



## Curriculum Vitae

### Personal information

Surname, First name **TRAMBEREND, Sylvia** (Birth name: PRIELER)  
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Nationality, Birth date Austria, 1.1.1967

### Work experience

Employer International Institute for Applied Systems Analysis (IIASA)  
Schlossplatz 1, A-2361 Laxenburg, Austria

Position, Dates Research Scholar, IIASA 1994 to present  
Water Program, 2014 to present; Ecosystem Services and Management  
Program, 2012 to 2013; Land Use Change and Agriculture Program, 1997  
to 2011; Regional Material Balance Approaches to Long-Term  
Environmental Policy Planning Program, 1994 to 1996

Main activities and responsibilities Dr. Sylvia Tramberend is a land use systems and GIS expert focused in the food and water thematic area. In IIASA's interdisciplinary and policy-oriented research, she is a member of the Water Program, with main responsibilities in scenario development, analysis of solution pathways until the 2050s in the food-water-energy-environment nexus, and capacity building.

Main research themes include i) Scenario development with a focus on the food, water and environment nexus; ii) Spatially explicit analysis of agro-ecosystems for the sustainable production of food, feed, fibre and bioenergy feedstocks; iii) Sustainable consumption in a globalized world; iv) Development of water indicators capturing coping capacity and challenges for identifying solution pathways towards the Sustainable Development Goals.

In the development of the FAO/IIASA Global Agro-Ecological Resources Assessment, she managed the integration of the large spatial input databases and analysis needs in the areas of global and selected higher resolution (Sub-Saharan Africa, China, Europe, Brazil) regional food-water-bioenergy-environment linkages, land use and water scenarios, food-system analysis and environmental transition.

In sustainable consumption research, she has been a principal investigator in analysis tracking land use and 'embodied' natural resources (e.g. land, deforestation, water) in agricultural and forestry products for revealing teleconnections in a globalized world.

She co-developed global water scenarios in the Water Futures and Solutions project and performed the comparative analysis of water use development pathways based on the multi-model assessment.

Capacity building: Supervision of PhD students in IIASA's Young Summer Scientist Program

Employer Information Technology company Prieler Hermann, 5023 Salzburg  
Position, Dates Programming, Accounting; Sep. 1985 to Sep.1986

## **Education**

Dates, 1999 to 2005  
Organization University of Natural Resources and Applied Life Sciences, Vienna, Austria  
Qualification awarded PhD (Dr.nat.techn.)  
Principal subjects Climate, Agriculture, Vulnerability; PhD Thesis: The impact of temperature and precipitation variability on potential agricultural production in China

Dates, Jun – Aug 1994  
Organization International Institute for Applied Systems Analysis  
Course and studies Participation in the Young Summer Scientist Program

Dates, Jan.-Dec. 1993  
Organization University of Manchester, UK  
Course and studies Erasmus student and grant scholar for master thesis

Dates, 1986 to 1994  
Organization University of Natural Resources and Applied Life Sciences, Vienna, Austria  
Qualification awarded Dipl.Ing.(equivalent to Master)  
Principal subjects Landscape Planning and Ecology  
Master thesis: 'Environmental Assessment - Assessing Impacts on Terrestrial Ecology and on the Landscape in the British Context

## **Personal skills**

Languages German (mother tongue); English (proficient user); French, Italian (Basic); Chinese (Started)

Organisational skills and competences Being part of an interdisciplinary team involves intensive contacts and discussion with colleagues and sometimes coaching of individual activities. Proposal writing and management of externally funded international research projects (EU, Industry). Supervision of over a dozen PhD students participating in IIASA's Young Summer Scientist Programs.

Computer competences GIS software (ArcGIS); Unix; MS Office (incl. Access); C, Python (basic);

**Annexes** Recent assignments  
Publications

## Recent assignments

<b>Water Futures and Solutions (WFaS) – Focus East Africa</b>	Start:	End:
Customer: Austrian Development Agency	2016	ongoing
<p>Water resources are central to development and poverty alleviation. Yet decision makers face many challenges to ensuring their sustainable and equitable use. WFaS works across various water-related sectors like agriculture, energy, and environment at different scales (global, regional, transboundary basin, country level). Developing and making use of hydrological and hydro-economic models, the research work is focusing on mid- to long term projections of future water availability and demand under different socio-economic, demographic and climatic scenarios. Stakeholder involvement allows co-designing the modelling tools, development scenarios and solution pathways. As a follow up of the global analysis in the 'Fast track Assessment', the initiative is currently focusing on East Africa with the Lake Victoria Basin and the Upper Nile as a key research area, which should feed into a wider Africa focus in a next phase.</p>		

<b>Sustainable aviation biofuel supply chains in Sub-Saharan Africa</b>	Start:	End:
Customer: WWF South Africa	2016	2018
<p>The WWF-SA and the Roundtable on Sustainable Biomaterials (RSB) are collectively undertaking a project to support the development of sustainable aviation biofuels in South Africa and the sub-Saharan Africa region. WWF-SA commissioned IIASA to conduct a spatially detailed resource assessment for different biofuel feedstocks and develop a set of scenarios of increased future biofuel feedstock demand, subject to defined sustainability criteria. The IIASA/FAO Global Agro-Ecological Zones (GAEZ) modelling system is applied for the estimation of the production potential of bio-energy feedstocks across Sub-Saharan Africa. A set of defined sustainability criteria for land use (e.g. no deforestation/land-clearing, retain adequate land for food production, preserve protected areas, etc.) together with available land-use data is employed to estimate, for a small number of scenarios, the extent of land potentially suitable and available for the production of targeted aviation biofuel feedstocks.</p>		

<b>Water Futures and Solutions (WFaS) - Fast Track</b>	Start:	End:
Customer: Austrian Development Agency; Asian Development Bank	2013	2015
<p>The Water Futures and Solutions initiative coordinates its work with other on-going scenario efforts for the sake of establishing a consistent set of new global water scenarios, based on the Shared Socioeconomic Pathways and Representative Concentration Pathways that are being developed in the context of the Intergovernmental Panel on Climate Change 5th Assessment Report. The global water scenario assessment framework has initially followed a 'fast-track' mode to produce well-founded yet preliminary scenario estimates. The stakeholder process will then broaden and enrich the analysis and assumptions underlying a second round of stakeholder-driven multi-model assessments.</p>		

<b>Global Agro-Ecological Zones Assessment Update 2010 (GAEZv.4)</b>	Start:	End:
Customer: IIASA and FAO	2013	on-going
<p>GAEZ update 2010 includes i) the update of the GAEZ input databases to year 2010 with climate data, best available global land cover data, latest protected area data, latest FAOSTAT production and land use statistics, and inclusion of available IPCC AR5 climate change GCM outputs; ii) spatial attribution/downscaling of year 2010 land use and agricultural production statistics; iii) GAEZ model runs using the updated input databases.</p>		

<b>Land use indicators for consumption</b>	Start:	End:
Customer: UBA Germany	2013	2016
<p>The project "Evaluation of resource use: Causal analysis and development of indicators at macro-and meso-level: Development of extended land use indicators" develops a methodology for land footprint indicators encompassing the extent of land area associated with different consumption patterns and lifestyles. These land footprint indicators will be extended with indicators and factors describing the intensity of land use and its interaction and intervention with ecosystems. IIASA's analysis focuses on describing the complex land-food-water nexus by applying the LADNFLOW and FAO/IIASA Agro-Ecological Zones model (GAEZ) for quantification of commodity flows as agents of virtual land, water, carbon and nutrients flow or environmental change impacts.</p>		

<b>The impact of EU consumption of food and non-food imports on deforestation</b>	Start:	End:
Customer: European Commission DG Environment	2010	2013
<p>In a globalized world with its complex supply chains and trade relations, consumption patterns in the European Union may cause deforestation far away. The project analyses the impacts of EU consumption, on deforestation and proposes policies how to reduce EU consumption impacts on deforestation. IIASA contribution in the Vision on Technology (VITO, Belgium) coordinated consortium focused on the land-intensive agriculture and forestry sector. First, a land use model attributed gross deforestation in each country to human activities and main sectors. Second, the IIASA LANDFLOW modelling framework has been applied to track each year 'total land' and 'deforested land' embodied in agricultural and forestry products from primary production in the country of origin to final utilization. The time frame covered was 1990 and 2008.</p> <p>See: <a href="http://ec.europa.eu/environment/forests/impact_deforestation.htm">http://ec.europa.eu/environment/forests/impact_deforestation.htm</a></p>		

<b>Assessing the Market for Commercial use of Biomass for Heat and Power Generation in Bulgaria, Romania, Ukraine, Belarus and Turkey</b>	Start:	End:
Customer: European Bank for Reconstruction and Development	2010	2012
<p>The assessment for the five countries includes i) an assessment of the current market for supply, distribution and use of biomass fuels; ii) their current legal and regulatory framework affecting the supply, distributing and use of biomass fuels in the countries; iii) environmental and social assessment of biomass options; iv) survey of the main participants in the biomass sector; v) Identification of the opportunities for scaling up biomass use and challenges to be addressed to realize those opportunities. IIASA was leading the assessment for these tasks related to agricultural biomass resources in a consortium coordinated by Österreichische Bundesforste AG Consulting and Pöyry Energy GmbH.</p>		

<b>Global Agro-Ecological Zones Assessment (GAEZ)</b>	Start:	End:
Customer: IIASA and FAO	2006	2012
<p>The GAEZ modelling framework for crop potential assessment uses detailed agronomic-based knowledge to assess land suitability, potential attainable yields and potential production of crops for specified management assumptions and input levels, both for rain-fed and irrigated conditions. Results are available from the GAEZ data portal (v3.0), which provides global, regional and local geospatial and tabular information on agricultural resources and potential.</p> <p>See: <a href="http://www.iiasa.ac.at/Research/LUC/GAEZv3.0/">http://www.iiasa.ac.at/Research/LUC/GAEZv3.0/</a> and <a href="http://www.fao.org/nr/GAEZ">http://www.fao.org/nr/GAEZ</a></p>		

<b>Scarcity and abundance of land resources</b>	Start:	End:
Customer: United Nations, Food and Agriculture Organization	2010	2010
<p>The study was prepared as a thematic report for 'The State of Land and Water Resources' (SOLAW), FAO's first flagship publication on the global status of land and water resources. It analyses the current status of land and water resources together with trends by assessing the biophysical and technical aspects of the resources and their use, and presents projections for the year 2050. See: <a href="http://www.fao.org/nr/solaw/en/">http://www.fao.org/nr/solaw/en/</a></p>		

<b>Effective and low-disturbing biofuel policies (ELOBIO)</b>	Start:	End:
Customer: European Commission under the Intelligent Energy Europe Programme	2008	2010
<p>The current market introduction of biofuels has significant impacts on other commodity markets. Such policy-induced market disturbances can become a major barrier for industry and public support for biofuels. Therefore, this project develops low-disturbing policy options, enhancing biofuels but minimizing the impacts on e.g. food and feed markets, and markets of biomass for power and heat. See: <a href="http://www.elobio.eu">http://www.elobio.eu</a></p>		

<b>Assessment of Brazil's residual land potential for biofuel feedstock production</b>	Start:	End:
Customer: Daimler Benz	2010	2012
<p>Global studies on future agricultural land availability indicate considerable potential for agricultural expansion in Brazil both for the production of food and feed crops as well as for bioenergy crops. At the same time agricultural expansion has been identified as a main driver of deforestation in the Brazilian Amazon. The project generated regional land balances based on most recent available statistical and remote sensing data for quantifying Brazil's sustainable land resource potentials. Results indicate the distribution and quality of residual land across Brazil at a spatial resolution of 30 arc-second (about 1km).</p>		

<b>Biofuels and Food Security</b>	Start:	End:
Customer: OPEC Fund for International Development (OFID)	09/2008	03/2009
<p>The project analysed the impacts of an accelerated expansion of biofuel production on world food system and environment. A detailed study report was presented and released at the 17th session of the UN Commission on Sustainable Development (CSD 17) (New York, 6th May 2009). See: <a href="http://www.iiasa.ac.at/Research/LUC/Homepage-News-Highlights/Biofuels_Report_Final.pdf">http://www.iiasa.ac.at/Research/LUC/Homepage-News-Highlights/Biofuels_Report_Final.pdf</a></p>		

<b>Planning the road ahead for biofuels (REFUEL)</b>	Start:	End:
Customer: European Commission under the Intelligent Energy Europe Programme	2006	2008
<p>The refuel project is designed to encourage a greater market penetration of biofuels. A biofuels road map was developed, consistent with EU biofuel policies and supported by stakeholders involved in the biofuels field. The project has produced a special issue of the Journal Biomass and Bioenergy. See: <a href="http://www.sciencedirect.com/science/journal/09619534/34/2">http://www.sciencedirect.com/science/journal/09619534/34/2</a></p>		

<b>Modelling Opportunities and Limits for Restructuring Europe Towards Sustainability (MOSUS)</b>	Start: 2003	End: 2006
Customer: European Commission, Research Directorate General		
The MOSUS project (2003-2006) aimed to integrate three major themes of European policies within a macroeconomic, multi-sectoral framework representing the interrelation of economic, social and environmental domains. These policy themes are: (i) sustainable development, (ii) competitiveness and social cohesion in the knowledge-based society, and (iii) globalisation and international trade. See: <a href="http://www.mosus.net">http://www.mosus.net</a>		

## Papers, Reports, Book chapters

- **Tramberend S**, Fischer G, Bruckner M, van Velthuisen H (2019). Our Common Cropland: Quantifying Global Agricultural Land use from a Consumption Perspective. *Ecological Economics* 157:332-341. DOI:10.106/j.econ.2018.12.005
- Fischer G, **Tramberend S**, van Velthuisen H, Bole-Rentel T, & Reeler J (2019). Sustainable Aviation Biofuel Feedstock Potential in sub-Saharan Africa. World Wide Fund for Nature. < [Web access](#) >
- Bole-Rentel T, Fischer G, **Tramberend S**, & van Velthuisen H (2019). Sustainable Aviation Biofuel Feedstock Potential in sub-Saharan Africa (Summary Report). World Wide Fund for Nature. < [Web access](#) >
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- Kanyerere, T., **Tramberend, S.**, Levine, A.D., Mokoena, P., Mensah, P., Chingombe, W., Goldin, J., Fatima, S. and Prakash, M., (2018). Water futures and solutions: Options to enhance water security in sub-Saharan Africa. In Systems Analysis Approach for Complex Global Challenges (pp. 93-111). Springer, Cham.
- Burtscher, R., Langan, S., Tramberend, S. and Burek, P., (2018). Solutions for a water secure East Africa in 2050 Workshop on mid-to long-term water resources management and planning in Eastern Africa December 4-6, 2017 Entebbe, Uganda. IIASA Report. Laxenburg, Austria < [Web access](#) >
- Shengfa Li, Xiubin Li, Laixiang Sun, Guiying Cao, Guenther Fischer, Sylvia **Tramberend**, (2018). An Estimation of the Extent of Cropland Abandonment in Mountainous Regions of China. *Land Degradation & Development*. DOI: 10.1002/ldr.2924
- Greve, P., Kahil, T., Mochizuki, J., Schinko, T., Satoh, Y., Burek, P., Fischer, G., **Tramberend, S.**, Burtscher, R., Langan, S. and Wada, Y., (2018). Global assessment of water challenges under uncertainty in water scarcity projections. *Nature Sustainability*, 1(9), p.486.
- Bruckner, M., Giljum, S., Fischer, G., Tramberend, S. and Börner, J., (2018). The global cropland footprint of the non-food bioeconomy. ZEF-Discussion Papers on Development Policy No. 253. < [Web access](#) >
- Bruckner M, Giljum S, Fischer G, & **Tramberend S** (2017). Review of land flow accounting methods and recommendations for further development. 67 p., Texte 77/2017. Umweltbundesamt, Dessau-Roßlau. < [Web access](#) >
- Bruckner M, Giljum S, Fischer G, **Tramberend S**, Wunder T, & Kaphengst T (2017). Development of consumption-based land use indicators. 38 p., Texte | 80/2017, Umweltbundesamt, Dessau-Roßlau. < [Web access](#) >
- Fischer G, **Tramberend S**, Bruckner M, & Lieber M (2017). Quantifying the land footprint of Germany and the EU using a hybrid accounting model. Umweltbundesamt, Dessau-Roßlau. 98 p., Texte 78/2017 < [Web access](#) >
- Fischer G, **Tramberend S**, van Velthuisen H, Wunder S, Kaphengst T, McFarland K, Bruckner M, & Giljum S (2017). Extending land footprints towards characterizing sustainability of land use. Umweltbundesamt, Dessau-Roßlau. 105 p., Texte 79/2017. < [Web access](#) >
- Satoh Y, Kahil T, Byers E, Burek P, Fischer G, **Tramberend S**, Greve P, Flörke M, Eisner S., Hanasaki N., Magnuszewski P., Nava L.F., Cosgrove W., Langan S., Wada Y (2017). Multi-model and multi-

scenario assessments of Asian water futures: the Water Futures and Solutions (WFaS) initiative. *Earth's Future* DOI:10.1002/2016EF000503.

- Yao M, **Tramberend S**, Kabat P, Hutjes RWA, & Werners SE (2017). Building Regional Water-Use Scenarios Consistent with Global Shared Socioeconomic Pathways. *Environmental Processes* 4 (1): 15-31. DOI:10.1007/s40710-016-0203-x.
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- Burek P, Satoh Y, Fischer G, Kahil MT, Scherzer A, **Tramberend S**, Nava LF, Wada Y, Eisner S., Flörke M., Hanasaki N., Magnuszewski P., Cosgrove B., Wiberg D. (2016). Water Futures and Solution - Fast Track Initiative (Final Report). IIASA Working Paper. IIASA, Laxenburg, Austria: WP-16-006.
- Fischer G, Hizsnyik E, **Tramberend S**, & Wiberg D (2015). Towards indicators for water security - A global hydro-economic classification of water challenges. IIASA Interim Report. IIASA, Laxenburg, Austria: IR-15-013
- **Tramberend S**, Wiberg D, Wada Y, Flörke M, Fischer G, Satoh Y, Yillia P, van Vliet M, Hizsnyik, E., Nava, L.F., Blokker, M. and Hanasaki, N. (2015). Building global water use scenarios. IIASA Interim Report. IIASA, Laxenburg, Austria: IR-15-014
- Lossau S, Fischer G, **Tramberend S**, van Velthuisen H., Kleinschmit B, Schomaketer R. Brazil's current and future land balances: Is there residual land for bioenergy production? *Biomass and Bioenergy*, 81:452-461 (2015). DOI: <http://dx.doi.org/10.1016/j.biombioe.2015.07.024>
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- **Tramberend S**, Wiberg D, Wada Y, Foerke M, Fischer G Satoh Y, Yillia P, van Vliet M, Hizsnyik E, Nava LF, Blokdder M, hanasaki N. Building global water use scenarios. (2015) IIASA Interim Report IR-15-014. < <http://webarchive.iiasa.ac.at/Admin/PUB/Documents/IR-15-014.pdf> >
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