NAVIGATING THE SUSTAINABILITY TRANSFORMATION IN THE 21ST CENTURY

FROM ALEXANDER VON HUMBOLDT'S KOSMOS TO TODAY'S GLOBAL CHALLENGES

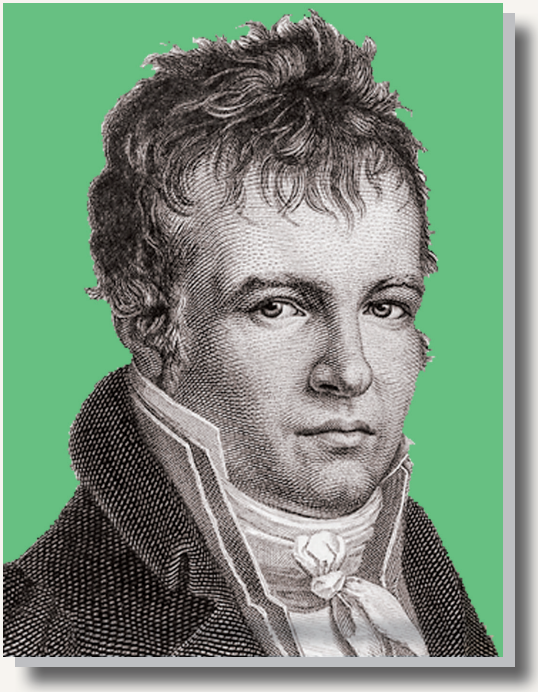
KOSMOS CONFERENCE

AUGUST 28-30, 2019 | HUMBOLDT-UNIVERSITÄT ZU BERLIN

KOSMOS
KOSMOS
KOSMOS
KOSMOS
KOSMOS
KOSMOS
KOSMOS

TABLE OF CONTENT

WELCOME



"If, through your honorable election, I have been granted the privilege of opening this assembly, I first have a duty of gratitude to fulfill. The distinction which has been given to him who has never before been able to attend your memorable associations is not the reward of scientific endeavours, of single weak attempts to find the persistent in the range of appearances, to draw from the dizzying depths of nature the dawning light of knowledge. A tender feeling has drawn your attention to me. You wanted to express that, in many years' absence, even in a distant part of the world, while pursuing the same ends along with you, I had not become estranged from your remembrance."

From Alexander von Humboldt's speech, held at the opening of the Assembly of German Natural Scientists and Physicians in Berlin on 18 September 1828.

Reference: Alexander von Humboldt, Oliver Lubrich, Thomas Nehrlich (Hrsg.) (2019): Der Andere Kosmos, 70 Texte, 70 Orte, 70 Jahre. 1789 – 1859. ISBN 978-3-423-28170-6.

SABINE KUNST

President of Humboldt-Universität zu Berlin

Alexander von Humboldt is an inspirational figure in more than one respect. He was a polymath and knew how to present his works to a wider public.

Alexander was a geographer as well as a geologist, a botanist and even an astronomer. In a time when the scientific fields started to diversify and specialization gained importance, Alexander was a truly inter- and transdisciplinary researcher. He incorporated as many view-points in his research as he was able to obtain. This might not be possible for a single researcher in today's research environment, which is why interdisciplinary collaboration is so important.

Alexander was also a brilliant communicator. He understood that scientific findings have to be circulated as wide as possible to have a real impact. It is not enough to explain them to a select few or to an inner circle. People are interested in state-of-the art research. It is our obligation to explain it to them in an open, understandable fashion. And then listen to their response. Science communication, like every good communication process, is not a one-way road. A peasant who has been ploughing his field for thirty or more years has accumulated an immense knowledge about weather, soil, plants and many more things. Alexander von Humboldt loved to talk to the inhabitants of the South American villages he visited. We should follow in his footsteps and engage in conversations with people outside academia.

The KOSMOS Conference is a good example for both these methods of Alexander von Humboldt. We at Humboldt-Universität will strengthen our efforts in opening up to the public sphere and we see this conference as an important step on our way.

I wish you all an inspiring week and a good time at Humboldt-Universität.

Berlin, August 2019 Sabine Kunst

WELCOME

CHRISTOPH SCHNEIDER

Director of the Geography Department at Humboldt-Universität zu Berlin
& Initiator of the KOSMOS Conference

Today Alexander von Humboldt is not known for a particular discovery or insight. His fame is based more on a point of view, a specific perspective on the world. Alexander von Humboldt has empirically extremely skillfully combined individual findings into larger contexts, thus enabling views that above all revealed systemic connections. He did this on the basis of comprehensive, detailed research and observation during his research trips. Otherwise he would hardly have succeeded in distilling such an scientific elaborated understanding in his KOSMOS. In his works he also preserved the reference to the economy and social life of human beings and his own natural philosophical approach. The combination of all four ingredients - empirical obsession with detail, understanding of systems, reference to human beings and natural philosophical context - makes him so successful today.

If we take up his work at present, however, we cannot stop at the "physical description of the earth" as presented within his KOSMOS, and merely comment on social and political conditions. In order to advance the creative power informed by scientific knowledge in the urgently needed transformation of sustainability in the 21st century, we must test concepts for action, develop blueprints, seek discourse and jointly strive for solutions for the future. In this respect, the title of the KOSMOS Conference commemorating Alexander von Humboldt "Navigating the Sustainability Transformation in the 21st Century" could have alternatively also been the same as the title of its concluding public debate: "From Knowledge to Action".

It was a challenge preparing the KOSMOS Conference together with a large team both at Humboldt-Universität zu Berlin and with scientists from all over the world for more than a year. It also was a great pleasure. I would like to thank everybody involved for their contribution in staging this event. Further, I wish for a successful and groundbreaking KOSMOS Conference and Birthday Party for Alexander von Humboldt.

Berlin, August 2019

JÖRG NIEWÖHNER

Director of the Integrative Research Institute on Transformations of Human-Environment Systems at Humboldt-Universität zu Berlin

The relentless curiosity with which Alexander von Humboldt pursued his studies of the dynamics of the material world and 'all that has been created' was remarkable. His KOSMOS volumes helped to shape Western cosmology and with it – albeit unintended by Humboldt – the modern belief that an unlimited nature could be put to human use. 160 years later, the dream of total control over nature enabled by science and engineering has turned out to be a modern fallacy. Global environmental change is fundamentally altering the social-ecological foundations of the way people live together on this planet. This is a deep transformation driven by disruptive ecological change, new modes of governance, alterations in the resource base of our economy and related infrastructural change. Most importantly, however, it entails 'cultural' change, i.e. change in the way people in their everyday lives relate to nature and to each other.

Understanding and governing this deep transformation is one of the key challenges for the academy in the 21st century. Humboldt's KOSMOS volumes were monographs. Today, this effort requires scholars across the natural sciences, the humanities and the social sciences to work together. The KOSMOS conference is one exciting step in this direction. Its panels address the manifold relations between physical and social worlds and we, the participants, will bring the relentless curiosity to engage with each other.

Importantly, our world is a post-colonial world and thus very different from the colonial contexts that Humboldt criticised as immoral while also depending on them for his research. Of course, planetary concerns require the global integration of findings. Yet they also require respect for alterity and difference. May this be the spirit for three wonderful days!

Berlin, August 2019

CONFERENCE OBJECTIVE

WHY THIS CONFERENCE?

The Humboldt-Universität zu Berlin is staging the KOSMOS Conference on the occasion of Alexander von Humboldt's 250th birthday. The event considers itself a scientific contribution to the Alexander von Humboldt Year of 2019.

Termed *Navigating the Sustainability Transformation in the 21st Century* the KOSMOS Conference shall provide a landmark for today's great challenges towards sustainability. It is intended as a platform to discuss the science of the sustainability transformation, and to interactively conceptualize a science-based framework in the context of the United Nations Sustainable Development Goals (SDGs).

"The KOSMOS Conference shall provide a landmark for today's great challenges towards sustainability."

Linking to Humboldt's perspective on nature and humanity as web of interconnections, we target symbiosis between social, cultural, political, economical, philosophical, human, philological, engineering, natural, earth, geo, and sustainability sciences to approach this challenge.

This interdisciplinarity is fundament to scientific conference formats such as expert forum, poster session and keynote lectures. The conference additionally leaves plenty of room for a high degree of interaction and exchange through a bar camp, a market place and an experimental treasure quest. But with Humboldt's famous KOSMOS lectures in mind, the conference also aims to open the scientific inner circle to the public and politics with public conference formats like a citizen scientist speed dating, a public debate and a KOSMOS lecture.

CONFERENCE COMMITTEES

Without both the scientific and the local organizing committee the ambitious programme of the KOSMOS Conference could not have been realized.

SCIENTIFIC COMMITTEE

Bettina König, IRI THESys, Humboldt-Universität zu Berlin

Christoph Schneider, Geography Department, Humboldt-Universität zu Berlin

Eric Lambin, Stanford School of Earth, Energy & Environmental Sciences, Stanford University & Earth and Life Institute, Université catholique de Louvain

Johan Rockström, Potsdam Institute for Climate Impact Research (PIK) & Stockholm Resilience Center

Jörg Niewöhner, IRI THESys & Institute of European Ethnology, Humboldt-Universität zu Berlin

Patrizia Nanz, The Institute for Advanced Sustainability Studies, Potsdam (IASS Potsdam)

LOCAL ORGANIZING COMMITTEE

Anne Dombrowski, IRI THESys, Humboldt-Universität zu Berlin

Axel Klie, IRI THESys, Humboldt-Universität zu Berlin

Boris Nitzsche, Communications and Media, Humboldt-Universität zu Berlin

Christoph Schneider, Geography Department, Humboldt-Universität zu Berlin

David Steger, Geography Department, Humboldt-Universität zu Berlin

Nora Milena Vehling, Faculty of Theology, Geography Department & IRI THESys, Humboldt-Universität zu Berlin

Stefanie Elsholz, Geography Department, Humboldt-Universität zu Berlin

ACKNOWLEDGEMENT

The KOSMOS Conference would not be possible without the financial and ideational support of many people and institutions: our sponsors, cooperation partners, colleagues, student assistants and KOSMOS coaches and trainers.

MAIN SPONSOR

First of all, the generous support by the Mercator Foundation has to be emphasized, which made the decision to organize this conference at all.

"The KOSMOS Conference would not be possible without the financial and ideational support of many people and institutions."

ADDITIONAL SPONSORING BY OR COOPERATION WITH

In addition, we would like to thank:

- Collective Leadership Institute
- Geo.X
- German Committee Future Earth
- Humboldt-Innovation GmbH
- netzwerk n
- Sustainability Office of Humboldt-Universität zu Berlin

COOPERATION AND SPONSORING BY PUBLISHERS

We would further like to thank the following specialist publishers and journals for their support through publications and the dissemination of the conference announcement:

- Frontiers in Earth Science
- Gesellschaft für Erdkunde
- Land – Open Access Journal
- oekom verlag

MAIN SPONSOR

STIFTUNG MERCATOR

ADDITIONAL SPONSORING BY OR COOPERATION WITH

netzwerk

German Committee Future Earth

COLLECTIVE LEADERSHIP INSTITUTE

HUMBOLDT-UNIVERSITÄT · NACHHALTIGKEITSBÜRO

GeoX

COOPERATION WITH AND SPONSORING BY PUBLSIHERS

PERVESTIGATORI TERRARUM BERLIN 1828

Gesellschaft für Erdkunde

oekom verlag

frontiers in Earth Science

land

an Open Access Journal by MDPI

ACKNOWLEDGEMENT

Thank you!

KOSMOS COACHES

Special thanks deserve the 34 student coaches and their trainers, who took care of our experimental treasure quest:

Adrian Ladenberger, Amy Foster, Angela Patricia Pérez Lora, Anna Nguyen, Carmen Schwartz, Evelin Pineros, Gideon Hussels, Gina Krebs, Husseim Stuck, Jana Wiarda, Johanna Alexandra Hoffmann, Joshua Dietz, Julia Marchetti, Lena Hantel, Lisa Kinne, Lucilia Westphal, Marius Derenthal, Marla Kaupmann, Mia Scheurmann, Nicole Pita, Nora Milena Vehling, Partricia Marques, Ricardo Göhler, Samyra Hachmann, Shalin Mathur, Silija Zimmermann, Sophia Reitzug, Theresa Weinstein, Tianling Yang, Tiemininimi Tidings, Valerie Kwan, Wenxue Cao

Josef Kaiser, Josephin Wagner, Rebecca Geyer

COLLEAGUES AND STUDENT ASSISTANTS

Last but not least, the enormous efforts made by colleagues and student assistants, without whom we would have been lost, must be highlighted:

Birgit Mangelsdorf, Gianpiero Tari, Jeannette Latino, Jörg Schulze, Lena Streckert, Olof Krüger, Sabine Kunst, Stefanie Weber, Sylvia Zinke-Friedrich, Volker Hofmann

Arne Zebski, Jana Otto, Juliana Eggers, Mira Koschitzke, Nicolas Rochas Vargas, Niels Reisinger, Nina Dwerlkotte, Tobias Rüst, Xenia Greff

Many thanks to the creators of the campaign #WIRSINDHUMBOLDT for inspiring our cover design!

Finally, we would like to thank those we accidentally forget to mention!

CONFERENCE SESSIONS

SESSION DESCRIPTION

The KOSMOS Conference is broken into seven main themes. Accordingly, all oral presentations in the expert forums and the poster session will be structured into seven topical sessions:

1. Publics and ethics of sustainability
2. Democracy, governance, and societal conflicts in a globalized world
3. Economies beyond unlimited growth
4. Limited land - a local to global perspective
5. Urban and rural: a necessary partnership
6. Water and biosphere: preconditions of survival
7. Climate Change: biophysical impacts and societal responses

SESSION 1
PUBLICS AND ETHICS OF SUSTAINABILITY

CONVENORS

Martin Kowarsch
Mercator Research Institute on Global Commons and Climate Change (MCC)

Anna Henkel
Universität Passau

In different publics, various response options to sustainability challenges are debated, including, e.g., taxation, regulation, or consumer education. Such instruments imply different modes of sustainability transformation – and thus different understandings of "sustainability". For better understanding the implications of alternative solution options, we first invite presentations of concrete solution options, explicating their implicit understanding of sustainability. Second, we aim to reflect on implications of the alternative solution options from (e.g., non-ideal) justice and ethics perspectives. This also includes papers on legitimate inter- and transdisciplinary deliberation about the desirability of policy alternatives. (Meta-) criteria of sustainability might evolve out of this discussion.

SESSION 2
DEMOCRACY, GOVERNANCE, AND SOCIETAL CONFLICTS IN A GLOBALIZED WORLD

We are looking back to decades were pressing sustainability problems are already well-known. Textbooks are full with policy instruments that, if introduced, would solve those problems effectively and possibly even in an efficient and just way. Yet, many of the most severe environmental problems have not sufficiently been resolved. Some people call for more strict top-down governance, while others request more participatory approaches, and even others conceive unresolved sustainability problems as a threat to democracy. We thus welcome contributions that study the interplay of governance mechanisms, opportunities for and barriers to an effective, just and equitable implementation of the sustainable development goals.

CONVENORS

Klaus Eisenack
Humboldt-Universität zu Berlin

Sabine O'Hara
University of the District of Columbia

SESSION 3
ECONOMIES BEYOND UNLIMITED GROWTH

After a plateau in in the mid-2010s, yearly greenhouse gas emissions are on the rise again. Despite rapid technological progress, emissions have failed to decouple from economic growth. Hence, we are as close as never before to miss the ambitious climate targets set out in Paris in 2015. Does that mean that we have to deliberately slow down economic growth or even reduce economic activity? Proponents of such a degrowth strategy argue that the goal of achieving SDG 13 on climate action is incompatible with economic growth. Opponents, however, emphasize the benefits of economic growth for other Sustainable Development Goals, such as SDG 1 on lifting people out of poverty. Recent contributions aim to reconcile these opposing paradigms by adopting a broader welfare diagnostics rather than a narrow focus on economic growth. In this topic stream we welcome contributions that help us to further the debate and develop a better understanding of the solutions space for well-being within planetary boundaries.

CONVENORS

Sabine Fuss
Mercator Research Institute on Global Commons and Climate Change (MCC)

Maja Göpel
German Advisory Council on Global Change

SESSION 4
LIMITED LAND - A LOCAL TO GLOBAL PERSPECTIVE

CONVENORS

Patrick Hostert
Humboldt-Universität zu Berlin

Ariane de Bremond
Global Land Programme

Land systems are the result of human interactions with the natural environment. Understanding the drivers, state, trends and impacts of different land systems on social and natural processes helps to reveal how changes in the land system affect the functioning of the socio-ecological system and the tradeoff these changes may represent. This session accordingly welcomes contributions to land systems science with a focus on limitations in land-based resources. We specifically invite oral presentations and posters that deepen our insights on

- land scarcity, either relating to certain land functions or landbased resources, in a specific world region or from a global perspective
- how land limitations connect across scales or between different regions of the world, including e.g. displacement
- how to improve modeling of land systems across scales
- advances in remote sensing for quantifying limitations in land resources

SESSION 5
URBAN AND RURAL: A NECESSARY PARTNERSHIP

CONVENORS

Bettina König
IRI THESys, Humboldt-Universität zu Berlin

Daniela Kempa
Leibniz Universität Hannover

Since the rise of the first cities 5,000 years ago, there has always been a very strong connection between cities and rural areas, with intense flows of people, goods, capital and information. Thus, rural-urban partnership is not a new feature. However, opposing dynamics between the urban and the rural, e.g. lifestyles, demographic and economic or ecological developments, trends on the (urban) consumption side and the (rural) production side may lead to a perception of an increasing divide. Such opposing trends could be intensification and extensification up to abandonment with multiple implications for the sustainability of urban and rural areas. We invite papers that (1) explore phenomena of urban-rural interlinkages and its implications for sustainability, (2) develop methods to understand such interlinked phenomena and (3) develop tools that support a sustainable development for urban-rural partnerships.

SESSION 6
WATER AND BIOSPHERE: PRECONDITIONS OF SURVIVAL

Freshwater comprises a very small fraction of the global water pool yet it is the foundation of life in terrestrial and aquatic ecosystems. It is predicted that climate change together with a growing imbalance among freshwater availability and supply and consumption will alter water resources dramatically. The increasing demands on freshwater resources require an urgent need to link research with sustainable management strategies. This session invites contributions which increase our understanding by studying freshwaters and related ecosystems through monitoring and modelling at different spatio-temporal scales. We also welcome examples of linking research with policies and management of ecosystems.

CONVENORS

Doerthe Tetzlaff
IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Tobias Krüger
IRI THESys, Humboldt-Universität zu Berlin

SESSION 7
CLIMATE CHANGE: BIOPHYSICAL IMPACTS AND SOCIETAL RESPONSES

Global anthropogenic climate change is profoundly affecting all parts of the Earth System already at current levels of warming of 1°C above pre-industrial levels. Future emissions will only exaggerate risks by temperatures and more frequent extreme weather including floods and droughts as well as rising sea level in the 21st century and beyond. These climate hazards translate into severe impacts for ecosystems as well as economy and human livelihood. In order to achieve the goals of the Paris Agreement and the corresponding Sustainable Development Goal on "CLIMATE ACTION", it is essential to achieve a transformational shift to climate resilience. This would entail stringent climate mitigation to achieve the 1.5°C limit of the Paris Agreement and robust adaptation to the impacts of climate change. This session includes interdisciplinary contributions including on climate impact projections, the land-climate-water-nexus, implications for human systems including climate security, as well as climate governance from the urban to the global scale.

CONVENORS

Christoph Schneider
Humboldt-Universität zu Berlin

Carl-Friedrich Schleussner
Climate Analytics & Humboldt-Universität zu Berlin

CONFERENCE FORMATS

FORMAT DESCRIPTION

The programme of the KOSMOS Conference offers different formats ranging from frontal presentations to interactive participation. Most of them are internal, but some of them invite the general public.

KOSMOS KEYNOTES

frontal

Prominent speakers frame the conference and set its central topics in KOSMOS keynotes: from the icebreaker speech on Wednesday evening to the opening speeches on Thursday and Friday morning.

PUBLIC KOSMOS LECTURE

frontal
public

The KOSMOS lecture is a public evening lecture that addresses both the conference participants and the citizens of Berlin. It is part of the KOSMOS lecture series which covers the entire anniversary year on the occasion of Alexander von Humboldt's 250th birthday. The series revives Humboldt's famous KOSMOS lectures from 1827/28.

EXPERT FORUM

frontal
interactive

The expert forums serve to deepen the discussion of the seven main themes of the conference: 1. Publics and ethics of sustainability, 2. Democracy, governance, and societal conflicts in a globalized world, 3. Economies beyond unlimited growth, 4. Limited land - a local to global perspective, 5. Urban and rural: a necessary partnership, 6. Water and biosphere: preconditions of survival, and 7. Climate Change: biophysical impacts and societal responses.
The expert forums are arranged into three 90 minutes blocks and one 60 minutes block with each 3 to 5 oral presentations, followed by a short moderated discussion. Seven parallel sessions are offered at the same time.

INTERACTIVE POSTER SESSION

interactive

The interactive poster session provides ongoing projects and recent results in the form of scientific posters in a sociable atmosphere with beer and wine. The session is organized along the topics of the expert forums.

BAR CAMP AND MARKET PLACE

frontal
interactiv e

The bar camp is a competitive science slam format. The audience decides which lecture to bring on stage based on a one-minute elevator pitch. Those with the most applause will be invited to present their research in detail. All others may communicate their work at bar tables at the following market place. The list of candidates can be found on page 45.

SPEED DATING & PUBLIC DEBATE

frontal
interactive
public

A citizen scientist speed dating and a public debate form the public closing point of the KOSMOS Conference. This format wants to underline the importance of dialogue when it comes to making our world more sustainable. More information can be found on page 47.

BEST CONTRIBUTION AWARD

In cooperation with the open-access journal *Frontier in Earth Science*, a best contribution prize will be awarded. The two winning contributions will each receive a voucher for an open access publication within *Frontiers in Earth Science*. The details of this competition will be announced during the conference.

TREASURE QUEST - A SCIENTIFIC ADVENTURE

interactive

The KOSMOS Conference aims to create space for exchange and teamwork. That is why we developed the idea of the treasure quest.

The treasure quest is an experimental workshop format discussing the 17 Sustainable Development Goals (SDGs) in small groups throughout the whole conference. Each participant of the conference – be it a professor, a doctoral researcher or a student and coming from natural sciences, humanities or social sciences – is assigned to one SDG via registration and will be part of one team.

In total there will be 17 teams. Each team is supposed to discuss their subject in an open process and finally present their results – the treasure – to colleagues and the public. These results can be understood as the true treasure: your jointly developed knowledge. This knowledge may consist of implementation ideas and solutions for the respective SDG, but the identification of questions, trade-offs and criticism is just as welcome.

Support & continued discussion

On you name badge you will find a pictogram with your selected SDG. This way you and your colleagues are able to recognize each other. Each team is also given a specific room for the joint work. A list with all rooms can be found on page 22.

The teams will be supported by student coaches specially trained for this purpose. The coaches serve as facilitators and shall enable constructive teamwork. Their prior training covers techniques for moderation and documentation as well as an introduction into SDG content.

Unfortunately, time is short. But there is nothing to stop you from continuing your discussion during the coffee and lunch breaks!

Schedule

The 17 teams come together several times to work on their subject:

Wed, 28th August, around 20.00
This is where the adventure begins: get started! Before and after the icebreaker speech, there is the chance to meet your team members for the first time and get acquainted to each other during informal conversation.

Thurs, 29th August, 13.30-15.00
This is where the adventure takes off: find your (whole) group, find your task, start scouting your solution! Your team should be complete now and you have to decide what you want to achieve.

Fri, 30th August, 11.30-12.30
This is where the treasure is taking shape: solution workout! Now it is all about getting your ideas to the point. Here you also assign tasks for the presentation of your results on Friday afternoon.

Fri, 30th August, 16.30-17.30
This is where the adventure almost comes to an end: communicate your treasure! Some of you will present your joint results to the other conference participants in the form of short oral statements, elevator pitches or similar.

Fri, 30th August, 18.00-19.00
This is the last stage of the adventure: discuss your treasure! You encounter citizens of Berlin to discuss your results and face their questions and comments. This event takes place as a public citizen scientist speed dating at 17 tables (see conference formats: speed dating & public debate).

CONFERENCE FORMATS

Room locations of SDG working groups

SDG 1: No Poverty - room 1.501
SDG 2: Zero Hunger - room 1.502
SDG 3: Good Health and Well-being - room 1.601
SDG 4: Quality Education - room 1.504
SDG 5: Gender Equality - room 1.505
SDG 6: Clean Water and Sanitation - room 1.506
SDG 7: Affordable and Clean Energy - room 1.401
SDG 8: Decent Work and Economic Growth - room 1.402
SDG 9: Industry, Innovation and Infrastructure - room 1.403
SDG 10: Reduced Inequality - room 1.404
SDG 11: Sustainable Cities and Communities - room 1.502
SDG 12: Responsible Consumption and Production - room 1.501
SDG 13: Climate Action - room 1.307
SDG 14: Life Below Water - room 1.308
SDG 15: Life on Land - room 1.204
SDG 16: Peace and Justice Strong Institutions - room 1.205
SDG 17: Partnerships to achieve the Goal - room 1.201

KOSMOS
KOSMOS
KOSMOS
KOSMOS
KOSMOS
KOSMOS
KOSMOS

PROGRAMME OVERVIEW

FROM WEDNESDAY TO FRIDAY

PROGRAMME OVERVIEW

Please nore: changes in schedule may be possible

Wednesday | August 28, 2019

18.00-19.00 Registration

19.00-22.00
Reuter-Saal
& Foyer

Icebreaker

Welcome

Icebreaker speech: A windy road back to KOSMOS? Reflections on sustainability challenges on the cusp of a new era
Beatrice Crona, Stockholm Resilience Center

Visual artist performance
Nicoletta Geiersbach (pantomime, Ökodorf 7 Linden) & Raffael Kircher (saxophon, Berlin)

Treasure quest
This is where the adventure begins: get started! The treasure quest is an experimental workshop format discussing the 17 Sustainable Development Goals (SDGs) in small groups throughout the whole conference. Each team will be supported by a trained student coach and finally present its results - the treasure - to colleagues and the public. When registering, each conference participant selected one SDG to work on.

Cold drinks & snacks

Thursday | August 29, 2019

8.00-9.00 Registration

9.00-10.30
Reuter-Saal

Conference opening & opening speech

Sabine Kunst, President of Humboldt-Universität zu Berlin
Elmer Schialer, Ambassador of Peru
Patrick Hostert, Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys) & Geography Department, Humboldt-Universität zu Berlin
Christoph Schneider, Geography Department, Humboldt-Universität zu Berlin

Scaling up solutions for sustainability
Eric Lambin, Université catholique de Louvain & Stanford University

10.30-11.00 Morning break

Parallel expert forums

Publics and ethics of sustainability (part 1): Examining publics, society and ethics

Session 1

Convenors: Martin Kowarsch, Mercator Research Institute on Global Commons and Climate Change (MCC) & Anna Henkel, Universität Passau
Session chair: Dominic Lenzi, Mercator Research Institute on Global Commons and Climate Change (MCC)

Approaches to the normative dimensions of sustainability governance
Martin Kowarsch, Mercator Research Institute on Global Commons and Climate Change (MCC) & Technische Universität Berlin

11.00-12.30
room 1.102

How to Study the Co-Evolution of Nature and Society: Humboldt and beyond
Jens Jetzkowitz, Museum für Naturkunde Berlin

No We Can't. On the reasons why our societies are unable to transform in face of climate change and why we prefer the technological approach
Christine Bismuth, GFZ German Research Center for Geosciences

A Diagram of the Whole Earth System
Wolfgang Lucht, Potsdam Institute for Climate Impact Research (PIK)

Democracy, governance, and societal conflicts in a globalized world (part 1): Modeling

Session 2

Convenors: Klaus Eisenack, Humboldt-Universität zu Berlin & Sabine O'Hara, University of the District of Columbia
Session chairs: Klaus Eisenack & Sabine O'Hara

The Role of Governance in Future Pathways of Sustainable Development
Marina Andrijevic, Humboldt-Universität zu Berlin

11.00-12.30
room 1.205

Some chance for consensus: voting methods for which consensus is an equilibrium
Jobst Heitzig, Potsdam Institute for Climate Impact Research (PIK)

Nuclear Power, Democracy, and Sustainable Development: Quantitative and Qualitative Analysis of the Role of Nuclear Power and Democracy in the Context of the Sustainable Development Goals (SDGs)
Christian von Hirschhausen, Technische Universität Berlin

Analytical tools for studying Earth system resilience in the Anthropocene: from ontologies to simulation models
Jonathan F. Donges, Potsdam Institute for Climate Impact Research (PIK)

Economies beyond unlimited growth (part 1): Connecting climate and sustainability ("multi-solving")

Session 3

Convenors: Sabine Fuss, Mercator Research Institute on Global Commons and Climate Change (MCC) & Maja Göpel, German Advisory Council on Global Change
Session chairs: Sabine Fuss & Maja Göpel

Revisiting the paradigm of manufacturing-led development: Sustainability, digitalisation and the future of manufacturing in low and middle income countries
Stefanie Kunkel, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam)

11.00-12.30
room 1.401

Climate Denial: Populism, Post-Truth and Environmental Politics
Maria Proestou, Humboldt-Universität zu Berlin; Frank Fischer, Humboldt-Universität zu Berlin

How a decision support tool helps to make sustainability tangible – A case study on dual-purpose chicken farming
Felix Zoll, Leibniz Centre for Agricultural Landscape Research (ZALF)

Thursday | August 29, 2019

How We Change The World
Friedrich Hinterberger, SERI Sustainable Europe Research Institute

Session 4 **Limited land – a local to global perspective (part 1):** Transitioning future land use towards sustainability

Convenors: Patrick Hostert, Humboldt-Universität zu Berlin & Ariane de Bremond, Global Land Programme
Session chair: Patrick Hostert

11.00-12.30
room 1.103

Taking stock of zero deforestation commitments
Floris Leijten, Unilever

Transition towards renewable energy sources in the EU: between ecological modernisation and new cycles of capital accumulation
Samadhi Lipari, University of Leeds

Towards coherent policy measures for achieving the Sustainable Development Goals
Hermann Lotze-Campen, Potsdam Institute for Climate Impact Research (PIK)

Towards revising the planetary boundary for land systems
Matthias Baumann, Humboldt-Universität zu Berlin

Session 5 **Urban and rural: a necessary partnership (part 1):** (novel) conceptual and methodological lenses to urban-rural interlinkages

Convenors: Bettina König, Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt-Universität zu Berlin & Daniela Kempa, Leibniz Universität Hannover
Session chairs: Bettina König & Daniela Kempa

11.00-12.30
room 1.502

Travelling Transect – an approach to mobile knowledge generation
Lisa Diedrich, Swedish University of Agricultural Sciences; Gini Lee, The University of Melbourne

Urban Eris? Chennai's anthropogenic water bodies and their future
Luise Haufe, Freie Universität Berlin

Critical business environment factors of innovative rural business cases
Muluken Elias Adamseged, Leibniz-Institut für Agrartechnik und Bioökonomie e.V. (ATB)

Creating innovative urban-rural linkages through transdisciplinary collaboration: experiences of nine Innovation Groups for a sustainable land management in Germany
Daniela Kempa, Leibniz Universität Hannover

Session 6 **Water and biosphere: preconditions of survival (part 1):** Water scarcity & water security

Convenors: Doerthe Tetzlaff, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries & Tobias Krüger, Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt-Universität zu Berlin
Session chair: Doerthe Tetzlaff

11.00-12.30
room 1.501

Paired event analyses to support sustainable risk management of floods and droughts
Heidi Kreibich, GFZ German Research Centre for Geosciences

Water scarcity in human-impacted basins: implications for river ecosystems
Sergi Sabater, Catalan Institute for Water Research, Girona (ICRA)

Working towards household water security as a cornerstone of sustainable development: A case study in rural Umvoti, South Africa
Karen Lebek, Humboldt-Universität zu Berlin

"Sky and land merged": Aerial river management for future water
Wei Weng, Humboldt-Universität zu Berlin

Climate Change: biophysical impacts and societal responses (part 1): Governance of Climate Change — Session 7

Convenors: Christoph Schneider, Humboldt-Universität zu Berlin & Carl-Friedrich Schleussner, Climate Analytics & Humboldt-Universität zu Berlin
Session chair: Christoph Schneider

How climate-related disasters contribute to armed conflict risk - providing multi-method evidence — **11.00-12.30** room 1.204
Carl-Friedrich Schleussner, Climate Analytics & Humboldt-Universität zu Berlin

Household mobility as response to an extreme weather event: Insights from novel trajectory data
Kati Krähnert, Potsdam Institute for Climate Impact Research (PIK)

The relevance of climate justice for climate goals
Angela Kallhoff, University of Vienna

Governing climate security and socio-ecological transformation
Judith Nora Hardt, Centre Marc Bloch (An-Institut Humboldt-Universität zu Berlin)

Lunch break on own expense - a list of options in the vicinity will be provided at the registration desk — **12.30-13.30**

Treasure quest

13.30-15.00 rooms listed on page 22

The adventure takes off: find your group, find your task, start scouting your solution! The treasure quest is an experimental workshop format discussing the 17 Sustainable Development Goals (SDGs) in small groups throughout the whole conference. Each team will be supported by a trained student coach and finally present its results to colleagues and the public.

Coffee break — **15.00-15.30**

Parallel expert forums

Publics and ethics of sustainability (part 2): Value-laden issues at the science-policy-society interfaces — Session 1

Convenors: Martin Kowarsch, Mercator Research Institute on Global Commons and Climate Change (MCC) & Anna Henkel, Universität Passau
Session chair: Martin Kowarsch

Planetary Justice and the Earth System — **15.30-17.00** room 1.102
Dominic Lenzi, Mercator Research Institute on Global Commons and Climate Change (MCC)

When optimization for governing human-environment tipping elements is neither sustainable nor safe
Wolfram Barfuss, Potsdam Institute for Climate Impact Research (PIK)

Science-based Systematic Sustainability Assessment in Practice
Volker Stelzer, Karlsruher Institut for Technology (KIT)

Evaluating changes in pro-ecological understanding and behaviour stemming from transdisciplinary interactions using a robust before-after-intervention-control design: an example from recreational fisheries
Robert Arlinghaus, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Session 2 **Democracy, governance, and societal conflicts in a globalized world (part 2):** Case Studies in Governance

Convenors: Klaus Eisenack, Humboldt-Universität zu Berlin & Sabine O'Hara, University of the District of Columbia
Session chair: Sabine O'Hara

15.30-17.00
room 1.205

Analyzing the food-energy-water nexus in Germany – insights from current resource management
Carolin Märker, Forschungszentrum Jülich (FZ Jülich)

Mechanisms of Weak Governance in Grasslands and Wetlands of South America
Luca Eufemia, Leibniz Centre for Agricultural Landscape Resarch (ZALF)

Women peasants facing Neo-Extractivism in Brazil: a food sovereignty potential
Ana Alvarenga de Castro, Humboldt-Universität zu Berlin

Understanding complexity situations to sustainability transformation: the case of Colombia post conflict areas
Michelle Bonatti, Leibniz-Centre for Agricultural Landscape Research (ZALF)

Experiences with citizen-science-policy interfaces on sustainable land use in Central Asia
Martin Welp, Eberswalde University for Sustainable Development

Session 3 **Economies beyond unlimited growth (part 2):** Patterns of ecologically sound solutions (Provisioning systems, Diffusion Theory, Circular Anthropocene, Digital, ...)

Convenors: Sabine Fuss, Mercator Research Institute on Global Commons and Climate Change (MCC) & Maja Göpel, German Advisory Council on Global Change
Session chairs: Sabine Fuss & Maja Göpel

15.30-17.00
room 1.401

Organizing in a Sustainable Degrowth Society
Iana Nesterova, University of Derby

The diffusion of environmental product and service innovations: Driving and inhibiting factors
Klaus Fichter, Carl von Ossietzky University Oldenburg

Gatekeepers of sustainability and well-being: Provisioning systems as intermediaries between energy use and basic needs satisfaction
Jefim Vogel, University of Leeds

Mining the Anthroposphere in the context of Circular Economy Aiming for Sustainable Development
Vivek Jaisree Mohandas, Wuppertal Institut für Klima, Umwelt, Energie gGmbH & Alexander von Humboldt-Stiftung

Session 4 **Limited land - a local to global perspective (part 2):** Land use impacts on carbon and biodiversity futures

Convenors: Patrick Hostert, Humboldt-Universität zu Berlin & Ariane de Bremond, Global Land Programme
Session chair: Ariane de Bremond

15.30-17.00
room 1.103

Towards improved biodiversity scenarios
Damaris Zurell, Humboldt-Universität zu Berlin

Mapping global land-based opportunities and challenges to simultaneously achieve biodiversity and food security
Diana Sietz, Potsdam Institute for Climate Impact Research (PIK)

Revision of environmental peacebuilding indicators in post-conflict scenarios. A Conceptual framework for research. The case of Colombia.
Hector Camilo Morales Munoz, Leibniz Centre for Agricultural Landscape Resarch (ZALF)

Road to glory or highway to hell? Global road access and climate change mitigation
Leonie Wenz, University of California Berkeley & Potsdam Institute for Climate Impact Research (PIK)

Urban and rural: a necessary partnership (part 2): approaches of cities to cope with sustainability challenges — Session 5

Convenors: Bettina König, Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt-Universität zu Berlin & Daniela Kempa, Leibniz Universität Hannover
Session chairs: Bettina König & Daniela Kempa

Climate Cooperation among Cities — **15.30-17.00**
Klaus Eisenack, Humboldt-Universität zu Berlin — room 1.502

Good Practices for Sustainable Development in Cities. Case Studies: Berlin and Xiamen
Berthold Kuhn, Freie Universität Berlin

The Smart city-critical raw material-energy nexus and its related problems concerning sustainability transformations
Florian Koch, HTW Berlin - Hochschule für Technik und Wirtschaft Berlin; Martin David, Helmhotz Centre for Environmental Research (UFZ)

Gentrification of Public Space and the Moral Right to Access - an Ethical and Public Theological Perspective on Social Sustainability
Torsten Meireis, Humboldt-Universität zu Berlin

Water and biosphere: preconditions of survival (part 2): Larger-scale modelling — Session 6

Convenors: Doerthe Tetzlaff, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries & Tobias Krüger, Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt-Universität zu Berlin
Session chair: Tobias Krüger

Exit Here: Dealing with Aging Dams and Reservoirs — **15.30-17.00**
Henry Hansen, University of Nebraska-Lincoln — room 1.501

Monitoring and modelling Germany's largest drinking water reservoir
Tom Shatwell, Helmhotz Centre for Environmental Research (UFZ)

Linking hydrologic and land use change models for more consistent predictions of global change impacts on water resources in India
Paul Wagner, Kiel University

Freshwater and biosphere in the Anthropocene: vital links
Dieter Gerten, Potsdam Institute for Climate Impact Research (PIK)

Climate Change: biophysical impacts and societal responses (part 2): Physical Dynamics of Climate Change — Session 7

Convenors: Christoph Schneider, Humboldt-Universität zu Berlin & Carl-Friedrich Schleussner, Climate Analytics & Humboldt-Universität zu Berlin
Session chair: Carl-Friedrich Schleussner

Changes in mid-latitudes summer weather persistence under global warming — **15.30-17.00**
Peter Pfleiderer, Humboldt-Universität zu Berlin — room 1.204

Social tipping dynamics for stabilizing Earth's climate by 2050
Ilona M. Otto, Potsdam Institute for Climate Impact Research (PIK)

Systematically evaluating the albedo of various land-cover types and albedo changes associated to land-cover transitions in Earth System Models
Quentin Lejeune, Climate Analytics

"Flying Rivers": The Invisible Interaction Between the Amazon and the Andes
Dirk Hoffmann, Bolivian Mountain Institute (BMI) & Dirk Hoffmann, Bolivian Mountain Institute (BMI)

17.00-18.30
Foyer

Interactive poster session

Cold drinks | Catering with food starts at around 18.00 and continues until 19.00

Publics and ethics of sustainability

Shift the focus from the super-poor to the super-rich
Ilona M. Otto, Potsdam Institute for Climate Impact Research (PIK)
Human Agency in the Anthropocene
Ilona M. Otto, Potsdam Institute for Climate Impact Research (PIK)
A Thought Experiment on Sustainable Management of the Earth System
Jobst Heitzig, Potsdam Institute for Climate Impact Research (PIK)
Ecological Worldviews and Sustainability Leadership
Katrina S. Rogers, School of Leadership Studies, Bundeskanzler Scholar, Alexander von Humboldt Foundation
Humboldt to the power of X – education for a sustainable future
Carl-Friedrich Schleussner, Climate Analytics & Humboldt-Universität zu Berlin

Democracy, governance, and societal conflicts

Collective perception of Anthropic and Extractive Interventions in the Colombian Llanos
Luca Eufemia, Leibniz Centre for Agricultural Landscape Resarch (ZALF)
Synthesis of Environmental Research Knowledge: The Case of Paraguayan Pantanal Tropical Wetlands
Luca Eufemia, Leibniz Centre for Agricultural Landscape Resarch (ZALF)
Community Based Governance and Sustainability in the Paraguayan Pantanal
Luca Eufemia, Leibniz Centre for Agricultural Landscape Resarch (ZALF)
Sustainability at Higher Education Institutions
Margarita Doneliene, Freie Universität Berlin
Laypersons in Environmental Law
Ulrike Zeigermann, Centre Marc Bloch (An-Institut Humboldt-Universität zu Berlin)
Food Democracy: analysis of power and participation in partnerships to end hunger and malnutrition
Julia Dennis, Humboldt-Universität zu Berlin
An exploration of the role of science in a socioecological transformation – Researching transformative research
Carolin Puhl, Freie Universität Berlin; Wiebke Nowack, Humboldt-Universität zu Berlin
Institutions and Instruments of Development Cooperation - Is there a need for change?
Denise Sumpf, Humboldt-Universität zu Berlin

Multifunctional Field Margins: Assessing the benefits for nature, society and business — Limited land
Juan Gonzalez-Valero; Varun Vats, Syngenta
The great whole of nature and the partial politics
Kristine Kjørup Rasmussen, Grøn University of Aalborg
A proposal to evaluate the impact of agricultural practices in the Water – Energy – Food Nexus
Margarita Doneliene, Freie Universität Berlin

Smart communities for a sustainable future. Opportunities for the rural environment in Mexico — Urban and rural
Elizabeth Toriz, Tecnológico de Monterrey
Sediments remove trace organic compounds in urban streams
Jonas L. Schaper, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries & Technische Universität Berlin

The Drying Up of Lake Poopó in the Bolivian Altiplano as a Result of Multiple Interactions of Different Stressors — Water and biosphere
Dirk Hoffmann, Bolivian Mountain Institute (BMI)
Introduction: Planetary Health as a new discipline
Oskar Masztalerz
Challenges to fisheries advice and management due to stock recovery
Rob van Gemert, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries
Growing the Future: the potential of phototrophic microorganisms
Ralf Steuer, Humboldt-Universität zu Berlin
Should changes in natural cycles induced by damming impose environmental restrictions to future hydropower optimization?
Suzana Blesic, Center for Participatory Science, Belgrade & Ca'Foscari University of Venice

Mobilizing domestic resources for the Agenda 2030 via carbon pricing — Climate Change
Max Franks, Potsdam Institute for Climate Impact Research (PIK)
Effects of Extreme Urban Microclimates on Tree Growth in Berlin
Sebastian Schneider, Humboldt-Universität zu Berlin
Precipitation characteristics and their association with large-scale atmospheric circulation over Tianshan Mountains, Central Asia
Xuefeng Guan, Humboldt-Universität zu Berlin

Evening break with continued catering — **18.30-19.00**

Public KOSMOS lecture - public

19.00-20.30 Senatssaal * (live), Reuter-Saal (video)

Towards sustainable business and finance within the planetary boundaries. A legal approach.
Anne-Christin Mittwoch, Philipps-Universität Marburg

Summer party Humboldt-Universität zu Berlin - public

until 22.00 main building, Grimm Centre **

The HU Berlin invites you to go on a journey of discovery through its buildings, collections and courtyards. With an extensive programme of events and activities to do with Alexander von Humboldt in the main building and the Grimm Centre, the university's summer party has something for everyone.

* Senatssaal: HU's main building, Unter den Linden 6, ** Grimm Centre: Geschwister-Scholl-Straße 1-3

Friday | August 30, 2019

8.00-9.00 Registration

9.00-10.00
Reuter-Saal

Keynote lecture

Sustainable Development Goals within Planetary Boundaries: Utopia or Panacea?
Johan Rockström, Potsdam Institute for Climate Impact Research (PIK)

10.00-11.00
Reuter-Saal

Bar camp

The bar camp is a competitive science slam format. The audience decides which lecture to bring on stage based on a one-minute elevator pitch. Those with the most applause will be invited to present their research in detail. All others may communicate their work at bar tables at the following market place (see below).

11.00-11.30
Foyer

Market place

The market place is a table session where the remaining bar camp participants (see above) will present their research.

Including coffee break

11.30-12.30
rooms listed on page 22

Treasure quest

The treasure is taking shape: solution workout! The treasure quest is an experimental workshop format discussing the 17 Sustainable Development Goals (SDGs) in small groups throughout the whole conference. The teams will be supported by trained student coaches and finally present their results to colleagues and the public.

12.30-13.30 Lunch break on own expense - a list of options in the vicinity will be provided at the registration desk

Parallel expert forums

Session 1

Publics and ethics of sustainability (part 3): Analyzing and framing societal discourses

Convenors: Martin Kowarsch, Mercator Research Institute on Global Commons and Climate Change (MCC) & Anna Henkel, Universität Passau
Session chair: Anna Henkel

13.30-15.00
room 1.102

Framing just transitions: discourses as facilitators and barriers of low-carbon energy transitions in Germany and Australia
Linda Wollersheim, Deakin University

Economic Instruments, Ecological Effectiveness, and Liberal Democracy
Felix Ekardt, Forschungsstelle Nachhaltigkeit und Klimapolitik

The 2030 Agenda in social discourse - participation and information as key factors for an improved implementation of the SDGs?
Jonas Birke, Bergische Universität Wuppertal

How to foster constructive emotions for sustainability? Positive psychology and hope-based education for sustainable development as a navigating tool for sustainability transformations
Antje Brock, Freie Universität Berlin

Democracy, governance, and societal conflicts in a globalized world (part 3a): Sustainability

Session 2a

Convenors: Klaus Eisenack, Humboldt-Universität zu Berlin & Sabine O'Hara, University of the District of Columbia
Session chair: Sabine O'Hara

13.30-15.00
room 1.205

Systems Aliveness as a Key Component of Sustainability Transformations
Petra Künkel, Collective Leadership Institute gGmbH

Reconsidering sustainability - as a societal challenge
Ilan Chabay, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam); Soléne Droy, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam)

Leapfrogging Democratization: meeting sustainability goals through fundamental democratization leaps
Frederic Hanusch, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam); Azucena Morán, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam)

Conditions of Environmental Policy Integration for Sustainability: the Politics of Multiple Dividends at Local Government Level in Turkey
Gökhan Orhan, Bandırma Onyedi Eylül University

Challenging scientific knowledge and expertise in sustainability politics
Ulrike Zeigermann, Centre Marc Bloch (An-Institut Humboldt-Universität zu Berlin)

Democracy, governance, and societal conflicts in a globalized world (part 3b): Science-Policy Interface

Session 2b

Convenors: Klaus Eisenack, Humboldt-Universität zu Berlin & Sabine O'Hara, University of the District of Columbia
Session chair: Klaus Eisenack

13.30-15.00
room 1.204

Humboldt as a Sustainable Design Hero
Julia Kulgavchuk, Laerdal

The Scientists4Future Statement in Germany, Austria, and Switzerland
Gregor Hagedorn, Museum für Naturkunde

A tale of multiple disconnects: Why the 2030 Agenda does not (yet?) contribute to moving German gender equality struggles forward
Hannah Birkenkoetter, Humboldt-Universität zu Berlin; Gabriele Koehler, United Nations; Anke Stock, Women Engage for a Common Future

Idiosyncrasies of bioeconomy governance. Insights from three policy areas of the German bioeconomy
Thomas Vogelpohl, FernUniversität in Hagen

Economies beyond unlimited growth (part 3): De-growth versus Green Growth (de-growth/green growth/a-growth/...), block 1

Session 3

Convenors: Sabine Fuss, Mercator Research Institute on Global Commons and Climate Change (MCC) & Maja Göpel, German Advisory Council on Global Change
Session chairs: Sabine Fuss & Maja Göpel

Friday | August 30, 2019

13.30-15.00
room 1.401

Decoupling resource use and emissions from economic growth: green growth, a-growth or de-growth for zero-carbon society?
Helmut Haberl, University of Natural Resources and Life Sciences Vienna

Limits to liberalism: rationality, well-being, and planetary health
Felix Creutzig, Mercator Research Institute on Global Commons and Climate Change (MCC) & Technische Universität Berlin

Should we put the brake on economic growth to save the climate? An overview of the scientific debate
Michael Jakob, Mercator Research Institute on Global Commons and Climate Change (MCC) & Technische Universität Berlin

Session 4 — **Limited land - a local to global perspective (part 3):** Land use: linking drivers with impacts

Convenors: Patrick Hostert, Humboldt-Universität zu Berlin & Ariane de Bremond, Global Land Programme
Session chair: Patrick Hostert

13.30-15.00
room 1.103

Implications of current and future dynamics of large-scale land acquisitions and African medium-scale farms
Niels Debonne, VU Vrije Universiteit Amsterdam

Reconciling food production and biodiversity conservation for food security in Nigeria
Kashimana Ivo, Universität Hamburg

Separating supply and demand-side drivers of land use change to govern telecouplings
Nicolas Roux, University of Natural Resources and Life Sciences, Vienna

Balancing agriculture and conservation in the South American Gran Chaco
Tobias Kuemmerle, Humboldt-Universität zu Berlin

Session 5 — **Urban and rural: a necessary partnership (part 3):** urban drivers and their interlinkages to the rural

Convenors: Bettina König, Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt-Universität zu Berlin & Daniela Kempa, Leibniz Universität Hannover
Session chairs: Bettina König & Daniela Kempa

13.30-15.00
room 1.502

Assessing the modal shift potential of urban and rural car drivers
Susann Ullrich, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam)

Beyond cities: Exploring the role of agriculture in the Sustainability Transformation in rural areas
Wiebke Nowack, Humboldt-Universität zu Berlin

Exploring urban land expansion process in light of land use planning in the Federal Capital City-Region of Nigeria
Evidence Chinedu Enoguanbhor, Humboldt-Universität zu Berlin

Contribution of Farmers' Organization in Engagement Process toward Adaptive Water Governance: Investigating the Perception of Different Actors
Mohammad Naser Reyhani, Humboldt-Universität zu Berlin; Saeid Eslamian, Isfahan University of Technology

Prospective Volition and Retrospective Thinking: Evidence from Adopting Climate Insurance in Agro-pastoral China
Lu Yu, German Development Institute (DIE)

Water and biosphere: preconditions of survival (part 3): Smaller-scale case studies

Session 6

Convenors: Doerthe Tetzlaff, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries & Tobias Krüger, Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt-Universität zu Berlin
Session chair: Tobias Krüger

Methane and CO2 in Lake Kivu – an Interdisciplinary Investigation in Respect of the Sustainable Development Goals — **13.30-15.00**
Maximilian Schmidt, Universität Heidelberg — room 1.501

Novel Lake Ecosystems – Biodiversity of Small Lowland Gravel-Pit Lakes and its Relation to Recreational-Fisheries Management
Robert Nikolaus, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Preconditions of survival: Removal of trace organics from closed urban water cycles
Jörg Lewandowski, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries & Humboldt-Universität zu Berlin

Water and nutrient dynamics in East African montane headwater catchments
Suzanne Jacobs, Justus-Liebig-Universität Gießen

Coffee break — **15.00-15.30**

Parallel expert forums

Publics and ethics of sustainability (part 4a): Having a closer look...

Session 1a

Convenors: Martin Kowarsch, Mercator Research Institute on Global Commons and Climate Change (MCC) & Anna Henkel, Universität Passau
Session chair: Martin Kowarsch

Neglected Ethics and its effect on tilted pillars of sustainability — **15.30-16.30**
Björn Koch, Carl von Ossietzky Universität Oldenburg — room 1.102

The power of the ancestral philosophy of Sumak kawsay (Good Living) in the indigenous movements of Colombia - Ecuador vs. exclusion by mega mining development, contributions to the Rights of Mother Nature from the global south.
Eduardo Erazo Acosta, University Nariño

Can network analyses of action situations help to scope leverage points for polycentric transformation? A review
Christian Kimmich, Masaryk University Brno

Publics and ethics of sustainability (part 4b): Democratic transformations in the Anthropocene

Session 1b

Convenors: Martin Kowarsch, Mercator Research Institute on Global Commons and Climate Change (MCC) & Anna Henkel, Universität Passau
Session chair: Anna Henkel

From Increasing Knowledge to "Real" Behavior Change: Evaluating Ways towards More Effective Ocean Literacy — **15.30-16.30**
Susanne Stoll-Kleemann, University of Greifswald — room 1.103

Towards a Formalisation of „Moral Responsibility"
Sarah Hiller, Freie Universität Berlin & Potsdam Institute for Climate Impact Research (PIK)

Humanity as a political subject in the Anthropocene: from planetary subjectivity to global sovereignty.
Manuel Arias-Maldonado, University of Malaga

Friday | August 30, 2019

Session 2a **Democracy, governance, and societal conflicts in a globalized world (part 4a):** Decision Making for Sustainability Outcomes

Convenors: Klaus Eisenack, Humboldt-Universität zu Berlin & Sabine O'Hara, University of the District of Columbia
Session chair: Sabine O'Hara

15.30-16.30 room 1.205

Sustainable Management Strategies for Corporate Change and Future Capacity Building
Raimund Schwendner, ISTOB Management Academy

Incorporating Sustainability Outcomes in Corporate Decision Making and Practice
Gregor Diem, Human Resources, Allianz Group

Addressing the Outcomes of Unsustainable Decision Making: the Experience of the Ruhrgebiet
Matthias Sinn, Environment Manager City of Munich and Essen

Internal and External Communication Networks: the UDC Urban Food Hubs Experience
Sabine O'Hara, Dean of CAUSES, UDC

Session 2b **Democracy, governance, and societal conflicts in a globalized world (part 4b):** Governance Theory

Convenors: Klaus Eisenack, Humboldt-Universität zu Berlin & Sabine O'Hara, University of the District of Columbia
Session chair: Klaus Eisenack

15.30-16.30 room 1.204

Closing the resource nexus governance gaps through reflexivity
Inaiê Takaes Santos, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam)

Transformation of the global value system framed by human rights and planetary boundaries
Thomas Hahn, Stockholm University

The interplay between urban governance and infrastructure development in sustainable urban transformation processes
Diana Nenz, University of Cambridge; Jan Hendrik Trapp, Deutsches Institut für Urbanistik; Jens Libbe, Deutsches Institut für Urbanistik

Session 3 **Economies beyond unlimited growth (part 4):** De-growth versus Green Growth (de-growth/green growth/a-growth/...), block 2

Convenors: Sabine Fuss, Mercator Research Institute on Global Commons and Climate Change (MCC) & Maja Göpel, German Advisory Council on Global Change
Session chairs: Sabine Fuss & Maja Göpel

15.30-16.30 room 1.401

Fossil capital is a monster, and it needs to go
Elke Pirgmaier, University of Leeds; William Lamb, Mercator Research Institute on Global Commons and Climate Change (MCC)

Examining the case for a Green New Deal to address economic and sustainability challenges
Tim Foxon, University of Sussex

Navigating through the (de-)growth controversy: the precautionary postgrowth position – a new consensus in the sustainability debate?
David Hofmann, Institut für ökologische Wirtschaftsforschung (IÖW)

Water and biosphere: preconditions of survival (part 4): Smaller-scale case studies

Session 6

Convenors: Doerthe Tetzlaff, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries & Tobias Krüger, Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Humboldt-Universität zu Berlin
Session chair: Dieter Gerten, Potsdam Institute for Climate Impact Research (PIK)

Strong Sustainability and SDG 14 „Life Below Water“
Klaus Konrad Ott, University Kiel

15.30-16.30
room 1.501

Freshwater biodiversity research from local to global scales
Sonja Jähnig, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Identifying multifunctional and sustainable land use scenarios with an ecosystem service index
Martin Pusch, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Treasure quest

16.30-17.30
Reuter-Saal

The adventure almost comes to an end: communicate your treasure! The treasure quest is an experimental workshop format discussing the 17 Sustainable Development Goals (SDGs) in small groups throughout the whole conference. The teams will be supported by trained student coaches and finally present their results to colleagues and the public.

Evening break with catering

17.30-18.00

Citizen scientist speed dating - public

18.00-19.00
Foyer

Last stage of the adventure: discuss your treasure! The conference participants encounter citizens of Berlin at 17 parallel tables to discuss the results of their treasure quest and to face their questions and comments.

Public debate: from knowledge to action - public

Moderator: Martin Kloss

19.00-21.00
Reuter-Saal

Edelgard Bulmahn, German politican, former Federal Minister of Education and Research, SPD

Ottmar Edenhofer, Director and Chief Economist of the Potsdam Institute for Climate Impact Research (PIK) & Director of the Mercator Research Institute on Global Commons and Climate Change (MCC)

Sebastian Grieme, Speaker for Fridays for Future & physics student at the University of Potsdam

Daniela Jacob, Director of the Climate Service Center Germany (GERICS)

Petra Künkel, Founder and Executive Director of the Collective Leadership Institute & Member of the Club of Rome

Closing remark - public

Christoph Schneider, Geography Department, Humboldt-Universität zu Berlin

Farewell gathering - public

21.00 - open end
Foyer

DJ-Set by Lotte Ahoi, Conscious Madness Berlin

Cold drinks, cool music

KOSMOS
KOSMOS
KOSMOS
KOSMOS
KOSMOS
KOSMOS
KOSMOS

DETAILED PROGRAMME

ABSTRACTS

Programme highlights
Expert forums
Poster session

PROGRAMME HIGHLIGHTS

ICEBREAKER

ICEBREAKER SPEECH

A windy road back to KOSMOS? Reflections on sustainability challenges on the cusp of a new era
Beatrice Crona, Stockholm Resilience Center

We are on the cusp of a new era. Will it be characterized by a new renaissance of biosphere thinking or plagued by increasingly rapid global environmental change? or both? Contemplating the academic legacy of Alexander von Humboldt provides an interesting backdrop to reflect on some of the key sustainability challenges of today and what they mean for our ability to transform.

Wed, 28th
19.00-22.00
Reuter-Saal
& Foyer

VISUAL ARTIST PERFORMANCE

Nicoletta Geiersbach (pantomime, Ökodorf 7 Linden) & Raffael Kircher (saxophon, Berlin)

Humboldt enters his own conference and lets the guests look into his research life. Lured by saxophone sounds, the guests follow him into the upper hall and listen to the words of the opening speech before HE, Humboldt, embarks on his next journey. There, too, Humboldt takes the guests with him, letting them linger in moments of his life burried deeply in HIMSELF.
For HIM, the sound of the saxophone portrays the path on which he moves through the land. In marked out areas he goes on a voyage of exploration and names what does not yet have a name.

Nicoletta Geiersbach

OPENING SPEECH

Scaling up solutions for sustainability
Eric Lambin, Université catholique de Louvain & Stanford University

Thurs, 29th
9.00-10.30
Reuter-Saal

Countless innovative solutions to environmental challenges are already implemented with success somewhere in the world. However, replicating these solutions at the scale required to lead to system-wide changes remains a major challenge. The key to up-scaling lies in building multi-stakeholder partnerships and developing synergies between various public and private policies – e.g., public policies integrating or supporting voluntary sustainability standards or large companies making sourcing commitments that apply sustainability standards to their entire supply chain. I will discuss theories, success stories, and challenges related to the up-scaling of solutions for forest conservation. The ability to convene multiple stakeholders to co-create effective partnerships is a key challenge for a sustainability transition.

INTERACTIVE POSTER SESSION

Thurs, 29th
17.00-18.30
Foyer

The interactive poster session provides ongoing projects and recent results in the form of scientific posters in a sociable atmosphere with beer and wine. The session is organized along the topics of the expert forums.
Some of the posters were created during the lecture series "Der Grüne Faden" at Humboldt-Universität zu Berlin. The posters are the academic achievements of students who are part of the *Studium Oecologicum*, a newly established educational module on sustainability. The organisation, composition and implementation of the *Studium Oecologicum* is carried by the student initiative "Sustainability Office of Humboldt-Universität".

PROGRAMME HIGHLIGHTS

PUBLIC KOSMOS LECTURE

Thurs, 29th
19.00-20.30
Reuter-Saal (video)
Senatssaal (live)

Towards sustainable business and finance within the planetary boundaries. A legal approach.
Anne-Christin Mittwoch, Philipps-Universität Marburg

Demands for more sustainability in corporate business transactions and on capital markets have been becoming increasingly urgent since the outbreak of the financial crisis. There is clear potential for innovation here; the law, with all its options as well as its enabling and incentive function, can and must also be used to provide a regulatory framework for the positive developments that are already emerging in the markets with regard to sustainability, and to promote them as far as possible. At the same time, law can discipline companies that disregard existing requirements in this respect more than before. Following on from the interdisciplinary approach of Alexander von Humboldt's KOSMOS lectures, the significance of "Business and Finance" for the transformation to a sustainable society will be examined from a legal perspective.

KEYNOTE LECTURE

Fri, 29th
9.00-10.00
Reuter-Saal

Sustainable Development Goals within Planetary Boundaries: Utopia or Panacea?
Johan Rockström, Potsdam Institute for Climate Impact Research (PIK)

The 17 Sustainable Development Goals present a new social contract for the world in the quest to achieve ways of living and economic well-being that no longer undermines the biological and physical life-support systems that human development depends on. Currently, we are following a very dangerous path, facing potentially irreversible and disastrous impacts, due to rising global environmental changes we have yet to arrest. To achieve the 17 SDGs by

2030 is an enormous challenge for humanity; to do so in a systemic manner - thinking climate, biosphere integrity, food security and healthy diets, and land use together - requires transformative solution. The Planetary Boundaries offer a framework to consider sustainable development in a way that respects the ecological resilience of the Earth while re-thinking social and economic development based on ecosphere integrity. Planetary boundaries define the scientific targets for a stable Earth system. Businesses, countries and communities increasingly recognize that socio-economic development in the Anthropocene - when human pressures on Earth pose rising global risks - must occur within scientifically defined boundaries, establishing a safe-operating space on Earth. SDGs within Planetary Boundaries suggests a pathway towards a world in 2050 in which a 'good life for all' – humanity and non-human species – is possible.

MARKET PLACE & BAR CAMP

The bar camp is a competitive science slam format. The audience decides which lecture to bring on stage based on a one-minute elevator pitch. Those with the most applause will be invited to present their research in detail. All others may communicate their work at bar tables at the following market place.

The following candidates face up to the challenge:

Multifunctional Field Margins: Assessing the benefits for nature, society and business
Juan Gonzalez-Valero, Syngenta

Growing the Future: the potential of phototrophic microorganisms
Ralf Steuer, Humboldt-Universität zu Berlin

An exploration of the role of science in a socioecological transformation – Researching transformative research
Carolin Puhl, Freie Universität Berlin; Wiebke Nowack, Humbold-Universität zu Berlin

Fri, 30th
10.00-11.00
Reuter-Saal
11.00-11.30
Foyer

PROGRAMME HIGHLIGHTS

Prospective Volition and Retrospective Thinking: Evidence from Adopting Climate Insurance in Agro-pastoral China

Lu Yu. German Development Institute (DIE)

The great whole of nature and the partial politics

Kristine Kjørup Rasmussen, Grøn University of Aalborg

Sediments remove trace organic compounds in urban streams

Jonas L. Schaper, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries & Technische Universität Berlin

Sustainability at Higher Education Institutions

Margarita Doneliene, Freie Universität Berlin

Reconciling food production and biodiversity conservation for food security in Nigeria

Kashimana Ivo, Universität Hamburg

Institutions and Instruments of Development Cooperation - Is there a need for change?

Denise Sumpf, Humbold-Universität zu Berlin

Introduction: Planetary Health as a new discipline

Oskar Masztalerz, Humbold-Universität zu Berlin

The power of the ancestral philosophy of Sumak kawsay (Good Living) in the indigenous movements of Colombia - Ecuador vs. exclusion by mega mining development, contributions to the Rights of Mother Nature from the global south.

Eduardo Erazo Acosta, University Nariño

Humboldt as a Sustainable Design Hero

Julia Kulgavchuk, Laerdal

Framing just transitions: discourses as facilitators and barriers of low-carbon energy transitions in Germany and Australia

Linda Wollersheim, Deakin University

Separating supply and demand-side drivers of land use change to govern telecouplings

Nicolas Roux, University of Natural Resources and Life Sciences, Vienna

Urban Eris? Chennai's anthropogenic water bodies and their future

Luise Haufe, Freie Universität Berlin

CITIZEN SCIENTIST SPEED DATING & PUBLIC DEBATE

From knowledge to action

A citizen scientist speed dating and a public debate form the public closing point of the KOSMOS Conference. This format wants to underline the importance of dialogue when it comes to making our world more sustainable.
The speed dating is the last step of the treasure quest adventure. Here, the conference participants encounter citizens of Berlin at 17 parallel tables to discuss the results of their team work about the 17 Sustainable Development Goals (SDGs).
The public debate is a panel discussion that invites the audience to participate. Representatives from science, policy and practice will meet in order to discuss the urgent question on how to get from knowledge to action. The discussion will be documented by an artist in the form of a visual recording.

Fri, 30th
18.00-19.00
Foyer
19.00-21.00
Reuter-Saal

The panel

Edelgard Bulmahn, German politican, former Federal Minister of Education and Research, Social Democratic Party (SPD)

Ottmar Edenhofer, Economic Director of the Potsdam Institute for Climate Impact Research (PIK) & Mercator Research Institute on Global Commons and Climate Change (MCC)

Sebastian Grieme, Speaker for Fridays for Future & physics student at the University of Potsdam

Daniela Jacob, Director of the Climate Service Center Germany (GERICS)

Petra Künkel, Executive Director and Co-Founder of the Collective Leadership Institute

Moderation: Martin Kloss

EXPERT FORUMS

SESSION1 - PUBLICS AND ETHICS OF SUSTAINABILITY (PART 1):
Examining publics, society and ethics

11.00-12.30
room 1.102

SESSION CHAIR
Dominic Lenzi

Martin Kowarsch, Mercator Research Institute on Global Commons and Climate Change (MCC)

Approaches to the normative dimensions of sustainability governance

This paper aims to provide an introduction to the strand "publics and ethics of sustainability". We outline challenges and democratic requirements for sustainability transformations when facing divergent normative viewpoints related to a heterogeneity of outcomes. The different ethics, values and worldviews in society require legitimate responses in sustainability governance, including at the science-policy-society interface. In different publics at the national and international level, various response options to sustainability challenges are debated, including, e.g., economic instruments, regulation, or consumer education. Such instruments imply different modes of sustainability transformation – and thus very different understandings of goals, means and central actors of "sustainability": e.g., consumers regarded as responsible for sustainable lifestyles, governments responsible for incentives or regulation, and industry responsible for developing better technologies. As all these different pathways necessarily involve prioritization, we argue for open, democratic and participatory processes, in which the divergent discourses on sustainability are deliberated. This requires linking abstract debates about sustainability framings with particular discourses about concrete solution options, explicating their respective implicit understanding of sustainability.

Moreover, we argue that an appropriate deliberation about ethical issues in sustainability governance requires a better understanding of, and a critical reflection on, the practical implications (i.e., direct and indirect, positive and negative effects) of concrete policy alternatives. Interdisciplinary approaches to "non-ideal justice" go in this direction, for example. (Meta-)criteria of sustainability might evolve out of this discussion.

Jens Jetzkowitz, Museum für Naturkunde Berlin

How to Study the Co-Evolution of Nature and Society: Humboldt and beyond

11.00-12.30
room 1.102

Humboldt's research was based on the idea that dynamic forces work in nature which, through their interaction in natural-historical processes, create the image of the cosmos. He was aware that human activities must be considered and researched in these interactions. How such interactions can be explored is an open question.

In most cases studies rely on socioeconomic indicators that consider the impact of activities on ecosystems. However, correlations between indicators may provide indications on interdependencies between societal and natural aspects, but cannot explain them. This can be illustrated by the debate triggered by various studies on the relationship between economic inequality and biodiversity loss. While some scholars address questions of justice aiming at removing one important cause of biodiversity loss, others point to the unsolved questions of correlation-based analyses of indicators and insist that the causal meshwork is yet not well understood.

In my presentation, I try to go beyond this state of methodological discussion and propose to examine the interfaces between nature and society with the instrument of style analysis. In this way, the focus is not on human action in general, but on identifying specific patterns of action and lifestyles and describing their interactions with natural aspects. This research approach is illustrated by the structure and results of my own research (e.g. studies explaining the distribution of native and alien species in settlements or the behaviour of German tourists under climate change conditions). Finally, I comment on implications for the study of the societal aspects of co-evolutionary processes.

EXPERT FORUMS

11.00-12.30
room 1.102

Christine Bismuth, GFZ German Research Center for Geosciences

No We Can't. On the reasons why our societies are unable to transform in face of climate change and why we prefer the technological approach

The water crisis is one of the most urgent problems facing our societies in view of the effects of climate change. Given the importance of water, one would think that we should work quickly towards the implementation of well-known solutions. So why is it so difficult and generation-spanning to implement them? And why do we prefer (large-scale) technical solutions to comprehensive behavioural changes? Using the examples of agriculture and water management from Germany, the Jordan Basin, and Central Asia, the reasons for our persistence in old and often unsustainable patterns, the long duration of change and our preference for short-term technical solutions will be studied. We will discuss the conditions under which comprehensive behavioural changes have been achieved and what conclusions can be drawn with regard to path dependencies, path deconstruction and societal bricollage. Reviewing human history and the social and economic contexts which shape our descissions and choices, will illustrate possible solutions to overcome the barriers for adaptation and mitigation measures with regard to climate change. The conditio humano influences the type of our choices considerably. Studies on the human nature, which governs our behaviour, can also help to draw conclusions as why mankind struggles to deal adequately with the consequences of climate change. We will consider those studies for their relevance in our analysis and their significance to overcome the barriers for climate adaptation and mitigation solutions.

This paper is founded in parts on research conducted by the Interdisciplinary Working Group „Water-Society-Technology“ Berlin-Brandenburg Academy of Science (BBAW).

Wolfgang Lucht, Potsdam Institute for Climate Impact Research (PIK)

A Diagram of the Whole Earth System

Diagrams have played an important role in shaping science. Already for Alexander von Humboldt, diagrams and carefully constructed depictions were part of his approch to seeing Earth as a system. Humboldt‘s Earth, though, was not the Earth of the Anthropocene. The famous Bretherton Diagram of the 1980ies, depicting Earth as one unified system of geophysical and biogeochemical interactions with some human intervention, foreshadowed the subsequent evolution of science in the fields of Earth modelling, Earth observation and international origanisation of the geosciences. It was something of a blueprint that was later built. This talk will present a new diagram of the whole Earth system for the Anthropocene, a diagram of planetary social ecology that fully includes the human sphere as an emergent evolutionary phenomenon, and the twin ambitions of maintaining planetary boundaries and inclusive sustainable development through socio-metabolic governance of the Earth system. The roles of biological and social innovation, as well as the phenomena of the technosphere and collective semiotic mental sphere appear in the diagram, which both are products of evolving connectivity. A simplified version provides a new paradigmatic logograph of sustainability. It is fitting to take up Humboldt‘s method of producing „tableaus“ and applying it to the largest, the planetary scale.

11.00-12.30
room 1.102

11.00-12.30
room 1.205

SESSION CHAIRS
Klaus Eisenack
Sabine O'Hara

EXPERT FORUMS

SESSION 2 - DEMOCRACY, GOVERNANCE, AND SOCIETAL CONFLICTS IN A GLOBALIZED WORLD (PART 1): Modeling

Marina Andrijevic, Humboldt-Universität zu Berlin

The Role of Governance in Future Pathways of Sustainable Development

Institutions and governance are key determinants of long-term stability and sustainable growth of nations. As such, they are also a central part of the Sustainable Development Goals, with the specific targets of promoting the rule of law, reducing corruption, developing effective, accountable and transparent institutions and building of institutional capacity at all levels.
While institutional characteristics are acknowledged as one of the pivotal ingredients of sustainable development, they are too often overlooked in quantitative research. Since good governance will be decisive for successful development on many levels including economics, health, education, or climate action, improving our understanding about possible future trajectories of governance are a central ingredient to assess societies' capacities to cope with global challenges in the 21st century.
We present future governance trajectories in line with different development narratives as reflected in the Shared Socio-economic Pathways (SSPs). The SSPs represent the backbone of scenario design in climate research to assess future impacts of climate change, but so far lack any quantitative indicators for future adaptive capacities. We find that governance can be proxied with a combination of income, post-secondary education and gender equality, which allows us to extend the SSPs in a consistent fashion. Our results highlight the temporal dimension of governance evolution, where even under the most optimistic scenarios it will take decades for countries with low development status to improve. We further show how governance is a key determinant for climate adaptation and discuss the importance of incorporating governance dimensions into climate impact assessments.

Jobst Heitzig, Potsdam Institute for Climate Impact Research (PIK)

Some chance for consensus: voting methods for which consensus is an equilibrium

A major issue with consensus decision-making is the question of what happens when no consensus can be reached, e.g., when someone (or, in case of partial consensus decision-making, a sufficiently large part of the group) "blocks." If in this case the issue is "laid down" and the status quo prevails, then all who favor that option have incentives to block. If, as is done often in practice, some common form of voting is used as a fall-back method when consensus cannot be reached within a given time frame, then all who prefer the result of the fall-back method over the potential consensus option have incentives to block. From a game-theoretic point of view, the combined procedure then becomes equivalent to using only the fall-back method in the first place, making it unlikely for rational agents to reach any consensus different from the status quo and from the majority's favorite. In this talk, we discuss voting methods that overcome this problem by introducing the possibility of a certain amount of chance that leads to rational voters seeking consensus and that removes incentives to block consensus.

Reference:
Heitzig, J. & Simmons, F.W. Soc Choice Welf (2012) 38: 43. https://doi.org/10.1007/s00355-010-0517-y

11.00-12.30
room 1.205

EXPERT FORUMS

11.00-12.30
room 1.205

Christian von Hirschhausen, Technische Universität Berlin

Nuclear Power, Democracy, and Sustainable Development: Quantitative and Qualitative Analysis of the Role of Nuclear Power and Democracy in the Context of the Sustainable Development Goals (SDGs)

Nuclear power is always present when it comes to sustainable development, either directly, i.e. in SDG 13 (climate change) and SDG 16 (peace - justice - strong institutions), or indirectly, such as in SDG 7 (energy access). In fact, nuclear power appears in as much as eight (8) of the 17 SDGs.Decisions in this sector have always been based on political bargaining and state financing, rather than on pure economic rationality (Lévêque, 2014; Hirschhausen, 2017; Stirling, Johnstone, 2018; Wealer et al., 2018). Currently, about thirty countries are considering, planning or starting nuclear (World Nuclear Association, 2018), and some still consider a high global potential for nuclear power up to the year 2050 (IAEA, 2017). We provide both a qualitative and a quantitative discussion of the drivers of nuclear power, and - going forward - its perspectives in the context of the SDGs. The qualitative section includes an economic analysis of different nuclear power options, a survey of ongoing trends in the sector, and a review of recent trends in European and globally. The quantitative (econometric) part of the contribution analyzes how a countries‘ choice to successfully introduce nuclear power interacts with the level of democratic development (1960-2017, panel of 217 countries). Countries with lower levels of democratic development are more likely to introduce nuclear power.

Jonathan F. Donges, Potsdam Institute for Climate Impact Research (PIK)

Analytical tools for studying Earth system resilience in the Anthropocene: from ontologies to simulation models

11.00-12.30
room 1.205

In the Anthropocene, societal processes have become critical to understanding planetary-scale Earth system dynamics. The conceptual foundations of Earth system modelling have externalised social processes in ways that now hinder progress in understanding Earth resilience and informing governance of global environmental change. New approaches to global modelling are needed to address these challenges, but the current modelling landscape is highly diverse and heterogeneous, ranging from purely biophysical Earth System Models, to hybrid macro-economic Integrated Assessments Models, to a plethora of models of socio-cultural dynamics. World-Earth models, currently not yet available, will need to integrate all these elements, so future World-Earth modellers require a structured approach to identify, classify, select, and combine model components. Here, we develop ontologies for ordering the multitude of societal and biophysical subsystems and their interactions. We suggest three taxa for modelled subsystems: (i) biophysical, where dynamics is usually represented by ``natural laws'' of physics, chemistry or ecology (i.e., the usual components of Earth system models), (ii) socio-cultural, dominated by processes of human behaviour, decision making and collective social dynamics (e.g., politics, institutions, social networks), and (iii) socio-metabolic, dealing with the material interactions of social and biophysical subsystems (e.g., human bodies, natural resource and agriculture). We present the copan:CORE framework as a flexible tool to construct World-Earth system simulation models. As an example, we study a stylised model of socially transmitted discount rates in a greenhouse gas emissions game to illustrate the effects of social-ecological feedback loops that are usually not considered in current modelling efforts.

11.00-12.30
room 1.401

SESSION CHAIRS
Sabine Fuss
Maja Göpel

EXPERT FORUMS

SESSION 3 - ECONOMIES BEYOND UNLIMITED GROWTH (PART)1: Connecting climate and sustainability („multi-solving“)

Stefanie Kunkel, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam)

Revisiting the paradigm of manufacturing-led development: Sustainability, digitalisation and the future of manufacturing in low and middle income countries

Manufacturing has traditionally been a key element in the development process from agricultural to service-based value creation. Industrial policies often refer to the manufacturing sector's potential to absorb large numbers of low-skilled workers, foster integration into international trade and economic growth. However, manufacturing substantially contributes to environmental degradation. With the digital transformation in industry becoming more important, questions are also raised about social and economic sustainability of manufacturing-led development in low and middle income countries: How is digitalisation affecting sustainability aspects of the manufacturing sector, such as employment creation, trade integration and environmental impacts? How are expectations about these changes reflected in policies in low and middle income countries?
I will present the preliminary results of research on expectations about the effects of digitalisation on sustainability in the manufacturing sector. Firstly, I present some empirical findings from the literature on the link between digitalisation and sustainability in the manufacturing sector. Secondly, I present the results from a qualitative content analysis of industrial and digital strategies of selected low and middle income countries focusing on expectations regarding employment, trade and environmental threats and opportunities.This research is useful in two ways. First, it provides an insight into policy perceptions of sustainability and digitalisation in the manufacturing sector. Second, it allows to examine the potential gaps between policy expectations and the scientific discourse and might help closing these gaps.

Maria Proestou, Humboldt-Universität zu Berlin; Frank Fischer, Humboldt-Universität zu Berlin

Climate Denial: Populism, Post-Truth and Environmental Politics

11.00-12.30
room 1.401

Post-truth, driven significantly by right-wing populist parties and movements, has become one of the major political concerns of our time. Basic to post-truth is an attack on science and traditional understanding of truth. In the case of environmentalism, post-truth is most prominently associated with the politics of climate denial. This presentation points to the fact that environmentalists have in various ways unwittingly contributed to the politics of climate denial by questioning the role of scientific technologies for having led to major environmental disasters, including global warming.
For this reason, much of the academic environmental literature has challenged the positivist conception of science from the perspectives of social constructivism and post-normal science. Thus, many academics have offered an alternative environmentalism that calls for a new self-reflexive post-modern epoch organized around the principles of sustainability. Now, however, numerous academics accuse constructivism of having nurtured the relativism basic to post-truth. Contemporary populist parties and movements have incorporated this critique into their politics, thereby supplying their rhetoric with arguments for climate denial. They portray climate change and the data supporting it as an academic theory grounded in a „truth regime“ advanced by political and environmental elites to serve their interests at the expense of ordinary citizens. To combat this, many environmentalists find themselves struggling to recapture the various sciences they were questioning. This presentation seeks to explore the nature of this battle and ways to deal with it.

EXPERT FORUMS

11.00-12.30
room 1.401

Felix Zoll, Leibniz Centre for Agricultural Landscape Research (ZALF)

How a decision support tool helps to make sustainability tangible – A case study on dual-purpose chicken farming

A change towards sustainable consumption requires innovative solutions for prevailing unsustainable practices. However, the development and implementation of such innovations can depict a challenge for the actors involved, since sustainability is an abstract concept that means different things to different individuals. To successfully integrate sustainability into an innovation, the coordination of actors' goals and a clear communication of the innovation's benefit within the actor network but also towards customers is needed. The challenging identification of common sustainability goals suggests the use of decision support tools. Thus, the aim of our research was to set up such a tool and to investigate if the tool is useful to identify commonalities and differences in actors' sustainability goals along a value chain. Furthermore, we wanted to know if the tool could assist in showing concrete aspects to be improved within the value chain. In a case study that aims at increasing sustainability and animal welfare in chicken meat and egg production, three different actor groups applied the decision tool. The results show that the involved actors have manifold goals but only some goals overlap and the perceptions of their implementation diverges as well. Based on the visualization of the actors' assessment of the common sustainability goals, we showed that the tool can be used to identify fields of action in which sustainability can be improved. The application of the tool also induced thinking processes for possible adjustments of the value chain regarding aspects such as information flows or marketing processes.

Friedrich Hinterberger, SERI Sustainable Europe Research Institute

How We Change The World

In order to limit global warming to 1.5° C above pre-industrial levels, humanity may only emit an additional 600-700 Gigatonnes of CO2. Without additional measures, total emissions would increase to around twice the reasonably safe limit by 2050 (http://www.meetpass.at/). While global economic output will almost double in this period (+85%), emissions will rise by a third. In order to reach the target, emissions per capita would have to decrease to about 1.0 tonne per capita by 2050. The good news is: the economy would even grow faster.

This would above all require an increase in CO2 prices to $225-265 per tonne and a considerable investment in renewable energy as well as public initiatives (e.g. credit programs) that double the rate of building renovation to upgrade energy performance. With regard to metal ores, a profound and detailed information programme for fostering resource efficiency would be established so that half of the primary metal ore inputs will be substituted by secondary materials.

With regard to dietary habits on each stage oft he food chain a reduction of 10% in mass inputs must be achieved by reducing food waste. Additionally, the growth rate in meat demand needs to be by 2-3 percentage points lower than in the business as usual. Finally, if people reduce their working hours and therefore have to reduce their consumption expenditures and value the gains in leisure time higher than the losses in (materialistic) consumption, the climate goals can be achieved in a socially and economically sound way.

11.00-12.30
room 1.401

EXPERT FORUMS

SESSION 4 - LIMITED LAND – A LOCAL TO GLOBAL PERSPECTIVE (PART 1): Transitioning future land use towards sustainability

11.00-12.30
room 1.103

SESSION CHAIR
Patrick Hostert

Floris Leijten, Unilever

Taking stock of zero deforestation commitments

The production of palm oil, soy, beef and timber are key drivers of global forest loss. For this reason, 470 companies involved in the production, processing, distribution or use of these commodities have issued commitments to eliminate deforestation from their supply chains. The potential effectiveness of these commitments depends on their scope and specificity as well as governance mechanisms. Here, we focus on scope and specificity, mapping the global extent of forest areas that are potentially protected under the different definitions and criteria articulated in the various corporate zero deforestation commitments. Focussing on the High Carbon Stock (HCS) and High Conservation Value (HCS) approach, we quantify the proportion of forests at a global, regional and country level that fall outside the scope of corporate commitments. These areas may thus be subject to increased pressure for future agricultural development assuming compliance with corporate commitments globally. Using agronomic suitability maps for each of the 4 commodities, we show how much potential cropland is left outside the protected forest areas and how much additional land may be developed by 2030 to meet global demand.

Samadhi Lipari, University of Leeds

Transition towards renewable energy sources in the EU: between ecological modernisation and new cycles of capital accumulation

11.00-12.30
room 1.103

This contribution fits into the debate around the implications of ensuring clean and affordable energy, as per the seventh UN sustainable development goal, in socio-technical systems, considered at a multiple spatial scale and implying diverse socio-ecological relations.
It will present the findings of two national case studies: wind energy in South Italy's Campania region and biogas in Eastern Germany's Brandenburg lander. The studies, conducted also thanks to a fellowship at the Humboldt University's IRIthesys institute, investigate renewable energy transitions, in the context of the EU. The two cases have been selected intending to develop an analysis of two energy sources in different national socio-technical contexts, in order to identify similarities and divergences within the EU energy governance framework. More specifically, the research clarifies how those transitions have interwoven with governance frameworks, triggered societal conflicts and thereupon affected substantial and procedural democracy.
Evolving from an initial focus on land grabbing in the EU and then expanding into ecological distributional issues, the research builds on the concept of territory, as a fulcrum vital in starting up global value chain productive processes through multiscalar governance frameworks. Around this rationale, the contribution will present the studies' findings, shedding light on the relation between the modernisation of socio-technical systems and potential distortion feeding into 'speculative' cycles of capital accumulation. This will be organised within four analytical ambits: (i) regulatory and policy frameworks and processes, (ii) value chains structure and dynamics, (iii) Inclusion dynamics of territorial socio-technical systems into energy transitions and (iv) conflicts.

EXPERT FORUMS

11.00-12.30
room 1.103

Hermann Lotze-Campen, Potsdam Institute for Climate Impact Research (PIK)

Towards coherent policy measures for achieving the Sustainable Development Goals

The political process of adopting the sustainable development goals (SDGs) has reached a turning point with the UN Summit in September 2015. However, given the ambitious list of 17 SDGs and 169 policy targets, research so far has not provided comprehensive tools and approaches to analyze the interactions, trade-offs, co-benefits and synergies across multiple SDGs in sufficient detail. Moreover, developing coherent policy measures to achieve a complex set of goals at different levels (from multi-national to sub-national) and across different policy domains remains a huge challenge. Important lessons can be drawn from the IPCC process on climate change impacts, adaptation and mitigation research and policy making. The climate-related SDG 13 has many interactions with other SDGs, especially with energy (SDG 7), but climate impacts may also affect poverty and hunger (SDG 1 and 2), water (SDG 6), marine resources (SDG 14) and economic growth (SDG 8). On the other hand, ambitious climate change mitigation may strongly change production and consumption patterns (SDG 12), urban development and infrastructure (SDG 9 and 11), and terrestrial ecosystems (SDG 15) with implications for justice and peace (SDG 16). Here we propose to advance the well-established Shared Socioeconomic Pathways (SSP) for improved sustainability policy assessments. Moreover, global-scale scenarios need to be combined with detailed national assessments.

Matthias Baumann, Humboldt-Universität zu Berlin

Towards revising the planetary boundary for land systems

The current planetary boundary for land systems is defined as the (biome-specific) area of forest loss that, if exceeded, may represent a risk for Earth system destabilization. Yet, this provisional "aggregate" boundary definition lacks linkages to, and between, different land systems. This is problematic, as forestry, cropping, and grassland systems exhibit different regional differences, and are at the same time intrinsically linked. As a result, it is unclear whether this current boundary definition is a suitable representation of the state of the land planetary boundary.
Against this background, we combined state-of-the-art global datasets on land use/cover, and related them to global representations of the human-transformed biomes with the goal to examine relationships between a pre-industrial baseline and today's transformed land systems at the ecoregional level.
Our results suggest the need for a differentiated view on the importance of understanding local to regional process regimes and human agency at fine grain to substantiate future land systems boundary definitions. Furthermore, our results show how data-related sensitivity needs to be considered when defining land system boundaries. Beyond quantification, we caution that such definitions will always need to put human agency in the center, e.g. relating to sustainable development goals such as food security, public health, or improving local livelihoods, among others.

11.00-12.30
room 1.103

11.00-12.30
room 1.502

SESSION CHAIRS
Bettina König
Daniela Kempa

EXPERT FORUMS

SESSION 5 - URBAN AND RURAL: A NECESSARY PARTNERSHIP (PART 1): (novel) conceptual and methodological lenses to urban-rural interlinkages

Lisa Diedrich, Swedish University of Agricultural Sciences; Gini Lee, The University of Melbourne

Travelling Transect – an approach to mobile knowledge generation

Contemporary interpretations of Humboldtian science promote knowledge generation conceived as a mobile enterprise, allowing researchers to travel across disciplinary and geographical boundaries and territories. A transareal explorative research practice enables both discovery and insight into relational links between diverse places previously regarded as unconnected. Leading European research programs such as JPI Urban Europe call for dilemma-driven and reflexive approaches to complex situations, in particular promoting SDG 11 (sustainable cities and human settlements) as an entry point to, and/or mediator for, other sustainable development goals. In order to operate effectively in places and landscapes subject to the processes of intensive global urbanisation we suggest it is necessary to adopt transdisciplinary methods to encourage interdisciplinary sustainability research. The transect is a fieldwork tool frequently used in the social and natural sciences. We introduce the idea of the Travelling Transect, drawn from the design discipline of landscape architecture, as an approach suited to research into contemporary urban, rural and remote landscapes through cultural, spatial, ecological, temporal and narrative mapping practices. Our explorations into critical water landscapes demonstrate how the Travelling Transect adopts Alexander von Humboldt's mobile fieldwork concept and subsequent tableau physique representations to reveal the possibilities for sustainable design and management programs for water-land intersections in times of weather induced change. We present the results of a series of transect travels to the Canary Islands, south eastern Australia and the land-water interfaces of Scandinavia to promote a designerly method that invites disruption towards fostering transition to sustainable futures.

Luise Haufe, Freie Universität Berlin

Urban Eris? Chennai's anthropogenic water bodies and their future

11.00-12.30
room 1.502

The landscape of Tamil Nadu, South India, is shaped by eri cascade systems. Eris (Tamil: lake,reservoir) are semi-natural water bodies, which divert river water to retain it in the landscape foragricultural irrigation. In an area, which is dependent on monsoonal and cyclonic rainfall, eris also help to retain stormwater for flood and drought control. In the peri-urban areas of Chennai, Tamil Nadu's capital, eri cascades are still widespread occurring and mostly functioning. Nevertheless, they are under threat due to rapid urbanisation and land use change. This PhD project aims at evaluating the impact of eri cascade systems and conceptualizing their new role in an upcoming urban region. Three key questions form the core of this PhD:1. What planning challenges does Chennai face? 2. What is happening in and around Chennai's peri-urban water bodies? 3. What can happen, when planning challenges lead to new approaches and peri-urban waterbodies receive a chance for sustainable urbanisation? Using the case study of Manimangalam Eri, located in the south-west of Chennai, I am currently surveying eri management processes, land use changes and stakeholder constellations. Interestingly, a new extension plan for Chennai Metropolitan Region and a new law to protect water bodies leads to major changes in and around Manimangalam Eri. The new regulations contain both, potential for eco-friendly development as well as threat to marginalised groups prone to eviction. How current conflicts can be resolved and whether alternative approaches can find their way into existing regulations, remains uncertain so far.

EXPERT FORUMS

11.00-12.30
room 1.502

Muluken Elias Adamseged, Leibniz-Institut für Agrartechnik und Bioökonomie e.V. (ATB)

Critical business environment factors of innovative rural business cases

Rural areas cover more than 50% of Europe's surface and are home to less than 25% of its population. Yet, they are lagging-behind in infrastructure for ICT and transport, as well as having low levels of accessibility to services, knowledge, skills, entrepreneurship and innovation in comparison to urban settings. In recent years, however, there are growing innovative and new business cases which are making rural areas attractive to live and work. This paper aimed, first, to develop an innovative business environment framework to characterize the business environment of these business cases in rural areas and figure out the most important factors of the innovative business cases. And second, to identify critical business environment factors to characterize specific categories of business cases. Data collection has been made on over 50 different business cases which are systematically selected from food, bioeconomy and eco-system services categories across 11 different European countries. The result of the study showed that the business environments of business cases in rural areas are importantly different from other conventional business cases working in urban setting. Mainly due to the nature of the business, their access to technology, knowledge, finance, infrastructures, and resource, and more importantly due to the different rules and regulations which facilitates or inhibit their business. Moreover, within the rural business cases, some business environment factors are critically important to some business cases while others factors to different businesses.

Daniela Kempa, Leibniz Universität Hannover

Creating innovative urban-rural linkages through transdisciplinary collaboration: experiences of nine Innovation Groups for a sustainable land management in Germany

11.00-12.30
room 1.502

Land management is one of the core fields where urban and rural areas shape sustainability through their direct and indirect interconnections. Within the funding program of the so called Transdisciplinary Innovation Groups for a sustainable land management, the German Ministry of Science and Education has provided special conditions for nine transdisciplinary consortia with focus on integrated urban-rural developments. The nine groups work on transformation challenges in the fields of regional energy transitions, innovative land management and its value chains and regional management of cultural and public services. Our contribution summarizes the findings of three innovation groups regiobranding, ginkoo and urba-rural-solutions. Their research agendas put a strong emphasis on urban-rural interrelations and city-state cooperation and use innovative transdisciplinary process designs. All have in common, that through the cooperation of science and practice, of different disciplines and of urban and rural actors new transdisciplinary methods and tools are developed. Vice versa specially adapted formats for participation, communication and knowledge integration pave the way for social innovations. These encompass e.g. organizational changes in the model regions such as cross-departmental and cross-country cooperation in administration and stakeholder networks. In addition several boundary objects such as hardware products and services were developed and tested, e.g. sustainable value chains addressing urban and rural linkages with regard to landscape management and valorization of landscape qualities. In our contribution we will present these results in detail and draw conclusions on the potential of boundary objects created through transdisciplinary collaboration to form innovative urban-rural linkages.

EXPERT FORUMS

SESSION 6 - WATER AND BIOSPHERE: PRECONDITIONS OF SURVIVAL (PART 1): Water scarcity & water security

Heidi Kreibich, GFZ German Research Centre for Geosciences

11.00-12.30
room 1.501

SESSION CHAIR
Doerthe Tetzlaff

Paired event analyses to support sustainable risk management of floods and droughts

For the development of sustainable, efficient risk management strategies for the hydrological extremes of droughts and floods, it is essential to understand the temporal changes of impacts, and their respective causes and interactions. To achieve scientific advancement in this area we suggest the approach of comparative analyses of paired event case studies (Kreibich et al. 2019, DOI: http://doi.org/10.1080/02626667.2018.1558367). The approach is analogous to the concept of "paired catchment studies", consisting of analysing two events that occurred in the same catchment or region and the processes between the events, which might have caused changes in hazard, exposure or vulnerability. This approach consists of collecting a large number of paired-event case studies from different hydro-climatic and socio-economic settings around the world. The advantages of this approach are that it allows detailed context- and location-specific assessments based on the paired-event analyses, and reveals general, transferable conclusions based on the comparative analysis of various case studies. Additionally, it is quite flexible in terms of data and can accommodate differences between floods and droughts. A pilot study, which analysed eight paired flood events from around the world revealed, that reduction of vulnerability is key for improved risk reduction (Kreibich et al. 2017, DOI: http://doi.org/10.1002/2017EF000606). Thus, we need to redouble efforts to improve our understanding of vulnerability. We hope to motivate a broader international initiative to collect and analyse a large number of paired-event studies, for example, in the framework of the Panta Rhei initiative of the International Association of Hydrological Sciences (IAHS).

Sergi Sabater, Catalan Institute for Water Research, Girona (ICRA)

Water scarcity in human-impacted basins: implications for river ecosystems

Water scarcity, a structural deficit in water resources, can have noticeable effects for both people and landscapes. Water scarcity occurs not only in arid areas, but also in many regions with intense use of water resources for agricultural, touristic or industrial purposes. The recently implemented EU project GLOBAQUA has assembled multiple lines of evidence on the effects water scarcity causes to river basins. While these are more acute in Mediterranean basins in Europe, effects in other areas are not negligible. Water scarcity drives the occurrence of complex stressors leading to multiple effects on biodiversity and ecosystem functions. The loss of hydrological dynamism associated to water scarcity is coupled to the rising concentrations of chemicals, nutrients, and organic matter. Effects include biodiversity loss, alteration of dispersal, shifts in trophic web connections, toxic effects, and impairment of ecosystem functions such as nutrient and organic matter processing. Ultimately, the stressors associated to water scarcity reduce the quality of services provided by river ecosystem. A proper management would therefore require the implementation of properly tailored, quick, mitigation actions, in order to maintain biodiversity, ecosystem functions, and the quality of river ecosystem services.

11.00-12.30
room 1.501

EXPERT FORUMS

11.00-12.30
room 1.501

Karen Lebek, Humboldt-Universität zu Berlin

Working towards household water security as a cornerstone of sustainable development: A case study in rural Umvoti, South Africa

The Sustainable Development Goal (SDG) No. 6 "Clean water and sanitation" puts renewed emphasis on the household level, where clean water and sanitation must be provided. In contrast, policy discourses such as water security have predominantly focussed on city, catchment, aquifer or national levels. Household water security has been particularly under-researched. When we started to investigate the multi-faceted nature of household water security in a rural ward in Kwazulu-Natal, South Africa, it became clear that we must map out the different manifestations of a spectrum of water insecurity instead of solely determining whether a household was water secure or not. We reflect our case study against the emerging literature on household water insecurity (HWI).

The results from our case study show significant differences in indicators of household water insecurity between different primary water sources. We also drew out the relational nature of water insecurity, where availability, access, infrastructure, livelihoods, opportunities and social relations are highly interdependent and dynamic. Together they shape individual household water insecurity. This multi-layered and dynamic situation of water insecurity cannot be understood using common water security framings. This holds important lessons for policy and practice; the focus should be reoriented on the household level and a differentiated analysis of water insecurity. This enables working towards sustainable solutions that go beyond common infrastructure planning in diversifying water sources and serving the provision of water and sanitation without compromising other SDGs.

Wei Weng, Humboldt-Universität zu Berlin

"Sky and land merged": Aerial river management for future water

*--Alexander von Humboldt, Personal Narrative of a Journey to the Equinoctial Regions of the New Continent

Moisture being evapotranspirated from the land, through transportation in the atmosphere, precipitates in the downwind regions. The main pathways of these moisture flows constitute invisible aerial rivers connecting regions across juristic and topographic boundaries. The intangible nature of the aerial rivers calls new instruments to facilitate their integration into land-water management. Here we present two examples utilizing moisture back-tracking algorithms to inform decision making at different scales. In the first example, we quantify the role of strategic reforestation in supplying important quantities of moisture into the aerial rivers, sustaining freshwater resources at a downwind city. Our simulations report a runoff gain by 26.93% during the dry season for Santa Cruz de la Sierra (Bolivia) from strategic reforestation. The increase of the renewable water resource could cover 22 to 59% of the city's growing demand by 2030. At the country scale, we outline key areas providing moisture to water-scarce regions of Colombia and examine land use practices and planning in those areas. We found the Orinoco region, which currently faces oil drilling, agricultural expansion and political uncertainties, critical in sustaining dry season moisture for cities such as Bogotá and Cali. Since also a large portion of the key areas is situated in neighboring countries, we discuss chances of cross-boundary moisture management to approach Colombian national "moisture security". The examples underpin the need for a more holistic view of sustainable land-water management.

11.00-12.30
room 1.501

EXPERT FORUMS

SESSION 7 - CLIMATE CHANGE: BIOPHYSICAL IMPACTS AND SOCIETAL RESPONSES (PART 1): Governance of Climate Change

Carl-Friedrich Schleussner, Climate Analytics & Humboldt-Universität zu Berlin

11.00-12.30
room 1.204

SESSION CHAIR
Christoph Schneider

How climate-related disasters contribute to armed conflict risk - providing multi-method evidence

Natural disasters linked to extreme weather events are among the most societal disruptive impacts of ongoing anthropogenic climate change. In addition to economic and livelihood destruction, disasters may also increase the risk of armed conflict. Evidence for such interlinkages remains limited so far as existing studies lack cross-scale and -method integration and thereby conclusiveness and process understanding in the light of the complex and context specific nature of armed conflicts. By combining global statistical approaches with systematic qualitative evidence in a multi-method research design, we show that climate-related disasters contribute to armed conflict risk. This link is highly context-dependent and we find that countries with large populations, excluded ethnic groups, and a low level of human development are particularly vulnerable. For such countries, almost one third of all conflict outbreaks over the 1980-2016 period have been preceded by a disaster within 7 days.The robustness of the effect is reduced for longer time spans. Case study evidence point to opportunity structures for armed groups as the main mechanism connecting disasters and conflict onset for up to a month. Our results outline areas for targeted adaptation action to reduce climate-conflict vulnerability.

Kati Krähnert, Potsdam Institute for Climate Impact Research (PIK)

Household mobility as response to an extreme weather event: Insights from novel trajectory data

Our study provides insights on one particular aspect of human mobility: We explore how nomadic households in Mongolia adjust their movements to cope with an extreme weather event. The novelty of our approach lies in combining precise household trajectories, obtained from GPS data recorded over a 9-month period, with socio-economic data from the same households. The identification strategy takes advantage of unusual circumstances: While recording locational information, an extreme winter event occurred that caused mass livestock deaths and varied strongly in its spatial intensity. Our focus is on movements that households undertake with their livestock across large distances to less affected areas during the midst of the winter, when moving is risky and expensive. Results show that living in a severely affected area strongly decreases the probability to conduct a movement during the extreme event. While in severely affected areas livestock was at risk of starving and freezing, the very same climatic conditions – high snow depth and low temperatures – constrained mobility. Wealth in livestock is a strong predictor for conducting a movement. However, neither land rights, nor experience in herding influence households' movement patterns. Exposure to the extreme winter also postponed the timing of the movement. The negative effect of the extreme winter on the timing of the movement is strongest for households with smaller herds.

11.00-12.30
room 1.204

EXPERT FORUMS

11.00-12.30
room 1.204

Angela Kallhoff, University of Vienna

The relevance of climate justice for climate goals

Philosophers argue that justice is not only a condition of right action, it also figures as an important normative frame for climate action. In particular, climate justice has several layers. It comprises distributive justice with respect to a fair share of emissions, restorative justice as compensation for climate harm, and egalitarianism with respect to an equal right of persons to use the atmosphere as a waste dump (Caney 2014, Singer 2002). Whether or not climate justice is helpful in framing climate action, or also hampers climate cooperation, has also been discussed recently (Gardiner and Weisbach 2016). This paper argues that even though climate justice is an important concept, it should better be placed in a theory of joint climate action (Tuomela 2010). In particular, principles of justice need to be reasoned as (a) principles that enhance the conditions of cooperation among parties that subscribe to shared climate goals, and (b) as principles of a fair share of burdens that relate to climate goals. In sum, the principles of climate justice are helpful, but need to be re-explored as a fair share of responsibility for actors, including collective actors.

Literature:
Caney, Simon, "Two Kinds of Climate Justice: Avoiding Harm and Sharing Burdens: Two Kinds of Climate Justice," Journal of Political Philosophy 22, No. 2 (June 2014): 125–49.
Gardiner, Stephen and Weisbach, David A., Debating Climate Ethics, New York: Oxford University Press, 2016.
Tuomela, Raimo, The Philosophy of Social Practices: A Collective Acceptance View, Cambridge University Press, 2010.
Singer, Peter, "One Atmosphere," in One World. The Ethics of Globalization. New Haven, Con.: Yale University Press, 2002.

Judith Nora Hardt, Centre Marc Bloch (An-Institut Humboldt-Universität zu Berlin)

Governing climate security and socio-ecological transformation

11.00-12.30
room 1.204

In spite of the contemporary shortcomings of security theory and practice, several climate scientists, representatives of international institutions such as the United Nations Security Council and state leaders of climate threatened states, have recently intensified their calls for responding to climate threats through the approach of climate security, while fierce discussions on the definitions, risks and potentials, implications and challenges of the concept prevail in the literature. Climate security is thus perceived by many practitioners and academics as a trigger and as providing a blueprint for socio-ecological transformation.
This paper parts from the hypothesis that these expectation of climate security rely on an underlying assumption of a new and integrated conceptualization and framework of security, that groups and connects human security, state, collective and climate security into a multidimensional and –interdependent web of different actors, policies and scientific evidence.
The empirical analysis is dedicated among other to frameworks that support or aspire to push societal transformation towards better futures, such as the Paris Agreement, the Sustainable Development Goals, the latest IPCC reports and the Planetary Boundaries approach. This project lies at the cross-section of International Relations, Security, Peace and Conflict and Development Studies and Climate Sciences.

15.30-17.00
room 1.102

SESSION CHAIR
Martin Kowarsch

EXPERT FORUMS

SESSION 1 - PUBLICS AND ETHICS OF SUSTAINABILITY (PART 2):

Value-laden issues at the science-policy-society interfaces

Dominic Lenzi, Mercator Research Institute on Global Commons and Climate Change (MCC)

Planetary Justice and the Earth System

Theorising planetary justice requires bringing together two distinctive perspectives which seldom interact. First, there is the perspective afforded by Earth system science which conceives of the planet as a closed system of energy and material transfer, composed of overlapping open systems and processes, and responsive to both positive and negative feedbacks. Concerns with overuse and degradation, expressed for instance within 'planetary boundaries' or 'ecological footprint' conceptions, begin from this perspective, and imply a distinctive ontology of the Earth. Second, there are designations of user rights to aspects of the Earth system, which are conventionally recognised through law and economics. This again implies a distinctive ontology, which overlaps with some aspects of the first view but does not coincide with it. The problem, however, is that conventional designations of user rights over 'natural resources' apply to only some aspects of the Earth system, while being blind to many others. This means that resource use cannot avoid producing externalities somewhere in the Earth system, because only some parts of it are considered (often in isolation), while other parts are presupposed as infinite or unchanging. And this seems to raise further problems for thinking about just entitlements to use the Earth, especially those arising between generations. Recent debates about natural resource justice have tried to accommodate the picture of Earth systems, departing from that of a perpetually accruing bounty presupposed by earlier political theorists. Yet we remain stuck with an unsystematic, mixed ontology of natural resources, with noclear connection between conventional designations of user rights and the Earth system. The first step to conceiving of planetary justice seems to be the development of a coherent ontological conception of the planet we actually inhabit, and not merely those aspects of it we have been concerned with in the past. In this paper, I provide an outline of such a view, which posits natural resources as fundamentally relational objects embedded within larger systems, and within the entire Earth system.

Wolfram Barfuss, Potsdam Institute for Climate Impact Research (PIK)

When optimization for governing human-environment tipping elements is neither sustainable nor safe

Optimizing economic welfare in environmental governance has been criticized for delivering short-term gains at the expense of long-term environmental degradation. Different from economic optimization, the concepts of sustainability and the more recent safe operating space have been used to derive policies in environmental governance. However, a formal comparison between these three policy paradigms is still missing, leaving policy makers uncertain which paradigm to apply.
Here, we develop a better understanding of their interrelationships, using a stylized model of human-environment tipping elements. We find that no paradigm guarantees fulfilling requirements imposed by another paradigm and derive simple heuristics for the conditions under which these trade-offs occur. We show that the absence of such a master paradigm is of special relevance for governing real-world tipping systems such as climate, fisheries, and farming, which may reside in a parameter regime where economic optimization is neither sustainable nor safe.

EXPERT FORUMS

15.30-17.00
room 1.102

Volker Stelzer, Karlsruher Institut for Technology (KIT)

Science-based Systematic Sustainability Assessment in Practice

Since being used in the Brundtland report, the term "sustainability" has been used in a wide range of meanings: from a very narrow meaning limited, for example, to the ecological effects, to a very broad meaning covering all positive aspects of well-being. Based on a systematic analysis of the Brundtland report and the Rio document as well as the scientific debates about "fairness", "ecology" or "social capital" and other concepts used in these documents, a research project developed an "Integrative Concept of Sustainable Development" (ICoS). This concept has been used as a tool for the systematic answering of scientific or politic questions such as: "Is the use of surplus grassland as energy source in Baden-Württemberg sustainable or not?" "What are the main sustainability deficits in Santiago de Chile" or "How sustainable is the German Energy Transition". This contribution will provide an insight into the theory and practice of ICoS. It shows how the "constitutive elements of sustainability" are transferred into three "overall sustainability goals" and "25 sustainability rules", and how to define indicator goals on the basis of these sustainability rules. At the end, we will demonstrate how ICoS helps to implement the SDGs within scientific and political sustainability assessments systematically.

Robert Arlinghaus, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Evaluating changes in pro-ecological understanding and behaviour stemming from transdisciplinary interactions using a robust before-after-intervention-control design: an example from recreational fisheries

Resolving uncertainties in managed social-ecological systems requires transdisciplinary research where scientists and stakeholders interact. However, whether transdisciplinarity indeed fosters ecological understanding among stakeholders beyond the sphere of science is unknown. We experimentally involved members of German angling clubs (n = 181 in workshops, n = 2483 in total) engaged in self-governance of freshwater fisheries resources in a large-scale ecological experiment of active adaptive management of fish stocking, which constitutes a controversial management practice for biodiversity and ecosystem functioning when conducted inappropriately. Using a robust within-subjects pretest-posttest control design, changes in ecological knowledge, environmental beliefs, attitudes, norms, and behavioral intentions were evaluated. Transdisciplinarily involved participants in adaptive management retained more knowledge of ecological topics after a period of 8 months compared to those receiving a standard lecture, both relative to controls. Involvement in transdisciplinary adaptive ecosystem management was also the only treatment that altered personal norms and beliefs related to stocking. Critically, only the stakeholders who participated in adaptive management reduced their behavioral intentions to engage in fish stocking in the future. Adaptive management and transdisciplinarity are essential for robust ecological knowledge, and we show that involving stakeholders in transdisciplinary experiments is a powerful tool to enhance ecological literacy and build environmental capacity to move toward sustainability.

15.30-17.00
room 1.102

15.30-17.00
room 1.205

SESSION CHAIR
Sabine O'Hara

EXPERT FORUMS

SESSION 2 - DEMOCRACY, GOVERNANCE, AND SOCIETAL CONFLICTS IN A GLOBALIZED WORLD (PART 2): Case Studies in Governance

Carolin Märker, Forschungszentrum Jülich (FZ Jülich)

Analyzing the food-energy-water nexus in Germany – insights from current resource management

Increasing impacts of climate change put major pressures on natural resources, not only in developing, but also in industrialized countries. This necessitates a coordinated way of using critical resources, such as water, land or energy resources. Especially, since their usage is highly interconnected. However, due to a historically grown institutional setting and sectoral mandates natural resource governance is often isolated. The UN SDGs call upon developing as well as industrialized countries to implement a more coherent policy design in order to deal with future challenges. Against this backdrop, this paper analyzes the food-energy-water (FEW) nexus for Germany. Therefore, the Institutional Analysis and Development (IAD) framework is adapted to the requirements and challenges of FEW nexus governance. Using the literature on Environmental Policy Integration two different governance frameworks are proposed representing horizontal and vertical policy integration.
In order to assess the FEW nexus in Germany, a comprehensive qualitative document analysis is conducted. The results not only show differences in the consideration of interconnections among the sectors, but also regarding the significance of the respective sector itself. It becomes apparent that the importance of interconnections is determined by policy preferences rather than biophysical interrelations and that it can change over time. Looking at sector combinations, the food-energy nexus is considered most frequently, closely followed by the food-water nexus. The energy-water nexus, by far, is mentioned the least. Most cross-references can be found in sustainable development strategies and action plans. An important step towards FEW nexus thinking can be seen in the development process of the revised German sustainable development strategy 2016. However, the majority of legal documents still follow a sectoral path. For the case of Germany instruments of vertical policy integration are more prominent. Hence, for an improved FEW nexus governance a higher level of horizontal policy integration is needed.

Luca Eufemia, Leibniz Centre for Agricultural Landscape Resarch (ZALF)

Mechanisms of Weak Governance in Grasslands and Wetlands of South America

Weak governance is a major threat to socio-economic sustainable development, especially with regard to rural contexts. This work highlights the perceptions of local groups regarding the mechanisms of weak governance and its relation to the use and management of natural resources in grassland and wetlands of the Colombian Llanos (Orinoquia) and the Paraguayan Pantanal. We address local groups´ perceptions of natural resource use and management, societal and economical instances, collective problems and social norms within processes of governance. Through the lens of the theory of the common-pool resources (CPR), new institutional economics (NIE) and the border of the Governance Analytical Framework (GAF), we conducted a methodological approach based on mixed qualitative and quantitative methods (e.g. online survey, interviews, focus group etc.). We reached 10 key informants, 32 experts and 32 local groups, involving a total of 144 participants. Our findings suggest that weak governance is found in both the institutional and community-based contexts. Hierarchical and market-based forms of community and natural resource management appear to rule in both regions under study. Three mechanisms that shape the process of weak governance were identified. The first is the lack of accountability in local and central governments. The second is represented by the present structure of the centralized, top-down and neoliberal system. The third mechanism regards the significance of social exclusion.

15.30-17.00
room 1.205

EXPERT FORUMS

15.30-17.00
room 1.205

Ana Alvarenga de Castro, Humboldt-Universität zu Berlin

Women peasants facing Neo-Extractivism in Brazil: a food sovereignty potential

This article is an effort to address the main question: Women practicing small-scale farming hold a potential to re-create mechanisms that safeguard peasant agriculture impacted by mining mega-projects, presenting an alternative to food systems. Its analysis is driven by a case study in Brazil through two feminist lenses with the aim of addressing the contradictory official statement of a current feminization of food production and hunger. One is the decolonial feminism addressed by Latin American scholars, specially Ochy Curiel Pichardo, which brings up a radical look at intersectionality addressing gender, race, class and sexuality under the regional perspective of an Afro-Caribbean social-anthropologist; the other is the history of science from Carolyn Merchant which gives the opportunity to look at the construction of Western-Northern notion of feminine associated to nature. A secondary data's observation over one mining mega-project impacting peasant agriculture in Brazil under these combined perspectives showed how Neo-Extractivism approach in Latin America reproduces capitalist-patriarchy over peasant territories. The locations affected by Minas-Rio mining project, in the Southeast Brazil, are inhabited by communities holding traditional farming rationalities and sociabilities over land and body which are under threat and can give important answers on sustainable food systems. Additionally, the surveys indicate that peasant women in these affected territories represent potential responses to the Neo-Extractive project by re-creating farming and collective practices that question the hegemonic proposals to "end hunger" and pose an alternative to peoples' food sovereignty.

Michelle Bonatti, Leibniz-Centre for Agricultural Landscape Research (ZALF)

Understanding complexity situations to sustainability transformation: the case of Colombia post conflict areas

In Colombia, the problem of illicit crops and conflict are heavily intertwined, generating much interest for many years. The situation is multidimensional, involving several actors and factors. In last years the country's situation got even more complex as the peace agreement got signed, increased deforestation took place, as well as governmental direction breaks. Consequently, the Colombian government and international agencies emphasize the need for new models and approaches, which help to understand the complexities from a broader perspective and within a framework of respect for human rights and sustainable development in post-conflict areas. Within this notion, this work applies a systemic approach to research on complex problems of post-conflict areas. It aims to find out how to integrate the population's knowledge in identifying the contextual factors that create the problem situation in Colombia and its possible improvements? What are hidden factors that also need to be targeted through policies? Looking at Caquetá, Colombia, as case study region, different actors directly and indirectly involved in the conflict are the targeted groups of investigation. The methodology is based on three steps: exploratory expeditions; household survey; and pedagogical workshops. First results show that, despite the influence of key biophysical environmental conditions, also interpersonal factors play a fundamental role in critical situations. Promoting forest friendly land-use systems in the production of global commodities seems to be a promising peacebuilding strategy. However, to discover what are the most appropriate forest friendly systems for Colombia request more communities integration and social learning process.

15.30-17.00
room 1.205

EXPERT FORUMS

15.30-17.00
room 1.205

Martin Welp, Eberswalde University for Sustainable Development

Experiences with citizen-science-policy interfaces on sustainable land use in Central Asia

Current land use policies in Central Asia are not well prepared to tackle with current and future risks related to climate change, soil degradation, and increasing demand for products of expanding bioeconomy-strategies. In such transition countries with limited democratic traditions, it is particularly relevant to experiment with participatory methods for the development of policies for sustainable land use. As part of a collaborative project on agroforestry in Central Asia, we applied a participatory approach to develop strategies for the adoption and re-establishment of agroforestry systems. The strategies were based on a jointly developed, holistic understanding of the complex interactions between nested social and ecological systems. Workshops with citizens (farmers, extension workers and civil society groups) and expert dialogues with scientists and policy makers were combined with efforts to formalizing knowledge. In a sequence of collecting, visualizing, processing and feeding results back to experts, we developed a semi-quantitative systemic knowledge map. Inspired by the MARISCO-methodology (https://www.marisco.training/), this map included different agroforestry practices, related ecosystem services, and a diversity of factors contributing to or hindering the adoption of agroforestry (land tenure, economic considerations, perceptions, and customary ways of doing things). Based on this knowledge map and semi-quantitative rating techniques of various factors and elements, appropriate strategies were developed and prioritized to formulate policy recommendations for Kazakhstan, Kyrgyzstan and Uzbekistan. These methodological experiences on bringing together key stakeholders' systemic knowledge for participatory policy and strategy development offer some important lessons learned for the promotion of sustainable land use in Central Asia and beyond.

SESSION 3 - ECONOMIES BEYOND UNLIMITED GROWTH (PART 2): Patterns of ecologically sound solutions (Provisioning systems, Diffusion Theory, Circular Anthropocene, Digital, ...)

Iana Nesterova, University of Derby

Organizing in a Sustainable Degrowth Society

Human activity is leading to ever increasing ecological degradation, including climate change, pollution and biodiversity loss. Since the 1970s post-growth scholars, and most recently the degrowth discourse, have been calling for downscaling, and a fundamental reorganisation of human economic activities to achieve a sustainable society. Despite increasing scholarly attention to the degrowth discourse, research on organisations, and particularly organising production, within the discourse is lacking. This paper theoretically explores and applies the underpinning theories of degrowth to an organisational level and attempt to answer the question: What does organising production in a sustainable degrowth society entail? A set of three categories around which organisation of production in a sustainable degrowth society should be centred is proposed. Following from the primacy of sustainable matter-energy throughput within the degrowth discourse, the first category includes the criteria related to downscaling of economic activities on the organisational level and frugal use of matter and energy. The second category revises the principles of organisation of production, including deviation from the logic of profit-maximisation and reorientation of production towards needs. Since wellbeing accounts for an essential part of degrowth discourse, the third category includes the consideration of wellbeing which encompasses the wellbeing of the society on multiple levels and that of non-human life. We argue that organising production for a sustainable degrowth society necessarily encompasses all three categories. This means a significant deviation from the current capitalist growth-based socio-economic system needs to occur.

15.30-17.00
room 1.401

SESSION CHAIRS
Sabine Fuss
Maja Göpel

EXPERT FORUMS

15.30-17.00
room 1.401

Klaus Fichter, Carl von Ossietzky University Oldenburg

The diffusion of environmental product and service innovations: Driving and inhibiting factors

About two thirds of environmental product and service innovations are produced and consumed only in small market niches. This constitutes a central problem for transitions to enhance an environmentally sustainable economy, because any possible environmental benefits only occur to a limited extent. While diffusion research on environmental innovation so far has been limited to case studies with only a small number of cases or has been focused on individual sectors, the purpose of our investigation is to provide generalizable insights on driving and inhibiting factors. Based on a large sample of 130 diffusion cases from a wide variety of environmental product and service fields, we provide cross-sector insights on key factors that are driving or hampering the diffusion of environmental innovations. We identify three clusters of factors, which form constructs at a higher level of aggregation. “Market push”, a “favourable cost-benefit ratio” and “high compatibility and confidence in the innovation” constitute meta-factors that help to explain why certain environmental innovations diffuse well (“stars”) and others remain in a small market niche (“poor dogs”).

Jefim Vogel, University of Leeds

Gatekeepers of sustainability and well-being: Provisioning systems as intermediaries between energy use and basic needs satisfaction

Universal human well-being within planetary boundaries requires that societies meet their citizens‘ basic needs at sustainable levels of biophysical resource use. Currently, all countries that achieve high levels of needs satisfaction are biophysically vastly unsustainable, whilst in all biophysically sustainable countries, people are heavily deprived of basic needs. The dominant paradigm of pursuing well-being through economic growth thus appears to be highly inefficient and unsustainable in meeting people’s basic needs. Technological change alone is very unlikely to improve that sufficiently. Instead, societies need to fundamentally rearrange which goods, services and infrastructure they use to satisfy human needs, and how they provide these.

To inform this agenda, we advance the understudied concept of provisioning systems as interlinked socio-technical intermediaries between biophysical resource use and basic needs satisfaction. Introducing country-level quantitative indicators for a wide range of physical and social aspects of provisioning across production, consumption, and societal organisation, we characterise provisioning systems based on a statistical cross-country analysis of their influence on energy use and needs satisfaction, using regression-based moderation analysis and cluster analysis.

Our study is the first to provide a coherent characterisation and functional analysis of provisioning systems for a wide range of countries. Our results indicate which aspects and configurations of provisioning systems, in which context, favour or disfavour basic needs satisfaction at low(er) levels of energy use. These findings may reveal versatile levers for, and constraints on, societal transformations towards sustainable and more equitable societies that provide for everybody‘s basic needs.

15.30-17.00
room 1.401

EXPERT FORUMS

15.30-17.00
room 1.401

Vivek Jaisree Mohandas, Wuppertal Institut für Klima, Umwelt, Energie gGmbH & Alexander von Humboldt-Stiftung

Mining the Anthroposphere in the context of Circular Economy Aiming for Sustainable Development

Achieving sustainable development with prima-facie importance to the society, economy and environment can only be facilitated by a paradigm shift in the modes of resource extraction, consumption and material obsolescence. Returning a product to the resource level is a necessary fundamental shift required, as resources are finite and a circular developmental economy is essential. This work tries to explore how frugality and circularity can be applied for the mining of materials from the anthroposphere. Frugality or Frugal Innovation refers to formulating faster, better and sustainable solutions for more people utilizing minimal resources. Circularity or Circular Economy not only emphasizes on Reduce, Reuse and Recycle, but also gives high priority for the elements of Re-imagine and Re-design to maximize the resource efficiencies by reconsidering the processes and the designing-out the wastages.
This study highlights on managing Construction and Demolition (C&D) waste streams in urban-rural scenarios, with focuses in Germany and India. The extraction and management of these Secondary Raw Material (SRM) resources will reduce the burden on virgin raw materials as well as save huge habitable landscapes. The quantitative and qualitative assessment of the externalities involved in the process is reported in the study. This study further tries to explore possible solutions (frugal and circular) which are affordable, acceptable and manageable, so that the resources are conserved within the value chain. The work is in progress.

SESSION 4 - LIMITED LAND - A LOCAL TO GLOBAL PERSPECTIVE (PART 2): Land use impacts on carbon and biodiversity futures

Damaris Zurell, Humboldt-Universität zu Berlin

Towards improved biodiversity scenarios

In his famous Cosmos series, Alexander von Humboldt said that „all natural forces are linked together, and made mutually dependent upon each other“. Humboldt recognized that society and economy ultimately depend on and largely influence the biosphere and services provided by nature. Almost 200 years later, biosphere is continuing to change and degrade due to anthropogenic pressures with unclear effects on economy and society. Despite repeated policy commitments, we have not been able yet to halt or bend the curve of biodiversity loss. Part of the problem could be limited understanding of the complexity of nature, but also limited data and uncoordinated modelling efforts. In my presentation, I will outline current incentives for an integrated modelling platform to forecast biodiversity change and test the effectiveness of management and mitigation strategies. Such a platform will strenghten our understanding of the drivers and state of biodiversity across scales, biomes and taxa. It can be operationalized using Bayesian and machine learning methods that can integrate heterogeneous and sparse data sources, and could even facilitate adaptive monitoring in the future. Coupling geo-biosphere interactions to adapative management modules will ultimately help to design more sustainable management strategies. Let’s follow in Humboldt’s footsteps and aim higher towards crossing disciplinary boundaries and understanding the complex interdependencies of the natural world.

15.30-17.00
room 1.103

SESSION CHAIR
Ariane de Bremond

EXPERT FORUMS

15.30-17.00
room 1.103

Diana Sietz, Potsdam Institute for Climate Impact Research (PIK)

Mapping global land-based opportunities and challenges to simultaneously achieve biodiversity and food security

Land-based Sustainable Development Goals (SDGs) and Aichi Biodiversity Targets (ABTs) are strongly interconnected, as they both aim to secure human well-being and ecosystem functioning. However, existing SDGs hardly reflect the role that biodiversity plays for meeting people's environmental, socio-cultural and economic needs. To realise the vision of sustainable development, it is therefore crucial to understand opportunities and challenges that land use generates for the simultaneous achievement of SDGs and ABTs. In this study, we assessed typical associations between biodiversity and food security at a global scale using advanced statistical analysis (e.g. cluster analysis). Focusing on exemplary interlinkages between agricultural land use, SDGs (e.g. SDGs 2 and 15) and ABTs (e.g. ABT 5 and 7), we selected quantitative indicators with sub-national resolution (e.g. biodiversity intactness, threatened species, diversity of crop and livestock species and undernourishment). Recently, globally consistent data on biodiversity intactness have become available indicating biotic responses to land use and related pressures. We also considered potential factors that help to explain SDG-ABT interlinkages (e.g. human appropriation of net primary production, food self-sufficiency, GDP). Our results demonstrate that there are distinct groups of land-based opportunities and challenges, e.g. better maintained biodiversity associated with higher food security. Our study contributes new insights urgently needed to further specify and achieve land-based SDGs by explicitly considering biodiversity interlinkages. This helps to avoid risks of management failure caused by unconsidered challenges and to better seize opportunities by recognising co-benefits.

Hector Camilo Morales Munoz, Leibniz Centre for Agricultural Landscape Resarch (ZALF)

Revision of environmental peacebuilding indicators in post-conflict scenarios. A Conceptual framework for research. The case of Colombia.

15.30-17.00
room 1.103

How can we measure the impact of environmental peacebuilding programs? What kind of indicators should be used? Even though quantitative studies have assessed the impact of natural resource management programs in peacebuilding, the question remains: What are the mechanisms involved in implementing those programs that impact peacebuilding? Furthermore, what is the scope of these mechanisms? This work examines the responses to these questions by performing a systematic literature review as well as conducting qualitative interviews. The review is twofold. First, we retrieve peacebuilding indicators and approaches to assess the impact of peacebuilding programs and secondly, we review the mechanisms that natural resource management programs use to solve conflicts. Complimentary, semi-structure interviews are conducted with experts in the fields of natural resources management and peacebuilding to establish an ideal set of environmental peacebuilding indicators. As result, we propose a first set of indicators for recovering a data baseline at the household level for designing sustainable land use systems in the region of Caquetá, Colombia. And we also test the set of indicators by assessing a) the convenience of the data retrieved from the application of the framework and b) the availability of the data retrieved from its application.

EXPERT FORUMS

15.30-17.00
room 1.103

Leonie Wenz, University of California Berkeley & Potsdam Institute for Climate Impact Research (PIK)

Road to glory or highway to hell? Global road access and climate change mitigation

Transportation infrastructure is considered a key factor for economic development and poverty alleviation. Consequently, the United Nationshave explicitly included access to roads in their Sustainable Development Goal agenda of "leaving no one behind" (SDGs, goal 9.1). Yet, little is known about how many people worldwide currently lack continuous and stable access to roads. This is true in both absolute terms and geographically. Here we quantify, for 250 countries and territories, current access gaps and the extent of roads that would have to be constructed in order to ensure access for a substantial proportion of the world's population. We then examine the trade-offs between additional roads and climate action (SDG-13). We find significant variation in current road density, both across and within countries, with the largest access gaps being identified in countries in sub-Saharan Africa and Southeast Asia. The investment required to ensure road access for 90% of the population in any world region is estimated to be about USD 100 billion and about USD 1 trillion if 97.5% are to be connected. We find moderate implications for climate change mitigation as even the 97.5% access goal would only imply one-time construction emissions of ~900 $MtCO_2$ and traffic emissions of ~100 $MtCO_2$ per year. We anticipate our geographically explicit global analysis to be the starting point for refined regional studies and for quantifying further environmental and social impacts that could arise from an expansion of the current road network, such as loss of biodiversity (SDG-15).

SESSION 5 - URBAN AND RURAL: A NECESSARY PARTNERSHIP (PART 2): approaches of cities to cope with sustainability challenges

Klaus Eisenack, Humboldt-Universität zu Berlin)

Climate Cooperation among Cities

Subnational actors like cities and business networks are cooperating transnationally to address global challenges, giving rise to a new dynamics of cooperation. Can climate cooperation among cities overcome barriers (e.g. resistance from carbon-based vested interests) and contribute effectively to decarbonisation and climate resilience? Current research is inconclusive: alternative hypotheses have been tested, but the considerable heterogeneity of cities excludes a unique and general explanation. The economic literature is silent about climate cooperation among cities. The study uses archetype analysis, a novel approach that identifies generalizable patterns in heterogeneous sets of cases, to study the emergence and effectiveness of climate cooperation among cities, drawing on new empirical data that is rapidly becoming available. Archetypes of cooperation function as theoretical building-blocks that can be combined in different ways to explain individual instances of cooperation. In particular, we identify building-blocks that are characterized by rent-seeking, long-lived infrastructure, new technologies, and standardization.

15.30-17.00
room 1.502

SESSION CHAIRS
Bettina König
Daniela Kempa

EXPERT FORUMS

15.30-17.00
room 1.502

Berthold Kuhn, Freie Universität Berlin

Good Practices for Sustainable Development in Cities. Case Studies: Berlin and Xiamen

This presentation aims to increase our understanding of sustainability transitions at the level of cities. Effective international partnerships and cooperative practices between local authorities, the private sector and nonprofits are considered to play a key role in promoting good urban governance and preparing the ground for sustainability transitions. Cities around the world are stepping up their contributions to meeting the Paris agreement targets. They are developing innovative projects to improve mobility with the purpose to become more environmentally-friendly, more inclusive, and more people-centric. In the context of the C40 initiative, cities are taking climate action, leading the way towards a healthier and more sustainable future. Leadership from cities – in partnership with states, regions and businesses – was demonstrated at the Global Climate Action Summit in San Francisco in September 2018 where commitments to make buildings net zero carbon, reduce waste generation and shift to zero-emission transport were announced.
This presentation will analyse good practice actions for climate protection at the city level in comparative perspective, including mainly two examples: the cities of Berlin (Germany) and Xiamen (China), both having a population of around 3.6 million and positioning themselves as frontrunners of sustainable development policies.

Florian Koch, HTW Berlin

The Smart city-critical raw material-energy nexus and its related problems concerning sustainability transformations

15.30-17.00
room 1.502

Globally emerging smart city concepts aim to improve efficient and thus more sustainable resource production and allocation in urban areas through new sociotechnical innovations such as smart grids, smart meters or solar panels. While recent critiques on smart cities focus on data security, surveillance or the influence of corporates on urban development, issues related to the material basis of smart city technologies and its interlinked resource problems are largely ignored in literature and urban planning. Linking literatures on smart cities, critical raw material mining and recovery from scrap metals, we exemplify on the smart city energy domain and explore the smart city-critical raw material-energy nexus and its related problems for sustainability transformations. Critical raw materials are the fundament of smart city energy applications. Smart city concepts potentially foster primary extraction of critical raw materials which cause considerable environmental and health issues. While problems associated with primary mining are well explored arguments in literature, we also turn to shed light on the potential recovery of critical raw materials from anthropogenic raw material deposits as represented by installed digitally smart city infrastructures. However, current smart city approaches do not address these issues. This leads to the paradox that smart city concepts support critical raw material dependencies which actually should be overcome.

EXPERT FORUMS

15.30-17.00
room 1.502

Torsten Meireis, Humboldt-Universität zu Berlin

Gentrification of Public Space and the Moral Right to Access - an Ethical and Public Theological Perspective on Social Sustainability

Gentrification is a term that's usually applied to urban housing: it denotes the upgrading of formerly affordable flats to a degree that effectively pushes middle and low income strata out, leaving the area affordable only to the wealthy and increasing mobility needs for the poor who are driven to the margins where often public transport is scarce.
However, in cities like Berlin, Frankfurt, or Munich, to use the German example, not only flats or houses become gentrified, but also urban open spaces and public places. When former public spaces like the Potsdamer Platz become privately owned as publically accessible shopping malls, private ownership rules apply also regarding access: As the visible presence of poor or homeless people as well as political or religious demonstrations might mar the shopping experience, both are usually banned from the premises.
From a normative sustainability point of view guided by SDGs 11 (sustainable, inclusive and participatory cities) and 16 (peace, justice and strong institutions) principles of inclusive social justice and access to a normatively understood public are tantamount. Consequently, the question of a moral and legal right of physical access to public spaces arises and in turn necessitates clarification of notions like ‚the public' or ‚gentrification'.
Concluding, the paper argues that public space should be understood as a public good which is basic in regard to justice and political as well as social participation.

SESSION 6 - WATER AND BIOSPHERE: PRECONDITIONS OF SURVIVAL (PART 2): Larger-scale modelling

Henry Hansen, University of Nebraska-Lincoln

Exit Here: Dealing with Aging Dams and Reservoirs

Rivers are a dynamic network system that provides fundamental services for adjacent socio-ecological systems. One substantial element of how humans have influenced this network is through building dams and impounding rivers. Water management structures do have functional and economic life-spans however, and we may be nearing the end for much of the current infrastructure in the United States of America. In respect to both structural integrity and ecosystem services provided, current policy and management across administrative hierarchies typically remain impartial to this reality. Consequently, there are no systemic plans or processes in place to proactively address the reverting of reservoirs and their associated dams back to riverine environments. We present initial perspectives on a possible exit strategy framework for aging dams and reservoirs that distills the complexities of this dilemma into identifiable obstacles, considerations, and viable solutions. Additionally, we will review past scenarios and case studies to evaluate the relationships of biophysical, socioeconomic and geopolitical concerns on dam exit strategies. Our exit strategy framework serves as the foundation of a much-needed discussion concerning the sustainability of aging water management infrastructure for rivers and society. Attendees will walk away with an understanding of dam aging, reservoir aging, and how the two processes influence rivers and sustainable development. With this knowledge, attendees will be able to contextualize and evaluate available management actions for dams and reservoirs. More importantly, attendees will be able to conceptualize how an exit strategy could function for their river system and what components should ideally be included.

15.30-17.00
room 1.501

SESSION CHAIR
Tobias Krüger

15.30-17.00
room 1.501

EXPERT FORUMS

Tom Shatwell, Helmhotz Centre for Environmental Research (UFZ)

Monitoring and modelling Germany's largest drinking water reservoir

Managing the usage conflicts on drinking water reservoirs, such as maintaining water quality, quantity and ecological integrity, requires complex management decisions. In the face of global change, such decisions will increasingly rely on dynamic models and high-frequency monitoring. As part of the TERENO project, scientists at the UFZ (Helmholtz Centre for Environmental Research) are investigating the hydrology, water quality and ecology of Germany's largest drinking water reservoir (Rappbode Reservoir in Harz), which provides drinking water to more than 1 million people. Using an advanced observatory system, we are particularly interested in quantifying the dynamics of carbon and nutrients (nitrogen and phosphorus) in the catchment and reservoir, evaluating the capacity of additional ecological services from these systems such as nutrient retention, and predicting the response of these aquatic systems to ongoing global change. Our contribution will describe specific modelling applications and the research outcomes related to nitrogen retention, oxygen dynamics and the influence of global warming on temperature and mixing. We envision that our research may offer important implications for a sound and sustainable water resource management in the future.

Paul Wagner, Kiel University

Linking hydrologic and land use change models for more consistent predictions of global change impacts on water resources in India

Water and the biosphere are closely linked. However, only rarely data is exchanged between hydrologic and land use change models. Nevertheless, such integrated environmental modeling approaches are in need to take feedbacks into account, e.g. when studying the impacts of global change. In this study, we demonstrate how hydrologic model predictions can be integrated in a land use change model and how dynamic land use change model predictions can be integrated in a hydrologic model. The study is carried out in the rapidly urbanizing catchment of the Mula and Mutha Rivers upstream of Pune, India. The benefits of the integration are quantified by comparing our integrated predictions to standard model setups. Our results indicate that the integration of spatially distributed hydrologic model outputs (e.g. soil water content) improved the land use change model accuracy shown by an increase of the figure of merit by +4 and +5.3 percentage points for two points in time. The integration of modeled dynamic land use data in a hydrologic model yielded more accurate results as compared to model runs using static land use information. In summary, more accurate predictions are produced when integrating outputs from the hydrologic model into the land use change model and vice versa. Hence, model coupling can be recommended to allow for an integrated assessment of global change impacts on water resources as well as for the analysis of feedbacks between the hydrosphere and the biosphere.

15.30-17.00
room 1.501

EXPERT FORUMS

15.30-17.00
room 1.501

Dieter Gerten, Potsdam Institute for Climate Impact Research (PIK)

Freshwater and biosphere in the Anthropocene: vital links

Freshwater cycling is elemental to support not only aquatic but also terrestrial natural and managed ecosystems around the globe. This talk will provide an overview on selected vital linkages between the world's freshwater resources and the (terrestrial) biosphere, maintenance of which is, in the era of the Anthropocene, increasingly important also for human societies. This includes presentation of recent research on how freshwater availability limits vegetation growth and how climate change may affect this interaction; how multiple SDG targets, namely those regarding food and water security, could be achieved by improved joint management of freshwater and agricultural systems; and how diverse 'planetary boundaries' related to land and water use could be better conceptualized and quantified by accounting for their crucial interlinkages.

SESSION 7 - CLIMATE CHANGE: BIOPHYSICAL IMPACTS AND SOCIETAL RESPONSES (PART 2): Physical Dynamics of Climate Change

Peter Pfleiderer, Humboldt-Universität zu Berlin

Changes in mid-latitudes summer weather persistence under global warming

Local weather patterns are expected to change as global mean temperature rises. Mid-latitudes summer weather is characterized by alternating periods of warm-dry and chilled-moist weather depending on the passing pressure system. Long persistent periods of similar weather conditions stress our environment and can thereby result in damaging weather extremes. Persistent high-pressure systems often lead to heat waves or droughts while slow moving low-pressure systems can result in flooding events. We systematically analyzed persistence of local weather conditions in 4 atmosphere-only HAPPI models in a current climate scenario (2006-2015 and 1°C above preindustrial global mean temperatures) and two end of the century warming scenarios at 2°C and 1.5°C global mean temperature. In a warmer world, warm, dry, compound dry-warm and rainy periods are projected to last longer. For central Europe, the probability of a dry-warm period lasting longer than 3 weeks relatively increases by 10% and the probability of finding 14 consecutive rainy days increases by 50%. An increase in local weather persistence could be driven by changes in atmospheric circulation and/or land atmosphere interactions. Local weather persistence increases irrespective of the studied weather conditions suggesting that a slowdown in summer circulation might be the main driver for the increase in weather persistence.

15.30-17.00
room 1.204

SESSION CHAIR
Carl-Friedrich Schleussner

EXPERT FORUMS

15.30-17.00
room 1.204

Ilona M. Otto, Potsdam Institute for Climate Impact Research (PIK)

Social tipping dynamics for stabilizing Earth's climate by 2050

Safely achieving the goals of the Paris Climate Agreement requires a world-wide transformation to carbon-neutral societies within the next 30 years. Despite decades-long efforts in international negotiations, not much progress has been achieved and few are convinced that business-as-usual technological progress and gradual policy implementations will deliver emissions reductions at rates sufficiently fast to avoid crossing dangerous tipping points in the Earth's climate system. Here, we present historical, recent empirical and theoretical evidence supporting the potential of social tipping elements (STEs) as drivers of the required disruptive change. STEs are subdomains of the planetary socio-economic system where targeted policy interventions can activate contagious processes of rapid spreading of technologies, behaviors and social norms that can ultimately propel a sufficiently fast reduction in anthropogenic greenhouse gas emissions. We identify six outstanding candidates for STEs and their associated critical intervention points based on online expert elicitation, a subsequent expert workshop, and a literature review. These critical social tipping interventions include (i) removing fossil fuel subsidies and incentivizing distributed energy generation (STE1: energy production and storage systems), (ii) building carbon-neutral cities (STE2: human settlements), (iii) divestments from assets linked to fossil fuels (STE3: financial markets), (iv) revealing the moral implications of fossil fuels (STE4: norms and value systems), (v) strengthened climate education and engagement (STE5: education system) and (vi) greenhouse gas emissions information disclosure (STE6: information feedbacks). Larger-scale empirical and modelling efforts are needed to understand the potentials of STE dynamics and their role in climate change mitigation pathways in more detail.

Quentin Lejeune, Climate Analytics

Systematically evaluating the albedo of various land-cover types and albedo changes associated to land-cover transitions in Earth System Models

Many modelling and observational studies demonstrated the impacts of variations in albedo across land surface types on local climate conditions. However, land surface models (LSMs) exhibit substantial differences in their simulated impacts of land-cover changes on albedo, therefore calling for evaluating this aspect in Earth System Models (ESMs). Nevertheless, such systematic evaluation efforts have been impeded by the structure of LSMs, as they have required designing dedicated model experiments in order for their results to be compared to observational data.

We have circumvented this problem by developing a tool that reconstructs the albedo values of the most important land cover types from default ESM or LSM global simulations, and compares them to the results from the most recent satellite-derived observations. We evaluate the reconstruction methodology using a simulation conducted with the Community Land Model 4.5, which already provides the albedo of various land cover. We show that the reconstruction method is well able to retrieve the albedo of forests and crops/grasses where these land cover types are at least moderately abundant, introducing an error of about 0.01 (0.02 where snow is present). We then reconstruct the albedo of forests and crops/grasses in historical simulations conducted with models from the model intercomparison effort CMIP5, and compare these results with satellite products. We identify substantial variations between models and also systematic differences with observations, like an almost systematic underestimation of mid-latitude forest albedo in CMIP5 models. As a result, all models simulate higher albedo increases associated to deforestation compared to satellite-derived evidence.

15.30-17.00
room 1.204

EXPERT FORUMS

15.30-17.00
room 1.204

Alan Forsberg, School for International Training; Dirk Hoffmann, Bolivian Mountain Institute (BMI)

"Flying Rivers": The Invisible Interaction Between the Amazon and the Andes

Bolivia is one of the countries most vulnerable to future reductions in water supplies due to climate change. New scientific research shows the key role of the Amazon rainforest in generating atmospheric "rivers" of water vapor that generate rainfall throughout much of South America, including the Bolivian Valles and Altiplano regions.
Our presentation will describe how the Andean highlands and Amazonian lowlands are intimately interconnected by these "flying rivers" of the South American Monsoon system, and spell out how this new recognition of the value of natural forests' ecosystem services may inform policy and influence the development debate in Bolivia.

17.00-18.30
Foyer

POSTER SESSION

SESSION 1 - PUBLICS AND ETHICS OF SUSTAINABILITY

Ilona M. Otto, Potsdam Institute for Climate Impact Research (PIK)

Shift the focus from the super-poor to the super-rich

Carbon mitigation efforts often focus on the world's poorest people, dealing with topics such as food and energy security, and increased emissions potential from projected population, income and consumption growth. However, more policies are needed that target people at the opposite end of the social ladder — the super-rich. Our estimates show that the lifestyle related carbon emissions of thw wealthiest 0.54% of the global population are equivalent to the lifest-style related carbin emissions of the world's poorest 50%. A better understanding of the super-rich is an important contribution to climate mitigation options. The lifestyles and consumption patterns of the super-rich strongly influence the globally growing middle classes, who emulate upper-class consumption styles to distinguish themselves from lower classes. In addition, the super-rich have a great impact on technological innovation and could actively support zero carbon and renewable energy technologies. Policies that more aggressively force carbon-footprint reduction of the wealthiest must be pursued as a part of a comprehensive portfolio of climate mitigation. In contrast to the poorest in the community, the richest have the agency and power needed to change their lifestyles to meet policy requirements without compromising quality of life.

Ilona M. Otto, Potsdam Institute for Climate Impact Research (PIK)

Human Agency in the Anthropocene

The human species has been recognized as a new force that has pushed the Earth's system into a new geological epoch referred to as the Anthropocene. This human influence was not conscious, however, but an unintended effect of the consumption of fossil-fuels over the last 150 years. Do we, humans, have the agency to deliberately influence the fate of our species and the planet we inhabit? The rational choice paradigm that dominated social sciences in the 20th Century, and has heavily influenced the conceptualization of human societies in social-environmental system modelling in the early 21st Century, suggests a very limited view of human agency. Humans seen as rational agents, coordinated through market forces, have only a very weak influence on the system rules and system structure. In this article we explore alternative concepts of human agency that emphasize its collective and strategic dimensions. We also explore the concept of social structure as a manifestation of, and a constraint on, human agency and investigate how human agency is distributed within the society. We discuss the implications for conceptualization of human agency in social-environmental system models.

17.00-18.30
Foyer

POSTER SESSION

17.00-18.30
Foyer

Jobst Heitzig, Potsdam Institute for Climate Impact Research (PIK)

A Thought Experiment on Sustainable Management of the Earth System

We introduce and analyze a simple formal thought experiment designed to reflect a qualitative decision dilemma humanity might currently face in view of anthropogenic climate change. In this exercise, each generation can choose between two options, either setting humanity on a pathway to certain high wellbeing after one generation of suffering, or leaving the next generation in the same state as the current one with the same options, but facing a continuous risk of permanent collapse. We analyze this abstract setup regarding the question of what the right choice would be both in a rationality-based framework including optimal control, welfare economics, and game theory, and by means of other approaches based on the notions of responsibility, safe operating spaces, and sustainability paradigms. Across these different approaches, we confirm the intuition that a focus on the long-term future makes the first option more attractive while a focus on equality across generations favors the second. Despite this, we generally find a large diversity and disagreement of assessments both between and within these different approaches, suggesting a strong dependence on the choice of the normative framework used. This implies that policy measures selected to achieve targets such as the United Nations Sustainable Development Goals can depend strongly on the normative framework applied and specific care needs to be taken with regard to the choice of such frameworks.

Reference:
Heitzig, J.; Barfuss, W.; Donges, J.F. A Thought Experiment on Sustainable Management of the Earth System. Sustainability 2018, 10, 1947.

Katrina S. Rogers, School of Leadership Studies, Bundeskanzler Scholar, Alexander von Humboldt Foundation

Ecological Worldviews and Sustainability Leadership

It is humankind's ability to change not only itself but also to transform organizations that will be the catalyst for addressing the highly complex, interrelated, and ultimately serious impacts of planetary climate change. This research focused on organizational leaders that were tasked with the responsibility of responding to climate change as part of an institutional priority. The question posed was, do organizational leaders accountable for developing responses to climate change, demonstrate cognitive shifts leading to organizational change? The research used the theoretical lens of ecological selves to enquire how individuals shape their leadership actions. Interviews were conducted with organizational leaders in corporate, non-governmental, and governmental settings. Ecological selves is a scholarly term used to describe one's assumptions about the environment and our subsequent behavior in our professional lives. Using this concept of ecological selves, leaders' worldviews were investigated to see if they presented distinct ways of perceiving the natural world, which influenced their leadership actions. Theoretical frameworks of adult development were used to develop the interview questions and provide a conceptual framework for interpreting the worldviews of these individuals. Understanding these perceptions of organizational leaders adds to the literature on adult development and sustainability, in particular how our own development impacts the possibilities for us to change organizations and improve sustainability transformation. The research also reveals that the framework of ecological selves may be useful as a way to understand the human capacity for change within organizational settings ultimately leading to societal and planetary change.

17.00-18.30
Foyer

POSTER SESSION

17.00-18.30
Foyer

Carl-Friedrich Schleussner, Climate Analytics & Humboldt-Universität zu Berlin

Humboldt to the power of X – education for a sustainable future

Alexander von Humboldt was not only a pioneering scientist, but should also be credited for his contribution to kick-starting the educational and academic revolution the world has witnessed since the days of the Kosmos lecture series. In the late 19th century, around 50 000 in the world had tertiary education of some kind. Nowadays, around 500 million people have university degrees, and this number could increase to 2.5 billion by mid-century. Unlike in the days of Humboldt, access to academic education is no longer a privilege of white upper-class European men, but is increasingly more accessible to all of humankind.
It is well established that educated people are healthier, wealthier and live longer. Widespread provision of education is an essential prerequisite for ending hunger and poverty, promoting good governance, democratic and inclusive institutions, as well as to build adaptive capacity to the impacts of climate change. Research also makes a case for the importance of education for changes in mindsets and lifestyle, such as acquiring environmentally-friendly attitude, sense of civic duty and increased political participation.
This contribution summarizes the evidence on the relevance of education for the sustainable development agenda. We will further provide a comprehensive overview on the possible futures of education in the 21st century and discuss the role that this unprecedented potential of human ingenuity can play in achieving the goals of the Paris Agreements and other environmental targets.

SESSION 2 - DEMOCRACY, GOVERNANCE, AND SOCIETAL CONFLICTS IN A GLOBALIZED WORLD

Luca Eufemia, Leibniz Centre for Agricultural Landscape Resarch (ZALF)

Collective perception of Anthropic and Extractive Interventions in the Colombian Llanos

The developmental model of anthropic and extractive interventions is increasingly a global concern. Its impacts are challenging not only the precarious equilibrium of natural resources but also the one of local communities and identities. The case of the Colombian Llanos shows, how the local culture of the Cultura Llanera (CL) is deep-rooted with natural resources, their use and management. The collective perception of local groups anthropic and extractive interventions in the flooded savannahs of the Colombian Llanos shows that the CL, in particular its traditional livestock practices in flooded savannahs is a key foundation for the sustainable development of the region. Besides, it reveals that agricultural and extractive activities, primarily rice and oil, are considered the main threats to both the ecosystem and the protection of the CL.

17.00-18.30
Foyer

POSTER SESSION

17.00-18.30
Foyer

Luca Eufemia, Leibniz Centre for Agricultural Landscape Resarch (ZALF)

Community Based Governance and Sustainability in the Paraguayan Pantanal

The megadiverse biome of the Paraguayan Pantanal is in danger due to the expansion of cattle ranching and agricultural frontiers that threaten not only the fragile equilibrium of natural resources, but also the one of local governance and cultural identities. As a consequence, weak governance stresses the relations between natural resource dependent communities, generating socio-environmental conflicts. This perception study seeks to find community-based governance model standing for sustainability in the context of Paraguayan wetlands. Under the organizational principles of community based natural resource management (CBNRM) we applied qualitative approaches with the use of the Governance Analytical Framework (GAF) to identify problems and social norms. Our findings suggest that community-based governance is constructed by the Yshiro indigenous community relation to land (e.g. Traditional Ecological Knowledge, TEK) and their self-organized group (Unión de Comunidades Indígenas de la Nación Yshiro, UCINY), as well as highly threatened by the impact of the national neo-extractive economy.

Luca Eufemia, Leibniz Centre for Agricultural Landscape Resarch (ZALF)

Synthesis of Environmental Research Knowledge: The Case of Paraguayan Pantanal Tropical Wetlands

The Paraguayan Pantanal offers a valuable case of research regarding natural resource management in tropical wetlands. It is one of the world´s largest wetland of globally important ecological and cultural value that is threatened from environmental exploitations. Paradoxically, this area is rarely scientifically investigated. Therefore, in this paper, this case was chosen to identify literature indirectly related to the area and to highlight the dominant research trends and corresponding gaps. This research was conducted to cluster the available science-based research of Pantanal´s tropical wetlands in order to advocate for more environmental governance focus. Concepts used in the scientific literature of the Paraguayan Pantanal were extrapolated and summarized in category system. A cluster framework of 12 variables of community-based natural resource management (CBNRM) was classified into three main search-categories: community engagement and participatory approach (CEPA), natural resources management (NRM) and framework developed (FD). The frequency of different categories demonstrates the natural science´s perspectives dominate over human sciences and humanities. Most of the Paraguayan Pantanal has been studied with regard to its ecological, biological and physical properties. A substantial research gap was identified in the FD as studies tended to link their findings to human activities but disregarded the connection between governance variables, natural resource and environmental developments. It is suggested to expand the natural science´s perspective on Paraguay´s wetlands to account for economic, social and political aspects in order to develop a holistic and environmentally sustainable production of science in and about the area.

17.00-18.30
Foyer

POSTER SESSION

17.00-18.30
Foyer

Margarita Doneliene, Freie Universität Berlin

Sustainability at Higher Education Institutions

The project "Sustainability at Higher Education Institutions (HEI): develop – network – report (HOCHN)" (2016-2020) aims to facilitate sustainable development at universities in Germany. A group of eleven German HEIs has joined forces in order to establish a program-based network to exchange experience, to develop a joint understanding of sustainability and transformational process, to identify fields of actions and new methods that help to promote sustainability at HEI and to create useful guidelines within these fields of action and implement them in HEI.
In order to secure a comprehensive approach towards sustainability at HEIs and seize the specific expertise of the interdisciplinary team of researchers, the project was divided into six working packages (teams): teaching, research, operations, sustainability reporting, transfer, and governance.

Fields of action; responsible universities:
Governance (Freie Universität Berlin, Universität Vechta); Sustainability Reporting (Universität Hamburg, Freie Universität Berlin, Universität Duisburg-Essen); Teaching (Universität Bremen, Eberhard Karls Universität Tübingen); Research (Leuphana Universität Lüneburg, Ludwig-Maximilians-Universität München); Operations (Technische Universität Dresden, Hochschule Zittau/Görlitz); Transfer (Hochschule für nachhaltige Entwicklung Eberswalde)

The team Governance at the FU Berlin focuses on the variety of different actors and structures that are involved in processes of developing and managing sustainability at universities. Methodologically analysis of sustainability governance at HEIs is grounded in an understanding of governance as an analytical approach, focusing on the coordination of actors in complex multi-level settings.

Ulrike Zeigermann, Centre Marc Bloch (An-Institut Humboldt-Universität zu Berlin)

Laypersons in Environmental Law

My poster presents research dealing with the translation of conflicts over natural resources in (international) criminal law. Specifically, I study the reinterpretation of the prominent notion of environmental "harm" into environmental "crime" in the context of the current climate change debate. The legal framing of natural resource conflicts indicates that laypersons in law – including activists from civil society and entrepreneurs from within (international) bureaucracies – increasingly promote judicial interpretation and law-making as instruments for effective climate change regulation. I critically analyze those developments from the perspective of emerging venues of governance in sustainability politics.

17.00-18.30
Foyer

POSTER SESSION

17.00-18.30
Foyer

Julia Dennis, Humboldt-Universität zu Berlin

Food Democracy: analysis of power and participation in partnerships to end hunger and malnutrition

This paper aims to understand how food democracy, through operationalized variables, could be measured in the context of global agri-food governance institutions. Despite technological innovations and an overall increase in global food quantity, an estimated two billion people remain malnourished today. On the one hand, agri-businesses, non-governmental organizations, and celebrity philanthropists are encouraged to partner with states for healthier food systems, as this could mean a more deliberative, inclusive and effective turn in food governance. However, widening the governance circle also leads to new questions about democratic legitimacy beyond the state. The concept of food democracy has been inspiring political research since the mid-1990s, though so far researchers have focused on the local level, for example in urban gardens or community supported agriculture. More theoretical and empirical work needs to be done to identify links between participation, power and food democracy nationally, regionally and transnationally. This research will aim to answer such questions as: how do global private actors become democratically legitimate and act on behalf of the public good? How do we democratize governance to represent those at the ends of the 'value chain,' such as food producers and consumers? At what level (global, local, national) should food policy be democratized? Democratization research is increasingly urgent as we reach the edge of planetary boundaries. By considering food democracy on a global level, this work strives to uncover new challenges and opportunities for all actors working to sustainably end hunger and improve global nutrition.

Carolin Puhl, Freie Universität Berlin; Wiebke Nowack, Humboldt-Universität zu Berlin

An exploration of the role of science in a socioecological transformation – Researching transformative research

Transformative research (TR) is science's direct response to the call for a socioecological transformation (SET). The aim of the TR is to support the SET with scientific methods and to provide system, target and transformation knowledge. Based on the concept of the SET, TR hence deals with complex, socially relevant topics. It examines the questions of how to characterise the existing system to be changed, which changes are possible and desirable and how the process of transformation can be carried out by whom and with what means. Recently, TR and its trans- and interdisciplinary methods have increasingly become an object of research itself and its application examples are increasing, whether in the form of real laboratories or transformative research colleges. No matter how much knowledge is generated about and by the TR in the meantime, its representatives are facing no fewer challenges. Differentiations from other methodological approaches such as action research or transdisciplinary research are not always clear. Is TR ultimately old wine in new bottles? In a dialogue, two young scientists discuss these and other challenges in TR by referring to relevant literature as well as own experiences.

17.00-18.30
Foyer

POSTER SESSION

17.00-18.30
Foyer

Denise Sumpf, Humboldt-Universität zu Berlin

Institutions and Instruments of Development Cooperation - Is there a need for change?

The presentation synthesises the research work of graduate students who will have participated in the course "Instruments and Institutions of Development Cooperation (SS2019)" as part of the lectures offered by the Albrecht-Daniel-Thaer Institute's Department of agricultural economics, international agricultural trade and development at Humboldt University. The conference contribution summarises the individual student's case studies discussing the evolution of the concepts of 'development' and 'development cooperation' in the 21st century with a view to support of implementation of Agenda 2030.
The students' case studies on "Who does what where and how?" draw from examples of bilateral and multilateral development cooperation institutions from both the public and private sphere in Germany and beyond. Focusing on specific organisations and their projects allows differentiation of roles/functions, motivations, interests, commitments, budgets, challenges as well as scope of contributions to the individual Sustainable Development Goals (SDGs). Such case study research contributes to mapping the complicated landscape of development cooperation by shedding light on the multitude of actors and the complexity of processes (e.g. from project proposal to grant to implementation). Mindful of the ongoing reform of the United Nations' development system and the need for more effective allocation of resources, the poster presentation distils some lessons learned and underscores the importance of an integrated, coordinated and sustainable response to development challenges.

SESSION 4 - LIMITED LAND - A LOCAL TO GLOBAL PERSPECTIVE

Juan Gonzalez-Valero; Varun Vats, Syngenta

Multifunctional Field Margins: Assessing the benefits for nature, society and business

17.00-18.30
Foyer

It is farmers and farming communities who mainly shape our agricultural landscapes.
While landscapes vary by geography, topography, cropping systems, and management intensiveness, they are mostly a rich mosaic of cultivated and uncultivated areas, separated by linear features including hedges, fences, walls, banks, ditches, drains and watercourses. These natural dividing lines provide an ideal framework for the field margins that, in the hands of farmers, can benefit nature, society and business.
Well-managed field margins can boost biological diversity on farms and hence are one of the most important environmental assets farmers can provide, in addition to producing food. Wider social gains include enhanced genetic diversity, carbon sequestration, flood attenuation and recreation opportunities.
Syngenta together with Arcadis and Bioversity International developed a paper - Multifunctional Field Margins: Assessing the benefits for nature, society and business – to ascribing a monetary value to the most important natural and social capital benefits provided to farmers and local communities by Multifunctional Field Margins (MFFMs). Based on the analysis done, estimated average monetary benefits from MFFMs varies from 1,600 USD/hectare/year (for MFFMs with flowers, grasses, and shrubsmargins) to 4,000 USD/hectare/year (with connected tropical forests).
The paper helps to facilitate a better understanding of the impact of MFFMs on farming and food production, allowing companies to integrate such analysis in their risk assessment and management systems, and aims to generate interest from the financial sector leading to investment. The results are used to improve collaboration between value chain actors and environmental and developmental NGOs.

POSTER SESSION

17.00-18.30
Foyer

Kristine Kjørup Rasmussen, Grøn University of Aalborg

The great whole of nature and the partial politics

In the works of Alexander Von Humboldt he emphasizes the importance of representing nature as one great whole. Today, many parts of modern society, science as well as politics, are based highly specialized fields of knowledge and technology. The high degree of specialization implies a risk of losing the Humboldtian perspectives of 'the whole'. A loss that can be problematic especially in relation to tackling global environmental and sustainability challenges, since a partial view of nature might lead to partial and suboptimal solutions for the future.
Based on a comprehensive reading of Humboldt's points about wholeness of nature and visions for understanding the balances in nature including human society, we apply his perspective on a modern case. The case is the actual debate and policy proposals for land sharing and planning in Denmark, in relation to the omnipresent biodiversity crisis. (Common Solutions – for nature and agriculture – 2019). An analysis of the discourses is carried out on the policy proposal and on some related documents and debate contributions. The resulting discourses are related to Humboldt's perspective of nature as a whole plus to the biological reality in Denmark today.
The results of the analysis reveal to what degree Humboldt's points and visions are represented in the Danish policy case. The results also allow for a discussion of how a Humboldtian perspective could broaden and hence benefit the debate and policies considering biodiversity and land use planning, in Denmark as well as in other parts of the world.

Margarita Doneliene, Freie Universität Berlin

A proposal to evaluate the impact of agricultural practices in the Water – Energy – Food Nexus

By 2030, it is estimated that the world population will be 8.3 billion people, increasing the pression in energy, water, food, land use and mineral extraction, especially in the developing world. By 2050, agriculture will need to produce 60 % more food globally and 100 % more in developing countries. These estimates indicate the immediate need to adopt interventions that can minimize these impacts. There is a lot of talk about sustainability, but it is still rare to make the results of integrated evaluations available on various topics. When considering the integrated Nexus Food-Water-Energy (F-W-E) assessment, this fact is even more challenging. Considering the importance an dimension of agricultural lands all over the world and the existence of areas in different stages of degradation, it becomes strategic for interventions that can generate socio-economic and environmental benefits with positive impacts to the tripod F-W-E. In this perspective paper we propose a framework that offer an opportunity to achieve the targets regarding the Availability and Stability dimensions of the F – W – E Nexus at rural landscapes thorough the evaluation of agricultural practices impact in ecosystem structure and functionality.

17.00-18.30
Foyer

POSTER SESSION

SESSION 5 - URBAN AND RURAL: A NECESSARY PARTNERSHIP

17.00-18.30
Foyer

Elizabeth Toriz, Tecnológico de Monterrey

Smart communities for a sustainable future. Opportunities for the rural environment in Mexico

Smart communities bring together technology, government and society to reduce environmental impact and increase the quality of life. They are characterized by generating their energy in a sustainable way and the inhabitants are permanently communicated with their governments through the Internet or their cell phones. There, they can consult public services including transportation, among other things. A community is considered intelligent when the following elements are integrated as the community grows: 1) Competitiveness and productivity; 2) Sustainable and safe mobility; 3) Sustainable management of resources; 4) Inhabitants with access to education; 5) Quality of life; 6) Citizen participation in government decisions in progress.

In Mexico there are a large number of dormitory communities, places with low economic activity that force its inhabitants to move both to work and to obtain goods and services, causing large amounts of polluting emissions and many hours in transfers with the consequent deterioration in their quality of life, so this research presents the results of working in a vulnerable rural community with the purpose of initiating its transformation towards an intelligent community that possesses all the elements that allow its inhabitants to have all the goods and services, opportunities of work and quality of life within their environment to avoid their displacement to other places.

It has been delivered to the community, proposals for innovative and viable solutions to be implemented in the areas of opportunity identified, which, through sustainable actions, achieve the optimization of some process to increase their quality of life.

Jonas L. Schaper, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries & Technische Universität Berlin

Sediments remove trace organic compounds in urban streams

Trace organic compounds (TrOCs) such as pharmaceuticals that originate from wastewater treatment plants are frequently detected in urban surface waters, where they impair ecosystem health and pose risks for drinking water production. The hyporheic zone (HZ), i.e., the portion of streambed sediments that is permeated with surface water, is considered to remove certain TrOCs more or less efficiently. Field data obtained in urban rivers in Berlin, Germany, and Adelaide, Australia, demonstrate that some TrOCs such as metformin, guanylurea and methylbenzotriazole are removed along both short (cm to dm) flow paths in the HZ and along river reaches. For the majority of the investigated TrOCs, reactivity is highest in the shallow hyporheic zone (upper 10 cm) where redox conditions are (sub)oxic and turnover rates of dissolved organic carbon are highest. The in-stream removal of TrOCs increases with increasing magnitude of hyporheic exchange flows (HEFs). Modeled transient storage parameters and correlations between reach-scale and hyporheic removal suggest that, if HEFs are relevant on the reach scale, hyporheic sediments are the main contributor to reach-scale removal of TrOCs. River restoration measures that aim at increasing the intensity of hyporheic exchange flows will therefore improve reach-scale TrOC removal and hence water quality in urban streams. However, while some TrOCs such as valsartan are transformed, others such as carbamazepine are relatively stable in both the HZ and along river reaches. Many TrOCs may be transported downstream over long distances with consequences for water management, particularly in urban areas where water cycles are partially closed.

17.00-18.30
Foyer

17.00-18.30
Foyer

POSTER SESSION

SESSION 6 - WATER AND BIOSPHERE: PRECONDITIONS OF SURVIVAL

Dirk Hoffmann, Bolivian Mountain Institute (BMI)

The Drying Up of Lake Poopó in the Bolivian Altiplano as a Result of Multiple Interactions of Different Stressors

Lake Poopó lies in the Bolivian Altiplano at an altitude of 3,686 meters high. It used to be the second largest lake in the central Andes, covering an area of around 3,000 km. In December 2015, Lake Poopó had completely dried up, with severe consequences on the lakes´ biodiversity and the livelihood of local (indigenous) communities.
When the lake dried up, explanations in the public debate involved five factors, ranging from water withdrawal for mining and the expansion of irrigation to natural climate variability, the occurrence of an ENSO event and climate change. However, very little research has been done on the roles played by each of those factors. Thus, the aim of our study is to analyze how a vulnerable socio-ecological system is impacted by various stressors and their multiple interactions.
On the basis of an extensive literature review, including technical documents and other grey literature, a series of expert interviews, as well as field visits, we conclude that even though the complete drying of Lake Poopó at the end of 2015 was triggered by a very strong ENSO in combination with an unusually late start of the rainy season, only the interactions of these climatic stressors with the other socio-economic factors can fully explain the drying event. As part of the results of our study we have produced a schematic overview showing the main feedbacks and interrelations existing between the factors behind the drying of Lake Poopó.

Oskar Masztalerz

Introduction: Planetary Health as a new discipline

Planetary Health is a new scientific discipline on the interface of health and sustainability science. It is defined as the health of human civilization and the natural systems on which it depends (Whitmee 2015). Planetary Health sees humanity and its well-being inseparably connected to the functioning of the Earth System and recognizes that our interference with the latter and its subsystems has become a key determinant of human health. A significant part of the global burden of disease is caused by environmental disruption, e.g. 9 million deaths are caused by pollution every year - more than by HIV, Tuberculosis and Malaria together (Landrigan 2018). The crossing of the Planetary Boundaries increases cardiorespiratory diseases, cancer, infectious diseases, malnutrition, neural and mental disorders. Potential medicaments are lost by the decrease of biodiversity, and poverty renders individuals more vulnerable to environment-related diseases (Butler 2014). At the same time, the sustainable transformation is one of the greatest opportunities for the improvement of human health worldwide. Beyond these interconnections, Planetary Health aims to re-conceptualize the human-environment-relationship (Gabrysch 2018) and wants to use health protection as a key motivator for the sustainable transformation. Over 120 institutions support the idea of Planetary Health and work together in the Planetary Health Alliance. In my contribution, I will not present a paper, but summarize scientific literature to introduce the concept and discipline, give an overview of the the interactions between the Planetary Boundaries and human health, and briefly examine the SDGs from a Planetary Health perspective.

17.00-18.30
Foyer

POSTER SESSION

17.00-18.30
Foyer

Rob van Gemert, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Challenges to fisheries advice and management due to stock recovery

During the 20th century, many marine fish stocks suffered from unsustainable fishing pressure. Now, signs of recovery are appearing among previously overfished large-bodied fish stocks. This new situation raises the question of whether current fisheries advice and management procedures, which were devised and optimized for depleted stocks, are well-suited for the management of recovered stocks. This study highlights two challenges for fisheries advice and management that arise as a result of stock recovery: First, recovered stocks are more likely to show density-dependent growth which, if ignored, will result in an inaccurate calculation of fisheries advice. Thus, optimal management of recovered stocks requires that density-dependent growth is considered when calculating fisheries advice. Second, a biomass increase of large-bodied piscivorous fish can trigger a reverse trophic cascade, where their increased predation mortality on forage fish reduces the productivity and abundance of forage fish stocks. This could result in conflicts between the fisheries of these two different types of fish. Avoiding such conflicts requires that choices are made between the exploitation of interacting fish stocks. Failing to account for the changed ecological state of recovered stocks therefore risks creating new obstacles to sustainable fisheries management.

Ralf Steuer, Humboldt-Universität zu Berlin

Growing the Future: the potential of phototrophic microorganisms

17.00-18.30
Foyer

Our planet is green! Oxygenic photosynthesis is perhaps the most important biological process within our entire biosphere. Plants and cyanobacteria supply almost all organic carbon compounds that form the building blocks of life. Without the evolution of oxygenic photosynthesis in the ancestors of modern-day cyanobacteria, there would be almost no free oxygen in the atmosphere, there would be no protective ozone layer and most likely no complex life on Earth as we know it today.
In addition to their glorious past, cyanobacteria also hold great promise for the future. The potential offered by phototrophic microorganisms will play a major role in mastering the challenges of the 21stcentury – from securing global food supply to the synthesis of renewable raw materials. The contribution will describe recent advances to better understand the mechanisms of phototrophic growth, and our efforts to improve cultivation of phototrophic microorganisms. In particular, the productivity of phototrophic cultures is currently limited by the low cell densities that are typically obtained in typical pilot scale photobioreactors. Newly developed ultrahigh-density cultivation devices, however, demonstrate the feasibility to grow phototrophic microorganisms in urban environments -- and therefore open new possibilities for urban farming and development.

POSTER SESSION

17.00-18.30
Foyer

Suzana Blesic, Center for Participatory Science, Belgrade & Ca'Foscari University of Venice

Should changes in natural cycles induced by damming impose environmental restrictions to future hydropower optimization?

We used three techniques of scaling and multifractal analysis – the detrended fluctuation analysis (DFA), the wavelet transform spectral analysis (WTS) and the wavelet transform modulus maxima method (WTMM) – to investigate how damming affects river dynamics and cyclical consistency, in the case study of the Danube river flow and the Djerdap/Iron Gates dams.
The two dams are positioned in the relative vicinity to each other, inside a canyon that river Danube forms in this region. We hypothesized that this would present with a conveniently confined natural system that will allow to study the influence of damming on the river flow dynamics, in the absence of substantial effects of any other major local hydroclimatic mechanism.
Our results show visible and significant impacts of Djerdap/Iron Gates on scaling of the Danube river level that affect DFA, WTS and WTMM functions in a different way, depending on the position of the data collecting hydrological station relative to dams. We found a distinct effect of damming on river level scaling upstream from dams that is mainly brought by the complete (in the vicinity of dams) or partial (further upstream, up to 220 km away) loss of the natural annual cycle, together with decrease of amplitude of other larger-scales noises. The observed loss of seasonality may pose a substantial risk for the stability and functioning of riverine ecosystems, particularly for systems strongly adapted to seasonal and interannual flow variability, raising, among other, economic and food security concerns.

SESSION 7 - CLIMATE CHANGE: BIOPHYSICAL IMPACTS AND SOCIETAL RESPONSES

Max Franks, Potsdam Institute for Climate Impact Research (PIK)

Mobilizing domestic resources for the Agenda 2030 via carbon pricing

17.00-18.30
Foyer

The twenty-first century is characterized by an underprovision of basic public goods, such as public health, education, infrastructure and so on, and an overuse of the atmosphere as disposal space for greenhouse gases. Carbon pricing could address both problems simultaneously: a transition from negative carbon prices (fossil fuel subsidies) to positive levels could generate revenues to finance progress towards the Sustainable Development Goals. Given the scarcity of private sources of finance in many lower-income countries, carbon pricing could be a particularly attractive policy option. Our analysis identifies countries where domestic revenues from carbon pricing consistent with the 2 °C target could contribute substantially to financing theSustainable Development Goals.

POSTER SESSION

17.00-18.30
Foyer

Sebastian Schneider, Humboldt-Universität zu Berlin

Effects of Extreme Urban Microclimates on Tree Growth in Berlin

In Berlin, the city with the most pronounced Urban Heat Island (UHI) effect in Germany, we examined eight tree species. Using dendroecological techniques, we aim at determining and prioritizing the growth factors for mean climatic and extreme weather conditions at different sites and thus assessing the health status of urban trees. Both urban (acer, ash, lime) and forest tree species (beech, douglas fir, oak, larch, pine) were considered. Two cores each from ~350 trees were collected with increment borers, the ring-widths dated and measured, and data processed following standard dendrochronological techniques. Linear correlations between tree ring-width and climate data were used for the analysis of climate-growth relationships. Urban tree sites along an UHI gradient were compared with ecologically distinct control sites in the Berlin hinterland, which range from near natural (Müritz National Park) to sub-urban (Potsdam-Telegrafenberg, and Stadtforst Köpenick). The UHI intensity of all sites was characterized by local microclimatic conditions following the approach of Local Climate Zones. Clearly deciduous trees, especially oak and beech, show higher correlations between tree-ring width and extreme heat in summer at urban locations. In conclusion, there is high potential to use these these urban trees in an inverse modeling approach for the analysis of the spatial and temporal evolution of the UHI over decades to centuries. The evidence from this study suggests a variety of factors related to regional climate change and sustainable demographic and urban planning of the German capital.

Xuefeng Guan, Humboldt-Universität zu Berlin

Precipitation characteristics and their association with large-scale atmospheric circulation over Tianshan Mountains, Central Asia

Tianshan Mountains, with its status as “water tower”, concentrate most of the precipitation in Central Asia. Considerable knowledge gaps exist regarding the understanding of precipitation over this region water-scarce region. Based on GPCC precipitation data sets, high-resolution reanalysis data ERA-Interim and NCEP/NCAR this paper covers the following research: (1) to reveal the interdecadal and decadal variability in annual and seasonal precipitation over the Tianshan Mountains, (2) to study the characteristics of water vapour sources and transport paths using a Lagrange trajectory model, (3) to analyze the modulating effects of circulation systems on water vapour transport and precipitation and to reveal the key influencing factors of precipitation in the Tianshan Mountains area. These findings will contribute to the understanding of water resources research in arid regions of Central Asia which is a vital contribution to the sustainable development in the study area.

17.00-18.30
Foyer

13.30-15.00
room 1.102

SESSION CHAIR
Anna Henkel

EXPERT FORUMS

SESSION 1 - PUBLICS AND ETHICS OF SUSTAINABILITY (PART 3):
Analyzing and framing societal discourses

Linda Wollersheim, Deakin University

Framing just transitions: discourses as facilitators and barriers of low-carbon energy transitions in Germany and Australia

This paper seeks to compare discursive frames of just low-carbon energy transitions identified in key policy documents steering Germany's Energiewende and Australia's transition to sustainable energy. The aim is to outline how and through which activities actors influence transition processes, focusing on the role of framing in maintaining asymmetric power relations between key energy stakeholders. Furthermore, this paper examines to what extent pre-existing institutional frameworks condition the transition dynamics, thereby addressing the interplay of governance mechanisms, opportunities for and barriers to effective, just low-carbon energy systems transformation. The analysis addresses the session theme of democracy, governance, and societal conflicts in the context of sustainable development goal seven (Ensure access to affordable, reliable, sustainable and modern energy for all). This paper employs a mixed-methods comparative political science methodology comprising two core components. First, using a policy mix lens, the discursive frames dominating sets of (sub)national policies relating to electricity-sector transformation are analysed, to identify the underlying assumptions of how transition pathways are constructed. Secondly, discourse analysis assesses the conflicting meanings of 'just' transitions and discusses how a diversity of actors' influences problem definitions. Particular attention is placed on the nature and role of citizen renewable energy (RE) in form of cooperatives, prosumers and SMEs. This paper draws some conclusions about whether citizen RE can function as a democratic source of reflexivity in low-carbon, socio-technical transitions and act as a site of problem-solving, affirmation and contestation in relation to state and market activities that both drive and hinder the sustainability transformation.

Felix Ekardt, Forschungsstelle Nachhaltigkeit und Klimapolitik

Economic Instruments, Ecological Effectiveness, and Liberal Democracy

The article presents the following theses (based on more than 20 years of own research on the topic): (1) The core strategies for various sustainability problems such as climate change, biodiversity loss, disturbed nitrogen cycles, public health, etc. are zero fossil fuels and much less livestock farming in about two decades - based on legally binding international targets. (2) The (environmental) effectiveness of policy instruments for unprecedented challenges can only be measured through a qualitative multi-methodological governance analysis. This is strongly based on - very interdisciplinary - behavioural scientific findings on the human motivational situation. (3) Both the scope of the challenge and the human motivational situation and certain governance problems (such as rebound and shifting) can be addressed optimally by means of economic instruments. (4) However, this only applies if they operate with a broad substantial and spatial scope. (5) Nevertheless, there is a need for certain complementary instruments. (6) This governance path is also the most compatible with the principles of liberal democracy.

EXPERT FORUMS

13.30-15.00
room 1.102

Jonas Birke, Bergische Universität Wuppertal

The 2030 Agenda in social discourse - participation and information as key factors for an improved implementation of the SDGs?

In times of global change, in which both societal and environmental conflicts are increasingly occurring worldwide, issues such as sustainability and sustainability strategies are becoming the focus of public attention. The latest milestone here is the "2030 Agenda". It is currently the most comprehensive and far-reaching sustainability strategy and must therefore be considered as the central instrument in order to solve global problems. However, studies show that this strategy and its goals are currently largely unknown to civil society. Nevertheless optimizing the implementation process is essential for a successful sustainable development of our society.

The poster therefore addresses the connection between the information situation and the social participation in the course of the 2030 Agenda and the resulting consequences for the future implementation of sustainability strategies.

Based on the results of a quantitative online survey (n=1650) on the social perception of the 2030 Agenda and the SDGs, the poster illustrates the current information situation on this strategy and how the Agenda and its objectives are perceived and evaluated by civil society. Furthermore, it will be discussed to what extent an improvement of the information situation can contribute to a better implementation of the SDGs and how such an improvement could look like. In particular, the focus will be on the information necessary and on potential information channels. Whether an improvement of the information situation can ultimately be seen as the key to future implementation is also subject of discussion.

Antje Brock, Freie Universität Berlin

How to foster constructive emotions for sustainability? Positive psychology and hope-based education for sustainable development as a navigating tool for sustainability transformations

13.30-15.00
room 1.102

There are indications that the lack of action towards sustainability is not sufficiently explained by dimensions like pro-sustainable attitudes, emotions and individual willingness to act. A large-scale study in Germany (n > 3.000) covering young people (14-24 years) as well as teachers was designed to, among others, shed light on the desirability and the likelihood of different future scenarios in 50 years time (Grund and Brock 2019). It could be shown that the by far most desirable future scenario is a sustainable future where mitigating climate change has been realized while this very scenario is at the same time ranked as the least likely. This future pessimism and a lack of constructive, motivating emotions such as “critical hope” (in contrast to naive, unreflected hope) present themselves as the most plausible explanations for a sleeping giant: While the largest fraction of the sample (50%) reveal a high potential for accelerating change towards sustainability through relatively high sustainability-affine emotions as well as the will to take responsibility for sustainability, this potential is not yet being translated into acting in a pro-environmental way.
The importance of hope as finding ways to achieve desired, but jeopardized aims, is increasingly being discovered in its importance for sustainability research. The merging of expertise from positive psychology (Corral-Verdugo 2012), hope-based research (Ojala 2012, 2017, 2007) and education for sustainable development (ESD) can provide a powerful solutions-based tool for sustainability-related action and research.

13.30-15.00
room 1.205

SESSION CHAIR
Sabine O'Hara

EXPERT FORUMS

SESSION 2A - DEMOCRACY, GOVERNANCE, AND SOCIETAL CONFLICTS IN A GLOBALIZED WORLD (PART 3A): Sustainability

Petra Künkel, Collective Leadership Institute gGmbH

Systems Aliveness as a Key Component of Sustainability Transformations

Many experts and scholars have called for a paradigm shift in thinking and acting (Finidori 2015; Fullerton 2015; Jaworski 1996; Scharmer and Kaufer 2013; Senge et al. 2015) however the essential question – what will advance the needed paradigm shift to accelerate the changes in collective behavior? - has not yet been answered (Fullerton 2015; Godfray et al. 2010; Meadows, 1999; Meadows et al. 2004). Fullerton (2015) advances the notion of responsible and regenerative capitalism, while Donaldson and Walsh (2015) proposes that it is time to redefine the true meaning of business as creating collective value. The paper introduces an approach to sustainability transformations that is anchored in systems thinking with a focus on life-enhancing processes. It does so in a trans- and multidisciplinary way and shows the role of patterns as a relational and constituting element in the co-creative process of transformative change. Drawing on socio-ecological research, it relates such constituting elements to vitality and resilience in human interaction systems. It introduces the concept of systems aliveness as a key element for understanding novel approaches to sustainability transformations. Based on essential features of life-enhancement in systems it suggests and emerging Patterns of Aliveness Theory, which shows how six essential organizing principles allow life to emerge, thrive, and re-create itself in natural as well as social systems. Moreover, it argues that transferring and translating the insights of this approach to understanding how socio-ecological systems function (or fail to function) is key to conceptualizing stewarding transformative change in a new way.

Ilan Chabay, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam); Soléne Droy, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam)

Reconsidering sustainability - as a societal challenge

Most of the effort undertaken globally to mitigate, or to adapt to, environmental change has been directed at studying the relationship between environmental phenomena and human behavior. In those efforts, the point of departure has been the environment. It is argued here that this effort, however valuable, has not looked at sustainability as a societal challenge. What are the dynamics that have driven our societies to the point that they have so heavily changed our environment that it has become unrecognizable, and that the changes threaten to undermine the existence of our societies as they are?
This paper will present a major effort to scientifically rethink our societal attitude to the environment and our relationship with it. This effort, the Global Sustainability Strategy Forum, is a three-year project funded by the Volkswagen Foundation. It provides vital input by making knowledge for sustainable development from diverse sources more actionable for effective policy decision-making. Many systems for measuring the state of sustainability produce results that can seem contradictory. What is needed are balanced and integrative judgements as to the meaning and implications of these findings, for the global and regional levels. The project aims at developing strategic solutions by reconciling the effects of interdependencies across the SDG spectrum, and between sustainability, globalization, and digitalization.

EXPERT FORUMS

13.30-15.00
room 1.205

Frederic Hanusch, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam);
Azucena Morán, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam)

Leapfrogging Democratization: meeting sustainability goals through fundamental democratization leaps

Research results largely demonstrate democracy's positive effect on sustainability. At the same time, even established democracies are far from reaching internationally agreed-upon targets, such as those set in the Paris Agreement and the Sustainable Development Goals. When taking into account shrinking timeframes for action, incremental democratization is unlikely to improve democracies' sustainability performance sufficiently. Against this background, the paper introduces the concept of "leapfrogging democratization". While much of the current effort in democracy research is spent on analyzing transitions along the autocracy-democracy continuum and on democratic innovations at the local level or as non-viable blueprints, we know little about fundamental democratization leaps of established democracies omitting single reform steps. "Leapfrogging democratization" fills this conceptual gap in transitology and consolidology, and identifies democratic means potentially able to improve sustainability performance to the extent needed.

The concept formation of "leapfrogging democratization" is derived from a theoretical as well as an empirical angle. First, we define possible drivers, conditions and processes of leapfrogging democratization based on democratic transition theory. Second, we identify rapid increases of democratic quality in order to isolate empirically elements of leapfrogging democratization. Third, we discuss and relate our theoretically and empirically derived insights to formulate the concept of "leapfrogging democratization". Lastly, we apply the concept to the planetary challenges ahead, outlining entry points for democracies in the framework of Alexander von Humboldt's perspective on nature and humanity as a web of interconnections.

Gökhan Orhan, Bandırma Onyedi Eylül University

Conditions of Environmental Policy Integration for Sustainability: the Politics of Multiple Dividends at Local Government Level in Turkey

Cross-border nature of environmental problems and interdependence of almost all players in an ever-globalised world entail a number challenges for policy-makers. In this context, sustainability has been a major policy goal endorsed all around the world. Although specific targets have changed in the meantime, from Millennium Development Goals to Sustainable Development Goals (SDG's), problems concerning sustainability "sustained" and many of the most severe environmental problems have not sufficiently been resolved. Problems behind this partial failure are not only about lack of certain techniques or policy instruments, but policy implementation in a multilevel and interdependent policy environment. This paper aims to focus on environmental policy integration (EPI), an environmental policy principle that was widely recommended and supported in environmental policy circles. Given the interdependent character of SDG's, EPI is not an option but a necessity in dealing with complex environmental problems. Although there is a consensus on the necessity of EPI, there are disagreements concerning its implementation. Prevalence of institutionalised ideas and discourses on environment and development contribute to a pattern of path dependence, which culminates in environmental policy failures. Yet again, ecological modernisation policies and existence of multiple dividends activate the potential for EPI and likely to bring certain improvements in environmental quality at the local level. Departing from successful experiences of Turkish municipalities' in a multilevel context, this paper will discuss the possibility of EPI in local level where multiple dividends and involvement of international players contribute to attainment of sustainability goals despite prevalence of barriers in attaining SDG's.

13.30-15.00
room 1.205

EXPERT FORUMS

13.30-15.00
room 1.205

Ulrike Zeigermann, Centre Marc Bloch (An-Institut Humboldt-Universität zu Berlin)

Challenging scientific knowledge and expertise in sustainability politics

Taking the need for new information and political change for an ecologically sustainable development as a starting point, the paper argues that the openness and independence of scientific research which is based on high academic standards can be considered as its strength although it may lead to complex results: It allows for reliable knowledge and for unforeseen findings which can be translated into innovative political solutions through the process of integration (Böcher/Krott 2016). At the same time, scientific expertise is increasingly challenged: The emergence of new information and communication technologies (ICTs) has contributed to new forms of citizen science and transdisciplinary knowledge which can be disseminated and influence sustainability politics despite critical ethical and methodological questions (Nichols 2017). In addition, current tendencies towards populism and post-truth discredit established expertise and academic research on the environment, climate change and sustainability as the agenda of a powerful elite (Lockwood 2018).

Building on the theoretical discussion in the first part of the paper, the second part presents initial empirical results from research on contested knowledge and the understanding of expertise in Sustainable Development Solutions Networks. Those networks which have emerged in different countries and with different thematic foci seek to promote the integration of innovative knowledge on sustainability into political decision-making. At the same time, it remains questionable if – and under what conditions – they address the two main challenges to scientific knowledge in sustainability politics as identified in the first part of the paper.

SESSION 2B - DEMOCRACY, GOVERNANCE, AND SOCIETAL CONFLICTS IN A GLOBALIZED WORLD (PART 3B): Science-Policy Interface

Julia Kulgavchuk, Laerdal

Humboldt as a Sustainable Design Hero

Designers are people who can have a huge impact on moving towards the sustainable development goals.
Humboldt, in addition to his other roles, was a creator, a brilliant designer, without being called that. He‘s known for the visualizations that he made and commissioned, which are clearly the works of information design. Those works were influential and helped change the way people see the world. However the visualizations are by far not the only aspect of his work that can inspire designers of today and help them come up with sustainable solutions. Designers have learned a lot about data visualization since, but in other areas of their work they could really use some inspiration from Humboldt.
Humboldt‘s whole approach to intellectual work can inform design work. Firstly, it‘s his systematic approach to knowledge and practice, cutting across disciplines. Secondly, his systematic approach to information retrieval that allowed for making connections and discovering new patterns. It‘s his connectedness to the community and constant networking, allowing for knowledge sharing, collaboration and freer access to knowledge. It‘s measuring what can be measured, but at the same time being in touch with the sensitive and poetic side of human nature, attending to which that is essential for people‘s wellbeing in the world.
I‘d like to show how this approach helped him make an impact that designers of today can strive for if they want to create good and lasting solutions.

13.30-15.00
room 1.204

SESSION CHAIR
Klaus Eisenack

13.30-15.00
room 1.204

EXPERT FORUMS

Gregor Hagedorn, Museum für Naturkunde

The Scientists4Future Statement in Germany, Austria, and Switzerland

Science has clearly elaborated the challenges of the climate and sustainability crisis. Solutions are available. These demand quick, decisive and well-financed action. The political mainstream has a different agenda.

Greta Thunberg, the Climate Strike, and Fridays for Future movements have mobilized a young generation. They realize how the older generation is squandering their future through inaction. Greta Thunberg aptly states that the politicians do not need to listen to her – "We want them to talk to the scientists instead. Listen to them. Because we are just repeating what they are saying and have been saying for decades".

What can scientists to support the young generation? Most of us understand the options, the threats and the dangers of inaction clearly. What is our responsibility?

A grassroots initiative in Germany, Austria and Switzerland, coordinated by Gregor Hagedorn, has created a statement, drawing conclusions from scientific facts, and expressing support for the young protestors. After collecting over 700 initial signatures, a broad collection between the 2 and 15th of March yielded by 23.000 scientific and academic signatories, among them several Nobel price laureates.

Our children face a sustainability crisis and take action. Is it enough for scientists to apply for the next research grant for fundamentally valuable research? Is it enough to sign the Scientists4Future statement?

Hannah Birkenkoetter, Humboldt-Universität zu Berlin; Gabriele Koehler, United Nations; Anke Stock, Women Engage for a Common Future

A tale of multiple disconnects: Why the 2030 Agenda does not (yet?) contribute to moving German gender equality struggles forward

One major innovation of the United Nations 2030 Agenda for Sustainable Development is its ambition to merge and transcend the currently rather disjointed social justice and ecological sustainability policy strands. This entails a gender perspective, embodied in SDG 5 of the 2030 Agenda. We study the domestication of the 2030 Agenda in Germany with a view to understanding its impact on domestic gender equality policies. Concentrating on federal level policy-making, the main finding is that the 2030 Agenda has, as of yet, no discernible impact on domestic gender equality struggles. Based on 28 qualitative interviews with policy actors, we observe that there exist multiple institutional disconnects. There is a lack of cohesion across ministries and civil society actors, resulting in a horizontal disconnect. There is a vertical disconnect between the 2030 Agenda as a multilateral agreement and its domestication. Perhaps because the UN Agenda is a soft-law tool, it has limited clout for transformative change domestically; it is moreover seen to be weaker on gender equality commitments than other pertinent international agreements. Transformative change thus requires strengthening institutional linkages. In government policy making, links between gender and "green" issues necessitate mutual understanding and explanation of the value added brought by the 2030 Agenda. Actors devoted to gender equality and actors primarily engaged in the ecological dimensions of sustainability would need to interface strategically. The study flags two immediate opportunities: a new German Sustainable Development Strategy to be developed by 2020, and Germany's 2021 presentation to the UN's High-level political forum.

13.30-15.00
room 1.204

EXPERT FORUMS

13.30-15.00
room 1.204

Thomas Vogelpohl, FernUniversität in Hagen

Idiosyncrasies of bioeconomy governance. Insights from three policy areas of the German bioeconomy

The concept of the bioeconomy has recently risen to great popularity with governments around the world as a new paradigm for a sustainable economy. Its essential element is the substitution of fossil resources with renewable raw materials in all economic processes. Notwithstanding the various potential socio-ecological conflicts this might entail, however, it is still highly contentious what the bioeconomy actually is or should be, which often leads to a certain arbitrariness when it comes to bioeconomy governance. Consequently, the bioeconomy often presents itself as a highly fragmented and heterogeneous policy field that is rather shaped from the bottom-up, i.e. by the idiosyncratic policy processes and practices of its numerous, already existing policy areas, than from the top-down, i.e. by an overarching policy strategy. Against this backdrop, we focus on the political processes of the bioeconomy in Germany by particularly inquiring these idiosyncratic aspects with regard to the policy areas of bioplastics, biofuels and bioenergy. We do so based on the political process-inherent dynamics approach (PIDA) that, drawing on a 'garbage can' understanding of such processes, serves as an analytical framework that draws attention to actors, institutions, instruments and problem structures as explanatory factors that shape political processes by their interplay and their inherent dynamics. By applying the PIDA framework to the abovementioned policy areas, we do not only show the idiosyncratic nature of bioeconomy governance, but also elaborate on the specific dynamics that shape these processes in order to reveal overarching patterns of the political processes of the bioeconomy.

SESSION 3 - ECONOMIES BEYOND UNLIMITED GROWTH (PART 3):
De-growth versus Green Growth (de-growth/green growth/a-growth/...), block 1

Helmut Haberl, University of Natural Resources and Life Sciences Vienna

Decoupling resource use and emissions from economic growth: green growth, a-growth or de-growth for zero-carbon society?

Economic growth is a key feature of modern societies. It has yielded high affluence but also requires biophysical resources (materials, energy), which drives environmental changes (climate heating, biodiversity loss etc.). The question emerges whether growth can be decoupled from resource use or emissions. “Relative decoupling” means that the economy grows faster than resource use, whereas “absolute decoupling” prevails when resource use declines while GDP grows. Based on a systematic review, we summarize the knowledge on the relationships between GDP growth and resource use, and the observed rates of relative and absolute decoupling. We report on evidence for absolute and relative decoupling of the biophysical basis of society from economic activity (GDP) in the recent literature. We discuss under what circumstances “green growth” (promoting eco-efficiency and renewables) suffices for a transformation towards zero-carbon society, or if a growth-agnostic “a-growth” strategy or even a “de-growth” approach seems more plausible. We finalize with reflections on moving beyond GDP growth as key societal goal and introduce the stock-flow-service (SFS) nexus as a framework for a richer conceptualization of sustainability transformations. The SFS nexus incorporates several metrics (monetary and non-monetary) to assess societal well-being and highlights combinations of flows (energy, materials) and stocks (e.g., buildings, infrastructures, machinery) delivering services and societal well-being.

13.30-15.00
room 1.401

SESSION CHAIRS
Sabine Fuss
Maja Göpel

EXPERT FORUMS

13.30-15.00
room 1.401

Felix Creutzig, Mercator Research Institute on Global Commons and Climate Change (MCC) & Technische Universität Berlin

Limits to liberalism: rationality, well-being, and planetary health

Modern liberal societies appear ill-prepared to meet the paramount challenges of global environmental change. While liberalism has been the winning modern ideology after 1990 dominating both political and economic institutions in most countries worldwide, liberalism is forced onto the defensive. This is symptomatically shown by the international ascent of the extreme right, and substantially by its inability to address rising inequality and to sustain planetary health, understood as keeping earth system processes within planetary boundaries. Here, I critique liberalism on its core assumption (autonomy of the individual), on its shaky empirical grounds (rational choice model), and on its track record (individual and social well-being and environmental degradation). I point to the importance of a value shift to overcome the shortcomings of a narrow-minded liberalism, and to foster the plausibility of planetary health. This critique should serve as groundwork to those interested in saving the accomplishments of liberalism, such as encompassing notions of freedom, and to foster the transformation of political and economic systems towards a terrestrial oikonomia.

Michael Jakob, Mercator Research Institute on Global Commons and Climate Change (MCC) &
Technische Universität Berlin

Should we put the brake on economic growth to save the climate? An overview of the scientific debate

Should economic growth continue in a world threatened by the prospect of catastrophic climate change? The scientific debate has brought forth a broad spectrum of views on this question, ranging from neo-classical economics to degrowth. We argue that such different positions can be attributed to underlying differences in views on (i) factors that determine human well-being, (ii) the feasibility and desirability of economic growth, (iii) appropriate intervention points, and (iv) preferences about governance and policy options. For each of these dimensions, we propose points of agreement on which a consensus between conflicting positions might be achieved. From this basis we distill a sustainability transition perspective that could act as a basis for a renewed debate on how to align human well-being with environmental sustainability.

13.30-15.00
room 1.103

SESSION CHAIR
Patrick Hoster

EXPERT FORUMS

SESSION 4 - LIMITED LAND - A LOCAL TO GLOBAL PERSPECTIVE (PART 3): Land use: linking drivers with impacts

Niels Debonne, VU Vrije Universiteit Amsterdam

Implications of current and future dynamics of large-scale land acquisitions and African medium-scale farms

Increasing commercial interests in land have given rise to new rural land systems. Large-scale land acquisitions (LSLAs) are a highly visible manifestation of this trend, but more subtle land system changes, such as the rise of medium-scale farms (MSFs) in Sub-Saharan Africa may instigate similar or greater land changes. Because land is limited, the arrival of new land systems not only creates direct land impacts, but may also displace other land systems.

We developed a forward looking land system model able to capture LSLAs at a national scale. An application for Laos highlights that, through competition, LSLAs instigate forest conversion beyond their boundaries and may undermine the position of smallholders on cash crop markets. In Cambodia, we coupled our model with earth observation data and show that the limited nature of land means that unregulated LSLAs undermine the planned reintroduction of tigers, because without stringent protection, the remaining potential habitat for tigers is likely to be converted, especially if LSLAs continue to remain largely uncultivated.

To gain understanding of the little-studied class of MSF in Sub-Saharan Africa, we performed a farmer survey in a high-potential area in Kenya to find out what the characteristics of larger farms are compared to smallholders. Results suggest that large land endowments can allow for high-productivity, capital-intensive agriculture in some cases, but contrary to previous research, we find that a majority of these farms are not new, and may lock high-potential land under low-productivity land management, with repercussions for future land use.

Kashimana Ivo, Universität Hamburg

Reconciling food production and biodiversity conservation for food security in Nigeria

Climate change and population growth in Nigeria is exerting pressure on its natural systems such as agricultural and forestry systems. This pressure is primarily from deforestation for agricultural expansion, game hunting, fuel gathering and development. Conflicting land use objectives accelerate deforestation, severely change agricultural and forestry systems, and impact food security.

To understand land use conflicts in Nigeria, We use the General Algebraic Modelling Systems (GAMS) to construct an integrated assessment model for the agricultural sector in Nigeria. This model jointly assesses the implication of changes in land use systems and policies on agricultural production and forest conservation taking into consideration important natural and societal developments. The model integrates climate, environmental, socio-economic and policy data and very importantly, stakeholders' perceptions in depicting motivations, restrictions, and options of farmers in a changing environment and society. Historical land use information is used to calibrate the model.

Because of diverse environmental and socio-economic conditions, options for reconciling agricultural and forestry systems may differ across Nigeria. In exploring such reconciliation options, this research hopes to provide important insight in opportunities and trade-off between sustainable development objectives including reduction of poverty and malnutrition, preservation of valuable forest ecosystems, and global efforts to slow down climate change.

13.30-15.00
room 1.103

EXPERT FORUMS

13.30-15.00
room 1.103

Nicolas Roux, University of Natural Resources and Life Sciences, Vienna

Separating supply and demand-side drivers of land use change to govern telecouplings

Human impact on ecosystems through land use has dramatically increased over the last century. Much hope was put into land sparing through intensification, but important rebound effects showed the need to reduce the quantity of land based commodities produced and consumed (hereafter market quantities). Although these market quantities are determined at the intersection of the demand and supply curves, standard decomposition analysis of the drivers of land use change typically label it as consumption. This paper argues that this has often led to misinterpretations, implying that market quantities could only be reduced through demand-side measures, ignoring that shifts in the supply curve as well affect market quantities by influencing prices. This reveals a need for new methods to weigh the potential of supply versus demand-side measures in reducing market quantities, especially because of the increasing disconnection of demand and supply through international trade and telecouplings.

We use a global dataset of embodied Human Appropriation of Net Primary Production (eHANPP) to measure bilateral land footprints, covering the flows of c500 products between c200 countries from 1986 to 2007. We carry out two plausible decompositions of the drivers of eHANPP flows, the first based on consumption and the other on production quantities. We finally determine the relative potential of consumption versus production drivers, based on the price elasticities of demand and supply.

Our results suggest that reducing the pressure on foreign ecosystems must be supported by reductions in quantities all along the value chain, including the production, consumption and international trade.

Tobias Kuemmerle, Humboldt-Universität zu Berlin

Balancing agriculture and conservation in the South American Gran Chaco

Trade-offs between agriculture and the environment are particularly strong in tropical deforestation frontiers. Focusing on the South American Gran Chaco, one of the last remain global land reserves, we use satellite image analyses to reconstruct how the increasing competition for land has played out since 1985, turning this region into a globally important agricultural region and deforestation hotspot. We then use a spatial multi-criteria optimization framework to describe the trade-offs between agricultural production, carbon stocks, and biodiversity that the increasing competition for land has produced. We find that the current Chaco landscape is far away from optimality, suggesting that there are major potentials for better outcomes in at least one of the dimension we explored (agriculture, carbon storage or biodiversity). Avoiding major losses in biodiversity and carbon stocks requires the protection of major shares of remaining forest, must focus on integrated systems such as silvopastoral ranching, and can be aligned with maintaining smallholder at the regional scale. More generally, our analyses show how multi-criteria optimization can help to describe trade-offs associated with land competition at broad scales and to identify land system configurations that mitigate these trade-offs. Finally, we highlight how increasing competition for land is directly linked to, and driven by, consumption in other parts of the world, including Germany.

13.30-15.00
room 1.103

13.30-15.00
room 1.502

SESSION CHAIRS
Bettina König
Daniela Kempa

EXPERT FORUMS

SESSION 5 - URBAN AND RURAL: A NECESSARY PARTNERSHIP (PART 3): urban drivers and their interlinkages to the rural

Susann Ullrich, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam)

Assessing the modal shift potential of urban and rural car drivers

What moves people? In urban and in particular in rural areas it is still mainly the own car. But looking at the demographic change and CO_2 emissions, behavioral changes in the private car sector are more than necessary. But how can people get to their work places without a car, especially when it affords commuting from suburban or rural places into big cities? Are people open for multimodal options? What are their obstacles to use the public transport or take the bike to work? And how do behavioral change potentials with regard to mobility differ between urban and rural places? We conducted a representative survey among N= 1,800 regular car drivers in the city-state of Berlin and the federal state of Brandenburg and asked for their modal switch preferences when it comes to mobility policy scenarios such as driving bans, city tolls, reduced speed areas as well as reduced or more expensive parking space. We also asked for the perceived barriers that keep them from using other mobility modes aside from their car. We will present regional and demographic differences in mobility behavior and behavioral change potential between rural (Brandenburg) and urban (Berlin) areas. These insights into human behavior change are valuable information for politicians as well as city and country planners, who want to take action for sustainable transportation.

Wiebke Nowack, Humboldt-Universität zu Berlin

Beyond cities: Exploring the role of agriculture in the Sustainability Transformation in rural areas

The German agricultural sector has experienced enormous structural changes in previous decades. Technological advances and intensification processes have led to impressive productivity gains. Production methods have shifted from being labour intensive to being increasingly capital intensive. The number of farms reduced significantly while the remaining grew in size. Taken together, these processes have fundamentally altered interrelations between agriculture and its ecological and sociocultural environment, creating severe sustainability challenges. In the 1990s, agriculture's multifunctionality became increasingly recognized and the concept of Multifunctional Agriculture was established. Debates on agricultural policies shifted from food security towards environmental and, to a smaller degree, sociocultural concerns. Numerous environmental measures have become either required or rewarded. But what is about sociocultural functions of agriculture? Which are these and how can these be maintained? Given the urgent need for a sustainability transformation, it is highly relevant to also address sociocultural dimensions. A systematic literature review supplemented by guided interviews with experts will carve out how farms may contribute to the sustainability transformation in rural areas.

EXPERT FORUMS

13.30-15.00
room 1.502

Evidence Chinedu Enoguanbhor, Humboldt-Universität zu Berlin

Exploring urban land expansion process in light of land use planning in the Federal Capital City-Region of Nigeria

Unsustainable spatial patterns and processes of urban expansion in city-regions are expected to be controlled using land use planning with sufficient data/information including the driving factors and spatial determinants. In this study, we focus on Abuja, Nigeria, because land use planning instruments were explicitly developed and adopted to foster a sustainable urban and regional development before and after relocating government seat from Lagos to Abuja in 1991. Our study aims for deeper insights into the past and current urban expansion processes in light of land use planning within a regional territory. We combined different datasets and methods: land cover maps generated using remote-sensed imagery, land use plans, surveys of experts and inhabitants, and population data. We applied statistical and spatial analyses to identify significant factors of urban expansion under the current land use planning instruments. Our results indicated the spatial pattern of elevation and protected areas are negatively associated with urban expansion. Conversely, distribution of roads, Central Business Districts, higher institutions, water bodies, slope, etc. are positively associated with urban expansion. Most importantly, our findings revealed that land use planning experts are not aware of some significant spatial determinants of urban expansion. Of particular interest, our study showed the unsustainable urban expansion, particularly in peri-urban/satellite settlements were associated with the inadequate implementation of urban plans. This paper contributes to current research on urban expansion and development of sustainable land use planning and policies in the Sub-Saharan African city-regions, and particularly in countries planning to relocate government seat of power.

Mohammad Naser Reyhani, Humboldt-Universität zu Berlin; Saeid Eslamian, Isfahan University of Technology

Contribution of Farmers' Organization in Engagement Process toward Adaptive Water Governance: Investigating the Perception of Different Actors

Water scarcity and growing socio-economic and political pressures have led to more demand from water users to effectually get engaged in water governance processes. This cannot be achieved without proper engagement of farmers as main water consumers whom are expected to compromise relatively more than other water users for reducing water demand in scarce conditions. In this study, we selected the case of Zayandeh-Rud basin (ZRB) in central Iran, where suffers from severe water scarcity, to study: 1) what factors do hinder effective engagement of farmers, particularly, for water demand management, and 2) how different actors perceive the performance and potentials of Farmers' Organization (FA) as a means to facilitate farmers' engagement toward water governance in the ZRB. For this order, five participatory workshops have been held to adapt Constellation Analysis method for structuring and integrating various perspectives of multiple stakeholders. As an outcome, a constellation map was jointly-depicted the factors and dynamics of four sub-constellations (water-soil, structural, coordination, and economic). This map clearly explicates the obstacles and hindrances of effective engagement of farmers for a water demand management. Besides, key-actors (N=156) were questioned via a self-administrated questionnaire to comprehend how do they perceive success and potentials of the FA. Appropriately, the results indicated that: 1) all actors have almost homogeneous perceptions on efforts taken by FA, 2) farmers found the taken efforts by FA with a greater impact, and 3) farmers are more optimistic than non-farmers about future contribution of FA towards an adaptive water governance in the ZRB.

EXPERT FORUMS

13.30-15.00
room 1.502

Lu Yu, German Development Institute (DIE)

Prospective Volition and Retrospective Thinking: Evidence from Adopting Climate Insurance in Agro-pastoral China

How does past experience influence current decision-making under an uncertain future? Although climate insurance has emerged as a promising solution to mitigating climate risk and the determinants underlying the uptake of insurance have been identified, the effects of past insurance experience on climate insurance uptake are less well studied. In addition, existing studies typically focus on societies in which local populations had previous climate insurance experience, whereas few studies have evaluated local pop1ulations that lack relevant experience. Our study fills this gap by examining the interest of agro-pastoral farmers in semi-arid China in a new hypothetical climate risk insurance. Employing propensity score matching, we find that past agricultural insurance experience has positive and significant impacts on the future interest in purchasing climate insurance. We interpret this finding as a cognitive decision making process based on prospective volition regarding retrospective thinking. It means that locals make decisions by looking forward to the future, build a logical premise of the causation of the specific action and possible outcomes by referring backward to the past experience. And then they make their decision to uptake that action once this logic convinces them that the desired future can be reached through a certain action.

SESSION 6 - WATER AND BIOSPHERE: PRECONDITIONS OF SURVIVAL (PART 3): Smaller-scale case studies

Maximilian Schmidt, Universität Heidelberg

Methane and CO2 in Lake Kivu – an Interdisciplinary Investigation in Respect of the Sustainable Development Goals

Lake Kivu lying on the border of Rwanda and the Democratic Republic of Congo is a methane and carbon dioxide containing lake. Due to its unique geophysical properties it bears enormous threads but also huge opportunities for its residents in both states. On the one hand, the gas resources stored in the lake bear the potential for limnic eruptions, a fatal catastrophe as happened before at e.g. Lake Nyos or Lake Monoun in Cameroon. On the other hand, there is a great potential of gaining electrical energy by mining the existing methane. In order to explore these socio-ecological contexts, a disciplinary perspective is not sufficient. Besides environmental analysis, we will equally consider societal issues as well as interests and knowledge of local residents.

Here we present a possible design of such a research project including inter- and transdisciplinary methods and perspectives. Therefore, we raise the following questions: How could we combine approaches of environmental physics and development sociology (interdisciplinary perspective)? How could we integrate local stakeholders and their needs into research processes (transdisciplinary perspective)? Which role does the global concept of Sustainable Development play locally (normatively or on a political level)?

To investigate these questions, a field trip to Lake Kivu is planned for May 2019 including hydrological studies and interviews with local and international hydrologists, technicians, energy companies and officials to gather a most broad perspective on a problem of vast complexity and of most importance to both Rwanda and the Democratic Republic of Congo.

13.30-15.00
room 1.501

SESSION CHAIR
Tobias Krüger

EXPERT FORUMS

13.30-15.00
room 1.501

Robert Nikolaus, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Novel Lake Ecosystems – Biodiversity of Small Lowland Gravel-Pit Lakes and its Relation to Recreational-Fisheries Management

There is general consensus about global declining biodiversity, and freshwater-associated biodiversity is in particular steep decline. Novel ecosystems created through human use of littoral resources (e.g., sand, gravel) can provide substitute habitats of large importance to conservation of freshwater biodiversity. However, we can expect these lakes, which are often managed for and by recreational fisheries, to also exhibit high recreational use intensity, which may negatively impact aquatic biodiversity. Our objective was to evaluate the species inventory and conservation value of a range of water-based aquatic taxa (plants, amphibians, waterfowl, dragonflies, damselflies, song birds) in and at artificially created lake ecosystems managed by recreational fisheries (N=16) and compare the biodiversity inventory present at similar lake ecosystems lacking recreational-fisheries management (N=10). Managed and unmanaged gravel pit lakes were similar in regards to morphological and productivity-related variables, while differing in littoral and riparian habitat structure and recreational use intensity by both anglers and other recreationists. Despite these differences, the average species richness and conservation value of the species detected at both lake types was largely similar. In fact, managed lakes hosted a significantly larger diversity and conservation value of submerged macrophytes, despite the presence of cyprinids. To conclude, the presence of recreational-fisheries management is not per se a constraint to aquatic biodiversity and thus selectively excluding one user group – recreational anglers – from newly created lake ecosystems or in nature conservation area seem unsupported from a conservation perspective that values multiple taxa jointly.

Jörg Lewandowski, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries & Humboldt-Universität zu Berlin

Preconditions of survival: Removal of trace organics from closed urban water cycles

Trace organic compounds (TrOCs) are quite stable and discharged with treated wastewater into urban waters. For example, in urban River Erpe up to 80 % of the total discharge originates from treated wastewater resulting in extraordinarily high TrOC concentrations in river water. Due to partially closed urban water cycles TrOCs might end up in drinking water even though processes such as photolysis, biodegradation, and sorption can decrease concentrations in rivers. We investigated under various conditions the fate of TrOCs in streams and hyporheic zones (HZs) underlying streams. Some of the degradation occurs in the water column but for many TrOCs the HZ is an efficient bioreactor regarding removal and transformation because of its high relative surface area of the sediment matrix, diverse microbial communities and steep physico-chemical gradients. Many TrOCs are preferentially removed under oxic or suboxic conditions, i.e. in the upper part of the HZ. However, the removal of some TrOCs is independent of redox conditions while others show hardly any decrease at all. However, some degradation processes can result in transformation products which might be even more problematic than parent compounds and are often neglected in past/current investigations. In general, the intensity of hyporheic exchange and the water residence time in the oxic part of the HZ govern the fate of TrOCs on a reach scale. Our findings implicate that additional treatment steps in wastewater treatment plants should be combined with river restoration measures promoting intense hyporheic exchange and repeated exposition of water to short subsurface flow paths.

EXPERT FORUMS

13.30-15.00
room 1.501

Suzanne Jacobs, Justus-Liebig-Universität Gießen

Water and nutrient dynamics in East African montane headwater catchments

The lack of research on water-related ecosystem services from African tropical montane ecosystems limits our ability to determine the consequences of land use change for water quality and supply, while this is crucial information for sustainable water management. We used a combination of methods (high-resolution monitoring, snapshot sampling, citizen science) to assess the effect of land use on water and nutrient fluxes in the Mau Forest Complex, Kenya.
High-resolution monitoring of catchments (27-36 km²) with contrasting land use (tropical montane forest, smallholder agriculture and commercial tea plantations) using automatic measurement systems showed that nitrate export was generally low. However, higher nitrate concentrations in the agricultural sub-catchments revealed a negative impact of agriculture on water quality, mainly through leaching of fertilizers to the groundwater. Individual snapshot sampling campaigns provided insight into the drivers of spatial variability in dissolved nitrogen and organic carbon concentrations. A tracer-based analysis identified groundwater as major source of streamflow.
Because such sophisticated and costly approaches are not always a feasible option to increase our understanding of hydrological and biogeochemical processes, especially when limited resources are available, we tested a citizen science water monitoring programme in which community members were trained to read water level gauges. The results show that citizens can provide a very good insight into water level dynamics, while community involvement improves environmental awareness and empowers community members to take part in local decision-making. These findings can be taken into account when developing monitoring programmes, interventions and policies for sustainable resource management.

SESSION 1A - PUBLICS AND ETHICS OF SUSTAINABILITY (PART 4A): Having a closer look...

Björn Koch, Carl von Ossietzky Universität Oldenburg

Neglected Ethics and its effect on tilted pillars of sustainability

The necessity and desire to include ethical aspects into sustainability has led to an increased amount of adaptions and adjustments to sustainability related theories within recent years. These theories cover all aspects and areas of sustainability and the majority of them try to paste ethical aspects to an existing theory. Most of these theories struggle to succeed in this intention for many reasons, mainly because ethical aspects are calculated and put into nameable, measureable and comparable values which will have to stand against and compete with values from economic systems. This way ethical aspects are reduced to their direct and measureable effects and benefits to the economic system which results in a massive tilt between the weights of the ethical and the economical values and their relationship. Based on this tilt and the fast growing amount of theories the question raises if these are the first signs that we have entered the third phase of the process of scientific change – the crisis period – introduced by Thomas S. Kuhn's „The Structure of Scientific Revolutions". This research tries to transform and adapt Kuhn's theory from the fields of philosophy of science to the field of the philosophy of sustainability and its underlying fields of economy, society and environment and their interactions with a special focus on the influence of ethics on the balance between these pillars.

15.30-16.30
room 1.102

SESSION CHAIR
Martin Kowarsch

15.30-16.30
room 1.102

EXPERT FORUMS

Eduardo Erazo Acosta, University Nariño

The power of the ancestral philosophy of Sumak kawsay (Good Living) in the indigenous movements of Colombia-Ecuador vs. exclusion by mega mining development, contributions to the Rights of Mother Nature from the global south.

The purpose of this research is to present the urgency of listening to indigenous epistemologies of Sumak Kawsay (in kichwa language: Buen vivir-Good Living) and also to accompany the care/defense of the biodiversity-rich indigenous territories of the Andean region. As a research question: How is the anthropocene affecting the indigenous territories and with it the threats of the epistemologies of the Sumak Kawsay/Good Living?
This ethnographic research has been carried in the last 7 years, in Republics of Colombia and Ecuador, in Indigenous Regional Council of Cauca CRIC, and The Indigenous Confederation of Ecuador CONAIE. Theoretical references: epistemology of indigenous communities, indigenous intellectuals. Due to its high impact in high mountain areas, climate change affects the melting of glaciers, strong droughts, seasonal changes for food production, water shortages and with this the displacement of animals and indigenous people and with it affects their traditions and cosmovisions due to geographical relocation and spatial-socio-cultural changes.
Ethnographic work is used: interviews, participant observation, and documentary analysis. Key to comment how from the epistemologies, their spirituality's, indigenous cosmovision, the elders (grandparents and grandmothers).
Results: This is considered from the Decolonial theory as an alternative to development or alternative development, based on the epistemological basis of the indigenous movement, the basis of current governments/states. Without a doubt the Sumak Kawsay is difficult to implement or live in praxis in the midst of individualistic societies with accelerated urban growth or in societies structured in fossil fuels.

Christian Kimmich, Masaryk University Brno

Can network analyses of action situations help to scope leverage points for polycentric transformation? A review

The action situation is a powerful unit of analysis in many social science research traditions. Situation concepts provide a general frame to select suitable theories and methods for analysis. Recent work has identified the explanatory power of linked situations in explaining outcomes of a focal situation and suggests to expand the analysis to situation networks.
This contribution addresses the question of whether and how the analysis of action situation networks provides actionable knowledge by identifying transformative agency and leverage points. I answer this question by reviewing case studies that have analysed action situation networks and the corresponding conclusions that can be derived from these analyses. This review considers not only analyses of cases which are explicitly framed as Networks of Action Situations (NAS), predominantly building on the IAD and IoS framework, but also work on the Ecology of Games (EoG) concept and the Management and Transition Framework (MTF), and also relates to Actor-Network Theory (ANT), as well as pertinent theories, such as game theory, related games on graphs, and practice theory. Accordingly, analyses of resource governance, including common-pool resources and the water–energy–food nexus, analyses of global value chains and telecoupling, bioenergy governance, energy infrastructure provision, and international development cooperation, have uncovered the multiple action situations that make up social-ecological systems of food, energy and resource provisioning. The study of situation networks generates diverse, case-specific, and frequently polycentric leverage constellations within and between situations, diagnosed through a generalized framework.

15.30-16.30
room 1.102

15.30-16.30
room 1.103

SESSION CHAIR
Anna Henkel

EXPERT FORUMS

SESSION 1B - PUBLICS AND ETHICS OF SUSTAINABILITY (PART 4A): Democratic transformations in the Anthropocene

Susanne Stoll-Kleemann, University of Greifswald

From Increasing Knowledge to "Real" Behavior Change: Evaluating Ways towards More Effective Ocean Literacy

Effective ocean literacy requires behavior change but achieving this is extremely difficult. Social-psychological research shows that even generating knowledge and awareness towards the (ocean) evnironment very rarely produces behavior change. The correlation between knowledge and behavior is demonstrably surpringly low.

Based upon a systematic interdisciplinary literature review, this article evaluates the factors constituting behavior that are important for ocean literacy. Furthermore, it includes an analysis of options for individual behavior change. Specifically, models of pro-environmental behavior are evaluated and transferred to the specific case of ocean-related behaviors and ocean literacy.

The results show that the theoretical analysis of different influence factors of ocean related behavior can help to identify options to enhance ocean literacy, partially not yet broadly applied in this field, such as social/conservation marketing and successfully diffusing social change which is illustrated within two examples of success stories.

Nevertheless, it remains problematic due to barriers identified on the individual level (e.g. cognitive dissonance and moral disengagement) and adverse political and economic power relations in the light of rapidly increasing environmental problems in our oceans.

Sarah Hiller, Freie Universität Berlin & Potsdam Institute for Climate Impact Research (PIK)

Towards a Formalisation of „Moral Responsibility“

Collective action regarding the United Nations sustainable development goals is clearly an ethical issue. Correspondingly, we often find ourselves confronted with the idea that agents in this respect have the responsibility to do the right thing and they are responsible for past actions leading to an undesirable status quo.
The term „responsibility“ however, is not clearly defined in common conversation. The meanings can range from „being a responsible person“ over „causing“ to „being held accountable“. Additionally, with sustainability transformation being a joint effort, a quantifiable measure of responsibility is desirable for distributing assignments in coordinated actions. Both of these issues can be addressed through a formal representation of responsibility. We will present work in progress of providing just this, focusing on moral responsibility regarding a certain action in settings with multiple agents and decisions taken under uncertainty.
We will initially present an introduction into the frameworks we have identified as valuable in this respect: game theory and extensions of modal logic, where agents' action spheres are represented using individualised accessibility relations. Both of these frameworks have a proven capacity in modelling agents' (inter)actions and their consequences in a non-deterministic universe. Subsequently we will spell out initial formalisations of responsibility concepts in these frameworks and investigate their potential by translating and evaluating well-known paradigmatic examples.

EXPERT FORUMS

15.30-16.30
room 1.103

Manuel Arias-Maldonado, University of Malaga

Humanity as a political subject in the Anthropocene: from planetary subjectivity to global sovereignty.

In the Anthropocene, the unprecedented disruption of planetary systems seems to demand from human beings an equally unprecented effort just to keep the Earth habitable. Is humanity up to the task? Does even «humanity», as a functioning political category ,exist? If not, can it be brought into existence? This paper will explore this question. It will begin by pointing out the need for a massive and concerted effort on the part of living generations of humans. Hints of this global sovereign can be found in climate agreemens and other forms of governance, but the rise of climate populism -as witnessed in the yellow vests movement in France- suggests that an unified action against planetary deterioration is still far from sight. The question, then, is how to create such a global political subject. Which form should this demogenesis adopt to be effective? The last section of the paper reflects upon how planetary subjectivities can be fostered, as the first part of an enlightening effort that should prepare the terrain for a coordinated human agency. As it happens, the goal of making the Anthropocene sustainable can be the unifying motif that increasingly fragmented and pluralistic human societies have been lacking for sometime now.

SESSION 2A - DEMOCRACY, GOVERNANCE, AND SOCIETAL CONFLICTS IN A GLOBALIZED WORLD (PART 4A): Decision Making for Sustainability Outcomes

Raimund Schwendner, ISTOB Management Academy

Sustainable Management Strategies for Corporate Change and Future Capacity Building

Private and public sector organizations are increasingly called upon to include sustainability outcomes in their organizational goals and objectives. Yet to move beyond lip service and to advance real sustainability outcomes requires more than new goals. It requires new strategies and organizational cultures. This presentation draws on extensive work with private and public sector clients to identify successful strategies that have resulted in sustainability outcomes and the organizational culture changes that support them. The presentation will identify both opportunities and limits to programs like Sustainable Strategies for Corporate Change, Future Capacity Building, and Sustainable Industry 4.0, and argues that new management strategies are needed as well to successfully implement these programs. These strategies include high value management approaches that focus on decision making under uncertainty and organizational learning. A successful decision framework and organizational learning model will be introduced and analyzed in terms of practical applicability and strategic value.

15.30-16.30
room 1.205

SESSION CHAIR
Sabine O'Hara

15.30-16.30
room 1.205

EXPERT FORUMS

Gregor Diem, Human Resources, Allianz Group

Incorporating Sustainability Outcomes in Corporate Decision Making and Practice

The Allianz Group is a multinational organization that has become a model for incorporating sustainability outcomes into every level of organizational decision making and practice. Key to this organizational transformation of a large private sector corporation was the implementation of core strategies and outcomes expectations at the Human Resources level of the Allianz Group. This entailed a commitment to becoming a learning organization that invests in the improved ability of its workforce to assess complex outcomes and long-term decisions. This investment in improved assessment and decision-making must be incorporated at every level of the organization and includes the implementation of new communication strategies that invite engagement at every organizational level. This presentation will in particular review modern hybrid project management and its impact on successful education and communication strategies that the Allianz Group has implemented. This cross-methodological approach supports the worldwide leadership role that the Allianz Group holds among insurance companies in sustainable decision-making.

Matthias Sinn, Environment Manager City of Munich and Esse

Addressing the Outcomes of Unsustainable Decision Making: the Experience of the Ruhrgebiet

15.30-16.30
room 1.205

Cities around the world are faced with the outcomes of unsustainable decision-making that has resulted in deteriorated natural and built environmental resources. This environmental decline is often paired with significant social decline as human skills and their aggregate in entire economic sectors have become obsolete. The Ruhrgebiet in the Western Part of Germany was one such region that was hard hit by the outcomes of unsustainable practices. Essen serves as a remarkable example of transformation. In 2017 it was nominated as a European Green City. Large land areas and buildings that were once hard hit by environmental deterioration have been restored and returned to productive and sustainable land use. The projects that have led to this remarkable transformation have also resulted in a transformation of skills and human and organizational resources. This presentation will identify key projects and sustainability strategies within and across the municipality of Essen that have led to the remarkable success in achieving sustainability outcomes that now serve as best practices model for municipalities.

EXPERT FORUMS

15.30-16.30
room 1.205

Sabine O'Hara, Dean of CAUSES, UDC

Internal and External Communication Networks: the UDC Urban Food Hubs Experience

The Urban Food Hubs model of the University of the District of Columbia seeks to advance food security and green infrastructure practices in underserved urban communities. Based in Washington DC where income inequality and disparities in health outcomes are staggering, the model centers around four components of the local food system to address these disparities: (1) Food production, (2) food preparation, (3) food distribution, and (4) waste and water management. The multipronged objectives of these four components is to develop a decentralized small-scale sustainable food system that increases food security, creates jobs, improves public health, expand green infrastructure installations, and reintroduces ecosystems services into the urban scape. The urban food hubs therefore exemplify a systematic approach to improved social and environmental sustainability outcomes. The presentation will discuss barriers and opportunities for implementing complex sustainability outcomes at the community level, and the role that public universities can play in moving beyond conceptualization to implementation.

SESSION 2B - DEMOCRACY, GOVERNANCE, AND SOCIETAL CONFLICTS IN A GLOBALIZED WORLD (PART 4A): Governance Theory

Inaiê Takaes Santos, Institute for Advanced Sustainability Studies Potsdam (IASS Potsdam)

Closing the resource nexus governance gaps through reflexivity

The resource nexus concept became prominent not only among private sector actors but also members of academic, public and multilateral organizations. While nexus' integrative appeal is stronger than its predecessors, such as Integrative Water Resources Management (IWRM) and Energy Systems Integration (ESI), there are barriers for integrating sectoral policies in established governance structures. Water, for instance, is often overlooked in energy planning because it falls outside the institutional competencies of energy decision-makers and they involve quite different planning scales. The same goes for land issues, like disputes involving dam construction in indigenous territories, revealing an evident power imbalance. Substantial work has advanced the Water-Energy-Food nexus understanding through quantification of interdependencies, and understanding the nexus certainly contributes to informing energy planning, water resources, and land management, but analyses must account for the interplay of these linkages with social, economic and political aspects. They will only be helpful if their scope is not limited to the resource interdependency and technology solutions that have so far dominated the nexus discussions. Reflexivity can be defined as the ability of a structure, process, or set of ideas to reconfigure itself in response to its performance. This paper explores the role of reflexivity for addressing resource nexus governance gaps and, consequently, providing insights for the implementation of Sustainable Development Goals (SDGs).

15.30-16.30
room 1.204

SESSION CHAIR
Klaus Eisenack

EXPERT FORUMS

15.30-16.30
room 1.204

Thomas Hahn, Stockholm University

Transformation of the global value system framed by human rights and planetary boundaries

The UN Declaration of human rights was adopted by the UN General Assembly on 10 December 1948 based on the experiences of the second world war. The Declaration is based on a "natural law of revolutionary character" (Kunz, 1949) that manifested a sharp global ideological transformation. Obviously, the war provided a policy window for this.

In this paper we describe this post-war ideological transformation and analyse the processes and agents of this change. We analyse to what extent subsequent large-scale social reforms, like the rise of the Western modern welfare states in the 1960s and the neoliberal change in the 1980s have adhered to human rights ideologies but also carried the seeds for the recent backlash. Human rights are seen as the fundamental leverage point (Meadows 1999) and the cultural beliefs as the underlying indirect drivers in this analysis (IPBES 2018). The paper discusses to what extent human rights can provide an overarching ideology for sustainability transformations. A tentative conclusion is that the SDGs and other sustainability initiatives like Sustainable inclusive growth (EU) the Green New Deal (USA) will fail unless they abandon the GDP growth obsession and formulate a new vision within the planetary boundaries.

References:
IPBES, 2018. Summary for policymakers of the ECA report. https://www.ipbes.net/assessment-reports/eca
Kunz, J. 1949. The United Nations Declaration of Human Rights. The American Journal of International Law 43 (2): 316-323. https://doi.org/10.2307/2193039
Meadows, D. 1999. Leverage points: Places to intervene is a system. Sustainability Institute.

Diana Nenz, University of Cambridge; Jan Hendrik Trapp, Deutsches Institut für Urbanistik;
Jens Libbe, Deutsches Institut für Urbanistik

The interplay between urban governance and infrastructure development in sustainable urban transformation processes

15.30-16.30
room 1.204

How can the quality of life in cities be shaped by resilient infrastructure development and what are the challenges for a democratic and just transformation therein? How to activate the SDGs for decision-makers in urban development and how to achieve this in a concerted action with all stakeholders together? While monitoring the utilization of SDGs to orientate the development of German municipalities and cities, our research group also looks at pathways for the transformation of cities in view of its urban metabolism and data flows. Bringing both research strands together enables us to link the global, national and local challenges with the opportunities and levers that emerge from a transformation of the different socio-technical infrastructure systems such as water, energy, heat and data. In the contribution of our research group we present a synthesis of insights and research results from our work on different governance levels and experiences in urban laboratories around the questions: What are the building blocks to guide transformation processes? We draw from our engagement with German municipalities around the topic of water, energy and heat transformation. How to create legitimacy and decision-making space for implementation processes? We draw from insights in implementation process in the frame of urban regeneration processes. How to adapt and reinterpret responsibilities in urban governance processes? We synthesize our research results on this. How to integrate the transformative capacity of global and national goals (SDGs, Sustainability indicators)? We synthesize our work developing and piloting the implementation of SDGs in German communities.

15.30-16.30
room 1.401

SESSION CHAIRS
Sabine Fuss
Maja Göpel

EXPERT FORUMS

SESSION 3 - ECONOMIES BEYOND UNLIMITED GROWTH (PART 4): De-growth versus Green Growth (de-growth/green growth/a-growth/...), block 2

Elke Pirgmaier, University of Leeds; William Lamb, Mercator Research Institute on Global Commons and Climate Change (MCC)

Fossil capital is a monster, and it needs to go

Conventional green growth/degrowth discourses tend to conflate symptoms with causes. Economic growth and greenhouse gas emissions are no more than the by-products of a system that is rarely discussed and poorly understood: globalised fossil capitalism. In this paper we apply Marxian Political Economy, and its foundations in theories of value and capital, to understand the core dynamics driving ecological and social trends in the 21st century. We introduce the general circuit of capital M-C-M' as the Marxian theoretical backbone, revealing profit and competition dynamics inherent to capitalist systems across countries and contexts. These in turn give rise to mechanisms that fuel environmental overuse: overproduction, technological dynamism, commodification, appropriation, overconsumption, acceleration, concentration and alienation. These tendencies form a web of social ecological dynamics that drive capital accumulation and crises formation.
Understanding the core features of capitalism is critical to a realistic programme of ambitious individual and collective actions that can deliver systemic change. Radical changes have to be fought for and we must not be naïve that sensible policies – sensible from a social justice and planetary health perspective – would be implemented easily by 'smart' decision-makers. Large fractions of the public are kept unaware of the challenge ahead, and those in power are compromised by their proximity to fossil capital. To deliver well-being within planetary boundaries, what is needed are not more piecemeal ideas about transformative proposals, but a coherent approach that includes challenging the distribution of power at its core.

Tim Foxon, University of Sussex

Examining the case for a Green New Deal to address economic and sustainability challenges

Recent political attention in the U.S. and other countries on how to reconcile addressing pressing climate and sustainability challenges with meeting social and economic goals has focused on the idea of a Green New Deal (Ocasio-Cortez, 2019). Proponents of this idea argue for the value of taking an integrated approach, in which climate goals are linked to the need to promote social justice and equity. The Green New Deal proposes that large-scale investment programs driven by a goal of rapid decarbonisation are linked to measures that create high-quality jobs, promote public ownership stakes and protect vulnerable communities. This paper examines the case for taking an integrated approach, and the underlying economic-political understandings. This study draws on insights from analysis of past energy and industrial transformations (Foxon, 2017), the need to restructure current physical and social provisioning systems to provide a good life for all within planetary boundaries (O'Neill et al., 2018), the role of public investment in promoting innovation (Mazzucato, 2013) and the need to open up choices about future technological pathways to wider public participation.

References:
Foxon, T J (2017), Energy and Economic Growth: Why we need a new pathway to prosperity, Routledge: Abingdon and New York.
Mazzucato, M. (2013) The Entrepreneurial State: Debunking Public vs. Private Sector Myths. London and New York: Anthem Press.
Ocasio-Cortez, A (2019), House Resolution on Green New Deal https://ocasio-cortez.house.gov/sites/ocasio-cortez.house.gov/files/Resolution%200n%20a%20Green%20New%20Deal.pdf
O'Neill, D, Fanning, A, Lamb, W and Steinberger, J (2018), 'A good life for all within planetary boundaries', Nature Sustainability 1, 88-95.

15.30-16.30
room 1.401

15.30-16.30
room 1.401

EXPERT FORUMS

David Hofmann, Institut für ökologische Wirtschaftsforschung (IÖW)

Navigating through the (de-)growth controversy: the precautionary postgrowth position – a new consensus in the sustainability debate?

The session focuses on the role of economic performance and its future development in wealthy countries such as Germany with respect to compliance with planetary boundaries. There are two particularly prominent and clearly antagonistic positions within the discourse whose political consequences are fully contradictory: green growth and degrowth. Our analyses show that both positions are based on core assumptions that cannot be adequately substantiated scientifically and thus cannot claim to serve as the sole strategy for environmental policy action. We therefore propose a third position and put it up for discussion: precautionary post-growth. From our point of view, this approach has the potential to create a new consensus in the sustainability debate. The session explores the potential for societal orientation and need for knowledge associated with this position. On the basis of an analysis of the various current positions in the growth debate, we present an overview of the causes of economic growth and identify those areas of society whose functioning could be dependent on economic growth. We then discuss the possibility that economic systems can be shaped by various reform proposals in such a way that they would be less dependent on permanent economic growth. Finally, we outline the guiding elements of our precautionary post-growth position with refer to practical fields of action.

SESSION 6 - WATER AND BIOSPHERE: PRECONDITIONS OF SURVIVAL (PART 4): Smaller-scale case studies

Klaus Konrad Ott, University Kiel

Strong Sustainability and SDG 14 "Life Below Water"

Sustainability science rests on ethical principles as well as on basic conceptions. There is tension between the humanitarian conception of the SDG's and the natural-capital based conception of "strong" sustainability. Presentation searches for reconciliation combining a theoretical outlook and a SDG-based paradigm case (SDG 14).

The rule-based conception of strong sustainability comprehends the guidelines of a) consistency, b) resilience, and c) sufficiency. Consistency within natural limits can be specified according to the planetary boundaries approach. Resilience can be specified according to the ecosystem services concept. Sufficiency can be specified according to both physical and economic degrowth strategies.

It has been argued that the environmental goals within the SDG-framework should be grounded in strong sustainability (Neumann et al. 2017). The argument is based on an analysis of SDG 14 showing that SDG 14 implicitly presupposes strong sustainability. According to this line of reasoning, the SDG-metaphor of "healthy ocean" might be, in a Leopoldinian spirit, interpreted in terms of fertility, resilience, and diversity (Böhm & Ott 2019). Recent research strategies in marine science comprehensively address the most pressing challenges of ocean sustainability (Visbeck et al. 2014). Presentation will analyze specific SDG 14 targets under the perspective being outlined. It also provides result from different research projects on a) ocean acidification, b) ocean recovery and restoration, c) ecosystem service analysis at the Baltic Sea, d) adaptation strategies at small island states.

15.30-16.30
room 1.501

SESSION CHAIR
Dieter Gerten

EXPERT FORUMS

15.30-16.30
room 1.501

Sonja Jähnig, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Freshwater biodiversity research from local to global scales

Global pressures on freshwater ecosystems are high and constantly rising. Viewed primarily as a resource for humans, current land use and water management practice have led to catastrophic declines in freshwater species and the degradation of freshwater ecosystems, including their genetic and functional diversity. An improved understanding of all facets of freshwater biodiversity is required to better inform decision making and for establishing the socio□economic context for sustainable water management. We introduce examples of ongoing and future research avenues aimed at developing tools and frameworks for better management, closing knowledge gaps about the distribution and status of freshwater biodiversity, and identifying the necessary data and knowledge needed to balance human needs with sustaining freshwater biodiversity. We will also discuss the relevance and importance of global initiatives like the Alliance for Freshwater Life (AFL), an emerging global initiative that seeks to unite specialists in research, data synthesis, conservation, education and outreach, and policymaking.

Martin Pusch, Simone Podschun, IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries

Identifying multifunctional and sustainable land use scenarios with an ecosystem service index

15.30-16.30
room 1.501

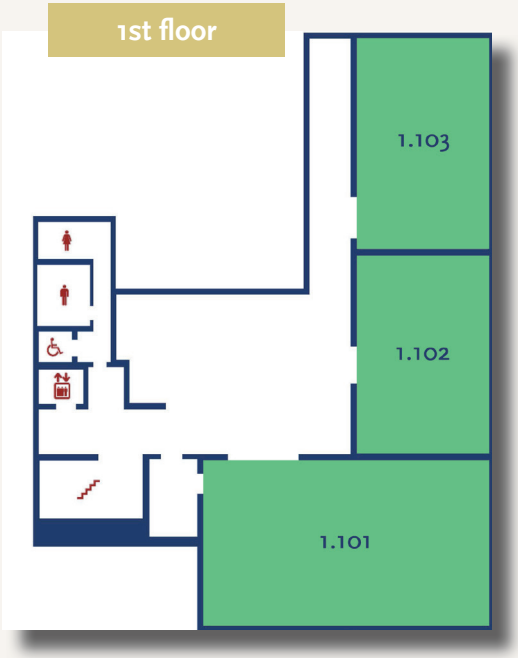
Most environmental problems are linked with certain land uses. Hence, how can sustainable development goals or the objectives of environmental legislation be translated into local decision-making, and thus local stakeholders be persuaded to support sustainable ways of land use? We studied that question in river valleys, which commonly represent most densely populated elements of landscapes. There, a multitude of human socio-economic interests compete for a very limited fraction of land surface, but which offers a very broad range of ecosystem services and natural capital, as high food production, fisheries opportunities, drinking water resources, hydropower, easy transport through navigation, recreational opportunities, and others. In Germany, the management of these sectoral interests is largely regulated by respective laws. However, ministries and agencies complain a backlog in investment and implementation due to many conflicts among their sectoral goals, e.g. among agriculture, urbanization, water quality protection, flood protection, nature conservation and recreation. As space is very limited in river valleys, land use obviously has to be prioritized. For that, we suggest to use non-monetized ecosystem services as a platform to collect data, visualize human benefits, facilitate stakeholder involvement and support transparent decision-making. Thereby, ecosystem services are identified using a modified CICES categorization scheme, and then quantified using a 1-5 scoring system. The highest score (5) is reached if the respective ecosystem service is available to the highest extent that can be expected in the respective regional setting, or if the respective legal objectives are fully reached. The effects of political decisions on the availability of ecosystem services can be first visualized based on the individual ecosystem services. This allows demonstrating synergies or negative trade among several human uses of ecosystem services, or effects from land or water management measures on ecosystem services. Furthermore, ecosystem services may be summarized to an integrative index. For the use for rivers and in river floodplains, we developed the 'River Ecosystem Service Index' (RESI) (www.resi-project.info), which may be used to compare complex river and floddplain management scenarios. The RESI has been already been implemented in practice in the framework of an official regional planning prioritization procedure (Raumordnungsverfahren) for a 80-km section of the Danube River in Bavaria (Germany), where projects on flood retention and nature conservation compete with agricultural and forestry interests. The RESI hence may is recommended as a transparent inter-sectoral visualization and decision support tool for inter- and transdisciplinary communication. Thus, this new cross-sectoral approach for the management of riverine landscapes enables the identification of optimized multifunctional and sustainable management options for river and floodplain sections with minimized trade-offs among available ecosystem services. The transparency of the bases and consequences of decision-making enabled by RESI supports the involvement of citizens and NGOs in planning decisions about land use. Hence, the use of RESI may be used for a more effective and equitable implementation of sustainable development goals across societal sectors.

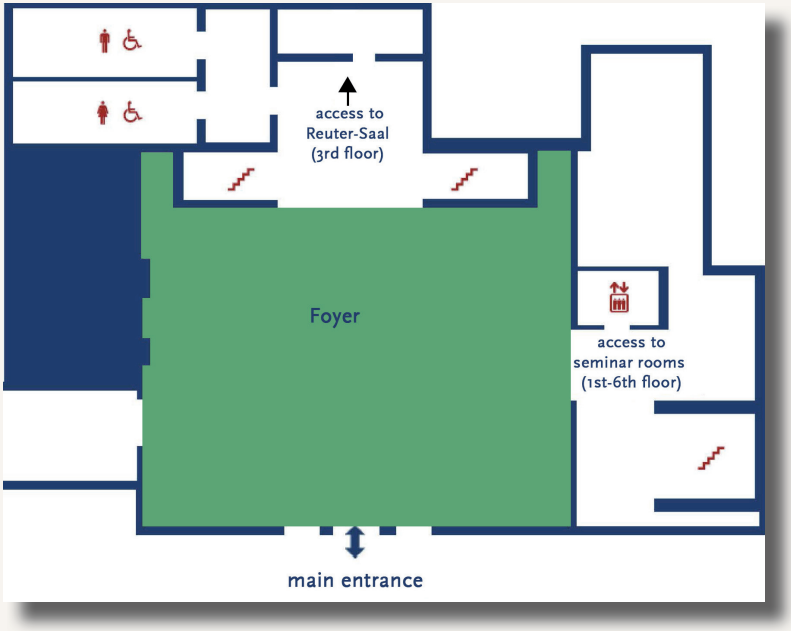
NOTES

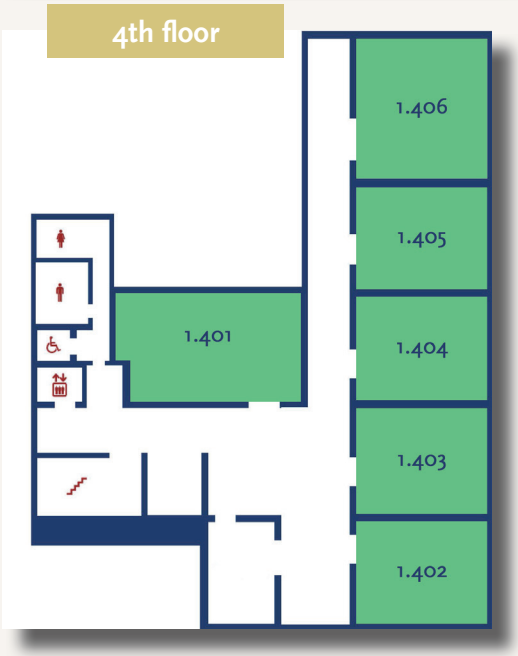
NOTES

FOR YOUR ORIENTATION

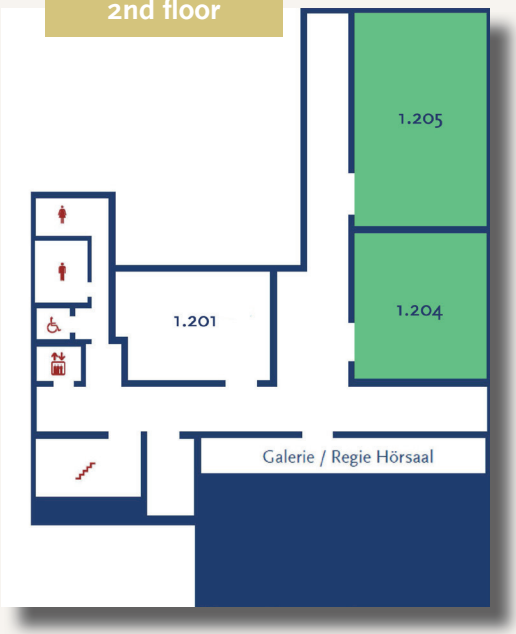
HU BERLIN
Dorotheenstr. 24
10117 Berlin



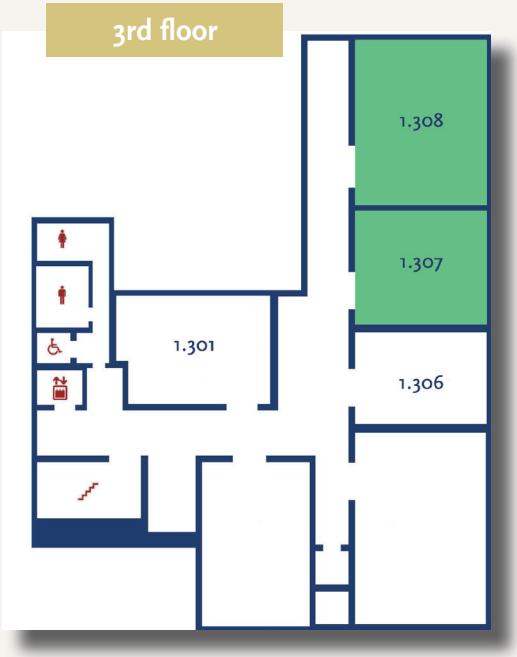




2nd floor



3rd floor



5th floor

6th floor

FOR YOUR ORIENTATION

CONFERENCE VENUE

Address: Dorotheenstraße 24, 10117 Berlin
Public service: S-/U-Bahn Friedrichstraße

CONTACT

Web: www.kosmos.hu-berlin.de
Email: kosmos.conference@hu-berlin.de

NOTE ON FILM AND PHOTO RECORDINGS

Parts of this event will be filmed and photographed. With your participation you agree that the image, sound and film recordings made by you might be used for publication in printed form and online.

IMPRINT

Editors
IRI THESys & Geography Dept.
Humboldt-Universität zu Berlin
Unter den Linden 6
10099 Berlin

Layout
Anne Dombrowski
Nina Dwerlkotte

Photo credits
Alexander von Humbolt's self portrait: Universitätsbibliothek, HU Berlin
Portraits S. Kunst, C. Schneider, J. Niewöhner: Matthias Heyde
Satellite image of Berlin (colour-changed): NASA Landsat
Rooms Doro 24: Humboldt-Innovation
Site map: CMS, HU Berlin
SDG colour wheel: United Nations
Alexander von Humboldt's signature: https://de.wikipedia.org/wiki/Datei:SignaturAlexanderVonHumboldt.svg

Print
HU Druckerei
Dorotheenstr. 16
10117 Berlin