- **ARL** ARL – Academy for Territorial Development in the Leibniz Association, Hannover
- **ATB** Leibniz Institute for Agricultural Engineering and Bioeconomy , Potsdam
- **DIfE** German Institute of Human Nutrition Potsdam-Rehbruecke
- **DIE** German Institute for Adult Education – Leibniz-Centre for Lifelong Learning, Bonn
- **DIW** German Institute for Economic Research Berlin
- **DSM** Deutsches Schifffahrtsmuseum – Leibniz-Institut für Maritime Geschichte, Bremerhaven
- **DSMZ** Leibniz-Institute DSMZ–German Collection of Microorganisms and Cell Cultures, Braunschweig
- **FZB** Research Center Borstel – Leibniz Lung Center
- **GESIS** GESIS – Leibniz Institute for the Social Sciences, Mannheim and Köln
- **GIGA** German Institute for Global and Area Studies / Leibniz-Institut für Globale und Regionale Studien, Hamburg
- **IAMO** Leibniz Institute of Agricultural Development in Transition Economies, Halle
- **IAP** Leibniz Institute of Atmospheric Physics at the University of Rostock, Kühlungsborn
- **IGB** Leibniz Institute of Freshwater Ecology and Inland Fisheries, Berlin
- **IGZ** Leibniz Institute of Vegetable and Ornamental Crops, Großbeeren
- **ifo** ifo Institut – Leibniz-Institut für Wirtschaftsforschung an der Universität München
- **IfW** Kiel Institute for the World Economy
- **INP** Leibniz-Institut für Plasmaforschung und Technologie, Greifswald
- **IÖR** Leibniz Institute of Ecological Urban and Regional Development, Dresden
- **IOW** Leibniz Institute for Baltic Sea Research, Warnemünde
- **IPB** Leibniz Institute of Plant Biochemistry, Halle
- **IPK** Leibniz Institute of Plant Genetics and Crop Plant Research, Gatersleben
- **IPHT** Leibniz Institute of Photonic Technology, Jena
- **ISAS** Leibniz-Institut für Analytische Wissenschaften – ISAS, Dortmund and Berlin
- **IUF** IUF – Leibniz Research Institute for Environmental Medicine, Düsseldorf
- **IWH** Halle Institute for Economic Research (IWH) – Member of the Leibniz Association, Halle
- **IWM** Leibniz-Institut für Wissensmedien, Tübingen
- **LEIZA** Leibniz-Zentrum für Archäologie, Mainz
- **LIB** Leibniz Institute for the Analysis of Biodiversity Change, Museum Alexander Koenig Bonn and Museum of Nature Hamburg
- **LSB** Leibniz Institute for Food Systems Biology at the Technical University of Munich, Freising,
- **MfN** Museum für Naturkunde – Leibniz Institute for Evolution and Biodiversity Science, Berlin
- **PIK** Potsdam Institute for Climate Impact Research
- **PRIF** Peace Research Institute Frankfurt, Frankfurt on the Main
- **TROPOS** Leibniz Institute for Tropospheric Research, Leipzig
- **SAFE** Leibniz Institute for Financial Research SAFE, Frankfurt on the Main
- **SGN** Senckenberg Society for Nature Research, Frankfurt on the Main
- **TIB** TIB – Leibniz Information Centre for Science and Technology and University Library, Hanover
- **ZALF** Leibniz Centre for Agricultural Landscape Research, Müncheberg
- **ZAS** Leibniz-Centre General Linguistics, Berlin
- **ZBW** ZBW – Leibniz Information Centre for Economics, Kiel and Hamburg
- **ZEW** ZEW – Leibniz Centre for European Economic Research, Mannheim
- **ZMT** Leibniz Centre for Tropical Marine Research, Bremen

- SECTION A Humanities and Educational Research
- SECTION B Economics, Social Sciences, Spatial Research
- SECTION C Life Sciences
- SECTION D Mathematics, Natural Sciences, Engineering
- SECTION E Environmental Sciences

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Leibniz Association

Front (object and photo): Elke Dingler

lab Systemic Sustainability

Systemic Sustainability

Biodiversity, Climate, Agriculture and Food within Planetary Boundaries

The foundations of life as a major scientific challenge

Biodiversity, climate, agriculture and food – a tense relationship

The current socio-ecological crisis is particularly apparent between biodiversity, climate, agriculture and food. The loss of biodiversity and climate change are progressing rapidly. One of the causes is the increasing intensity of agriculture worldwide, as well as food industry and demand. Environmental change in turn exacerbates the risks for agriculture and food security. Many facets of this crisis are already being investigated. The enormous pressure to act underlines the need for more holistic and actionable knowledge. This involves the multi-layered interlinkages of the tense relationship, inlcuding goal conflicts and implementation problems, and should result in coordinated solutions. Accordingly, the exchange between science and society is gaining in important.

The Leibniz Lab 'Systemic Sustainability'

In the new scientific format of a Leibniz Lab, 41 institutions of the Leibniz Association are explicitly addressing the tension between biodiversity, climate, agriculture and food as a common area of action and conflict. Together with national and international partners, they are developing new tailored approaches to interdisciplinary and transdisciplinary knowledge integration and the systemic assessment of sustainability. In specific dialogue formats, they tap into innovation potentials for transformations towards sustainability and target group-oriented transfer products with societal actors. Due to mutual interdependencies, they take into account the local-regional level in areas of the Global North and South, up to the international level. Boundaries of the earth system are deliberately included.

Enhanced understanding of sustainability

Significant social, economic and ecological characteristics are regarded in their complexity and dynamics as interconnected systems. This makes it possible to better understand the interlinkages and derive coherent goals for basic social needs and the compliance of planetary boundaries. Innovations can be systemically conceived for transformative levers and capacities as well as conflicts and synergies.

Research and innovation for systemic sustainability

A novel approach

The Leibniz Lab 'Systemic Sustainability' combines knowledge integration with model-based assessments and systemic innovations. Its scientific activities are geared towards dialogue with societal actors. Science communication and specific products enhance the impact of the results.

Cross-level transdisciplinary dialogues

Facets of the common area of action and conflict in society and the knowledge needs from society are identified in dialogues between the Lab and actors from politics and administration, business and civil society. Mapping of relevant discourses in selected forums enables the subsequent co-creation of goals and the co-evaluation of their achievement. Interdependencies between local-regional sites and the international level are taken into account.

Interdisciplinary and transdisciplinary knowledge integration

Biodiversity, climate, agriculture and food are each independent fields of research. Key interfaces between these fields and gaps in knowledge are systematically identified. On this basis, a framework concept and infrastructure for knowledge integration emerge. The new approaches are tested in pilot sites.

Assessment of systemic sustainability

Observational data and analytical findings on the interfaces between biodiversity, climate, agriculture and food are interpreted. This draws upon selected bodies of knowledge from Leibniz institutions and other sources as well as new model simulations on the status of planetary boundaries. A quantitative and qualitative knowledge base for assessing systemic sustainability evolves for the common area of action and conflict.

Systemic innovations

A wide range of solutions exist for aligning agriculture and food with biodiversity conservation and climate protection. The Lab therefore carries out holistic innovation mapping. Selected technological, economic, social and political innovations are co-designed for sustainability transformations and assessed for their potential impacts.

Science communication

The context conditions for sharing information on the common area of action and conflict 'biodiversity, climate, agriculture and food' are in particular characterised by misinformation and disinformation. Hence, the Lab investigates means of science communication with regard to the comprehensive practical knowledge required be the actors addressed.

Target group-specific transfer products

The Leibniz Lab's integrative and action-oriented research results in a range of actor-specific products. These extend from assessments of regulatory options for policymakers to a dashboard with data on systemic sustainability and information on new technologies for companies in the agricultural and food sector. Innovative information and educational offerings are aimed at practitioners and the general public.

Current pilot sites, marking the countries, and associated sites of the Leibniz Lab 'Systemic Sustainability'