IVM Institute for Environmental Studies

VU

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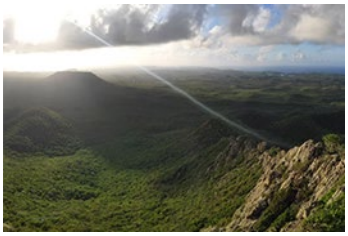
Selected research highlights

Knowledge and support key to drought adaptation for Kenyan households

From 2020 to 2023, the Horn of Africa experienced one of the worst droughts in decades. This kind of severe droughts are expected to happen more often due to climate change, and put pressure on the traditional way of living in rural communities. Research led by Teun Schrieks of our Environmental Economics section, has analysed what kind of support can help Kenyan households to adapt to these drought conditions, based on 502 survey interviews. The results indicate that knowledge is a barrier to adaptation and that target training and information can be effective to increase adaptation uptake. Training is, however, only valued by households that are already positive towards adaptation. The most vulnerable households, with high drought risk perceptions and limited access to financial resources, need more fundamental support, such as water supply and emergency aid, before they can start thinking about implementing adaptation measures. The research was published in Ecological Economics.

> Link to paper

Integrated Model Assesses Curaçao's Development Pathways and Environmental Impact



Constrained by limited land and mounting pressures, small island states face complex challenges in charting sustainable futures. Research led by Rex Steward presents an integrated modelling framework to assess how different development pathways and zoning policies influence land use, environmental outcomes, and economic trade-offs in Curaçao. By combining stakeholder-informed Bayesian networks with spatial impact modelling, the study evaluates nine scenarios – including tourism-focused, agriculture-driven, and business-as-usual strategies – under varying zoning regimes. Results show that enforcing existing zoning plans helps curb environmental degradation, such as rare habitat loss and nitrogen runoff. Unregulated and modified zoning scenarios offer limited economic gains but lead to significantly greater ecological degradation. The study highlights the critical role of spatial planning in small island contexts and offers practical tools for navigating land use decisions under conditions of uncertainty, competing interests, and limited resources. The research was published in Environmental Science & Policy.

> Link to paper

One-third of the global soybean production failure in 2012 is attributable to climate change

In 2012, hot and dry weather caused soybean crop failure in the United States, Brazil, and Argentina, which together account for approximately 75 % of the global soybean supply. Combining a statistical crop model with climate model simulations of 2012 conditions under pre-industrial, present-day, and future conditions, IVM researcher Raed Hamed and others estimate that one-third of the 2012 production

Featured recent publications

Dissertations:

Mirja Schoderer (3 April 2024): *Negotiating the nature of water- and miningscapes: institutions, discourses and practices of governing natural resources*

Sem Duijndam (5 June 2024): *Floods of movement: drivers of human migration under sea-level rise and flood risk*

Shutong He (6 June 2024): *Energy conservation at home: understanding heterogeneous effects of information-based behavioural interventions with experimental evidence*

Lize Borms (18 June 2024): *Out with jobs and in with skills: measuring current circular jobs and analyzing future necessary skills*

Sophie de Bruin (3 July 2024): *Futures of conflict risk, migration and equity implications: complexity and irregularity in scenario projections*

Tim Busker (7 November 2024): *Anticipating weather and climate extremes: the value of early action to reduce disaster impacts*

Raed Hamed (10 January 2025): *Crop impacts from compound weather extremes in major breadbaskets under climate change*

Dona Geagea (17 January 2025): *Recommoning water: Emerging water governance practices as a response to the austerity crisis*

Teun Schrieks (17 January 2025): *Living with drought: Understanding adaptation decisions in African pastoral communities*

Henrique Moreno Dumont Goulart (27 January 2025): *Narratives of an uncertain future: Storylines to connect extreme weather events to impacts and decision making*

Nina Valin (26 February 2025): *Deciding and knowing for radical environmental policy change: the formulation, evaluation and implementation of the European Water Framework Directive*

Job Rosier (22 April 2025): *Characterization of urban land use and urban land dynamics in data scarce regions*

Albert Moerkerken (22 April 2025): *On the way to climate-friendly farming: Attitude and behaviour of Dutch farmers towards greenhouse gas emission reduction on their farms*

Tim Leijnse (24 April 2025): *Riding the wave: Enabling large-scale wave-resolving probabilistic coastal compound flood modeling*

Camille Venier-Cambron (9 May 2025): *Justice in conservation: a global land use perspective*

deficit is attributable to anthropogenic climate change. They also show that future warming (+2°C above pre-industrial levels) could further exacerbate production deficits by 50% compared to the 2012 crop failure. This highlights the rising intensity of global soybean production shocks as global warming increases and emphasises the urgent need for adaptation strategies. The research was published in Communications Earth and Environment and featured in the Carbon Brief and in Nature Climate Change.

Art installation on virtual water selected for the 19th Venice Biennale of Architecture

An immersive art installation titled "**The Architecture of Virtual Water**" by Jampel Dell'Angelo and Miralles Tagliabue (EMBT Architects) "makes visible the invisible" and raises awareness on the value and crisis of global water resources at the 19th Venice Biennale of Architecture. The Architecture of Virtual Water pavilion consists of a wooden skeleton, shaping the word AQUA (Latin for Water). Its paper walls are made of dismissed filter paper worked by hand to achieve the shaped walls The interactive installation on the inside included immersive music and digital visuals that complete a narrative based on years of scientific research. It thus combines architectural design, environmental awareness, musical composition and interactive technology. It will be exhibited at Corderie in Arsenale, Venice from 10 May to 23 November 2025, before moving to Barcelona in December.

Education news

VARM Simulator – Virtual reality game translates project results into innovative teaching tool

VARM Simulator, a VR serious game co-created by VU Amsterdam and the University of Twente (UT), conveys cutting-edge research on sustainable agriculture and salinity issues exacerbated by climate change in an engaging and accessible format. It allows players such as students, farmers, and policymakers to experiment with crop management, soil treatment, and salinity challenges under climate change scenarios. Building on insights from the research projects SALAD and Trustfarm, the game concept was developed during a hackathon co-organised by partners of FOSC projects, including Katarzyna Negacz, and the IVM VU VR Lab, including Ana Clara Cassanti and Sanchayan Banerjee. The winning student team – Andres Lot Camarena, Javier Cepeda Batiz, Li Pan, and Tim But – developed the simulator under SALAD and IVM VR Lab's guidance. The VARM simulator has been featured in the Partners for Water podcast, *The Salty Intruder*, and the upcoming *Climate Breakdown Podcast* series. It will be showcased at the eduXR Amsterdam workshop and then made publicly available.

Prizes, awards and grants

EAERE Visiting Programme 2025

Marta Buso has won this grant with the project The project "Offsetting or reducing? An experimental evaluation of willingness to offset dietary emissions".

VU BETA Faculty Impact Award

Alicja Grudnowska, Anne van Loon, Anne-Sophie Sabino Siemons, Hans de Moel and Marthe Wens won this award for their work on the World Drought Atlas, published by UNCCD and the European Commission's Joint Research Centre (JRC). The Atlas is the most comprehensive global publication on drought risks and measures. It aims to raise awareness around drought as a global challenge and to act as a wake-up call for world leaders.

Nikki Funke (26 May 2025): *Three perspectives, one problem: a multi-theoretical approach to the role of expertise in the acid mine drainage policy controversy in Gauteng, South Africa*

Selected journal articles:

Appelt, J.L., Saphangthong, T., **Verburg**, P.H., **van Vliet**, J. (2025). Climate change impacts on the suitability of lowland and upland crop systems in Lao PDR. *Agricultural Systems, 226*, 104316. https://doi.org/10.1016/j.agsy.2025.104316

Bartels, L. & **Werthschulte**, M. (2025). 'More Bang for the Buck'? Experimental Evidence on the Mechanisms of an Energy Efficiency Subsidy. *Environmental and Resource Economics, 88*, 631–654. https://doi.org/10.1007/s10640-024-00942-2

Claassen, J.N., **Koks**, E.E., **de Ruiter**, M.C., **Ward**, P. & **Jäger**, W.S. (2024). VineCopulas: an open-source Python package for vine copula modelling. *Journal of Open Source Software*, *9*(101), 6728. https://doi.org/10.21105/joss.06728

Enechi, O. & **Pattberg**, P.H. (2025). What determines participation in multi-stakeholder partnerships? Assessing sustainability awareness and knowledge. *Discover Sustainability, 6*(1), 104. https://doi.org/10.1007/s43621-025-00884-9

Enechi, O. & **Pattberg**, P. (2025). Stakeholder motivations for participation in partnerships for the SDGS: the case of Nigeria. International Environmental Agreements*: Politics, Law and Economics, 25*(1), 107–126. https://doi.org/10.1007/s10784-025-09663-3

Grafton, R.Q., Fanaian, S., Horne, J., Katic, P., Nguyen, N.-M., Ringler, C., Robin, L., Talbot-Jones, J., Wheeler, S. A., Wyrwoll, P.R., Avarado, F., Biswas, A.K., Borgomeo, E., **Brouwer**, R., Coombes, P., Costanza, R., Hope, R., Kompas, T., Kubiszewski, I. & Manero, A. & 11 others. (2025). Rethinking responses to the world's water crises. *Nature Sustainability, 8*, 11–21. https://doi.org/10.1038/s41893-024-01470-z

Hackbarth, T.X., May, J.D., **Magaya**, S., **Verburg**, P.H. (2025). Food systems modelling to evaluate interventions for food and nutrition security in an African urban context. *Food Security, 17*, 145–160. https://doi.org/10.1007/s12571-024-01502-8

Happé, T., Wijnands, J., Fernández-Torres, M.-A., Muntjewerf, L., **Scussolini**, P. & **Coumou**, D. (2024). Detecting Spatiotemporal Dynamics of Western European Heatwaves Using Deep Learning. *Artificial Intelligence for the Earth Systems, 3*(4). https://doi.org/10.1175/AIES-D-23-0107.1

Helm, L., **Venier-Cambron**, C., **Verburg**, P.H. (2025). The potential land-use impacts of bio-based plastics and plastic alternatives. *Nature Sustainability, 8*, 190–201. https://doi.org/10.1038/s41893-024-01492-7

Madgulkar, S. & **Dell'Angelo**, J. (2025). Who grabs the land? Unveiling the role of domestic actors in the global land rush. The Journal of Peasant Studies, 1-33. https://doi.org/10.1080/03066150.2025.2452373

Nirandjan, S., **Koks**, E.E., **Ye**, M., Pant, R., van Ginkel, K.C., **Aerts**, J.C. & **Ward**, P.J. (2024). Physical vulnerability database for critical infrastructure hazard risk assessments–a systematic review and data collection. *Natural Hazards and Earth System Sciences, 24*(12), 4341–4368. https://doi.org/10.5194/nhess-24-4341-2024

VU Master's Thesis Award 24-25

Clara Luxardo won the "VU Scriptieprijs", awarded yearly for the best final thesis, for her Master's thesis on "Pastoral Socio-Ecological Systems in Transition", based on a case study she conducted in Mustang, Nepal, supervised by Jampel Dell'Angelo.

ASI Starter Grant and the Connected Worlds grant

Moné Vasquez Ladron de Guevara, Mirja Schoderer and Mario Torralba have won these grants for their research into diverging understandings of and approaches to territory. Titled "Decolonizing perspectives on land", the project focuses on participatory counter-mapping in and of Mapuche territory.

ASI Starter Grant

Natalie Davis and Nynke Schulp, in collaboration with VU colleagues at the Department of Health Sciences, have won this grant for their project "Landscape & Diet Biodiversity" This project will explore how landscape and diet biodiversity are interconnected in high-income settings, contributing to an understanding of the ecological and health dimensions of food systems.

SGW XS grant for innovative projects

Miguel Poblete Cazenave received the grant for his project "Towards a High-Resolution Integrated Assessment Model for Assessing Inequalities in Climate Change Impacts and Risks". In the project he will develop a hybrid Integrated Assessment Model (IAM) that combines the strengths of both approaches, integrating detailed economic models, climate risk assessments, and downscaled energy and emissions data.

IVM in the spotlight

Wouter Botzen visited the House of Representatives as part of a discussion focused on the economic consequences of climate change.

> **Watch the video** (in Dutch at 10.03)

Juan Antonio Hernández-Agüero was interviewed by de Volkskrant for his study about Noise pollution as a major disturbance of avian predation in Amsterdam.

> **Read more**

Tamara Happé and Nadia Bloemendaal were featured in an in-depth interview about extreme weather in the Netherlands on NPO Radio 1's "5 Dagen" programme: https://www.nporadio1.nl/uitzendingen/5-dagen/9bca413c-7cac-4c80-ad72-91e9dbd4fbb1/2024-10-21-5-dagen

Kate Negacz joined hosts Mathieu Blondeel and Paulina Raniecka for a new episode of their Podcast Climate Breakdown to talk about saline agriculture and the challenges and opportunities associated with it.

Upcoming events

Monday 30 June-Friday 4 July, Den Burg, Texel, the Netherlands: **AI in Weather & Climate: Forecasting, Process Understanding & Real-World Applications** – Workshop organised by VU Amsterdam & eScience Center

The **drought-to-flood exhibition** is currently on a tour that started in Amsterdam at the Anthropocene conference, went to Kenya, and will go on to Peru, Japan and Canada before coming back to Amsterdam

Wednesday 24 September, 15.45h, Auditorium VU Amsterdam:
PhD defence Eric Mortensen. Thesis title: *Preparing for future flood risk now: An expanded understanding of forward-looking disaster risk reduction in the face of increasing coastal and riverine flood risk*

Wednesday 29 October, 11.45h, Auditorium VU Amsterdam:
PhD defence Thijs Endendijk. *Thesis title: Homes under water: From physical to financial flood risk for real estate*

Odongo, R.A., **Schrieks**, T., **Streefkerk**, I., **de Moel**, H., **Busker**, T., **Haer**, T., ... & **van Loon**, A. F. (2025). Drought impacts and community adaptation: perspectives on the 2020-2023 drought in East Africa. *International Journal of Disaster Risk Reduction, 19*, 105309. https://doi.org/10.1016/j.ijdrr.2025.105309

Schoderer, M., Bittig, H., Morales, K.C., da Cunha, L.C., Faber, C., Hägele, R., ... & Hornidge, A.K. (2025). Open science for the ocean. Recommendations from the perspective of marine carbon observations in Germany, Brazil, and beyond. Marine Policy, 178, 106736. 10.1016/j.marpol.2025.106736

Schoderer, M., Bittig, H., Klein, B., Hägele, R., Steinhoff, T., Castro-Morales, K., ... & Körtzinger, A. (2025). From Individual Observations to Global Assessments: Tracing the Marine Carbon Knowledge Value Chain. *Ocean and Society, 2*. https://doi.org/10.17645/oas.i435

Schrieks, T., **Botzen**, W.J.W., **Haer**, T., **Aerts**, J.C.J.H. (2025). Preferences for drought risk adaptation support in Kenya: Evidence from a discrete choice experiment and three decision-making theories. *Ecological Economics, 227*, 108425. https://doi.org/10.1016/j.ecolecon.2024.108425

van Opstal, W., Bocken, N., **Brusselaers**, J. (2025). Smart, circular and renewable: The role of cooperative governance in accelerating a sustainable energy transition. *Energy Research and Social Science, 123*, 104049. https://doi.org/10.1016/j.erss.2025.104049

West, T.A.P., Caviglia-Harris, J.L., Fearnside, P.M. (2025). Additionality in Theoretical von Thünenian Models of Deforestation and Conservation Payments. *Land, 14*(2), 272. https://doi.org/10.3390/land14020272

STAFF AND ORGANISATIONAL NEWS

Hello and goodbye

This year, IVM has welcomed several new staff members:

- In the section Water and Climate Risk (WCR) Miltos Kofinas started as a Postdoc.
- The section Environmental Policy Analysis (EPA) welcomed Clara Luxardo as a Junior Researcher and Maximilian Roßmann and Ananya Tiwari as Postdocs.
- The section Environmental Economics (EE) welcomed Max Tesselaar as an Assistant Professor, Maximilian Roßmann, Floris van Montfoort, Hùng Nguyen and Alexandra Krendelsberger as Postdocs and Bente-Sophie van Kalken and Yudha Pratama as PhD Candidates.
- In the section Environmental Geography (EG) Willem Hordijk and Bernadette van Heel started as Postdocs.
- Iris van den Brand joined IVM as a Management/Office Assistant

This year we said goodbye to Nuno Garcia, Nicolien van der Grijp, Alicja Grudnowska, Eric Mortensen, Lena Reimann and Janina Smaoui.

Other news and announcements

To help us tailor future newsletters to your needs, we would love to hear from you. Would you like to see some additional or alternative sections? What did you find most insightful this time, and what is on your mind that we could explore in upcoming issues? Reach us at m.c.schoderer@vu.nl and m.torralbaviorreta@vu.nl