

## **We need a food system transformation – in the face of the Ukraine war, now more than ever**

*The Ukraine crisis exposes the fact that our current ways of producing and consuming food are unsustainable and unjust. In response, we should reinforce – and not abandon – the transformation towards a healthy, just, and environmentally-friendly food system. We need comprehensive solutions that bring relief in the short term and at the same time avert the existential threat our food system poses to the health of people and the planet.*

Russia's invasion of Ukraine has created a humanitarian catastrophe, while simultaneously disrupting global energy systems and the world's agricultural markets. Ukraine and Russia are major global producers of wheat, maize, and oilseeds as well as fertilizer and fuel. Exports are likely to be severely disrupted due to the war. The Middle East and Africa are highly dependent on imported grain from the area and will be most affected. Soaring grain prices could push millions of people in these regions into poverty and hunger. As an immediate reaction, policy-makers should ensure open agricultural trade flows and adequate financial support for international food aid programmes.

The anticipated shocks to agricultural markets have also prompted short-sighted suggestions like abandoning sustainable agricultural practices that form part of the EU's Farm2Fork strategy, and increasing Europe's grain production capacities, partly to secure animal feed supply. These measures would not move us towards but further away from a reliable food system that is resilient to future shocks, and delivers healthy and sustainable diets.

### *Transforming today's food systems to ensure food security*

Global food insecurity has its origin not in a shortage of supply, but in high economic inequalities and maldistribution. Today's global food production is more than sufficient to feed an even higher world population. However, grains are fed to animals, used as biofuels, or wasted rather than supplied to those with limited financial means<sup>1</sup>.

Contrary to what ongoing discussions might imply, European food security is not under threat from the Ukraine crisis. Rather, Europe is threatened by a long-standing crisis of unhealthy diets with consumption of refined grains and animal products markedly above the recommendations of national dietary guidelines and those for healthy and sustainable diets<sup>2</sup>.

Here we propose three levers for coping with the short-term shocks to the food system while also ensuring human health and long-term sustainable development.

**1. Accelerate the shift towards healthier diets with less animal products in Europe (and other high-income countries).** A shift towards higher human consumption of legumes, vegetables and fruits, and less animal products in Europe could substantially alleviate pressure on global grain supplies. One-third of global calories are currently used to feed animals<sup>3</sup> and more than three-quarters of agricultural land are used to produce

<sup>1</sup>Berners-Lee et al. (2018). Current global food production is sufficient to meet human nutritional needs in 2050 provided there is radical societal adaptation. *Elementa: Science of the Anthropocene*, 6, 52. <https://doi.org/10.1525/elementa.310>; Cassidy et al. (2013). Redefining agricultural yields: from tonnes to people nourished per hectare. *Environmental Research Letters*, 8(3), 034015. <https://doi.org/10.1088/1748-9326/8/3/034015>

<sup>2</sup>Willett et al. (2019). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170), 447–492. [https://doi.org/10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4); Springmann et al. (2020). The healthiness and sustainability of national and global food based dietary guidelines: modelling study. *BMJ*, 370, m2322. <https://doi.org/10.1136/bmj.m2322>

<sup>3</sup>Cassidy et al. (2013).

animal-source foods<sup>4</sup>. Based on FAO data, we estimate that reducing the EU's use of grains to feed livestock by about one-third could compensate for the collapse of Ukrainian exports of grains and oilseeds<sup>5</sup>.

Concurrent reductions in the consumption and production of animal-source foods would lead to a more balanced food and agricultural system in line with health and environmental targets<sup>6</sup>. Drastically reducing consumption of animal-source foods is a prerequisite for limiting global warming to well below 2°C<sup>7</sup>, halting the continuous destruction and pollution of natural habitats, and thus stopping agriculture's transgression of planetary boundaries<sup>8</sup>. Furthermore, a shift towards predominantly plant-based diets could prevent 11 million premature deaths each year and substantially lower the global burden of disease<sup>9</sup>.

Conversely, political efforts to allocate further land to feed production with the aim of stabilizing livestock capacities within the current crisis are counterproductive to global food security. These efforts increase the feed-food competition and delay the transformation towards more sustainable food production.

**2. Increase production of legumes and strengthen Farm2Fork.** European agriculture heavily depends on energy-intensive nitrogen fertilizers. Supplies are currently interrupted as Russia is one of the world's largest producers of fertilizers and natural gas. The Farm2Fork strategy, which aims at halving nitrogen surplus and expanding organic agriculture on 25% of the land, would largely reduce this import dependency. Increasing diversity in crop rotations by including nitrogen-fixing legumes could replace synthetic fertilizer by biological fixation<sup>10</sup>. Improving nitrogen use efficiency by better dosing and timing of synthetic and organic fertilizers would further reduce imports, and would also result in enormous benefits to climate, air quality, and water quality. In addition, implementing the Farm2Fork strategy rapidly would improve soil quality and strengthen biodiversity in agricultural landscapes, thereby ensuring long-term food security through preserving ecosystem services.

Political efforts to abandon the sustainability targets of the Farm2Fork strategy (including greenhouse gas emission reduction, reduction of nitrogen fertilizer and pesticide use, and protection of fallow land for biodiversity) do not shield us from the current crisis, they rather worsen it and make the crisis permanent. Global warming and ecosystem decline are already affecting crop yields and livelihoods worldwide, a situation that will substantially deteriorate in the absence of ambitious mitigation strategies<sup>11</sup>.

**3. Reduce the amount of food waste.** According to our calculations, the amount of wheat wasted in the EU is approximately half the amount of Ukraine's wheat exports and a quarter of other grain exports<sup>12</sup>. Efforts to reduce food waste along the value chains from retailers to

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<sup>4</sup>Poore et al. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, 360(6392), 987–992. <https://doi.org/10.1126/science.aag0216>

<sup>5</sup>According to FAOSTAT, Ukrainian exports of grains amounted to 57 Mt in 2019, whilst 160 Mt were used as feed in the EU (for the EU, EFTA and UK, the combined value was 175 Mt).

<sup>6</sup>Willett et al. (2019); Springmann et al. (2020)

<sup>7</sup>Clark et al. (2020). Global food system emissions could preclude achieving the 1.5° and 2°C climate change targets. *Science*, 370(6517), 705–708.

<https://doi.org/10.1126/science.aba7357>

<sup>8</sup>Springmann et al. (2018a). Options for keeping the food system within environmental limits. *Nature*, 562(7728), 519–525. <https://doi.org/10.1038/s41586-018-0594-0>;

Soergel et al. (2021). A sustainable development pathway for climate action within the UN 2030 Agenda. *Nature Climate Change*, 11(8), 656–664.

<https://doi.org/10.1038/s41586-021-01098-3>

<sup>9</sup>Willett et al. (2019); Afshin et al. (2019). Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, 393(10184), 1958–1972. [https://doi.org/10.1016/S0140-6736\(19\)30041-8](https://doi.org/10.1016/S0140-6736(19)30041-8);

Springmann et al. (2018b). Health and nutritional aspects of sustainable diet strategies and their association with environmental impacts: A global modelling analysis with country-level detail. *The Lancet Planetary Health*, 2(10), e451–e461.

[https://doi.org/10.1016/S2542-5196\(18\)30206-7](https://doi.org/10.1016/S2542-5196(18)30206-7)

<sup>10</sup>Drinkwater et al. 1998). Legume-based cropping systems have reduced carbon and nitrogen losses. *Nature*, 396(6708), 262–265. <https://doi.org/10.1038/24376>

<sup>11</sup>IPCC, 2022: *Climate Change 2022: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Pörtner et al. (eds.)]. Cambridge University Press. In Press.

<sup>12</sup>According to the FAO, 25% of grains in the EU are wasted in households. We combined this with estimates of EU's demand for wheat, which according to FAOSTAT was 47 Mt in 2019, and compared it to Ukrainian wheat exports, which according to FAOSTAT was 21 Mt in 2019.

private homes could thus reduce short-term pressures on global markets. Food waste does not only contribute to the maldistribution of food supplies, it is also responsible for a large share of our food system's environmental footprint, as 30% of food produced is wasted at different stages of production and consumption<sup>13</sup>. Halving the amount of food waste worldwide by 2030 is therefore also an integral part to align the food system with the Sustainable Development Goals and stay within planetary boundaries<sup>14</sup>. Policy-measures have so far failed to adequately address this issue.

*It's time to act – to ensure global food security today and a livable future*

We have presented three levers to address the current food crisis while keeping long-term sustainability goals in mind. In addition to these overarching strategies, further short-term actions by European governments should be taken to ensure that vulnerable people in poor, food-importing countries do not fall into food insecurity. These actions include providing funds to the World Food Programme to purchase grains and keeping trade open, including food trade to and from Russia. Furthermore, social-security systems and food banks need to be strengthened across the EU to avoid detrimental effects of rising food prices for poor households. Effective long-term action however needs to tackle the inequalities of the current food system, in which hunger, waste, and resource-intensive consumption patterns coexist.

Russia's invasion of Ukraine and the ongoing war have sent shock waves through the food system. How the current crisis is handled politically has far-reaching implications for each one of us. The recently published IPCC report states that there is only a short window of opportunity left for effective action in the face of accelerating climate change and other environmental crises<sup>15</sup>. Focusing on short-term solutions now without considering the longer-term consequences or integrating the wider picture exacerbates future risks including the threat of surpassing critical tipping points of our planet's natural systems. Investing in a transition towards healthy and sustainable food systems now is essential to increase our resilience against future crises and ensure a safe and livable planet for generations to come.

**Authors:** Lisa M. Pörtner<sup>1,2</sup>, Nathalie Lambrecht<sup>1,2</sup>, Marco Springmann<sup>3</sup>, Benjamin Leon Bodirsky<sup>2,4</sup>, Franziska Gaupp<sup>2,5</sup>, Florian Freund<sup>6</sup>, Hermann Lotze-Campen<sup>2,7</sup>, Sabine Gabrysch<sup>1,2</sup>

1. Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Institute of Public Health, Charitéplatz 1, 10117 Berlin, Germany
2. Research Department Climate Resilience, Potsdam Institute for Climate Impact Research (PIK), Member of the Leibniz Association, P.O. Box 60 12 03, 14412 Potsdam, Germany
3. Oxford Martin Programme on the Future of Food and Nuffield Department of Population Health, University of Oxford, Oxford, UK.
4. World Vegetable Center, Tainan, Taiwan
5. EAT, Oslo, Norway
6. Johann Heinrich von Thünen Institute - Federal Research Institute for Rural Areas, Forestry and Fisheries, Institute of Market Analysis, Bundesallee 63, 38116 Braunschweig
7. Department of Agricultural Economics, Humboldt-Universität zu Berlin, 10099 Berlin, Germany

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<sup>13</sup>Shafiee-Jood et al. (2016). Reducing food loss and waste to enhance food security and environmental sustainability. *Environmental Science & Technology*, 50(16), 8432–8443. <https://doi.org/10.1021/acs.est.6b01993>

<sup>14</sup>Willett et al. (2019)

<sup>15</sup>IPCC, 2022.

### Co-Signatories:

1. Prof. Dr. Josef Settele, Co-Chair of IPBES Global Assessment; Head of Dept. of Conservation Biology and Social-Ecological Systems, Helmholtz Centre for Environmental Research - UFZ, Halle, Germany
2. Prof. Dr. Hans-O. Pörtner, Head of Integrative Ecophysiology, Alfred-Wegener-Institut, Bremerhaven, Germany. Co-Chair of first joint IPBES-IPCC workshop and report on Biodiversity and Climate Change
3. Prof. Dr. Johan Rockström, Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany
4. Professor Jessica Fanzo, nutritionist, Johns Hopkins University, USA
5. Dr Tara Garnett, University of Oxford / Oxford Martin School, United Kingdom
6. Prof. Dr. Harald Grethe, Thae-Institute, Humboldt-University of Berlin
7. Prof Olivier De Schutter, UCLouvain, Belgium, former UN Special Rapporteur on the right to food, co-chair, IPES-Food, Belgium
8. Dr Rachel Nugent, RTI International and University of Washington, Seattle, WA, USA
9. Prof. Dr. Friedhelm Taube, University of Kiel, Germany
10. Professor Johannes Vogel, Ph.D., Museum für Naturkunde - Leibniz-Institute for Evolution and Biodiversity Science (Berlin), Humboldt-Universität zu Berlin, Germany
11. Dr Sébastien Treyer, Executive Director, IDDRI, Sciences Po, Paris, France
12. Prof. Dr Eva Rehfuss, Ludwig-Maximilians-Universität München (LMU Munich) and Pettenkofer School of Public Health, Germany
13. Prof. Dr. Wolfgang Cramer, CNRS-IMBE, Académie d'Agriculture de France, Aix-en-Provence, France
14. Prof. Dr. Almut Arnecht, KIT, Atmospheric Environmental Research, Garmisch-Partenkirchen, Germany
15. Dr. Irmgard Jordan, Alliance Bioversity and CIAT
16. Dr. Adrian Leip, Bioeconomy, Brussels, Belgium
17. Dr. Margareta Büning-Fesel, Director General, Federal Centre for Nutrition, Bonn, Germany
18. Prof. Emeritus Howard Frumkin, University of Washington, USA
19. Professor Rachel Bezner Kerr, Department of Global Development, Cornell University, Ithaca USA
20. Professor Jonathan Patz, Director, Global Health Institute of the University of Wisconsin-Madison
21. Prof. Dr. Dr. Martina Schäfer, Center for Technology and Society, Technische Universität Berlin, Berlin, Germany
22. Prof. Dr. Jörg Niewöhner, Human-Environment Systems, IRI THESys, HU Berlin, Germany
23. Emeritus Prof. Barbara Harriss-White, Wolfson College, Oxford University, UK
24. Prof. Sir Andy Haines, Professor of Environmental Change and Public Health, Centre for Climate Change and Planetary Health, London School of Hygiene and Tropical Medicine, UK
25. Prof Soora Naresh Kumar, Indian Agricultural Research Institute, New Delhi, India
26. Dr Jody Harris, Institute of Development Studies, UK
27. Dr. Srinivasan Ramasamy, World Vegetable Center, Shanhua, Tainan, Taiwan

28. Dr. Wafaie Fawzi, Richard Saltonstall Professor of Population Sciences, and Professor of Nutrition, Epidemiology and Global Health, Harvard T.H. Chan School of Public Health, Boston, MA, USA
29. Dr Ana Pereira, Institute of Nutrition and Food Technology, University of Chile, Santiago, Chile
30. Prof. Dr. Ralf Seppelt, Helmholtz Centre for Environmental Research, Martin-Luther University Halle-Wittenberg.
31. Dr. Fabrice DeClerck, EAT and Alliance of Bioversity and CIAT of the CGIAR. Montpellier, France
32. Prof. Dr. Patrick Webb, Friedman School of Nutrition Science and Policy, Tufts University, Boston, USA
33. Prof. Dr. Ir. Peter H. Verburg, VU University Amsterdam & Swiss Federal Research Institute for Forest, Snow and Landscape Research WSL.
34. Dr. Samuel Myers, Department of Environmental Health, Harvard School of Public Health
35. Prof. Dr. Wilfried Winiwarter, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria
36. Prof. Dr. Mark Lawrence, Institute for Advanced Sustainability Studies, Potsdam, Germany
37. Prof. Michael Obersteiner, Environmental Change Institute, University of Oxford, UK
38. Prof. Dr. Keith P. West, Jr., Department of International Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA
39. Dr. Birgit Müller, Helmholtz-Centre for Environmental Research - UFZ, Leipzig, Germany
40. Prof. Philippe Ciais, Laboratoire des Sciences du Climat et de l'Environnement, Gif sur Yvette France
41. Professor Peter Scarborough, University of Oxford, UK
42. Dr. Esther Boere, Biodiversity and Natural Resources Program, International Institute for Applied Systems Analysis, Austria
43. Prof. Dr. Anette Buyken, Institute for Nutrition, Consumption and Health, Paderborn University, Germany
44. Prof. Dr. Christoph Schneider, Humboldt-Universität zu Berlin, Germany
45. Dr. Prajal Pradhan, Potsdam Institute for Climate Impact Research, (PIK), Potsdam, Germany
46. Prof. Dr. Peter H. Feindt, Agricultural and Food Policy Group, Thuer Institute for Agricultural and Horticultural Sciences, Humboldt-Universität zu Berlin, Germany
47. Dr. Peter von Philipsborn, Ludwig-Maximilians-Universität München (LMU Munich) and Pettenkofer School of Public Health, Germany
48. Dr. Susanne Hanger-Kopp, Climate Policy Lab, ETH Zürich
49. Jun.-Prof. Dr. Laura M. König, University of Bayreuth, Germany
50. Dr Pierre-Marie Aubert, Institute for Sustainable Development and International Relations (Iddri)
51. Prof. Mark Pelling, King's College London, UK
52. PD Dr. Christian Schulz, AG Klimawandel, Klinik für Anästhesiologie und Intensivmedizin, Technische Universität München
53. Dr. Barbara Hentzsch, Leibniz Institute for Baltic Sea Research
54. Dr. Steven Lord, Environmental Change Institute, University of Oxford, UK
55. Prof. Lindsay C Stringer, University of York, UK

56. Dr. Tim G Williams, Institute for Environmental Studies, Vrije Universiteit Amsterdam
57. Dr. Anne Elise Stratton, Institute Prof Environmental Studies, Vrije Universiteit Amsterdam, the Netherlands
58. Dr. Lisa Schipper, University of Oxford and University of Vienna
59. Prof. Dr. Wolfgang Kießling, Friedrich-Alexander Universität Erlangen-Nürnberg
60. Dr. Dariush Mozaffarian, Friedman School of Nutrition Science & Policy, Tufts University, USA
61. Camille Venier-Cambron, PhD Candidate, IVM VU Amsterdam
62. Prof. Dr. Anita Engels, Universität Hamburg, Germany
63. Dr. Jennifer Cole, Royal Holloway University of London, UK.
64. Prof. Dr. Rita Adrian, Leibniz Institute of Freshwater Ecology and Inland Fisheries, Berlin, Germany
65. PD Dr. Christian S. Keßler, M.A., M.Sc.; Charité Universitätsmedizin Berlin, Germany
66. Dr. Martin Herrmann KLUG Deutsche Allianz Klimawandel und Gesundheit, Munich Germany
67. Gianluca Brunori, PAGE group University of Pisa, Italy
68. Prof (Adj.) Dr Ian Darnton-Hill AO, University of Sydney, Australia
69. Prof. Johannes Mann, University of Erlangen, Germany
70. Dr. Bernhard Goodwin, Munich Science Communication Lab, LMU Munich, Germany
71. Prof. Jeffrey B. Blumberg, Tufts University, Boston, MA USA
72. Prof. Dr. Christof Mauch, Rachel Carson Center for Environment and Society, LMU Munich, Germany
73. Dr. Martin Jung, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria
74. Dr. Michael Beckmann, Helmholtz Centre for Environmental Research - UFZ, Leipzig Germany
75. Dr. Florian Zabel, Ludwig-Maximilians-University Munich, Germany.
76. Maïke Voss, German Alliance on Climate Change and Health (KLUG), Berlin, Germany
77. Prof. Camille Parmesan, Make Our Planet Great Again Laureate, Theoretical and Experimental Ecology Station (SETE), CNRS, France
78. Jan-Frederic Kuhlmann, PhD Candidate, Ludwigs-Maximilians-Universität (LMU) München
79. Prof. Dr. Patrick Hostert, Geography Department, Humboldt-Universität zu Berlin, Germany
80. Prof. Dr. Dagmar Mithöfer, Thae-Institute of Agricultural and Horticultural Sciences, Humboldt-Universität zu Berlin, Germany
81. Prof Daniela Schmidt, Cabot Institute & University of Bristol, UK
82. Matthias Siebeck, Center for International Health, LMU Hospital, Munich, Germany
83. Prof. Dr. Jan Börner, Institute for Food and Resource Economics & Center for Development Research, University of Bonn, Germany
84. Dr. med. Eva-Maria Schwienhorst-Stich, MSciH, Planetary Health Unit, University of Würzburg Medical School and Department of General Practice, University Hospital Würzburg, Germany
85. Dr. Klaus Jacob, Freie Universität Berlin
86. Professor Mike Rayner, University of Oxford, UK
87. Dr. Gordon Fitch, University of Massachusetts Amherst, USA

88. Dr. Elias Charles Nyanza, Catholic University of Health and Allied Sciences, MWANZA, Tanzania.
89. Professor Holly K. Gibbs, University of Wisconsin-Madison, USA
90. Professor Owen T. Lewis, University of Oxford, UK
91. Lesli Hoey, Sustainable Food Systems Initiative, University of Michigan, USA
92. Dr. Claudia Hunecke, Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany
93. Prof. Dr. Henny Annette Grewe, Public Health Institute Fulda
94. Dr. Valentin Fiala, Freie Universität Berlin, Germany
95. Dr. med. Hannah Richter, Global Advisory Council on Global Change, Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany
96. Dr. Tatiana Schreiber, Environmental Studies, Keene State College, USA
97. Professor Emeritus Bruno Borsari, Department of Biology, Winona State University, Winona, MN 55987, USA
98. Dr. med. Kristin Hünninghaus, University Hospital Essen, Germany
99. Dr. Erin Coughlan de Perez, Feinstein International Center, Friedman School of Nutrition Science & Policy, Tufts University, USA
100. Prof. Martin Fischer, Institute of Medical Education, University Hospital, LMU Munich, Munich, Germany
101. PD Dr. Guenter Froeschl, Center for International Health, LMU Munich
102. Prof Lilia Ahrné, Department of University of Copenhagen, Denmark
103. Dr. Simone K. Frey, Nutrition Hub, Berlin, Germany
104. Amanda Harding, Convene
105. Dr. Melanie Schneider, Institute of Health Sciences, University of Education Schwäbisch Gmünd, Germany
106. Professor Molly Anderson, Middlebury College, Middlebury, VT, USA
107. Prof. Tobias Kuemmerle, Geography Department, Humboldt-Universität zu Berlin, Germany
108. Stefano Bisoffi, Independent expert, Italy
109. Katharina Wabnitz MD, MSc, Ludwig-Maximilians-Universität Munich, Germany & German Alliance on Climate Change and Health (KLUG)
110. Philippe Huneman, Research Director, IHPST, CNRS, Paris
111. Prof. Dr. Dea Niebuhr, Fulda University of Applied Sciences, Fulda Public Health Centre, Germany
112. Dr. Alexandra Thorn, Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy, Tufts University, Boston USA
113. Niklas Oppenrieder MD, Physicians Association for Nutrition (PAN), Munich, Germany
114. Dr Alexander Popp, Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany
115. Dr. Christian Abshagen, MBA, University Hospital Basel and School of Life Sciences University of Applied Sciences and Arts Northwestern Switzerland
116. Prof. Dr. Kerstin Cuhls, Fraunhofer Institute for Systems and Innovation Research, Karlsruhe, and University of Heidelberg.
117. Prof. Dr. Louise Willemen, Faculty of Geo-Information Science and Earth Observation, University of Twente, Netherlands
118. Prof. Dr. Andy Nelson, Faculty of Geo-Information Science and Earth Observation, University of Twente, Netherlands

119. Jun-Prof. Lisa Biber-Freudenberger, Center for Development Research, Bonn University, Germany
120. Prof. Dr. med. Clarissa Prazeres da Costa, Center for Global Health, School of Medicine, Technical University Munich (TUM), Germany
121. Dr Pauline Scheelbeek, Centre on Climate Change & Planetary Health, London School of Hygiene & Tropical Medicine
122. Dr. Florian Humpenöder, Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany
123. Dr Alberte Bondeau, CNRS, Mediterranean Institute for marine and terrestrial Biodiversity and Ecology, Aix-Marseille University, Aix-en-Provence, France
124. Dr. Christoph Müller, Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany
125. Prof. a. D. Wolfgang Bokelmann, Thaer Institute of Agricultural and Horticultural Science, Humboldt Universität zu Berlin, Germany
126. Dr. Anne Lotte Potzel, Physicians Association for Nutrition (PAN), Munich, Germany
127. Dr. Alexandra Schneider, Institute for Epidemiology, Helmholtz Zentrum München (HMGU), Neuherberg, Germany
128. Prof. Dr. Heike Lotze, Department of Biology, Dalhousie University, Halifax, Canada
129. Dr. Marion Desquilbet, Toulouse School of Economics, INRAE, Toulouse, France
130. Prof. Dr. Markus Reichsten, Max-Planck-Institute for Biogeochemistry, Jena
131. Prof. Dr. Philippe Baret, Université de Louvain, Louvain-la-Neuve, Belgium
132. Dr Eve Fouilleux, CNRS-LISIS, CIRAD-MoISA (Montpellier Interdisciplinary Center for Sustainable Agri-Food Systems), Montpellier University, France
133. Prof. Ivette Perfecto, University of Michigan, Ann Arbor, MI, USA
134. Prof. Dr. Eike Luedeling, Institute of Crop Science and Resource Conservation, University of Bonn, Germany
135. Dr. Jennifer N. Nielsen, Senior Nutrition Advisor, Helen Keller International, New York, NY, USA
136. Prof. Dr. Kurt Christian Kersebaum, Leibniz Centre for Agricultural Landscape Research, Müncheberg, Germany
137. Prof. Dr. Heidi Webber, Leibniz Centre for Agricultural Landscape Research, Müncheberg, Germany
138. Prof. Dr. Ralf Ludwig, Department of Geography, LMU Munich, Germany
139. Dr. Toby D. Pilditch, University of Oxford and University College London
140. Dr. Tom van Mourik, Global Food Systems Advisor, Helen Keller International, Haarlem, The Netherlands
141. Dr Laurence Gaume, CNRS-INEE (National Institute for Ecology and Environment), AMAP, Montpellier University, France.
142. Dr Etienne-Pascal Journet, CNRS and INRAE (National research institute for agriculture and environment), AGIR, Toulouse University, France
143. Dr Jeanne Pahun, Chaire santé de Sciences Po Paris, Paris, France
144. Dr Laurans Marilyne-CIRAD (French Agricultural Research Centre for International Development), AMAP, Montpellier University, France
145. Dr. Pierre Martre, LEPSE, Université Montpellier, INRAE, Institut Agro Montpellier, Montpellier, France
146. Prof. Dr. Anna Cord, Chair of Computational Landscape Ecology, TU Dresden, Germany
147. Nicolas Treich, Toulouse School of Economics, INRAE, Toulouse, France



148. Oleksandr Mialyk, PhD candidate, Multidisciplinary Water Management group, University of Twente, the Netherlands
149. François Warlop, Research Group in Organic Farming/Sciences Citoyennes, Avignon, France
150. Dr Peter Alexander, School of Geosciences, University of Edinburgh, UK
151. Dr Jean-Baptiste Floc'h, Centre pour la biodiversité, Institut de Recherche en Biologie Végétale, Montréal. Canada
152. Andrew Farlow, Nuffield Department of Medicine and Oxford Martin School, University of Oxford
153. Dany Neveu, Docteur en pharmacie, Université de Poitiers, France
154. Dr. Thomas Wassmer, Biology Department, Siena Heights University, Adrian, Michigan, USA
155. Théo Guillerminet, MSc in Ecology and evolutionary biology, University of Montpellier, France
156. Dr. Lisa Rausch, University of Wisconsin-Madison, USA
157. Dr. Swetha Manohar, Johns Hopkins University, USA
158. Dr Naomi Saville, University College London, UK
159. Dr. Bruce G. Ferguson, Dept. of Agriculture, Society, and the Environment, El Colegio de la Frontera Sur, San Cristóbal de Las Casas, Mexico
160. Dr. Debora Ley, Economic Affairs Officer, Energy and Natural Resources, Economic Commission for Latin America and the Caribbean (ECLAC)
161. Dr. Kathryn De Master, Department of Environmental Science, Policy, and Management, University of California, Berkeley
162. Dr. Daniel Müller, Department of Structural Change, Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale), Germany
163. Dr. Jonas Jägermeyr, Columbia University Climate School and NASA Goddard Institute for Space Studies, New York, USA
164. Professor Andrew K L Robinson, Deputy Dean, North West University, Public Health Physician.
165. Stefanie Bühn, German Alliance on Climate Change and Health (KLUG), Berlin, Germany
166. Prof. Dr. Elmar Schulte-Geldermann, Department of Life Science, Bingen, University of Applied Sciences, Bingen am Rhein, Germany
167. Prof. Dr. Reimund P. Rötter, Department of Crop Sciences, University of Göttingen, Göttingen, Germany
168. Dr. Laura Kehoe, University of Oxford, UK; The Nature Conservancy, UK
169. Dr. Katja Schiffrers, Institute of Crop Science and Resource Conservation, University of Bonn, Germany
170. Prof. Dr. Richard Lucius, FoodBerlin, Berlin, Germany.
171. Dr. David Leclère, Biodiversity and Natural Resources Program, International Institute for Applied Systems Analysis, Austria
172. Bina Agarwal, Professor of Development Economics and Environment, The University of Manchester, UK
173. Dr. Romain Espinosa, CIRED, CNRS, Paris, France
174. Dr. Kim Gruetzmacher, Museum für Naturkunde, Leibniz-Institute for Evolution and Biodiversity Research
175. Prof. Nanette Ströbele-Benschop, University of Hohenheim, Germany
176. Dr. Annie Chateau, Bioinformatics, University of Montpellier, France

177. Dr. Nathalie de Noblet-Ducoudré, Laboratoire des Sciences du Climat et de l'Environnement, CEA; Académie d'Agriculture de France; Paris, France
178. Dr. Christian Folberth, International Institute for Applied Systems Analysis, Laxenburg, Austria
179. Dr. Alexandre Courtiol, Leibniz Institute for Zoo & Wildlife Research, Berlin, Germany
180. Prof. Dr. Martin Smollich, Institute of Nutritional Medicine, University Medical Center Schleswig-Holstein, Lübeck, Germany
181. Dr. Clelia Sirami, French National Research Institute on Agriculture, Food and Environment, Toulouse, France.
182. Prof. Dr. Jessica Aschemann-Witzel, MAPP Center for Research in Food Marketing and Consumer Behaviour, Department of Management, Aarhus University
183. Dr. Marten Graubner, Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale), Germany
184. Dr. Guillaume Martin, French National Research Institute on Agriculture, Food and Environment, Toulouse, France.
185. Gabi Waldhof, Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale), Germany
186. Prof. Dr. a.D. Alois Heißenhuber, Agricultural Economics and Farm Management, Technische Universität München-Weihenstephan
187. Dr. Florence Volaire, French National Institute for Agronomic Research and environment (INRAE), Montpellier, France
188. Dr. Raphaël Manlay, AgroParisTech, Montpellier, France
189. Prof. Dr. Bernhard Schauburger, University of Applied Sciences Weihenstephan-Triesdorf & Potsdam Institute for Climate Impacts Research (PIK)
190. Dr. Philippe Grandcolas, Director, Institut de Systématique, Evolution et Biodiversité, Muséum national d'Histoire naturelle, CNRS, Sorbonne Université, EPHE, UA, CP50, 57 rue Cuvier, 75005 Paris, France
191. Dr. Vivian Valencia, Assistant Professor, Farming Systems Ecology, Wageningen University and Research, The Netherlands
192. Dr. Silvia De Monte, IBENS, PSL Research University, Paris, France and Max Planck Institute for Evolutionary Biology, Plön, Germany
193. Dr. Olivier Jaillon, CEA, Genoscope, Evry, France
194. Dr. Sabrina Schulz, Executive Director, Sustainable Development Solutions Network (SDSN) Germany
195. Dr. Jeroen Candel, Associate Professor of Food and Agricultural Policy, Wageningen University, the Netherlands.
196. Dr. Chantal Le Mouél, French National Research Institute on Agriculture, Food and Environment, Rennes, France.
197. Dr. Tomáš Václavík, Associate Professor, Department of Ecology and Environmental Sciences, Palacký university Olomouc, Czech Republic
198. Dr. Josette Garnier, Research Director CNRS, Metis 7619, Sorbonne Université, Paris, France
199. Dr. Christoph Schmitz, Founder and Managing Director of Acker e.V., Bessemerstr. 2-14, 12103 Berlin
200. Dr. Ulrich Kreidenweis, Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB), Potsdam, Germany

201. Dr Patricia Genet, Professor assistant, Institute of ecology and environmental sciences of Paris, Université Paris Cité, France
202. Dr. Dilini Abeygunawardane, Research Associate, Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale), Germany
203. Dr. Friedrich J. Bohn, Helmholtz Centre for Environmental Research - UFZ, Leipzig, Germany
204. Dr Christian Mougin, Research Director, INRAE, ECOSYS, Versailles, France
205. Dr Sarah Jones, Scientist, Alliance of Bioversity International and International Center for Tropical Agroforestry, Montpellier, France
206. Dr. Kati Krähnert, Potsdam Institute for Climate Impact Research (PIK)
207. Dr. François Chiron, Université Paris Saclay, Ecology Systematics Evolution, Orsay, France
208. Dr. Raphaël Antoine, Research Scientist, Centre for Studies on Risks, the Environment, Mobility and Urban Planning (Cerema), Endsum research team, Rouen, France
209. Dr. Fabienne Barataud, Research Engineer, National Research Institute for Agriculture, Food and the Environment (INRAE), Nancy, France
210. Dr Hélène I Joly, CIRAD, Crop evolution scientist, research unit AGAP (Plant adaptation and plant breeding), Dynamics of Diversity, Societies and Environment team. Montpellier , France
211. Dr. Sarah Scholze, Center for International Health, LMU Munich
212. Dr Denis Lairon, Emeritus research director at INSERM, Human nutrition team-Sustainable food systems at Cardio-vascular and nutrition research center INSERM-INRAE-AMU, Faculty of Medicine, Aix-Marseille University, France
213. Dr. Jean-Michel Olivier, research engineer CNRS, UMR CNRS 5023-LEHNA, University of Lyon France
214. Dr Manon Fallet, Postdoctoral researcher at MTM Research Center, Örebro University, Sweden
215. Prof. Michael Bonsall, University of Oxford, United Kingdom.
216. Jérôme Belliard, Research Engineer, National Research Institute for Agriculture, Food and the Environment (INRAE), HYCAR RU, Antony, France
217. Dr. Gabrielle Bouleau, Research Scientist, National Research Institute for Agriculture, Food and the Environment (INRAE), Champs-sur-Marne, France
218. Catherine Donnars, Research Engineer, French National Research Institute for Agriculture, Food and Environment, Paris, France.
219. Dr. Emmanuelle Kesse-Guyot, Senior Researcher, INRAE, France.
220. Dr Timothée Cook, Science Officer at BlueSeeds, Darwin Ecosystem, Bordeaux, France
221. Dr Thierry Desjardins, IRD, Paris, France
222. Dr. Ing. Martin Seidl, Senior researcher, LEESU ENPC, Champs/Marne, France
223. Dr. Anja Hansen, Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB), Potsdam, Germany.
224. Dr. Alberto Sanz-Cobena, Associate Professor at the Research Center for the Management of Agricultural and Environmental Risks (CEIGRAM) of the Universidad Politécnica de Madrid (UPM, Spain).
225. Jun.Prof. Dr. Antje Risius, Professur Ernährung Gesundheit und Nachhaltigkeit, Pädagogische Hochschule Schwäbisch Gmünd/Universität Göttingen (Germany)

226. Dr. Christine Hatté, researcher at the Laboratoire des Sciences du Climat et de l'Environnement (Gif-sur-Yvette, France) and associate professor at the Silesian University of Technology (Gliwice, Poland)
227. Dr Thomas Pugh, Senior Lecturer, Lund University, Sweden.
228. Dr Jan Ellenberger, Researcher at the Institute of Crop Science and Resource Conservation, University of Bonn, Germany.
229. Carmen Klinger, PhD Candidate, Ludwigs-Maximilians-Universität (LMU) München
230. Pierre-Alain Jayet, DR INRAE (National research institute for agriculture, food and environment)
231. Pr. Jean-Marie Mouchel, Sorbonne Université, Paris.
232. Thomas Puech, Research Ingeneer, National Research Institute for Agriculture, Food and the Environment (INRAE), Mirecourt, France
233. Mr. Olav Kjørven, Senior Director of Strategy, EAT Foundation, Oslo, Norway
234. Dr. Gesa Maschkowski, Federal Centre for Nutrition, Bonn, Germany.
235. Masihullah Hasanyar, Doctorant, Mines ParisTech, Fontainebleau, France
236. Dr. Kai Kornhuber, Lamont-Doherty Earth Observatory, Columbia University, NYC
237. Dr. Agnès Rivièrè, researcher at Mines ParisTech, PSL University, Paris, France
238. Dr. Michel Meybeck, Senior scientist, CNRS, Sorbonne Université, Paris, France
239. Ivanka Puigdueta Bartolomé, MSc in Environmental Sciences, Research Centre for the Management of Agricultural and Environmental Risks (CEIGRAM), Spain
240. Dr. Carmen Bessa Gomes, Associate Professor, AgroParisTech, Paris, France
241. Dr. Niels Debonne, postdoctoral researcher, Swiss Federal Research Institute WSL and VU Amsterdam, Switzerland/the Netherlands
242. Dr. Christian Levers, Assistant Professor, Vrije Universiteit Amsterdam, The Netherlands
243. Marie Aureille, PhD Candidate, Ecole des Hautes Etudes en Sciences Sociales, Paris, France
244. Dr Thierry Desjardins, IRD, Paris, France
245. Dr. Rasmus Einarsson, Postdoctoral researcher at the Research Center for the Management of Agricultural and Environmental Risks (CEIGRAM), Universidad Politècnica de Madrid (UPM), Spain
246. Prof Pete Smith FRS, FRSE, Professor of Soils & Global Change, University of Aberdeen, Scotland, UK
247. Dr. François Bonhomme, Directeur de recherches émérite, Université de Montpellier, France
248. Dr. Hervé Philippe, Directeur de recherche, Station d'Écologie Théorique et Expérimentale, UAR CNRS 2029
249. Dr. Yasmina Boussafir, Ingénieure, Université Gustave Eiffel, Département Géotechnique Environnement Risques naturels Sciences de la terre, Campus Marne-la-Vallée, France
250. Bram Droppers, PhD, Wageningen University, Wageningen, The Netherlands
251. Dr. Pietro Barbieri, Associate Professor, Bordeaux Sciences Agro, Bordeaux, France
252. Dr. Michael Hagenlocher, Associate Academic Officer, United Nations University, Institute for Environment and Human Security (UNU-EHS), Bonn, Germany
253. Dr. Amanda Wendt, Climate Change and Health Working Group, Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany

254. Dr. Yue Dou, Assistant professor, Natural Resource Department, Faculty of Geoinformation Science and Earth Observation, University of Twente, the Netherlands
255. Dr. Julie Augustin, Postdoctoral researcher, French Agricultural Research Center for International Development (CIRAD)
256. Dr. Janine Pelikan, Deputy Director, Thünen Institute of Market Analysis.
257. Dr. Julia Baudry, researcher, INRAE, France
258. Bea Bardusch, researcher at Thünen Institute of Market Analysis.
259. Dr. Marco Heinrich, researcher at Thünen Institute of Market Analysis
260. Prof. Dr. Martin Banse, Director, Thünen Institute of Market Analysis
261. Dr. Felicitas Schneider, researcher at Thünen Institute of Market Analysis, Germany
262. Dr. Josef Efken, researcher at Thünen Institute of Market Analysis, Germany
263. Dr. Sebastian Brandis, Speaker of the Board, Stiftung Menschen für Menschen-Karlheinz Böhms Äthiopienhilfe
264. Dr. Anthony Fardet, Research Scientist, National Research Institute for Agriculture, Food and the Environment (INRAE), Clermont-Ferrand/Theix, France
265. Dr Marko Kerac, Associate Professor, London School of Hygiene & Tropical Medicine, UK
266. Dr. Meredith Jackson-deGraffenried, Global Technical Advisor, Helen Keller Intl, Malawi
267. Dr Clotilde Biard, Associate Professor, Sorbonne Université, Institute of Ecology and Environmental Sciences IEES-Paris, Paris, France
268. Dr Rémi Tournebize, Postdoc, Instituto Gulbenkian de Ciência, Oeiras, Portugal
269. Fabian Jacobs, Institute of Medical Education, University Hospital, LMU Munich, Munich, Germany
270. Dr. Ivica Faletar, Researcher at Thünen Institute of Market Analysis, Germany
271. Dr. Julio G. Fournier Gabela, researcher at Thünen Institute of Market Analysis, Germany
272. Dr. Pierre Dupraz, Research Director, National Research Institute for Agriculture, Food and the Environment (INRAE), Rennes, France
273. Dr. and Prof. Emeritus Gerald C. Nelson, University of Illinois, Urbana-Champaign, United States
274. Dr. David Kilian, researcher at Thünen Institute of Market Analysis, Germany
275. Dr Laurent Penet, researcher, National Research Institute for Agriculture, Food and the Environment (INRAE), Petit Bourg, Guadeloupe
276. Elizabeth Zehner, Director, Assessment and Research on Child Feeding Project, Helen Keller International (ARCH), Washington, D.C., USA
277. Dr Vincent Daubin, CNRS, Laboratoire de Biométrie et Biologie Evolutive, Université de Lyon, France
278. Dr. Felix Herzog, Agroscope, Zurich, Switzerland
279. Dr. Julien Tournebize, Senior Researcher, National Research Institute for Agriculture, Food and the Environment (INRAE), HYCAR UR, Antony, France.
280. Dr. Michael Krawinkel, Prof. em., Justus-Liebig-University, Giessen, Germany
281. Dr Patrick A. Jansen, Associate professor, Wildlife Ecology and Conservation group, Wageningen University, The Netherlands.
282. Dr Jean Humphrey, Professor, Human Nutrition. Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA.
283. Prof Dr. Thomas Nesme, Univ Bordeaux and INRAE, Bordeaux, France

284. Dr. Sam S. Rabin, Rutgers University, USA
285. PD Dr. Philipp Grundmann, Leibniz-Institute for Agricultural Engineering and Bioeconomy (ATB) and Humboldt Universität zu Berlin, Germany
286. Prof Ian Hamilton, UCL Energy Institute, University College London, UK
287. Dr. Daniela Weible, researcher, Thünen-Institute of Market Analysis
288. Prof. dr. Roos Vonk, Radboud University, Behavioral Sciences Institute, The Netherlands
289. Dr. Bruno Dorin, Researcher (economics), Cirad/Cired, Paris, France
290. Kenneth A. Meter, MPA, President of Crossroads Resource Center, USA
291. Henk Folmer. Professor of Spatial Economics, University of Groningen, The Netherlands, Professor of Spatial Statistics, Padjadjaran University, Bandung, Indonesia, Founder and first president of the European Association of Environmental and Resource Economics
292. Joel Guiot, emeritus CNRS, CEREGE, Aix-Marseille University, Aix-en-Provence, France
293. Prof. dr. Pim Martens, Maastricht University, The Netherlands
294. Dr. Carsten Meyer, German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Germany
295. Prof. dr. Jeltsje van der Meer-Kooistra, University of Groningen, The Netherlands
296. Dr. Žiga Malek, Vrije Universiteit Amsterdam, the Netherlands
297. Dr. ir. Ignas M.A. Heitkönig, Wildlife Ecology and Conservation group, Wageningen University, The Netherlands.
298. Prof. Dr Theunis Piersma, Rudi Drent Chair in Global Flyway Ecology, GELIFES, University of Groningen & senior research scientist NIOZ Royal Netherlands Institute for Sea Research
299. Emeritus Professor Robert Gottlieb, Occidental College, Los Angeles
300. Dr. Jeanne Nel, Programme Lead: Biodiversity Environment, Wageningen University & Research, the Netherlands
301. Prof. dr Liesje Mommer; Plant Ecology and Nature Conservation; Leader of the Wageningen Biodiversity Initiative; Wageningen University & Research, the Netherlands
302. Dr. Sandrine Dury, Cirad, Montpellier, France.
303. Dr Ludovic Temple, Cirad, Montpellier, France.
304. Prof. Dr Stéphane André; Université de Lorraine, Nancy, France
305. Dr. Nicolas Ferry, Postdoctoral researcher, Bavarian Forest National Park Administration, Germany.
306. Dr. Fabien Esculier, Ecole des Ponts ParisTech, France
307. Dr. Tristan Berchoux, Mediterranean Agronomic Institute of Montpellier, France
308. Dr. Arnaud Béchet, Research Institute of Tour du Valat, Arles, France
309. Dr. Philippe Jarne, Centre d'Ecologie Fonctionnelle et Evolutive, CNRS, France
310. Dr. Lysanne Snijders, Behavioural Ecology Group, Wageningen University & Research, the Netherlands
311. François Mitteau, Conseil orientation recherche et prospective, fédération des parcs naturels régionaux de France
312. Dr Noémie Gaudio, INRAE (National research institute for agriculture, food and environment), AGIR, Toulouse University, France
313. Prof. Frederic Landy, université Paris Nanterre, France
314. Dr. Ralf Kurvers, MPI for Human Development, Berlin, Germany

315. Dr. Jörn Sanders, Research Institute of Organic Agriculture (FiBL), Frick, Switzerland
316. Dr Jean-Marc Meynard, Senior Researcher, National Research Institute for Agriculture, Food and the Environment (INRAE), Grignon, France
317. Gilles Maréchal, chercheur associé, CNRS, Rennes, France
318. Dr Frédéric Magnin, CNRS - IMBE, Aix-en-Provence, France
319. Dr. Laura Michel, senior social scientist, Université de Montpellier, France
320. Borah Lim, University of California, Davis, USA
321. Dr Sophie Gerber, INRAE and Univ Bordeaux, France
322. Prof. Philippe Martin, AgroParisTech and National Research Institute for Agriculture, Food and the Environment (INRAE), Paris, France
323. Dr Nicolas Legay, INSA Centre Val de Loire, CITERES, Blois, France
324. Dr Raphael Leblois, INRAE Montpellier, France
325. Dr. Sébastien Barot, Senior Scientist, IRD, France
326. Dr Romain Garrouste, Researcher MNHN, France
327. Dr Marie-Hélène Jeuffroy, Senior Researcher, National Research Institute for Agriculture, Food and the Environment (INRAE), France
328. Dr Albert Olioso, Senior Researcher, National Research Institute for Agriculture, Food and the Environment (INRAE), France
329. Dr Xavier Poux, Researcher, AScA and IDDRI, France
330. Dr. Chloé Salembier, Researcher, National Research Institute for Agriculture, Food and the Environment (INRAE), France
331. Prof Laurence Després, Université Grenoble Alpes, France
332. Prof. Carole Hermon, Toulouse University, France
333. Dr Isabelle Arpin, Senior Scientist, INRAE, France
334. Prof. Dominique Bourg, honoraire, Université de Lausanne, Suisse
335. Dr. Olivier Godinot, Institut Agro, Rennes, France
336. Prof. Nathalie Frascaria-Lacoste, AgroParisTech, Université Paris-Saclay, France
337. Dr. Mary Stockdale, Department of Community, Culture and Global Studies, Faculty of Arts and Social Sciences, University of British Columbia, Okanagan campus, BC, Canada
338. Dr. Gilles Nalbone, Emeritus research director at INSERM, Aix-Marseille-University.
339. Dr. Grégoire Freschet, Senior Scientist, CNRS, France
340. Dr Fabien Quétier, biodiversity and ecosystem restoration specialist, Rewilding Europe
341. Dr Floriane Clément, Researcher, National Research Institute for Agriculture, Food and the Environment (INRAE), France
342. Dr Sylvaine Lemeilleur, researcher, CIRAD, France
343. Dr Marie Mourad, Food Waste Specialist, independent consultant, France / U.S.
344. Prof. Alex Barnard, Assistant Professor of Sociology, New York University, U.S.
345. François Colson DR honoraire Institute for Agriculture, Food and Environment (INRAE), Nantes, France
346. Dr. Jean-François Molino, Botanist and Ecologist, Institut de Recherche pour le Développement (IRD), France
347. Prof. Dr. Marie-Antoinette Mélières, honoraire, LGGE, Université Grenoble Alpes, France

348. Dr. Didier Bazile, agroecologist and geographer, senior researcher at CIRAD, France
349. Mathilde Douillet, agronomist, economist, Fondation Daniel & Nina Carasso, France
350. Prof. Sylvie Ferrari, Ecological economist, Bordeaux School of Economics, University of Bordeaux, France
351. Dr. Yves Martin-Prevel, public health nutritionist, senior researcher at IRD, Montpellier, France
352. Prof. Claude Miaud, ecologist, senior scientist at EPHE, Montpellier, France
353. Dr. Isabelle Doussan, jurist, senior researcher at INRAE, France
354. Prof. Dr. Anke Weidenkaff, Materials and Resources, Technical University Darmstadt
355. Dr. Christine Lauzeral, PRAG, EDB, Université Toulouse III, Paul Sabatier, France.
356. Dr Mourad Hannachi, Researcher, National Research Institute for Agriculture, Food and the Environment (INRAE), Grignon, France
357. Dr Carole Bedos, Researcher, INRAE, France
358. Dr Jean-Marc Pons, Muséum national d'Histoire naturelle, Paris, France
359. Prof. Dr. Allison Marie Loconto, sociologist, National Research Institute for Agriculture, Food and the Environment (INRAE), France
360. Dr Emmanuel Torquebiau, Agroforestry specialist, CIRAD (Emeritus), French Agricultural Research Center for International Development, Montpellier, France
361. Dr Antoine Leblois, Economist, National Research Institute for Agriculture, Food and the Environment (INRAE), France.
362. Dr Benoit Ricci, Researcher in agroecology and agroforestry, INRAE, Montpellier, France
363. Dr Marc Deconchat, Landscape ecologist, INRAE, Toulouse, France
364. Dr Etienne Hainzelin, agronomist, CIRAD, Ottawa, Canada / Montpellier, France
365. Michel Duru, agronomist, INRAE, Toulouse, France
366. Dr Lionel Alletto, agronomist, INRAE, Toulouse, France
367. Prof. Alexandra Magro, evolutionary ecologist, University of Toulouse, France
368. Dr. Frédéric Rees, plant ecophysiologicalist, INRAE, Thiverval-Grignon, France
369. Prof. Jean-Pierre Sarthou, Agronomist-Agroecologist, University of Toulouse, France
370. Dr Simon Vonthron, Geographer, University of Liège, Belgium
371. Dr Simon Fellous, Research director in pest-management and ecology, INRAE, France
372. Sonja Schönberg, Research Dietitian, Bern University of Applied Sciences, Switzerland
373. Gaël Plumecocq, Researcher in economics, INRAE, Toulouse, France
374. Prof. Jane Lecomte, Ecology, Paris-Saclay University, Gif-sur-Yvette, France
375. Dr. Catherine Aubertin, Researcher in environmental economics, IRD-MNHN, France
376. Dr Claire Jouany, agronomist, INRAE, Toulouse, France
377. Emeritus Professor Doyle McKey, ecologist, University of Montpellier, France
378. Paola Clerino, agronomist, INRAE, Paris, France
379. Emeritus Professor Barbara Demeneix, Muséum National d'Histoire Naturelle, Paris, France
380. Dr. med. Antje Herbst, MPH, Klinikum Leverkusen, Klinik für Kinder und Jugendliche, Leverkusen, Germany
381. Pr Alexandra Jullien, ecophysiologicalist, AgroParisTech, Université Paris-Saclay, France



382. Professor Pierre Cornu, Late Modern History & History of Sciences, Lumière University Lyon 2 / Inrae, France
383. Prof. Dr. Claire Chenu, soil scientist INRAE, Grignon, France. Coordinator of the H2020 European Joint Programme SOIL.
384. Dr. Jacques Blondel, Centre d'Ecologie Fonctionnelle et Evolutive, CNRS, Montpellier, France
385. Professor Florence Pinton, environmental and rural sociology, Agroparistech, University Paris Saclay, France
386. Prof. Dr. Salma Loudiyi, geographer, VetAgro Sup, Clermont-Ferrand, France
387. Dr Marianne Cerf, Ergonomics, UMR SadApt, INRAE AgroParisTech, University Paris Saclay, France
388. Dr. Pierre-Benoit Joly, Economics and sociology, LISIS, INRAE, Paris, France
389. Dr. Sylvain Pellerin, agronomist, INRAE, France
390. Dr. Christine King, Researcher in earth science, natural hazards, BRGM, member of the French Academy of Agriculture
391. Dr. Francois Bousquet, social and ecological systems, UMR SENS, CIRAD
392. Dr Pierre Benoit, soil scientist, INRAE, Grignon, France
393. Dr Timothée Flutre, geneticist, INRAE, Université Paris-Saclay, France
394. Dr Alain Vidal, Consulting Professor, AgroParisTech, Montpellier, France
395. Dr Francesco Accatino, Researcher (socio-ecological modelling), UMR SadApt, INRAE AgroParisTech, University Paris Saclay, France
396. Ass. Pr. Christophe Déprés, economist, VetAgro Sup, Clermont-Ferrand, France
397. Dr Roseline Remans, Researcher on Biodiversity in Food systems, Glocolearning & Multi-functional Landscapes, Alliance of Bioversity and CIAT, CGIAR
398. Dr Mireille Navarrete, Senior Researcher, National Research Institute for Agriculture, Food and the Environment (INRAE), Ecodéveloppement Unit, France
399. Prof. François Sarrazin, conservation ecology, CESCO, Sorbonne Université, Paris, France.
400. Dr. Amy Webb Girard, Associate Professor, Hubert Department of Global Health, Rollins School Of Public Health, Emory University Atlanta GA USA
401. Dr. med. Sarah Verweyen, M.A.Kulturwissenschaften & Komplementärmedizin, Germany
402. Dr. Abigail Fallot, UMR SENS, CIRAD France
403. Professor Ricardo Abramovay University of Sao Paulo (Environment Program)
404. Dr Benoît Lallau, Sciences Po Lille, France
405. Philippe Segers, Head of European HPC projects, GENCI, France
406. Dr. Jean-Philippe Choisis, agronomist, French National Research Institute on Agriculture, Food and Environment (INRAE), UMR Selmet, Montpellier, France.
407. Dr. David Grémillet, senior scientist at the French National Center for Scientific Research (CNRS). Centre d'Etudes Biologiques de Chizé (CEBC) / La Rochelle Université. Chaire d'Excellence Nouvelle Aquitaine. France.
408. Professor Dr Chevalier John R Porter, University of Copenhagen, Denmark
409. Dr. Yanne Goossens, researcher at Thünen Institute of Market Analysis, Germany
410. Luca Colombo, Secretary General, Italian Foundation for Research in Organic Agriculture (FIRAB), Italy
411. Dr Soizic Rochange, Toulouse University, France
412. Prof. Dr. Angela Häußler, Nutrition and Home Economics University of Education Heidelberg, Germany

413. Prof. Dr. Katja Schneider, Nutrition Ecology and Nutrition Education, University of Education Heidelberg, Germany
414. Dr. Christine Aubry, Agronomist, INRAE AgroParistech, France
415. Prof. Ranjan Kumar Ghosh, Indian Institute of Management Ahmedabad, India
416. Dr. Cian Blaix, UMR GEOLAB, Université Clermont Auvergne, CNRS, France
417. Professor Sophie Devienne, Agroeconomist, Social and Economic Sciences, AgroParisTech, Paris
418. Dr. Marie Nevoux, INRAE, Dynamics and durability of ecosystems, France
419. Dr. Valentin Bellassen, Agricultural and food economics, INRAE, France
420. Dr. Anne Teyssède, ecologist, Institut de la Transition Environnementale, Paris, France
421. Dr. Johanna Schott, researcher, Thünen-Institute of Market Analysis
422. Dr. Rosemary Green, Associate Professor in Sustainability, Nutrition and Health, Centre on Climate Change and Planetary Health, London School of Hygiene & Tropical Medicine, UK
423. Dr. Julian Helfenstein, postdoctoral researcher, Agroscope, Zürich, Switzerland
424. Dr. Caroline Brand, Lecturer, ISARA-LER, Lyon, France
425. Dr. Philippe Burger, agronomist, INRAE, Montpellier, France
426. Dr. Raphaël Paut, agronomist, INRAE, France
427. Dr. Benoît Geslin, Ecologist, Associate Professor, IMBE, Aix-Marseille Université, Avignon Université, CNRS, IRD, Marseille, France
428. Dr. Marie-Claude Marsolier, geneticist, CEA/MNHN, Paris, France
429. Dr. Marine Legrand, anthropologist, LEESU, Ecole des Ponts Paristech, Marne-la-Vallée, France
430. Dr. Christine Léger-Bosch, economist, INRAE, Clermont-Ferrand, France
431. Prof. Christian A. Kull, geographer, University of Lausanne, Switzerland
432. Dr. Antoine Gardarin, agronomist and ecologist, AgroParisTech, INRAE, France
433. Dr. Benjamin Loubet, Environmental scientist, INRAE, France
434. Dr. Nicole de Paula, Founder of the Women Leaders for Planetary Health and Affiliate Scholar at the Institute for Advanced Sustainability Studies, Potsdam, Germany
435. Dr. Daniela Küllenberg de Gaudry, Independent expert, Freiburg, Germany
436. Pr. Marianne Le Bail, agronomist, Agroparistech INRAE, Paris, France
437. Dr. Katja Kehlenbeck, Climate Change and Health Working Group, Charité Universitätsmedizin Berlin, Germany
438. Dr. Barbara Kaiser, Federal Centre for Nutrition, Bonn, Germany
439. Dr. Gregor Hagedorn, Museum für Naturkunde Berlin, Germany
440. Dr. François Papy, Académie d'agriculture de France, France
441. Audrey Béthinger, Research engineer, INRAE, France
442. Christian Feist, CEO, GESOCA GmbH
443. Françoise Lescourret, agroecologist, INRAE, Avignon, France
444. Dr. Marianne Lefebvre, agricultural economist, Angers, France
445. Dr. Hayo van der Werf, agroecologist, INRAE, France
446. Dr. Luc Bodiguel, Agricultural and Food Lawyer, CNRS, France
447. Dr. Alexander Beck, Managing board member, AöL e.V., Germany
448. Dr. Benoît Fontaine, Muséum National d'Histoire Naturelle, France
449. Dr. Pauline Marty, UR InSyTE, Université de Technologie de Troyes, France

450. Dr. Loïc Viguier, Research engineer, National Research Institute for Agriculture, Food and the Environment (INRAE), France
451. Prof. Stefan Rahmstorf, climatologist, Potsdam Institute for Climate Impact Research, Germany
452. Dr. Ir. A.R. Hof, Wildlife Ecology and Conservation group, Wageningen University, The Netherlands
453. Prof. em. Michael B. Krawinkel, MD, Institute of Nutritional Sciences, Justus-Liebig-University, Giessen, Germany
454. Dr. Nicolas Gross, National Research Institute for Agriculture, Food and the Environment (INRAE), France
455. Julie Borg, National Research Institute for Agriculture, Food and the Environment (INRAE), Avignon, France
456. Dr. Francine Van den Brandeler, Swiss Federal Institute of Aquatic Science and Technology (Eawag), Dübendorf, Switzerland
457. Prof. Dr. Jelle Bijma, Alfred-Wegener-Institut, Helmholtz Zentrum für Polar- und Meeresforschung (AWI), Bremerhaven, Germany
458. Dr Frédéric Madre, Directeur associé de Topager, chercheur associé au CESCO (MNHN-CNRS-Sorbonne Université), Paris, France
459. Prof. Dr. Claus-Heinrich Daub, University of Applied Sciences and Arts Northwestern Switzerland, Windisch, and University of Basel, Switzerland
460. Prof. Emeritus Mark L. Wilson, University of Michigan, USA
461. Prof. Dr. Werner Aeschbach, Institute of Environmental Physics, Heidelberg University, Germany
462. Dr. Martin Drenthen, Radboud University, Nijmegen, The Netherlands
463. Dr. François Massol, ecologist, senior scientist at the French National Center for Scientific Research (CNRS), Lille, France
464. Dr. Delphine Leenhardt, agronomist, INRAE, Montpellier, France
465. Dr. Lucille Steinmetz, Agence BIO, Montreuil, France
466. Michel Duru, agronomist, INRAE, Toulouse, France
467. Prof. Line Gordon, Stockholm Resilience Centre, Stockholm University, Sweden
468. Dr. Françoise Burel, Emeritus ecologist, CNRS, Rennes, France
469. Dr. András Báldi, Centre for Ecological Research, Vácrátót, Hungary
470. Dr. Olivier Barreteau, water scientist, INRAE, Montpellier, France
471. Dr. Ingo Fetzer, Stockholm Resilience Centre, Stockholm University, Sweden
472. Prof. Dr. Michael Weiß, Steinbeis Innovation Center: Organismal Mycology and Microbiology, Tübingen, Germany
473. Dr. Nathalie Becker, Museum National d'Histoire Naturelle, Paris, France
474. Sophie Frei, Nutritionist, independent expert, Bern, Switzerland
475. Dr. Max Troell, Beijer Institute, The Royal Swedish Academy of Sciences, 10405 Stockholm, Sweden
476. Dr Jean-Marc Bonmatin, Centre National de la Recherche Scientifique, Centre de Biophysique Moléculaire, 45071 Orléans, France
477. Dr Laurence Huc, INRAE, Toxalim, Toulouse, France
478. Dr Laure Hossard, Researcher in Agronomy, National Research Institute for Agriculture, Food and the Environment (INRAE), Innovation, Montpellier, France
479. Polina Voylokova, French National Institute for Agronomic Research and environment (INRAE) Thiverval-Grignon, France
480. Dr Olivier Duchene, Agronomist, ISARA, Lyon, France

481. Dr Léa Tison, Ecotoxicologist, INRAE, Bordeaux, France
482. Dr Delphine Marie-Vivien, Researcher in Food Law, UMR Innovation, CIRAD (French Agricultural Research Centre for International Development), Montpellier, France
483. Nicolas Bricas, researcher in socio-economics of food systems, UMR MoISA, Cirad (French Agricultural Research Centre for International Development) and Director of the Unesco Chair in World Food Systems, Montpellier University, France
484. Martine Antona, social scientist, Commons and Biodiversity, UMR SENS, CIRAD, Montpellier, France
485. Dr Philippe Gaubert, researcher in biodiversity conservation, UMR EDB, Institut de Recherche pour le Développement (IRD), Toulouse, France
486. Dr. Cornelia Huth, MSc, Epidemiologist and Medical Science Manager, medi, Bayreuth, Germany
487. Olivier Therond, HDR, landscape agronomist, UMR LAE, National Research Institute for Agriculture, Food and the Environment (INRAE), Colmar France
488. Carolina Orellana-Torrejon, PhD student, agronomist, AgroParisTech, National Research Institute for Agriculture, Food and the Environment (INRAE), Grignon, France
489. Dr Nelly Moulin, researcher at Agriculture Institute (Agrocampus), Rennes, France
490. Dr Nathalie Hostiou, researcher, UMR Territoires, French National Research Institute For Agriculture, Food and Environment
491. Dr Christian Bockstaller, systemic agronomist, UMR LAE, National Research Institute for Agriculture, Food and the Environment (INRAE), Colmar France
492. Dr Audrey Alignier, landscape ecologist, National Research Institute for Agriculture, Food and the Environment (INRAE), Rennes, France
493. Anne Carolin Schäfer, PhD-Candidate, Scientific department, German Nutrition Society (DGE), Bonn, Germany
494. Dr. My Sellberg, researcher at Stockholm Resilience Centre, Stockholm University, Sweden
495. Dr. Koladé Akakpo, research fellow, CIRAD, Montpellier, France
496. Dr. Lan Wang-Erlandsson, researcher at Stockholm Resilience Centre, Stockholm University, Sweden
497. Prof. Dr.-Ing. Andreas Pfennig, Department of Chemical Engineering, University of Liège, Belgium
498. Dr. Carsten Neßhöver, geoecologist, Coordinator International Academy Transformation for Environment and Sustainability, German Environment Agency (UBA), Germany
499. Dr Alain Baranger, geneticist, French National Institute for Agronomic Research and Environment, Rennes, France
500. Dr. Susanne Rolinski, Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany
501. Dr. Maud Charles, French National Institute for Agronomic Research and environment (INRAE), Rennes, France
502. Dr. Giles B. Sioen, Co-lead for Research and Innovation, Future Earth Global Secretariat, Japan
503. Prof. Dr. Hans-Peter Grosart, microbial ecologist, Leibniz Institute for Freshwater Ecology and Inland Fisheries (IGB), Berlin, Germany

504. Dr. Eduardo Aguilera, Research Center for the Management of Agricultural and Environmental Risks (CEIGRAM), Universidad Politécnica de Madrid (UPM, Spain)
505. Dr. Judith Bopp, VISTRA, University of Vechta, Germany
506. Prof. Dr. Robert Finger, ETH Zürich, Switzerland
507. Prof. Dr. Christoph Gornott, Potsdam Institute for Climate Impact Research (PIK) & University of Kassel, Potsdam & Kassel, Germany
508. Dr. Bettina Wenzel, Julius Kühn Institut - Federal Research Centre for Cultivated Plants, Kleinmachnow, Germany
509. Dra. Gloria I. Guzmán, Agro-ecosystems History Laboratory, Pablo de Olavide University (UPO, Sevilla, Spain)
510. Dr. Tonjes Veenstra, Leibniz-Centre General Linguistics (ZAS), Berlin, Germany
511. Prof. Dr. Nina Buchmann, ETH Zürich, Switzerland
512. Prof. Dr. Bettina Matzdorf, Leibniz Centre for Agricultural Research (ZALF) Müncheberg, Germany
513. Dr. Louisa Prause, Humboldt Universität zu Berlin, Germany
514. Prof. Sebastian Villasante, Economist, CRETUS-Department of Applied Economics, University of Santiago de Compostela, Spain
515. Dr. Toni Klemm, Leibniz Centre for Agricultural Research (ZALF) Müncheberg, Germany
516. Dr. Joan Moranta, Centre Oceanogràfic de Balears, CN Instituto Español de Oceanografía (IEO, CSIC), Mallorca, Spain
517. Dr. Johannes Fehrle, Humboldt Universität zu Berlin, Germany
518. Dr. Karine Princé, Research Associate CESCO - Muséum National d'Histoire Naturelle, Paris, France
519. Dr Frank Liebisch, Head of water protection and substance flows research group at Agroscope, Zürich Switzerland
520. Dr. Renzo Guinto, Chief Planetary Health Scientist, Sunway Centre for Planetary Health, Sunway University, Malaysia and Director, Planetary and Global Health Program, St. Luke's Medical Center College of Medicine, Philippines
521. Prof. Dr. Christine Brombach, Zurich University of Applied Sciences, Wädenswil, Switzerland
522. Dr. Asya Dimitrova, Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany
523. PD Dr. Valentin H. Klaus, ETH Zürich, Zürich, Switzerland
524. Prof. Nadav Davidovitch, Director, School of Public Health, Ben Gurion University of the Negev, Israel
525. Eva Revoyron, PhD candidate, agronomist, National Research Institute for Agriculture, Food and the Environment (INRAE), France
526. Olivier Réchauchère, agronomist, French National Research Institute for Agriculture, Food and Environment (INRAE), Paris, France
527. Dr. Andreas Exner, ecologist and political scientist, RCE Graz-Styria, Center of Sustainable Social Transformation, University of Graz
528. Dr. Christina Plank, Institute for Development Research, University of Natural Resources and Life Sciences, Vienna, Austria
529. Prof. Markus Schermer, Department of Sociology, University of Innsbruck, Austria
530. Univ.-Prof. Christian Zeller, Department of Sociology and Social Geography, University of Salzburg
531. Prof Emmanuel Frossard, Institute of Agricultural Sciences, ETH Zurich

532. Dr Anant Jani, University of Heidelberg and University of Oxford
533. Dr. Friederike Habermann, economist & historian, Commons Institut, Germany
534. Dr Charlotte Spring, Laurier Centre for Sustainable Food Systems, Waterloo, Canada
535. Dr. Miriam Boyer, Department of Agricultural Politics, Humboldt University, Berlin, Germany
536. Prof. Dr. Johanna Jacobi, Institute of Agricultural Sciences, ETH Zürich
537. Jennifer Ramme, De-PI Literatur- und Kulturbeziehungen und Gender Studies, Kulturwissenschaftliche Fakultät, Europa Universität Viadrina, Frankfurt/Oder, Germany
538. Dr. Franck Galtier, CIRAD, France
539. Prof Niels Heine Kristensen, Department of People & Technology, Roskilde University, Denmark
540. Prof. Dr. Aletta Bonn, Department Ecosystem Services Helmholtz-Centre for Environmental Research – UFZ, Friedrich Schiller University Jena, German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Germany
541. Maha Tahiri, Adjunct professor at Tuft university and founder of Nutrition Sustainability Strategies, USA
542. Erum Sattar, Lecturer and Program Director, Sustainable Water Management program, Friedman School of Nutrition Science & Policy, Tufts University
543. Prof. Dr. Claudia Bieling, Dep. Societal Transition and Agriculture, Institute of Social Sciences in Agriculture, University of Hohenheim, Germany
544. Dr. José Luis Vicente-Vicente. Environmental scientist, postdoctoral researcher in agroecology and sustainable food systems, Leibniz Centre For Agricultural Landscape Research (ZALF), Müncheberg, Germany
545. Dr. Agnès Fargue-Lelièvre, agronomist, teacher/researcher, AgroParisTech, National Research Institute for Agriculture, Food and the Environment (INRAE), UMR SAD-APT, Paris-Grignon, France
546. Dr Alexandre Ribéron, associate professor, University of Toulouse III, Laboratoire Evolution & Diversité Biologique, France
547. Prof. Dr.-Ing. Burkhard Ahlert, Food Technology and Microbiology, HS Fulda, Germany
548. Dr. Birgit Hoinle, Dep. Societal Transition & Agriculture, University of Hohenheim
549. Prof. Hagai Levine, School of Public Health, Hebrew University-Hadassah, Jerusalem, Israel
550. Karlotta Koch, PhD Candidate, Dep. Societal Transition and Agriculture, Institute of Social Sciences in Agriculture, University of Hohenheim, Germany
551. Dr. Dorit Adler, President of the Israeli Forum for Sustainable Nutrition - IFSN
552. Dr. Lujain Alqodmani, Director of Global Action, EAT Foundation, Oslo, Norway
553. Dr. Bruno Mary, Research Director, National Research Institute for Agriculture, Food and the Environment (INRAE), UMR BioEcoAgro, Laon, France