in Science network, Radboud University
2022	Session chair at Scenarios Forum 2022
2022	Local organizer of the global student competition <i>Map the System</i> at Radboud University
2016-2021	Organizer of seven <i>stakeholder and expert workshops</i> at UCL, EIT Climate KIC and IIASA (12-30 participants)/ UK, France and Austria
2021	Mentor within the IIASA Women in Science Club Mentorship Program
2020	Organizing committee member of the <i>Annual Meeting of the Society for Decision Making under Deep Uncertainty</i> (~200 participants)
2020	Member of the IIASA Staff Social and Cultural Association
2019	Organizing the IIASA lecture by Prof. Katharine Hayhoe, <i>Barriers to Public Acceptance of Climate Science, Impacts, and Solutions</i> (~60 participants)

2019	Group facilitator at the International Symposium on Global Sustainable Development Goals in a Mediatized World, organized by Austrian Academy of Sciences
2018 - 2020	Sustainability representative at the IIASA Staff Association Committee
2014	Organization of the <i>International System Dynamics Summer School</i>
2014 - 2015	<i>Vice President of the Student Chapter of the System Dynamics Society</i> , organization chair of the 15 th (2014) and 16 th (2015) PhD Colloquium
2013 - Present	Member of the <i>System Dynamics Society</i> , <i>Society for Decision Making under Deep Uncertainty</i>
2012 - 2015	Organizer of the Policy Analysis Lunch Lectures at Delft University of Technology

KEY COMPETENCES

Key expertise	System dynamics modelling, participatory modelling and stakeholder engagement, scenario planning, decision making under deep uncertainty applied in various climate change mitigation and sustainability contexts
Languages	English (fluent), Turkish (native), Dutch (conversational), German (conversational)
Analytical skills	<p>Systems thinking, systems analysis, problem structuring, causal mapping</p> <p><i>Mathematical modelling</i>: System dynamics, network modelling, agent-based modelling, (multi-objective) optimization, multi-criteria decision analysis,</p> <p><i>Programming</i>: Python (various libraries for data analysis, visualization, modelling and software development); used R, Java and C/C++ in the past</p> <p><i>Data analysis</i>: quantitative, text-mining and geospatial data analysis, qualitative data analysis (e.g. text analysis, coding using NVivo)</p>

HONORS AND AWARDS

2009 - 2011	Scholarship by the Faculty of Technology, Policy and Management, TU Delft (~40K EUR)
2004 - 2009	Scholarship by Bogazici University
2004	Ranked 141 st in University Entrance Exam in Turkey (among ~1,5 mil. candidates)
2004	2 nd place in the Contest of Research Projects Among High School Students (Chemistry) organized by The Scientific and Technological Research Council of Turkey

TEACHING EXPERIENCE

2021 -	Teaching MSc and BSc courses at <i>Radboud University</i> on systems thinking, system dynamics modelling and research methods; supervising masters students
2020 -2021	Co-supervising PhD student Gloria Crabolu from University of Surrey
2018 -	Co-supervising PhD student Phyllis Kwenda from University of Kwazulu-Natal
2019	Training professionals and academics on participatory systems modelling, EIT Climate-KIC
2019	<i>Institute for Management Research; Radboud University</i> , Guest lecturer on agent-based modelling
2018	<i>Institute for Social Ecology; University of Natural Resources and Life Sciences (BOKU)</i> Guest lecturer on systems modelling to investigate sustainable consumption dynamics
2010-2017	<i>Faculty of Technology, Policy and Management; TU Delft</i> Teaching MSc and BSc courses, and a MOOC for professionals, on model-based decision making and deep uncertainty, text-mining, systems engineering, system dynamics modelling and mathematical modelling (linear optimization, multi-criteria decision analysis, network modelling)
2016	<i>University College London</i> , Evaluation of MSc theses

PUBLICATIONS

Journal articles

- Moallemi E, **Eker S**, Gao L, Hadjikakou M, Kwakkel J, Reed P, Obersteiner M, Bryan B. (in press) Global pathways to the post-2030 sustainable development. *One Earth*.
- Moallemi E.A., Gao L., **Eker S** & Bryan B.A. (2022). [Diversifying models for analysing global change scenarios and sustainability pathways](#). *Global Sustainability*, 5 (e7).
- Moallemi EA, Bertone E, **Eker S**, Gao L, Szetey K, Taylor N, & Bryan BA. (2021). [A review of systems modelling for local sustainability](#). *Environmental Research Letters* 16, 11.
- Goll D, Ciais P, Amann T, Buermann W, Chang J, **Eker S**, Hartmann J, Li W, Oliveira Garcia W, Streffer J, Tanaka K, Vicca S. (2021) [Potential CO2 removal from enhanced weathering by ecosystem responses to powdered rock](#). *Nature Geoscience* 14, 545–549.
- Eker S**, Garcia D, van Ruijven B, Valin H. (2021). [Using social media audience data to analyse the drivers of low-carbon diets](#). *Environmental Research Letters* 16, 074001.
- Eker S** (2021). [Drivers of photovoltaic uncertainty](#). *Nature Climate Change* 11, 184–185.
- Kwenda P, Lagerwall G, **Eker S**, van Ruijven B. (2021) [A mini-review on household solid waste management systems in low-income developing countries: A case study of urban Harare City, Zimbabwe](#). *Waste Management & Research*, 40 (2), 139-153.
- Eker S**. (2020). [Validity and usefulness of COVID-19 models](#). *Humanities and Social Sciences Communications* 7, 54.
- Eker S**, Ilmola-Sheppard, L. (2020). [Systems Thinking to Understand National Well-Being from a Human Capital Perspective](#). *Sustainability* 12 (5): 1931.
- Eker S**, Reese G, Obersteiner M (2019). [Modelling the drivers of a widespread shift to sustainable diets](#). *Nature Sustainability* 2: 725-735.
- Eker S**, Rovenskaya E, Langan S, & Obersteiner M (2019). [Model validation: A bibliometric analysis of the literature](#). *Environmental Modelling & Software* 117: 43-54.
- Eker S**, Rovenskaya E, Obersteiner M, Langan S (2018). [Practice and perspectives in the validation of resource management models](#). *Nature Communications*. 9 (1): 5359.
- Eker S**, Kwakkel J (2018). [Including robustness considerations in the search phase of Many-Objective Robust Decision Making](#). *Environmental Modelling and Software* 105: 201-216.
- Eker S**, Zimmermann N, Carnohan S, Davies M (2017). [Participatory system dynamics modelling for housing, energy and wellbeing interactions](#). *Building Research & Information* 46 (7):738-754.
- Eker S**, van Daalen E, Thissen W (2017). [Incorporating stakeholder perspectives into model-based scenarios: Exploring the futures of the Dutch gas sector](#). *Futures* 93: 27-43.
- Eker S**, Zimmermann N (2016). [Using Textual Data in System Dynamics Model Conceptualization](#). *Systems* 4 (3):28.
- Eker S**, van Daalen E (2015). [A model-based analysis of biomethane production in the Netherlands and the effectiveness of the subsidization policy under uncertainty](#). *Energy Policy* 82:178-196.
- Eker S**, Slinger J, van Daalen E, Yücel G (2014). [Sensitivity analysis of graphical functions](#). *System Dynamics Review* 30 (3):186-205.
- Eker S**, van Daalen E (2013). [Investigating the effects of uncertainties in the upstream gas sector](#). *International Journal of System of Systems Engineering* 4 (2):99-139.

Working papers

- Eker S**, Wilson C. [System Dynamics of Social Tipping Processes](#). IIASA Report, March 2022.
- Kwenda P, Lagerwall G, **Eker S**, van Ruijven B (under review). Identifying the Leverage Points in the Household Solid Waste Management System for Harare, Zimbabwe: Using Network Analysis Techniques.
- Liu Q, Gao L, Guo Z, **Eker S**, Moallemi E, Yang J, Obersteiner M, Bryan B (under review). Robust strategies to end global poverty and reduce environmental pressures.
- Liu Q, Guo Z, Gao L, Dong Y, Moallemi E, **Eker S**, Yang J, Li X, Obersteiner M, Bryan B (under review). A review of model-based scenario analysis of poverty for informing sustainability.
- Moallemi E, Hosseini SE, **Eker S**, Gao L, Bertone E, Szetey K, Bryan B. (under review) Acting on Sustainable Development Goal (SDG) synergies and trade-offs requires policy-focused systems tools.
- Crabolu G, **Eker S**, Font X (under review). *A Complexity-Informed Methodology to Study the Use of Sustainable Tourism Policy Instruments*.

Book Chapters

- Kwakkel J, **Eker S**, Pruyt E (2016). "How robust is a robust policy? Comparing alternative robustness metrics for robust decision-making." In *Robustness Analysis in Decision Aiding, Optimization, and Analytics*, edited by Michael Doumpos, Constantin Zopounidis and Evangelos Grigoroudis. Springer.

Peer-reviewed conference papers

- Eker S**, Wilson C. (2022). "Social tipping mechanisms for rapid decarbonization". The 40th International Conference of the System Dynamics Society. July 2022, Frankfurt, Germany.
- Eker S** (2021). "Societal dynamics of low-carbon lifestyles". The 39th International Conference of the System Dynamics Society, Chicago, US.

- Eker S, Reese G, Obersteiner M (2018). "Meat or vegetarian? - A model-based analysis of the global diet change dynamics." The 36th International Conference of the System Dynamics Society, Reykjavik, Iceland.
- Eker S, Zimmermann N (2016). "Understanding the Mechanisms behind Fragmentation in the Housing Construction and Retrofit." The 34th International Conference of the System Dynamics Society, Delft, Netherlands.
- Eker S, Leston D, Djong J (2014). "Modeling the Dynamics of Canine Rabies and Policy Analysis under Uncertainty." The 32nd International Conference of the System Dynamics Society, Delft, Netherlands.
- Eker S, van Daalen E (2014). "Analyzing the Dynamics of the Bio-methane Production Chain and the Effectiveness of Subsidization Schemes under Uncertainty." The 32nd International Conference of the System Dynamics Society, Delft, Netherlands.
- Eker S, van Daalen E (2013). "A Supply Demand Model for Exploration of the Future of the Dutch Gas Sector." The 31st International Conference of the System Dynamics Society, Cambridge, MA USA.
- Eker S, van Daalen E (2012). "Investigating the Effects of Uncertainties Associated with the Unconventional Gas Development in the Netherlands." Third International Engineering Systems Symposium, CESUN 2012, Delft, The Netherlands, 18-20 June 2012.
- Eker S, van Daalen E (2012). "Uncertainties in the development of unconventional gas production in Europe." 9th International Conference on the European Energy Market (EEM), Florence, Italy.
- Eker S, van Daalen E (2012). "Uncertainties in the Development of Unconventional Gas in the Netherlands" The 30th International Conference of the System Dynamics Society, St. Gallen, Switzerland.
- Eker S, Slinger J, Yucel G (2011). "Investigating an Automated Method for the Sensitivity Analysis of Functions " The 29th International Conference of the System Dynamics Society, Washington, D. C.

International conference talks (excl. the papers listed above)

- Eker S (2022-invited) Using simple integrated assessment models to explore human and earth system feedbacks. Scenarios Forum 2022, 20-22 June 2022.
- Eker S, Mastrucci A, Pachauri S, van Ruijven B (2021). Trends and drivers of air-conditioning adoption: Confidence-building in social media data. In: Annual meeting of the Integrated Assessment Modelling Consortium, 29 November-3 December 2021.
- Eker S, Siegel L, Jones C, Sterman J, Kapmeier F, et al. (2021). Public Outreach and Interactive Learning with En-ROADS Global Energy and Climate Simulator. In: European Geosciences Union General Assembly, 19–30 April 2021.
- Eker S (2020). Can we use online social media data for modelling lifestyle change?. In: Annual meeting of the Integrated Assessment Modelling Consortium, 1-4 December 2020.
- Moallemi E, **Eker S**, Gao L, Bryan B. (2020) Global pathways to the post-2030 sustainable development. In: Annual meeting of the Society for Decision-Making under Deep Uncertainty, 10-12 November 2020.
- Eker S (2020). Using DMDU methods to explore the lifestyle change uncertainty in integrated assessment models. In: Annual meeting of the Society for Decision-Making under Deep Uncertainty, 10-12 November 2020.
- Eker S, Reese G, & Obersteiner M (2019). Modelling the drivers of a widespread shift to sustainable diets. In: World Resources Forum, 23-24 October 2019, Geneva, Switzerland.
- Eker S, Reese G, & Obersteiner M (2019). A widespread shift to sustainable diets requires rapid risk perception. In: Global Sustainable Development Goals in a Mediatized World, 4-5 April 2019, Vienna, Austria.
- Eker S, Rovenskaya E, Obersteiner M, & Langan S (2019). Validation of models used for scenario generation. In: Scenarios Forum, March 2019, Denver, Colorado.
- Eker S, Reese G, Gao L, Obersteiner M (2018). Investigating global diet change dynamics by linking models of human behavior to IAMs. The 11th Annual Meeting of the Integrated Assessment Modeling Consortium, 13-15 November 2018, Seville, Spain.
- Eker S, Rovenskaya E, Obersteiner M, Langan S (2018). A bibliometric analysis of the model validation literature. The 11th Annual Meeting of the Integrated Assessment Modeling Consortium, 13-15 November 2018, Seville, Spain.
- Eker S, Rovenskaya E, Obersteiner M, Langan S (2018). Validation of environmental models: Practice and perspectives. EGU General Assembly, April 2018, Vienna, Austria.
- Eker S, Rovenskaya E, Obersteiner M, Langan S (2017). Validation of uncertainty-oriented environmental models: A review of the existing approaches. Fifth Annual Workshop on Decision Making Under Deep Uncertainty, November 2017, Oxford, UK.
- Eker S, van Daalen E (2015). A Multi-Method Approach to Evaluate the Robustness of Policies in the Dutch Gas Sector. Third Annual Workshop on Decision Making Under Deep Uncertainty, November 2015, Delft, Netherlands.
- Eker S (2014). A systems modelling and exploratory uncertainty analysis of the future of the Dutch gas sector. Energy Systems Conference, June 2014, London: Elsevier.
- Eker S, Slinger J (2014). Model Analysis Tools and Methods: Multivariate Sensitivity Analysis. Workshop organized at the 32nd International Conference of the System Dynamics Society, July 2014, Delft, Netherlands.
- Eker S (2013). Dealing with uncertainties in the Dutch gas sector. Technology, Management, and Policy Consortium Meeting, June 2013, Cambridge, MA: Massachusetts Institute of Technology.

Invited talks and workshops

- 2022 – Acting on Sustainable Development Goal (SDG) synergies and trade-offs requires policy-focused systems tools. Keynote speech at the 5th International Research Workshop on Archetypes in Sustainability Research, University of Greifswald, Germany.
- 2022 – Social dynamics of low-carbon lifestyles. [Radboud Interfaculty Complexity Hub](#).
- 2021 - Social dynamics of demand-side mitigation. [Integrated Decision Making Hotspot](#) of Nijmegen School of Management.
- 2021 - Interactive simulation environments and role playing games to explore climate solutions. Koc University, Turkey.
- 2021 - Career Development Panel. Webinar series of the Society for [Decision-making under Deep Uncertainty](#).
- 2021 - Global Modeling for Climate Change Research and Action. [System Dynamics Society Webinar](#)

2021 - Drivers of solar photovoltaic uncertainty. June 2021, [NAVIGATE webinar](#) organized by Euro-Mediterranean Center on Climate Change (CMCC).

2021 - EU Agricultural Outlook Spring workshop. June 2021, *European Commission DG Agriculture and Rural Development*.

2021 - Using online social media data to estimate energy demand. May 2021, ENERGYA Workshop, *Euro-Mediterranean Center on Climate Change (CMCC)*, Italy.

2021 - Societal Dynamics in Global Change Modeling. February 2021, *Copernicus Institute of Sustainability, Utrecht University*, Netherlands.

2019 - Introduction to agent-based modelling for MSc Business Administration. October 2019, *Institute for Management Research, Radboud University*, Netherlands.

2019 - Network modelling for resilience. February 2019, *Faculty of Technology, Policy and Management, Delft University of Technology*, Netherlands.

2019 - Modelling human behaviour behind global diet shifts. May 2019, *Complexity Science Hub, Vienna*, Austria.

2018 - Systems modelling to investigate sustainable consumption dynamics. Lecture series on "Delivering on the Sustainable Development Goals: Systems analytical perspectives on strategies and trade-offs", October 2018, *Institute for Social Ecology*, Vienna, Austria.

2018 - System dynamics modelling for sustainable production and consumption. IIASA-University of Tokyo Workshop on "How can advanced mathematical modeling tools be useful to address sustainability challenges?", March 2018, Laxenburg, Austria.

2016 - Dealing with Uncertainties in the Dutch Gas Sector: An exploratory modeling and analysis approach. Seminar at Industrial Engineering Department, *Bogazici University*, January 2016, Istanbul Turkey.

Theses

Eker S (2016). Dealing with Uncertainties in the Dutch Gas Sector: An exploratory modeling and analysis approach. PhD Thesis, Delft University of Technology.

Eker S (2011). A Sensitivity Analysis Method for System Dynamics Table Functions. MSc Thesis, Delft University of Technology.

Blog posts & outreach

2021 - En-ROADS Climate Action Simulation role-play game (in Turkish). <https://sosyaliklim.org/>.

2021 - [Social Cost of Carbon in En-ROADS](#). Climate Interactive blog post.

2021 - [En-ROADS Climate Workshop \(in Turkish\)](#) Ashoka Turkey Social Entrepreneurship Day (with Pinar Oncel, Tuna Ozcuahdar, and others).

2021 - [Exploring the Economic Impacts of Climate Change in En-ROADS](#). Webinar by Climate Interactive (with Andrew Jones).

2021 - [Testing the Economic Impact of Climate Change in En-ROADS](#). Climate Interactive blog post.

2021 - [En-ROADS Climate Workshop](#). Webinar by Climate Interactive (with Adem Delibas).

2020 - [DMDU and Critical Infrastructure Systems](#). Decision Making under Deep Uncertainty Society blog post.

2020 - [What did we learn from COVID-19 models?](#). IIASA Nexus Blog.

2019 - [Behind the paper: Modeling the drivers of a widespread shift to sustainable diets](#). Nature Sustainability Community blog post.

2019 - [This is not reality](#). IIASA Nexus Blog.

2018 - [Systems thinking to better understand the scientific process](#). Project Open Up Hub blog post.