

## Selected research highlights

### Sustainable food production: organic agriculture can be part of the solution



Organic farming has clear environmental advantages in terms of reduced pollution, better soil quality, more biodiversity and less use of chemical inputs. At the same time, it is often argued that organic agriculture, due to its lower productivity per hectare, will never be able to meet the food demand of a growing world population, or only so if the area of agricultural land is vastly expanded (at the expense of natural areas). Two recent articles in the scientific journal **Nature Sustainability**, co-authored by IVM's **Verena Seufert**, provide a balanced picture of organic farming's potential

contribution to sustainable food production. Organic farming is neither an irrelevant niche nor a silver bullet. In any case, feeding the world 100% organically would require profound adaptations of human diets and animal husbandry.

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### Flood risk assessments should take adaptive behaviour into account



Photo: Ooms Bouw & Ontwikkeling

Recent floods in the United States and Asia again highlighted their devastating effects, and without investments in adaptation, the future impact of floods will continue to increase. Key to making accurate flood risk projections are assessments of how disaster-risk reduction measures reduce risk and how much risk remains after adaptation. Current flood risk assessment models are ill-equipped to address this, as they assume a static adaptation path, implying that vulnerability will remain constant. Using a new, multi-disciplinary approach, IVM researchers **Toon Haer**, **Wouter Botzen** and **Jeroen Aerts** found that the increase in flood risk due to climate change may be largely offset by adaptation decisions. Moreover, adaptation by households may be more influential for risk reduction than government protection in the short term. The results highlight the importance of integrating behavioural methods from social sciences with quantitative models from the natural sciences.

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## Featured recent publications

### Dissertations:

Yus Budiyo (21 November 2018), [Flood risk modeling in Jakarta: development and usefulness in a time of climate change](#).

Sanne Muis (4 December 2018), [Assessing coastal flood risk at the global scale](#).

Belinda McFadgen (17 December 2018), [Opening the Black Box of Policy Experimentation: How the Governance of Policy Experiments Affects Learning Outcomes for Climate](#).

Solomon Tarfasa Faro (10 January 2019), [Using discrete choice experiments to inform environmental policy in a developing country context: case studies from Ethiopia](#).

Koen Tieskens (21 January 2019), Cultural Value of European Landscapes: A quantitative approach. (Not yet available in VU-Dare).

Samantha Scholte (23 January 2019), [The value of nature through an ecosystem service lens: Exploring public perceptions](#).

Mehmet Kutluay (2 May 2019), The Value of (Avoiding) Malaria. (Not yet available in VU-Dare).

Mireia Tarradell (10 May 2019), [Reconsidering the political role of international organizations: Persuaders or social leveragers in the orchestration for environmental sustainability?](#)

Theodoros Chatzivasileiadis (23 May 2019), [Climate, Uncertainty and the Stock Market: Assessing the economic effects of sea level rise while addressing the uncertainty surrounding CGE models, and the reactions of the stock market to climate change information and weather stimuli](#).

### Selected journal articles:

Ariti, A.T., van Vliet, J. & Verburg, P.H. (2019). [The role of institutional actors and their interactions in the land use policy making process in Ethiopia](#). *Journal of Environmental Management*, 237, 235–246.

Bais-Moleman, A.L., Schulp, C.J.E. & Verburg, P.H. (2019). [Assessing the environmental impacts of production- and consumption-side measures in sustainable agriculture intensification in the European Union](#). *Geoderma*, 338, 555–567.

Barbieri, P., Pellerin, S., Seufert, V. & Nesme, T. (2019). [Changes in crop rotations would impact food production in an organically farmed world](#). *Nature Sustainability*, 2, 378–385.

de Boer, J. & Aiking, H. (2019). [Strategies towards healthy and sustainable protein consumption: A transition framework at the levels of diets, dishes, and dish ingredients](#). *Food Quality and Preference*, 73, 171–181.

## Towards a Global Biodiversity Action Agenda



Convention on  
Biological Diversity

Non-state and sub-national actors (e.g. cities, regions and companies) are increasingly taking action to address biodiversity loss. They set up standards and commitments, provide funding, create and disseminate information, and execute

projects on the ground. As part of the post-2020 Global Biodiversity Framework, parties to the Convention on Biological Diversity (CBD) decided to implement the 'Sharm El-Sheikh to Beijing Action Agenda for Nature and People'. While there is general support for a voluntary commitment process, the question now is how the Action agenda should look like, what form voluntary commitments for biodiversity should take and if and how the action agenda could become a meaningful pillar in the post-2020 global biodiversity framework. A recent study by IVM's **Philipp Pattberg** and **Oscar Widerberg**, together with Marcel Kok (PBL Netherlands Environmental Assessment Agency) argues that lessons learned from the ongoing climate change action agenda should urgently be taken into account when further developing the biodiversity action agenda.

Meanwhile, In a new project called 'Global Biodiversity Governance Beyond 2020: The Role of International Cooperative Initiatives' IVM researchers in cooperation with PBL will explore the role of transnational cooperative initiatives in global biodiversity governance. The project will map the landscape of initiatives, analyse their effectiveness and suggest ways to integrate them into the CBD. It will also assess the policy implications for the Dutch government.

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## Education news

### Summer course on global energy transition



The transformation towards a low-carbon energy system is one of the key societal changes for the decades to come in the Netherlands, Europe and globally. In the Netherlands as elsewhere, many efforts are undertaken to push this transformation. The decision towards a gas-free built environment in the traditional gas country Netherlands is only one example of the many ambitions that have been

aired by governments worldwide. In addition, many companies, citizens and other stakeholders in the transition are contributing to change. However, despite spectacular growth of renewable energy sources in many countries, energy demand is still increasing and fossil fuels are far from being phased out. IVM has therefore set up this new summer course for Bachelor, Master and PhD students wishing to get insights into the players and interests behind the global energy transition. The course will address the key hurdles that will have to be taken for successful change that is effective, efficient and socially legitimate.

In addition to in-depth lectures by academics and professionals from the field, discussions, assignments and excursions to energy organisations in the Netherlands will give students a comprehensive and thorough understanding of the main issues at stake. The course takes place two weeks full-time from 8 to 20 July. More information is available [here](#) or from the course organisers Dr Stephan Slingerland ([s.slingerland@vu.nl](mailto:s.slingerland@vu.nl)) and Dr Julia Blasch ([julia.blasch@vu.nl](mailto:julia.blasch@vu.nl)).

## Staff and organisation news

### Amsterdam Sustainability Institute inaugurated

On 16 May 2019 the [Amsterdam Sustainability Institute](#) (ASI) was officially opened by the Director of SDG Charter Netherlands Maresa Oosterman and the Vice-Dean of the Faculty of Science Prof. Jacqueline Broerse. Prof. Joyeeta Gupta (University of Amsterdam) gave a keynote speech on 'Healthy Planet, Healthy People: What can cross-disciplinary research contribute to achieving the SDGs?'. Next, ASI

Debonne, N., van Vliet, J. & Verburg, P. (2019). [Future governance options for large-scale land acquisition in Cambodia: Impacts on tree cover and tiger landscapes](#). *Environmental Science & Policy*, 94, 9–19.

de Ruig, L.T., Barnard, P.L., Botzen, W.J., Grifman, P., Finzi Hart, J., de Moel, H., Sadrpour, N. & Aerts, J.C.J.H. (2019). [An economic evaluation of adaptation pathways in coastal mega cities: An illustration for Los Angeles](#). *Science of The Total Environment*, 678, 647–659.

D'Odorico, P., Carr, J.A., Davis, K.F., Dell'Angelo, J. & Seekell, D.A. (2019). [Food Inequality, Injustice, and Rights](#). *BioScience*, 69(3), 180–190.

D'Odorico, P., Carr, J., Dalin, C., Dell'Angelo, J., Konar, M., Laio, F., Ridolfi, L., Rosa, L., Suweis, S., Tamea, S. & Tuninetti, M. (2019). [Global virtual water trade and the hydrological cycle: patterns, drivers, and socio-environmental impacts](#). *Environmental Research Letters*, 14(5).

Eyhorn, F., Muller, A., Reganold, J.P., Frison, E., Herren, H.R., Luttkholt, L., Mueller, A., Sanders, J., El-Hage Scialabba, N., Seufert, V. & Smith, P. (2019). [Sustainability in global agriculture driven by organic farming](#). *Nature Sustainability*, 2, 253–255.

Guimarães Nobre, G., Davenport, F., Bischiniotis, K., Veldkamp, T., Jongman, B., Funk, C.C., Husak, G., Ward, P.J. & Aerts, J.C.J.H. (2019). [Financing agricultural drought risk through ex-ante cash transfers](#). *Science of the Total Environment*, 653, 523–535.

Guimarães Nobre, G., Hunink, J.E., Baruth, B., Aerts, J.C.J.H. & Ward, P.J. (2019). [Translating large-scale climate variability into crop production forecast in Europe](#). *Scientific Reports*, 9, 1277.

Haer, T., Botzen, W.J. & Aerts, J.C.J.H. (2019). [Advancing disaster policies by integrating dynamic adaptive behaviour in risk assessments using an agent-based modelling approach](#). *Environmental Research Letters*.

Harmann, K.S. & Malek, Ž. (2019). [Adaptations in irrigated agriculture in the Mediterranean region: an overview and spatial analysis of implemented strategies](#). *Regional Environmental Change*.

Hein, W., Wilson, C., Lee, B., Rajapaksa, D., de Moel, H., Athukorala, W. & Managi, S. (2019). [Climate change and natural disasters: Government mitigation activities and public property demand response](#). *Land Use Policy*, 82, 436–443.

Hsu, A., Höhne, N., Kuramochi, T., Roelfsema, M., Weinfurter, A., Xie, Y., Lütkehermöller, K., Chan, S., Corfee-Morlot, J., Drost, P., Faria, P., Gardiner, A., Gordon, D.J., Hale, T., Hultman, N.E., Moorhead, J., Reuvers, S., Setzer, J., Singh, N., Weber, C. & Widerberg, O. (2019). [A research roadmap for quantifying non-state and subnational climate mitigation action](#). *Nature Climate Change*, 9, 11–17.

Kahsay, T.N., Arjoon, D., Kuik, O., Brouwer, R., Tilmant, A. & van der Zaag, P. (2019). [A hybrid partial and general equilibrium modeling approach to assess the hydro-economic impacts of large dams – The case of the Grand Ethiopian Renaissance Dam in the Eastern Nile River basin](#). *Environmental Modelling & Software*, 117, 76–88.

Komossa, F., van der Zanden, E.H. & Verburg, P.H. (2019). [Characterizing outdoor recreation user groups: A typology of peri-urban recreationists in the Kromme Rijn area, the Netherlands](#). *Land Use Policy*, 80, 246–258.



Director Prof. Philipp Pattberg talked with ASI researchers about their plans to foster excellence and generate impact in terms of sustainability. Inspired by the United Nations Sustainable Development Goals (SDGs), ASI seeks to build bridges among VU researchers and with the wider community to increase our scientific and societal impact. Its motto is: 'Integrating knowledge for sustainable societal choices'.



### VU member of Climate-KIC

As of January 2019, Vrije Universiteit Amsterdam is an official member of Climate-KIC. Climate-KIC is a European knowledge and innovation community, working towards a prosperous, inclusive, climate-resilient society founded on a circular, zero-carbon economy. The backbone of the Climate-KIC community consists of about 300 different companies, research institutes, NGOs and start-ups across Europe with a common goal: bringing successful climate innovation to the market.

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### Appointments

**Philip Ward** has been appointed Full Professor of Global Water Risk Dynamics at the Faculty of Science of VU Amsterdam. In his new position, Prof. Ward aims to develop new scientific approaches and tools, and train a new generation of researchers and professionals, for co-designing sustainable solutions to water-related problems.



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**Pieter van Beukering** was appointed professor Environmental Economics on 1 May with the assignment 'Economics of Natural Capital'. Pieter was already Head of the department Environmental Economics and Deputy Director of IVM, as well as the Director of the Master Environment and Resource Management (ERM) programme.



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### Prizes, awards and grants

The European Union (EU) has awarded a grant of four million euros to Dr **Jampel Del'Angelo** and Prof. **Dave Huitema** of IVM. They will lead a new network that aims to radically rethink current approaches to water governance and develop promising ideas for improvement. The project is called NEWAVE (Next Wave Water Governance) and will employ 15 Early Career Researchers and one Postdoctoral



Kuik, O., Branger, F. & Quirion, P. (2019). Competitive advantage in the renewable energy industry: Evidence from a gravity model. *Renewable Energy*, 131, 472–481.

Lesiv, M., Laso Bayas, J.C., See, L., Duerauer, M., Dahlia, D., Durando, N., Hazarika, R., Sahariah, P.K., Vakolyuk, M., Blyshchik, V., Bilous, A., Perez-Hoyos, A., Gengler, S., Prestele, R., Bilous, S., ul Hassan Akhtar, I., Singha, K., Choudhury, S.B., Chetri, T., Malek, Ž., Bungnamei, K., Saikia, A., Sahariah, D., Narzary, W., Danylo, O., Sturn, T., Karner, M., McCallum, I., Schepaschenko, D., Moltchanova, E., Fraisl, D., Moorthy, I. & Fritz, S. (2019). Estimating the global distribution of field size using crowdsourcing. *Global Change Biology*, 25(1), 174–186.

Linderhof, V., Oosterhuis, F.H., van Beukering, P.J.H. & Bartelings, H. (2019). Effectiveness of deposit-refund systems for household waste in the Netherlands: applying a partial general equilibrium model. *Journal of Environmental Management*, 232, 842–850.

Morseletto, P. (2019). Confronting the nitrogen challenge: Options for governance and target setting. *Global Environmental Change*, 54, 40–49.

Muis, S., Lin, N., Verlaan, M., Winsemius, H.C., Ward, P.J. & Aerts, J.C.J.H. (2019). Spatiotemporal patterns of extreme sea levels along the western North-Atlantic coasts. *Scientific Reports*, 9, 3391.

Parra Paitan, C. & Verburg, P.H. (2019). Methods to Assess the Impacts and Indirect Land Use Change Caused by Telecoupled Agricultural Supply Chains: A Review. *Sustainability*, 11(4), 1162.

Rulli, M.C., Casirati, S., Dell'Angelo, J., Davis, K.F., Passera, C. & D'Odorico, P. (2019). Interdependencies and telecoupling of oil palm expansion at the expense of Indonesian rainforest. *Renewable and Sustainable Energy Reviews*, 105, 499–512.

Schulp, C.J.E., Levers, C., Kuemmerle, T., Tieskens, K.F. & Verburg, P.H. (2019). Mapping and modelling past and future land use change in Europe's cultural landscapes. *Land Use Policy*, 80, 332–344.

Schulze, K., Malek, Ž, Verburg, P.H. (2019). Towards better mapping of forest management patterns: A global allocation approach. *Forest Ecology and Management*, 432, 776–785.

Unterberger, C., Hudson, P., Botzen, W.J.W., Schroer, K. & Steininger, K.W. (2019). Future Public Sector Flood Risk and Risk Sharing Arrangements: An Assessment for Austria. *Ecological Economics*, 156, 153–163.

van der Grijp, N., van der Woerd, F., Gaiddon, B., Hummelshøj, R., Larsson, M., Osunmuyiwa, O. & Rooth, R. (2019). Demonstration projects of Nearly Zero Energy Buildings: Lessons from end-user experiences in Amsterdam, Helsingborg, and Lyon. *Energy Research & Social Science*, 49, 10–15.

van Vliet, J., Verburg, P.H., Grădinaru, V. & Hersperger, A.M. (2019). Beyond the urban-rural dichotomy: Towards a more nuanced analysis of changes in built-up land. *Computers, Environment and Urban Systems*, 74, 41–49.

Vicente, J.R., Kueffer, C., Richardson, D.M., Vaza, A.S., Cabral, J.A., Hui, C., Araújo, M.B., Kühn, I., Kull, C.A., Verburg, P.H., Marchante, E. & Honrado, J.P. (2019). Different environmental drivers of alien tree invasion affect different life-stages and operate at different spatial scales. *Forest Ecology and Management*, 433, 263–275.

Researcher, to be based at the VU and several collaborating institutions. Funding comes from the Marie Skłodowska-Curie ITN programme of the EU.

IVM's **Jasper van Vliet** receives an € 800,000 VIDI grant from NWO (the Netherlands Organisation for Scientific Research). He will use this grant to map urbanisation processes using satellite data and to develop computer models that can support sustainable land use.



IVM researcher **Marleen de Ruiter** has been awarded the AGU18 Outstanding Student Presentation Award (OSPA). In her presentation, Marleen discussed how the current state-of-the-art regional and global models and their outputs do not allow for a thorough representation and analysis of consecutive disasters and their impacts. Marleen underscored the relevance of improving our understanding of consecutive disasters by showing a global analysis of consecutive disasters consisting of historic earthquakes and typhoon events, and a local analysis of historic earthquakes, typhoons, volcanic eruptions and floods in the Philippines.

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IVM PhD candidate **Perrine Laroche** has been awarded the Best Poster at the Global Land Program Open Science Meeting (GLP OSM) 2019. Perrine's poster spotlights the impact of dietary shift in western countries on the spatial allocation of the land footprint for food. Using an approach built on footprint and trade-based analyses and the United States of America case study, the study demonstrates that beyond reducing the global environmental burden, dietary shifts would transform telecouplings. Such shift would also drive the reallocation of land use, as well as patterns of ecosystem services demand and supply supporting food production.

## Upcoming events

**14 June 2019:** [PhD defence Willem Verhagen](#). Thesis title: '*Managing our land for multiple ecosystem services – Identifying priority areas and actions to maintain and restore ecosystem services across Europe*'.

**19 June 2019:** [PhD defence Jarl Kind](#). Thesis title: '*Drowning by Numbers – Social Welfare, Cost-Benefit Analysis and Flood Risk Management*'.

**24 June 2019:** [PhD defence Eleni Dellas](#). Thesis title: '*Sharing Scarce Resources – Membership and allocation in permit trading schemes*'.

**28 June 2019:** [PhD defence Reinhard Prestele](#). Thesis title: '*Linking land use and climate: the key role of uncertainty and spatial location*'.

**20 September 2019:** [PhD defence Christine Ornetsmüller](#). Thesis title: '*Advancing the Representation of Human Dimensions in Large-scale Land Use Models – Case studies for Laos*'.

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Wens, M., Johnson, J.M., Zagaria, C. & Veldkamp, T.I.E. (2019). [Integrating human behavior dynamics into drought risk assessment – A sociohydrologic, agent-based approach](#). *Wiley Interdisciplinary Reviews: Water*.

## Staff and organisational news

### Hello and goodbye

[Anna Filyushkina](#) and [Yue Dou](#) have joined IVM's section Environmental Geography as postdocs.

[Rebecca Swart](#) has started as a PhD student in the Environmental Geography section.

[Julia Grimm](#) has started as a postdoc in IVM's section Environmental Policy Analysis. She will be working together with Oscar Widerberg and scholars from Stockholm University and Linköping University on climate action and energy transformation in Sweden.

[Harro van Asselt](#) has returned to IVM as a visiting researcher in the EPA section. He is also Professor of Climate Law and Policy at the University of Eastern Finland and an Associate with the Stockholm Environment Institute (SEI). Before that he worked at the University of Oxford and at the IVM, where he also finished his PhD in 2013. Harro's research interests are in the area of climate law and governance.

[Ralph Lasage](#) has left IVM and is now working as a project manager at Vrije Universiteit.

[Astrid van Teeffelen](#) has swapped IVM for Ecogroen, an ecological consultancy.

[Yus Budiyo](#) moved to Jakarta where he is working at the Department of Disaster Risk Reduction in the Agency for the Assessment and Application of Technology.

[Stefania Munaretto](#) has also said goodbye to IVM.