UNPACKING THE POLITICAL IN SUSTAINABILITY TRANSFORMATIONS

SCOPING A RESEARCH AGENDA FOR INTERDISCIPLINARY SOCIAL SCIENCE

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Workshop Report

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Content

Introduction

This report offers a thematic discussion of the main issues covered throughout the course of the international workshop on "Unpacking the Political in Sustainability Transformations" convened by the social sciences division of the Helmholtz Centre for Environmental Research (UFZ) in November 2016, in addition to presenting areas and questions for further research.

The workshop, and the broader current research agenda at UFZ of which it forms part, responds to the need for research into the political dimensions of current debates about sustainability transformations in an era when those dimensions risk being subsumed by an incessant focus on technical-economic dimensions and (quick) solutions. In 2011, the *German Advisory Council on Global Change* (WBGU) published its flagship report *World in Transition* and initiated an important and diverse debate about transformations towards sustainability (WBGU 2011).[1] Around the same time, various reports by international organizations and panels, such as the UN, OECD, WBCSD and IPCC, also used the term and called for fundamental changes in natural and human systems.[2] Natural and social scientific debate on the topic heated up,[3] and international research programmes and related topics have emerged.[4] As a result, 'transformation' has become an umbrella term such as 'sustainable development' in the 1990s: It puts ecological problems into their larger political, social, and economic context and brings together different research traditions and policy practices.[5]

The main aims of the workshop were thus to bring together researchers and policy makers in order to stimulate discussion and debate around the topic, to create a space for critical reflection upon different actors and approaches within transformation research, and to explore a research agenda for interdisciplinary social science research.

To this end, the key questions addressed over the course of the workshop included:

- **To what end?** What are the rational guiding calls for transformation? To what end? What role(s) have particular agents such as state actors, experts, business, cities, bottom-up social movements and individuals to perform in accelerating transformations to a sustainable world?
- **How?** If taken seriously, what are the challenges, implications and impacts of putting in practice transformative modes of action? What are particular challenges (such as coping with complexity, uncertainties/ignorance and political conflicts)?

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1 WBGU (German Advisory Council on Global Change) (2011). World in Transition – A Social Contract for Sustainability, Flagship Report. WBGU, Berlin.

2 See, e.g., UN (2012). From Transition to Transformation: Sustainable and Inclusive Development in Europe and Central Asia, New York and Geneva; UN DESA (United Nations Department of Economic and Social Affairs) (2011). World Economic and Social Survey 2011 – The Great Green Technological Transformation. UN DESA, New York; OECD (Organisation for Economic Co-operation and Development) (2012). Green Growth and Environmental Governance in Eastern Europe, Caucasus, and Central Asia, OECD Green Growth Papers 2012-02. OECD Publishing, Paris; WBCSD (World Business Council on Sustainable Development) (2010). Vision 2050. A new agenda for business. WBCSD, Geneva.

3 For a good overview, see O'Brien, K. (2012). Global environmental change (2): From adaptation to deliberate transformation. Progress in Human Geography 36(5), 667-676.

4 Hackmann, H., St. Clair, A. L. (2012). Transformative Cornerstones of Social Science Research for Global Change. Report of the International Social Science Council. ISSC, Paris; JPI Climate (2011). Strategic Research Agenda for the Joint Programming Initiative "Connecting Climate Knowledge for Europe". JPI Climate; Mauser, W., Klepper, G., Rice, M., Schmalzbauer, B. S., Hackmann, H., Leemans, R., Moore, H. (2013). Transdisciplinary global change research: the co-creation of knowledge for sustainability. Current Opinion in Environmental Sustainability 5, 420-431.

5 O'Brien 2012: 670 (*op. cit.*); Brand, U. (2016). "Transformation" as a New Critical Orthodoxy: The Strategic Use of the Term "Transformation" Does Not Prevent Multiple Crises. GAIA – Ecological Perspectives for Science and Society 25, 23-27.

- **Impacts?** It is often assumed that novel actors and modes of governance will almost automatically bring about transformative practices. How, if at all, can their transformative promise be secured?
- **So what?** What lessons can we learn from these discussions and case studies in different fields?

On **day one** of the workshop, participants discussed these questions in working groups that focussed on six specific actors within and approaches towards sustainability transformations: the state (I), science (II), business (III), urban real-life laboratories (IV), bottom-up initiatives (V) and individuals (VI). The groups discussed challenges raised by transformations to sustainability and explored the goals, options and problems that particular groups of actors or actor-based approaches have to respond to these challenges. The participants also moved beyond their internal view to identify how actions of different actors and approaches are interlinked and how they influence each other.

The challenge of **day two** was to look across particular groups of actors, contexts and places and change perspectives, which is necessary to address the particular challenges of complex and multi-dimensional transformations. They cannot be managed by single group of actors (such as the state or business actors only) and there is neither a 'one size fit all' solution nor a silver bullet instrument. The potentials for transformation lay in building novel alliances and coalitions between diverse actors – state and non-state. Thus, a cross-cutting and integrative perspective is important to identify trade-offs and unintended effects between different interventions and choices taken by different group of actors and to explores potential synergies. With the aim to deduct and discuss new, cross-cutting research topics and questions that may emerge from the interplay of different actors, three working groups ("alliances") were formed that were composed of a combination of two working groups from day 1: state & bottom-up initiatives; science & urban real-life laboratories; business & individuals.

Day 1

Setting the Scene: Keynote Speech

Sustainable Transformations – State of the Art, Controversies and Open Questions

Ulrich Brand
Professor for International Politics, Deputy Director, Institute of Political Science, University of Vienna

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Sustainable Transformations
State of the Art, Controversies, Open Questions
Ulrich Brand
UFZ – Leipzig – 10 November 2016

- Transformation as a "hot debate":
  - tension between radical diagnoses and incremental proposals
- Controversies
  - State, politics and governance
  - Actors and structures
- Open questions

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Transformation as a "hot debate"

- many reports, articles, conferences
- focus on social-ecological crisis, energy, resources, climate change
- rarely, indirectly: links to economic and financial crisis

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Consensus

- transformation as fundamental change that challenges values and routine practices and with that decisions and pathways
- multi-scalar
- normatively: change system for better; trafo towards sustainability
- however, trafo vaguely defined

Focus mainly

– Energy basis; away from fossil fuels
– Resource basis in general: using less, more efficient
– *greening* of markets / investment, jobs, consumers ... win-win
– Much trust in change of values towards sustainability
– "it´s politics, stupid" ... state / global governance should regulate

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"… the discussion around transformative change is still emerging and it is not clear as to what transformation means, how it can be evaluated, and how the conceptions of transformation fit within the current understanding of dealing with policy problems in practice."

Nalau/Handmer; *When in transformation a viable policy alternative? In Environmental Science and Policy 54 (2015), 349*

Far-reaching diagnosis and aims –
concrete steps not radical, trust in institutions
Political-strategic overload

➔ *"new critical orthodoxy" (in: GAIA, March 2016)*

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2nd part: controversies

State / politics ... one mechanism of steering / shaping

Actors and structures: what is to be transformed?

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Understanding of state in transformation debate

mentioned article of Nalau/Handmer

"Transformation has recently emerged as a suggested approach to manage change in societies given the increasing complexity of policy problems. ... well-planned and facilitated transformation calls for a careful consideration of what exactly needs to be changed and how." (p.355)

- I agree: "careful consideration of what exactly needs to be changed and how"
- *but focus on policies to me not core of trafo debate – however, exemplary approach to policy and politics*
- *should be reflected during workshop*

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- Complex policy problems (type III; climate change, heat waves or disaster risks), not routine, nor non-routine → require transformation

→ search for sufficient management approaches

→ change / trafo of structures by introducing "new regulatory frameworks" … but works only when actors change values and practices

- Politics = public policy /// Politics – "power structures" remain vague

controversy within debate

a) knowledge that policies / politics hardly work

b) policies matter but no conceptualisation of polity and – vaguely – of politics

- Does this have to do with implicit focus on "education of princes"? (*Fürstenerziehung*)
  - Participation is often claimed, but not real trust in it (max: decisions more legitimate)
  - Top-down and trust in existing institutions → politics is largely state politics
  - Not questioning of power relations but working with them: Realpolitik

Effect: trafo remains in corridor of eco-modernisation → might lead to Green Capitalism

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contribution of critical state and governance studies (my own work)

• state as a social relation: not autonomous actor or problem solver, nor instrument of one percent / the rich / business;

And: analysis should not be reduced to state policies, e.g. economic policies

paradox

• state / governance structures part of stabilising of contradictory societal relations (esp. general conditions of production); to give societal relationships of forces and orientations certain durability

• at the same time, strategic terrain of contest; societal actors act often towards the state … state is institution to formulate binding decisions

→ *empirical research but against background of paradox / concept of state*

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2nd controversy: *what needs to be changed?*

Focus of workshop seems adequate: actors

state actors, experts, business, cities, movements, individuals

a) other dimensions: niches, everyday practices, discourses / narratives/ stories, good examples, technologies etc. – also: not just there (e.g. technologies are artefacts and also social relations)

b) but what are particular conditions of action for actors (structures, social reations)?

e.g. state (as social relation)… above

e.g. experts … structure of scientific knowledge production

proposal for workshop: different actors should discuss this: what is their perception of problems, their space of action within structures *(power relations, dominant logics etc.)*

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3rd part: open questions

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Opener for workshop – some questions

We do not know how transformations work, how do they look like? … what we know is that we need structural changes in order to cope with ecological / multiple crisis

Evaluation: how do we know when trafo is real? How can certain achievements be stabilised? → *empirical research about existing practices*

Neglected issues *(many!)*: work and the role of trade unions

Relationship between incremental change & structural trafo

Cooperation is important, but in many cases also conflicts (brown industry, automobile industry, free-traders etc.)

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very final questions

To consider other transformative dynamics (like austerity politics, fossilist development paths, new president of U.S. etc.) …

often ignored but highly relevant context of any approach to sustainability, part of an analytical look at transformation

- helps to identify the obstacles of far-reaching transformation

Do we need a broadly shared definition of sustainability transformation(s) or is it mainly a research approach (with normative implications)

What kind of research (systems, methods, practices, incentives and funding) is required for trafo research?

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Thank you for your attention !

some further reading:

interesting response in GAIA (June 2016) from Uwe Schneidewind and colleague
… this is "new critical orthodoxy" at work

- Brand, Ulrich (2016): How to get out of the multiple crisis? Towards a critical theory of social-ecological transformation. In: Environmental Values 25(5), 503-525
- Brand, Ulrich/Wissen, Markus (2017): Social-Ecological Transformation. In: Noel Castree et al. (eds.): International Encyclopedia of Geography. People, the Earth, Environment, and Technology. Hoboken: Wiley-Blackwell/Association of American Geographers.

Working Group I: The State

What role(s) for the state in sustainability transformations?

Sabine Weiland

Background

In times of multiple crises (environmental, climate, financial, migration etc.) the state is challenged to respond to problems of great complexity and magnitude. Critics doubt that the state has the capacity to address such a daunting task. These doubts are not only being nourished by various implementation and legitimation deficits regarding various sustainability issues – they also emerge because the state is deeply entrenched in an economic and societal system that has caused the various crises in the first place.

The lack of faith in the state's ability to contribute to sustainability transformations has fostered the search for other promoters of change, as witnessed by the expanding scholarship on non-state actors, transnational governance arrangements, and other forms of governance 'beyond the state' to achieve sustainability goals.[6] However, this literature is often rather silent of the role of the state in these arrangements, or implicitly assumes a functioning state as a context condition for new governance forms. The question remains open what the role of the state actually is, or should be, in these arrangements. In contrast, the research with a more positive account of the state's role in promoting change (e.g. on the evolution of environmental policy since the 1960s as a distinct field of state action) sets an explicit focus on the state and its contribution to change.[7] In other areas, such as climate governance, we can discern a renewed interest in the role of the state as it appears that only the state might possess the kind of power and authority needed to orchestrate collective responses to current problems of unsustainability.

Against this background, the session aimed to reinstate the state as a facilitator and promoter of sustainability transformations.[8] A pioneering work in this field was Robyn Eckersley's 'The Green State'[9] which has argued in favour of a green democratic state as an alternative to the classical liberal democratic state, the growth-dependent welfare state, and the neoliberal market-focused state – and made the vision of a 'good' green state explicit. In the same vein, the German Advisory Council for Global Change (WBGU)[10] develops the vision of a 'proactive state', which is a state that actively sets priorities for the transformation, while at the same time increasing the number of ways in which its citizens can participate in sustainability transformations. In this spirit, the thrust of the workshop session was to identify and discuss the features of a 'good' sustainability state and its role in a broader societal transformation towards sustainability.

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[6] E.g. Bäckstrand, K. et al. (2010). Environmental Politics and Deliberative Democracy: Examining the Promise of New Modes of Governance. Cheltenham; Bulkeley, H. et al. (2014). Transnational Climate Governance. New York; Biermann, F., Pattberg, P. (2012). Global Environmental Governance Reconsidered. Cambridge, MA; Andronova, L. et al. (2009). Transnational climate governance. Global Environmental Politics 9(2), 52-73.

[7] Meadowcroft, J. (2012). Greening the state. In: Steinberg, P., VanDeever, S. (eds.): Comparative Environmental Politics: Theory, Practice and Prospects. Cambridge, MA, 63-87.

[8] Bäckstrand, K., Kronsell, A. (eds.) (2015). Rethinking the Green State. Environmental Governance towards Climate and Sustainability Transitions. London/New York.

[9] Eckersley, R. (2004). The Green State. Rethinking Democracy and Sovereignty. Cambridge, MA.

[10] WBGU (2011). World in Transition: A Social Contract for Sustainability (Flagship Report). Berlin.

To what end? – Why 'bring the state back in'?

Ideas about 'state steering' went out of fashion in the late 1970s, but are now coming back in transformation debates. Arguably, the state is uniquely placed in the transformation towards a more sustainable society, and holds unique power and resources, such as the monopoly on the legitimate use of force and the legal right of sovereignty. Moreover, the state's task is indeed to care about the common good and the public interest in society, and it can rely on an extended state authority to regulate and supply a broader range of welfare services. Therefore, the state can be seen as the key actor in sustainability transformations.

Its role can of course not be limited to a traditional or paternalistic state with top-down, pre-planned and hierarchical steering. We also cannot rely on a 'state fix' for sustainability problems.[11] The challenges of sustainable development relate to the complex character and the uncertainty of the problems to be dealt with. To handle this in an adequate way, the green state should be a reflexive, listening and learning organisation that can use the state repertoire of instruments wisely to promote and facilitate sustainability transformations.

How?

Robyn Eckersley, in her seminal work on the 'Green State'[12] made the vision of a 'good' green state explicit. At the heart of this approach is the state's potential as a focus for democratic transformation and as an agent for pro-environmental change. Eckersley boldly takes up these issues, arguing that the state must play a critical role if there is any chance of moderating ecological destruction. She emphasises three key features of deliberative democracy that are key for green statehood: namely its capacity to encourage 'unconstrained dialogue', its 'inclusiveness', and its role in 'social learning'. If these are followed, this will most likely 'generate a risk-adverse orientation' favourable to environmental protection. Moreover, to the extent that the 'moral horizons' of deliberation are not confined to the citizens and territory of a particular polity (or country), it can be considered a transnational form of democracy. Like this, the green state adopts a normative orientation towards the creation of a sustainable society.

Sustainable development scholarship as well has emphasised the need for inclusive policy processes that allow a broad range of actors to be engaged in processes of communication, democratisation and deliberation.[13] The broad inclusion of various stakeholders, which means: citizens together with experts and government representatives, can be a way to safeguard legitimacy for the kind of transformations required to reach sustainability. This of course may result in a dilemma which is well-known in transition studies, namely how to have open, broadly participative deliberative processes without running the risk of the agenda being captured by the most powerful actors representing the incumbent regime.[14] We agreed that this should be the role of the state – to take care and to enable actors who are experimenting with new thinking and innovation that they can continue their mission, and are not becoming hostages of the process.

[11] Hysing, E. (2015). The green state in governance for sustainable development. In: Bäckstrand, K., Kronsell, A. (eds.): Rethinking the Green State. Environmental Governance towards Climate and Sustainability Transitions. London/New York, 27-42.

[12] Op.cit.

[13] E.g. Bäckstrand et al. 2010 (*op.cit.*); Dryzek, J. (2005). The Politics of the Earth: Environmental Discourses, 2nd ed. Oxford.

[14] Smith, A., Stirling, A. (2010). The politics of social-ecological resilience and sustainable socio-technical transitions. Ecology and Society 15(1), art. 11.

Constraints and complexities

The vision of a green state faces severe constraints imposed by the international system, global capitalism, and democratic deficits. The state remains "enmeshed with the dominant political and economic institutions we know today"[15], and asymmetric access to the state is an enduring issue which points to the influence of vested interests on state decisions. In the current era of 'Trumpism' these pattern clearly surface. As a result, the need to talk about the sustainable state is even more important in order to deal with issues that have been excluded to date.

In this context, one key question is: What is the sustainable state, normatively and analytically? Conceptually, we may distinguish different 'states', such as the 'outside' state, the 'green' state, the 'proactive' state, the 'strong' state, the 'authoritarian' state etc. These concepts reveal different roles the state may take in sustainability transformations. Whereas the sustainable, green and/or proactive state may take a promoting role in fostering transformations, concepts of the strong and/or authoritarian state may in fact denote a state that rather obstructs changes and cements the status-quo of unsustainability. Notably, the notion of an 'authoritarian capitalist state' points to the fact that the taken-for-granted assumption that capitalism and democracy go well together, and are a characteristic of Western political systems and societies, is evaporating. This pattern is emerging in many countries.

In addition to that, we should remember that the state is not a monolithic block. The state is made up of all sorts of actors and people, levels, bodies, institutions, power relations etc. Hence, it is possibly more fruitful to conceptualise the state in plural, as composed of many actors and institutions that pursue different objectives and interests regarding sustainability transformations. The state should also be considered in transnational dimension since current problems of unsustainability cannot be addressed within the boundaries of the nation state alone. The resulting picture of the state as an actor is characterised by plurality and polycentricity, both within the state and beyond.

In sum, we find that the state is neither a neutral nor a single actor. The 'black box' of the state needs to be opened in order to clarify the complexities involved when we look at the role of the state in sustainability transformations. At the same time, we may argue that this does not completely erode the potential for states to place sustainability concerns at the core of their activities. We rather need to identify those parts of the state that have an interest and are in the position to promote sustainability transformations.

Impacts and broader context: State and society

In addition to pluralising the state, it is also of key importance to envisage the broader context, i.e. society and its role in sustainability transformations. A positive vision of the 'sustainable state' implies that we need to seriously think about the relationship between polity and institutions, on the one hand, and various 'niche' actors and networks in society that can enhance the transformation toward the sustainable state, on the other hand. Government and governance will always go together in sustainability transformation, and the state is only one – but key – actor in these processes of change. This, in turn, necessitates reforming the state, in terms of its ways of interacting with society (governance) while ensuring that key values (such as democracy) and capacities (i.e. regulative and distributive powers) that are upheld by the state are in place.

One important task for researchers is to analyse those factors that promote or obstruct sustainability transformation in the state-society interaction. This includes, among others, analysis of the polity (constitution) and its impact on sustainable development. A focus could also be on opportunities that

[15] Meadowcroft, J. (2005). From welfare state to ecostate. In: Barry, J., Eckersley, R. (eds.): The State and the Global Ecological Crisis. Cambridge, 3-24, here: p. 6.

might exist with a reconfiguration of state territorialities, such as 'radical regions'. Regarding societal factors, another task is analysis of processes, e.g. brought forward by social movements that successfully promote changes. Also, it could be interesting to learn from experiences of productive actor constellations, and their successes and failures. In addition, governance modes are a central topic of analysis, for example: Do other modes of governance exist that fulfil state roles – to complement state government? Which other modes of statehood exist?

So what?

Over the last two decades, the focus of debate was rather on single issues, such as climate change, energy, or other policy fields (which arguably raise a plethora of still complex enough issues to be addressed). Nevertheless, it is important to keep an overarching and integrative view on sustainability transformation. Questions arise, such as: How to get 'the sustainable' back in? How to 'embed' sustainability transformation in ongoing debates?

Conflicting interests at the core of sustainability transformations, and conflicts are arguably coming increasingly to the surface along the way. One important task to be addressed therefore is to get people (back) to sustainability. Perhaps the sustainability debate has so far been a rather 'elite' affair, without much involvement of 'the people'. The state has an important role in this, namely to promote and convey the project of sustainability transformations to the whole of society. In this context, co-benefits are crucial for legitimising sustainability as a state concern. Co-benefits are a way to rethink sustainability issues, and present them in new ways, which can build new supporters and advocacy coalitions. One example from Scotland is the strong renewables policy which is linked to reinvigorating industry policy. More generally, industrial policy is perhaps (re-)emerging as a key area where sustainability can possibly be addressed.

The state's task in this can be seen as preparation of structural and transformative changes. Sustainability transformation needs a convincing storyline, or an 'irenic formula', as a common ground to be successful. The state thus holds a key role regarding setting vision for sustainability transformation (the German energy transition might serve as a good example here).

Key questions identified by the working group

1) What is the 'sustainable' ('green', 'proactive', etc.) state?
2) Why should the state have an interest in promoting sustainability transformations?
3) What is the role of the state, or what should this role be, in broader state-society arrangements?

Working Group II: Science

What role(s) for research in sustainable transformations?

Silke Beck

Background

The objective of this working group was to take stock of the discussions on research that is 'called to arms' to provide support for transformation to sustainability. It is often claimed that transformations to sustainability also require novel forms of knowledge production and a new social contract between science and society.[16] *Future Earth*, for example, is established as an international hub to coordinate new, interdisciplinary approaches, bringing together and in partnership with existing research programs on global environmental change, to *accelerate transformations to a sustainable world.*[17] The aim of the working group (WG) on science was to explore the intellectual merits and practical value of science in the service of sustainable transformation.

The starting point for the WG discussion offered the definition as presented by the WBGU:

> *"Transformative research supports transformation processes in practical terms through the development of solutions and technical as well as social innovations, including economic and social diffusion processes and the possibility of their acceleration, and demands, at least in part, a systemic perspective and inter- and cross-disciplinary methods, including stakeholder participation." (WBGU 2011: 322)*[18]

There was an agreement that there is a need for research *on* sustainability transformations as an object of future investigation.[19] At the same time, it remains controversial (both in the WG and in the literature) whether or not science is/has to be transformative, how and what impacts and implications transformative research can/should have and finally how these impacts/transformations can be evaluated.

Following Brand's keynote speech, the WG came to the conclusion that the lack of a clear-cut or universally valid definition is not a problem per se, but rather an advantage if it contributes to opening up a forum for a debate about the role(s) of research in sustainability transformation.

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[16] For an overview see: https://www.oekom.de/zeitschriften/dossier.html; http://www.leopoldina.org/uploads/tx_leopublication/2013_Wissenschaftssystem_Diskussionspapier.pdf; http://www.wissenschaftsrat.de/download/archiv/4594-15_engl.pdf; Mauser, W., Klepper, G., Rice, M., Schmalzbauer, B. S., Hackmann, H., Leemans, R., Moore, H. (2013). Transdisciplinary global change research: the co-creation of knowledge for sustainability. Current Opinion in Environmental Sustainability 5(3), 420-431. http://www.csap.cam.ac.uk/media/uploads/files/1/fdsaw.pdf (accessed July 22, 2012); Leemans, R. (2016). The lessons learned from shifting from global-change research programmes to transdisciplinary sustainability science. Current Opinion in Environmental Sustainability 19, 103-110; Moser, S. C. (2016). Can science on transformation transform science? Lessons from co-design. Current Opinion in Environmental Sustainability 20: 106-115.

[17] Strohschneider, P. (2014). Zur Politik der Transformativen Wissenschaft. In: Brodocz, A. et al. (eds.): Die Verfassung des Politischen. Festschrift für Hans Vorländer. Berlin, 175-194.

[18] http://www.wbgu.de/fileadmin/templates/dateien/veroeffentlichungen/hauptgutachten/jg2011/ wbgu_jg2011_en.pdf.

[19] The potential input of science – in particular the contribution of basic bottom-up research – to support decision-making can be defined to better understand the interlinkages between the goals of sustainable transformations, underlying thresholds, rebound effects and tipping points and to support the evaluation of Sustainable Development Goals and track the progress of their achievement (http://www.dkn-future-earth.org/aktuelles/news/deutschland/new-dkn-future-earth-report-out-now-the-contribution-of-science-in-implementing-the-sdgs.html).

To what end? The challenge of defining the 'right impacts' of science

First of all, the WG discussed **why** science is 'called to arms' to support sustainable transformations. According to the vision of Future Earth and ICSU (International Council for Science), science has to operate in the 'service of society.' The orientation towards solutions indicates a major shift from autonomous, curiosity-driven basic research at the national level. According to Peter Strohschneider, president of the German Science Foundation, it invites a new form of 'environmental instrumentalism' where all research is transformed into a practical tool to work out scientific solutions to problems that society has already defined?[20] Even if there seems to be formal agreement that science has to contribute to achieving sustainability transformations, there is also a reluctance to explicitly define the normative or desirable ends of research (what are called the 'right impacts' in discussions on Responsible Research and Innovation[21]). Such processes of definition, however, matter because they set the goals for both, the governance of research as well as the monitoring and evaluation of their outcomes. The obvious question then becomes, what are the 'right impacts' of research and what societal values are these be anchored in?

The goals that are attributed to science in debates about sustainability transformations are

- to advance the 'usability' of science, thus to improve decision-making and to trigger transformation (*instrumental*);
- to encourage transformative action;
- to democratise science by primarily empowering citizens to govern research and emerging technologies in a responsible way.[22]

The discussion about the 'right impacts' of science remains often very vague about the rational per se: whether science is used as *means* to achieve particular goals such as sustainability (*instrumental rationality*) or whether autonomous knowledge production and political pluralism as a virtue per se?

Much of the focus (in the Future Earth context) is on the production of knowledge as a 'solution' to the sustainability problems. Empirical research, however, has shown that this is only a half of the picture. Science has not only produced understanding, knowledge, and economic impact, but also questions, and unintended (and sometimes undesirable) impacts.[23] The increasing awareness of risks as side effects of science has catalysed an increasing willingness at a policy level to discuss, challenge and rethink linear models of science policy and the social contract for science (in which scientific freedom is exchanged for the promise or expectation of socially beneficial impacts).[24]

Since the controversies about the role of science in society are not really new, it is also worth asking whether the discussion on transformation is simply *new wine in old bottles* (such as mode two), or whether there are new visions for the role of science/science in society in the first place? What transformations are needed? And which direction should transformations inside science and their contract to society take? Besides our usual types of intervention: what is "transformative"? It also remains contested whether or not science per se is/has to be transformative in terms of deliberate economic or political impacts ('solutionismus' – Strohschneider). Even with a sustainability transformation as the socially desirable goal, TR is open, uncertain and may have unpredictable dynamics

[20] According to Peter Strohschneider (2016), president of the German Science Foundation, transformative research tends towards a particular of *technical instrumentalism* by conceptualising research as a matter of predefined problems and predictable solutions (http://www.dkn-future-earth.org/aktuelles/news/deutschland/new-dkn-future-earth-report-out-now-the-contribution-of-science-in-implementing-the-sdgs.html).

[21] See Stilgoe, J., Owen, R., Macnaghten, P. (2013). Developing a framework for responsible innovation. Research Policy 42(9), 1568-1580.

[22] See Stilgoe et al. 2013 (*op. cit.*).

[23] See Stilgoe et al. 2013 (*op. cit.*).

[24] Chilvers, J., Kearnes, M. (eds.) (2015). Remaking participation: Science, environment and emergent publics. Routledge.

and outcomes – which in turn can be an object of investigation for transformation research. This includes empirical and normative dimensions: How 'transformative' is/ has research to be? At the same time, there was a common understanding that if science deliberatively decides to be transformative, it has to account for and be accountable for its impacts and implications and reflect on its own *role in society*.

One of the challenges is that in different areas of research and in different cultural contexts, different values will be more or less pertinent, and they may be conflicting. As a result, the definitions of 'right impacts' vary significantly across cultural contexts and political levels, there is neither a uniform answer nor a 'one-size-fits-all' model that applies to all cases but calls for novel approaches.

Given the intended societal and economic impacts of research supporting sustainability transformations, there one can see a need to unpack the motivations for transformation of research itself, asserting that it is conducted for substantive and normative reasons rather than an instrumental approach to expedite the meeting of pre-defined policy goals. The crucial question is therefore not *how* much transformation but *what* kind of transformation; *who* should participate and *with what purpose*. Former discussions on science in society concentrated on the *means* of governance such that an improved – more democratic or more legitimate – consideration of ends becomes possible, and in ways that are attentive to the distinctive social and ethical stakes that are associated with particular scientific and technological developments[25]. Reflections on the 'right impact' are prompting new discussions about the remit and role of research/scientific advice, and about the division of labour between science and society. These discussions not only re-ignite an older debate about scientific autonomy and modes and societal boundaries of research such as mode 1 but also offer new opportunities for creating value. The discussion so far also calls for shifting the attention from the *how* to the *why* of transformation of science and to the broader meaning and political implications of these activities.

Open questions

One of the challenges then is how deal with the tensions between classical academic values such as the autonomy of science[26] and efforts to open research to novel, non-scientific actors and to meet political demands and goals (including policy relevance, geopolitical representativeness and public accountability). These trade-offs between scientific and political principles also matter when it comes to defining criteria for the evaluation of research in science. In their first operational years, the Future Earth's Governing Council and its Science and Engagement committees, for instance, must decide on more precise criteria for research and engagement contributions, and the executive secretariat should implement them.[27]

The tensions between scientific and political principles that also characterise the discussion about aims of research in society (see section *What End?*), also return at the level of their governance: one of the key problems consists in defining the relationship between and combining different forms of governance such as decentralised and informal forms of scientific self-organisation with hierarchical and networked forms of governance. It remains contested how to locate science in their broader societal context – namely in science policy and changing science-society contract. In the German debate, for instance, there was a controversy about the question whether the "entire" public research system is oriented towards one single overarching purpose, has to completely turn towards the support of sustainability and "all" research is/has to be transformed into transformative research

[25] See Stilgoe et al. 2013 (*op. cit.*).
[26] See Strohschneider 2016 (*op. cit.*).
[27] Leemans, R. (2016). The lessons learned from shifting from global-change research programmes to transdisciplinary sustainability science. Current Opinion in Environmental Sustainability 19, 103-110. doi: http://dx.doi.org/10.1016/j.cosust.2016.01.001.

('solutionism' – Strohschneider) and novel forms of knowledge production resubstitute forms of academic research or complement them (pluralism) and thus lead to new institutional arrangements that have been introduced in the interface between science and society.[28] It is also open question whether and how challenges such as coping with complexity and diversity[29] require changes/ transformations of and empirically leads to reconfigurations of lines of accountability between scientific and political communities, the standards by which it defines evidence, and its procedures for review and approval.

Concerning this problem, it may be helpful to use Michael Burawoy's concept of division of sociological labour[30] which considers different types of knowledge and audiences:

Division of sociological labour according to Michael Burawoy (2005: 11)

	Academic Audience	Extra-academic Audience
Instrumental Knowledge	Professional	Policy
Reflexive Knowledge	Critical	Public

We can replace 'sociology' here by 'science' and distinguish 'professional science' (instrumental knowledge for an academic peer groups), 'policy science' (instrumental knowledge for an extra-academic audience), 'critical science' (reflexive knowledge for an academic audience) and 'public science' (reflexive knowledge for an extra-academic audience). On the one hand, it seems possible to place TR within the domain of reflexive knowledge, acknowledging its normative character and its need for self-criticism and self-monitoring. This leads to a concept of TR as critical or public science. On the other hand, one could understand sustainability as an 'instrumental' goal political decision-makers want to achieve, thus resulting in TR as a form of policy science. One of the results of the WG discussion is that given the complexity of the transformation challenges and the diversity of actors affected by and involved in those challenges, we have to acknowledge a plurality of scientific identities, potential roles and societal functions and their contributions to transformation. One can imagine preferred roles such as narrator (explaining science or telling stories of successful transformations), educator, adviser ('speaking truth to power'), 'honest broker' or moderator and so on. Given the diversity of information demands, it is import to think about and support a broad range of roles for scientist rather than reduce it to one and only role such as transformative research and how to combine them in order to avoid unintended effects and paralysis and realizes synergies. Based on the consideration of different roles, scientists have to define their role regarding types of knowledge and audiences. The WG also came to the conclusion that TR is a complement to research on transformation rather than a substitute, a rather 'professional science' type of research.

How?

There was consensus that transformation to sustainability requires novel forms of knowledge production (such as co-production, transdisciplinary science, action research and citizen science). In the international arenas, knowledge co-production is often taken as the means to rethink and restruc-

[28] Rohe, W. (2015). Vom Nutzen der Wissenschaft für die Gesellschaft: Eine Kritik zum Anspruch der transformativen Wissenschaft. GAIA-Ecological Perspectives for Science and Society 24(3), 156-159; Grunwald, A. (2015). Transformative Wissenschaft – eine neue Ordnung im Wissenschaftsbetrieb? GAIA – Ecological Perspectives for Science and Society 24(1), 17-20.

[29] The political context has changed to more fragmented, polycentric orders where governance occurs not simply at the level of nation states alone and where policy needs to address diverse citizens with multiple values and sources of knowledge. In increasingly complex international landscape, science and expert panels such as the IPCC and PBES have to respond to diverse political communities with diverging knowledge need and multi-level governance structures.

[30] Burawoy, M. (2005). 2004 Presidential Address: For Public Sociology. American Sociological Review 70(1), 4-28.

ture knowledge production to surmount the usability gap and to bridge between science and action (as Future Earth shows).

There are many well-established approaches, tools, guidelines and criteria how to define, organise and evaluate processes of knowledge production. There are striking similarities between the approaches, such as their emphasis on the importance of processes and procedural principles for producing usable scientific knowledge that is credible, relevant, and legitimate to actors outside the expert community. At the same time, the discussion has commonly been restricted to procedural questions such as how processes and mechanism can improve the effectiveness and legitimacy of their outcome (see Mitchell et al. 2006). Case studies, however, show that there is no direct or linear causal relationship between processes and their outcomes.

At the same time, it is an open question whether these approaches, tools, guidelines and criteria as they stand now are *fit for function* to address challenges raised by transformation to sustainability such as coping with the diversity and complexity of voices and divergent expectations of different target groups and actors. Taking diversification, or opening-up seriously, it implies that stakeholders and experts may bring with them very different epistemic and normative framings of putative solutions.

The procedural approaches as discussed before also underestimate the extent to which knowledge and power can be unequally available and differentially composed, ignore unequal power relations to define problems and identify appropriate research strategies and also neglect explanation power incorporated in more disciplinary approaches (Klenk and Meehan 2015). In a variety of expert bodies and public engagement experiments there is still a misfit between participation and political representation in the main decision making bodies.

These persistent problems highlight the importance of openly addressing questions of representation and inclusion, rather than defending the ideal of neutral, aggregated and thus more balanced expertise.

The societal impacts and implications of different forms of research – in particular if science is transformative – raise questions about the kinds of authority and agency asserted in the scientific narrative of transformation and consequently about the accountability and legitimacy of experts claiming to speak for the future of the earth.[31] Therefore, we have to take into account the composition of and modes of representation in new emerging expert networks (such as Future Earth) and to discuss their political implications: who is in, what does this mean, where is their legitimacy coming from? How representative and legitimate are their statements in the eyes of citizens and people affected by their research, especially when it comes to policy recommendations and prescriptions.

One of the most pressing challenges is the question of inclusion: how to address a broad range of citizens that do not participate in and are not invited to or addressed by traditional forms of knowledge production. If we are living in 'post-factual' times, can scientists count on audiences interested in participatory modes of research in the first place? The framing of civil society as morally 'good' or politically 'correct' includes the risk of overlooking political forces pressing for 'transformation' in a completely different way (such as PEGIDA in Germany). Also, experiences in concrete projects indicate that 'extra-academic' audiences often consist of highly educated people with aca-

[31] Turnhout, E., Dewulf, A., Hulme, M. (2016). What does policy-relevant global environmental knowledge do? The cases of climate and biodiversity. Current Opinion in Environmental Sustainability 18, 65-72. http://www.faz.net/aktuell/politik/energiewende/klimapolitik-die-rettung-der-welt-ist-ersatzlos-gestrichen-12678882.html; Brunnengräber, A. (2014). Eine Weltbürgerbewegung ohne Realitätsbezug. Zum WBGU-Gutachten Klimaschutz als Weltbürgerbewegung. *GAIA* 23(4), 306-308; Unmüβig, B. (2015). Die Rolle der Zivilgesellschaft in der Klimapolitik. GAIA – Ecological Perspectives for Science and Society 24(3), 160-163.

demic training.[32] How can/ do and should novel forms of knowledge production engage with social movements in general? Do they have to be inclusive or representative in the context of post-truth politics? What are the risks and side effects – such as vulnerable to politicization, cherry-picking and the misuse of scientific evidence (climate *denials*)? How can they address public mistrust against experts and how can trust in science be maintained?

Broader impact and broader context – science in society

There is stable belief that usable science will be used and thus improve decision-making and trigger transformation. It is often assumed that novel forms of research will almost automatically bring about transformative practices, but yet do they so? Extensive empirical research – on climate change for instance – has demonstrated that scientific knowledge alone is rarely effective in compelling public policy and there is no linear uptake from science expertise to decision makers. Even when knowledge is perceived as useful it does not mean that it will have an impact in decision making. These findings suggest a need to shift focus from the production of knowledge and truth claims to the ways knowledge resonates with and is reframed in politics. The broader governance context is vital in understanding the role, use and uptake of research.

Novel forms of knowledge production such as co-production are not a silver bullet: case studies reveals that also serve as a lip-service. The challenge now is to take stock, to make sense of these conflicting trends and to propose changes that are consistent with new social and institutional realities (such as institutional fragmentation and 'network governance'). There is a *misfit* between funding policies and structures (knowledge regimes) providing incentives for disciplinary academic research at the national level and requirements of novel inter- and transdisciplinary forms emerging at the international level.

Then question, then, is how do novel forms of knowledge production fit into institutional arrangements such as funding structures, incentives and models for research policies that may enable and constrain capacities for conducting alternative forms of research. The key challenge then is to take into account the deep institutional and structural changes needed to achieve transformations to support novel forms of knowledge, and the development of processes and norms to address societal challenges. Transdisciplinary knowledge production can only become a serious option if broader changes are made to the knowledge regimes in place (Felt et al. 2016).

So what: What are the impacts and consequences of research?

One of the major challenges remains how the transformation of science for sustainable transformation can be evaluated. Evaluation matters. There are different, reinforcing justifications for this claim. First, if impacts cannot be measured and attributed they cannot be taken into account into science and decision making. Second, the way how and why they are taken into account also determines their performance.

In scientific research and in political agencies there are a variety of established and standardized tools to account for scientific excellence. Whereas there is a longstanding critique of these managerial and quantitative approaches and their narrowing down of relevance criteria simply to economic relevance, they do not hinder institutions from continuing to perform assessments deeply rooted in this logic and according to a trust in numbers as an 'objective measure' for quality (Felt et al. 2013). At the same time, it is rather unclear what 'social impact' is and it can be achieved through research and it can be assessed. There is a central issue present across many sites: the gap between broader

[32] Felt, U., Igelsböck, J., Schikowitz, A., Völker, T. (2016). Transdisciplinary Sustainability Research in Practice. Science, Technology, & Human Values 41(4), 732-761. Felt, U., Barben, D., Irwin, A., Joly, P. B., Rip, A., Stirling, A., Stöckelová, T. (2013). Science in Society: caring for our futures in turbulent times. *Policy Briefing* 50.

and often quite complex value systems employed by societal actors to evaluate science as a public good and the often narrow indicator-driven evaluation used in research and education policy. Incentives to mainstream research along a fixed set of indicators might hinder engaging with wider societal value regimes.

There are also criteria to guide and evaluate processes of transdisciplinary research that focusses on *input* criteria. Given the diversity of demands for knowledge by different groups at global, national, regional levels, it is difficult to operationalize a common set of guidelines and criteria/metrics, and not to fall in the trap of measuring publications and outputs, but to account for the actual impact.

One of the major challenges is there is no simple linear causal relationship between causes and impacts in complex contexts such as societal impacts of knowledge production. It is easy to detect societal impacts of research but it is hard to clearly attribute them to a single cause (similar to homoeopathy). There was also consensus that the discussion on societal valuation of research impacts has to be informed by established social science concepts from fields such policy evaluation, Science and technology studies and reflexive governance.

What is required instead is a thorough discussion of broader notions of societal relevance and impacts and how they can be embedded in science policy and evaluation systems. There is a need to

- opening up the notions of relevance beyond economic criteria and of excellence beyond classical research indicators;
- better research-based understanding of how scientific excellence and societal relevance relate to each other;
- explicitly integrating science-society issues into the programmes and institutional settings dedicated to research excellence.

Open question transformative/transformation research – further questions:

1) What kind of roles can we identify for and of scientists?
2) When and how does science become performative?
   Beyond evaluation: How does performativity of science become observable?
3) What aspects of transformation have been neglected? (power, democracy …)

Working Group III: Business

How do business actors become agents of change?

Julian Rode, Nicole Heinz, Olaf Dilling

Companies play an ambivalent role in the transformation towards sustainability. On the one hand, they may act as barriers to transformation, as their productive activities can cause environmental damage and social unrest, their marketing often promotes unsustainable lifestyles, and their political actions frequently influence political decision-making against regulations[33]. On the other hand, companies are key actors in transformations towards sustainability, by developing more sustainable technologies and products (e.g., renewable energies) or by tackling societal challenges beyond legal compliance (e.g., ensuring humane labour conditions or reducing ecological footprint along the supply chain, establishing participatory processes and raising awareness for sustainability).[34]

Three themes to structure research on business transformations towards sustainability

Prior to the workshop, the organizers of the working group identified three themes along which current and future research could be classified. In the beginning of the group work, the themes were shortly presented to stimulate the discussions.

Theme 1: Interactions and dynamics in business transformations towards sustainability

In a common understanding of the capitalist system, state and market spheres are separated: the state provides regulatory boundaries in line with the interests of society, within which companies are free to act in their (financial) business interest[35]. In reality, however, there are many interactions and dynamics that are relevant for sustainability transformations, (a) between business actors and state actors[36], (b) among business actors in a given sector, and (c) within companies (e.g., among the management and/or stakeholder groups). For example, companies may interact with state actors by providing innovations that open up new political options[37], by engaging in public-private partnerships, or as lobbyists who promote or block political decisions. Within the business sphere, early movers in a sector can be the inspiration for competitors to follow suit, they can find themselves at a competitive advantage[38] or remain in a niche. If forces of change are to prevail, this may require processes of "creative destruction", which differ from the static equilibrium of mainstream economic models.[39] Within companies, the values and motivations of individuals (e.g., the CEO, employees)

[33] Le Menestrel, M., Rode, J. (2013). Late lessons about business: Why did industry not respond with precaution to early warnings? In: Gee, D. (ed.): Late Lessons from Early Warnings, Volume II. European Environment Agency. www.eea.europa.eu/publications/late-lessons-2.

[34] See, e.g., WBCSD (2010). Vision 2050: The new agenda for business. World Business Council for Sustainable Development.

[35] See, e.g., Friedman, M. (1970). The Social Responsibility of Business Is to Increase Its Profits. The New York Times Magazine, 13 September 1970; Karnani, A. (2010). The Case Against Corporate Social Responsibility. The Wall Street Journal, 23 August 2010.

[36] Scherer, A., Palazzo, G. (2011). The New Political Role of Business in a Globalized World – A Review of a New Perspective on CSR and Its Implications for the Firm, Governance, and Democracy. Journal of Management Studies 48, 899-931.

[37] Dangelico, R., Pujari, D. (2010). Mainstreaming Green Product Innovation: Why and How Companies Integrate Environmental Sustainability. Journal of Business Ethics 95, 471-486.

[38] Dechant, K., Altman, B. (1994). Environmental leadership: From compliance to competitive advantage. Academy of Management Executive 8(3), 7-27; Porter, M., Kramer, M. (2006). The Link Between Competitive Advantage and Corporate Social Responsibility. Harvard Business Review, December 2006, 1-16.

[39] Hart, S. L., Milstein, M. B. (1999). Global Sustainability and the Creative Destruction of Industries. Sloan Management Review 23.

towards sustainability may differ from professional norms and business interests, raising the challenge of combining personal and professional integrity on sustainability issues.[40] A better comprehension of these dynamics and interactions is essential to assess and shape the policy options for sustainability transformations.[41]

Theme 2: Refining what characterises "sustainable business"

The notion of sustainability is often criticised as being vague, and this seems particularly true for businesses; in that field sustainability can even be interpreted as comprising merely financial sustainability. Is it possible to agree on defining characteristics of what constitutes a 'sustainable company', for instance with respect to corporate governance structures and property, economic activities and business models, working conditions, corporate culture/identity/ethics[42], and the relationship to societal interests and politics (e.g., along the notion of "shared social value"[43])?

Theme 3: Rethinking governance and regulatory interventions to enable business transformation

At first sight, legal obligations and fiscal measures, as well as subsidy schemes come to mind as policy instruments to "steer" business action towards closer alignment with societal goals. However, there may be many more options to create an environment in which sustainable businesses can thrive.[44] To evaluate the different governmental interventions, it will be crucial to assess how they interact with initiatives and mechanisms in the private sector. Do they promote or rather suppress beneficial developments already in place? Are they sufficient to overcome the forces of inertia?

Group members' interests and research ideas

In a 'tour de table', all group members shortly presented their own background and research interests with respect to business transformation towards sustainability. Promising research topics and questions were collected on paper cards. The following list contains some of the main questions that were mentioned:

- Which incentives and motivations can enable a sustainability transformation among farmers?
- How can niche initiatives be scaled up to the 'mainstream' without undermining their core features (and do the initiatives actually want that)?
- Given that 'growth' implies an increase, yet does not say of what – which aspects of an organisation can/should grow in accordance with (or even as a condition for) a sustainability transformation?
- How can the state financially support companies' sustainability aspirations and actions?
- Where should the state impose green action and when is it at the discretion of consumers or citizens?

[40] Bielak, D., Bonini, S., Oppenheim, J. (2007). CEOs on strategy and social issues. The McKinsey Quarterly, October 2007.

[41] For an example of policy interactions in the field of hazardous substance use in consumer products: Dilling, O. (2012). From Compliance to Rulemaking: How Global Corporate Norms Emerge from Interplay with States and Stakeholders. German Law Journal 13, 381-418.

[42] Windsor, D. (2006). Corporate Social Responsibility: Three Key Approaches. Journal of Management Studies 43(1), 93-114.

[43] Porter, M., Kramer, M. (2011). Creating Shared Value – How to reinvent capitalism – and unleash a wave of innovation and growth. Harvard Business Review, Jan-Feb 2011, 1-17; Crane, A., Palazzo, G., Spence, L., Matten, D. (2014). Contesting the Value of "Creating Shared Value". California Management Review 56(2), 130-153.

[44] See, e.g., Vermeulen, W., Kok, M. (2012). Government interventions in sustainable supply chain governance: Experience in Dutch front-running cases. Ecological Economics 83, 183-196.

- How effective is communication based on “business case” vs. “responsibility” arguments for stimulating a corporate sustainability transformation? Which other (long-term) consequences does the choice of either set of arguments have?
- Which psychological barriers hinder companies’ transformation towards sustainability, and how can they be overcome?
- Why do some companies act proactively towards sustainability?

Subsequently, the group organised the input on the pin board. In order to prioritise the questions, all members allocated points to what they considered the most interesting topics.

Formulating research topics and approaches

Splitting up into small teams, the working group then formulated three specific research topics, clarified which other actors are involved, and how the topics could be addressed (e.g., in terms of scientific disciplines, methods, or approaches).

1) How do business actors relate to **political activity**? Do businesses see themselves as playing an explicit political role to steer towards sustainability or rather as acting within regulatory constraints? How do businesses see their interaction with the state for setting policy instruments, e.g. in lobbying or pro-active engagement (standards, price based, strategic investor etc.)? Where and how do they interact in order to discuss and decide on regulatory decisions?

   Other actor groups involved:
   - State (regulator, politicians)
   - Cities, communal politics

   How to address:
   - Interviews in companies on political role of business (also in public businesses); network analysis of communities and how they interact in events and processes leading to political decisions

2) Which (mix of) **motivations and logics** are positively and negatively influencing transformation in different types of businesses (e.g., bottom up or social entrepreneurs vs. SMEs vs. large companies)? How do different framings of ‘why should business be sustainable’ affect businesses’ motivation to act? How does a discourse that places sustainability within a ‘business case’ logic affect modes of thinking, compared to a responsibility/ethics/societal value discourse?

   Other actor groups involved:
   - Individuals – managers/farmers/entrepreneurs/etc.: How are their motivations, mindsets and decisions affected? Identification with brands/trends.
   - Experts : How do they create, shape and communicate the concepts? How do they inspire, influence and support businesses?
   - Urban living labs: “transformative mindset” in cities
   - State: tries to influence motivations through e.g. regulations
   - Businesses: by influencing each other; e.g. through competition, marketing, business attractiveness for customers, employees and owners/shareholders

How to address:

- Interviews with companies
- Social psychology/organizational behaviour: empirical studies on framing effects

3) How precise do **goals and criteria** have to be defined, so as to be able to evaluate the transformative potential of different business forms?

Other actor groups involved:

- State: Does the state use such definite criteria in different policy fields, such as public procurement or subsidies or tax relieves?
- Experts: How are experts involved in the definition of such criteria?

How to address:

- A particular challenge for social science research is how values can be addressed in a methodologically appropriate manner. How can value decisions be made transparent?
- Participatory, transdisciplinary, integrated methods and approaches
- Interpretation of sustainability norms of business associations or public organizations

Working Group IV: Urban Real-World Laboratories

Florian Koch

Background

Currently, cities and urban areas shift into the focus of the broader transformation debate. In recently published political documents, such as the SDGs or the Paris Agreement on Climate Change it is acknowledged that cities can considerably contribute to more sustainable development. This is based on the fact that current development paths of cities are often perceived as contrary to sustainability goals and therefore – as the majority of the global population is urban – considerably contribute to global environmental change.

In this context, urban development agendas such as the New Urban Agenda of UN Habitat, which has been adopted during the Habitat III conference in Quito in October 2016, refer to concepts of sustainability transformations and contain so-called "transformative commitments for sustainable urban development".[45]

Hence, a two-fold process can be identified: On the one hand, cities are increasingly considered as an important dimension of sustainability transformations. On the other hand, it is frequently acknowledged that transformative action needs to be included in current urban development strategies. Therefore the starting point for this working group was the assumption that a discussion between scholars from urban studies and from transformation studies is a fruitful endeavour and can produce new insights into the relation between cities and sustainability transformation.

Nevertheless, beyond these general remarks, a critical reflection seems to be necessary on *how* cities can contribute to more sustainable development – even more in times where financial restrictions, juridical limitations and an accumulation of many different urban problems define contemporary urban development in most parts of the world. In other words: How can the plea for a transformative urban development actually be transferred to the practice of urban politics?

Urban Real-World Laboratory as an instrument for urban sustainability transformation?

Recently, the concept of Urban Real-World Laboratories has gained importance and is considered as one instrument which helps to realise sustainable development in cities. The notion of Urban Real-World Laboratories emerges in political documents, in funding schemes for research projects on urban development as well as in the academic literature.[46] Still, the increasing use has not yet led to conceptual clarity: A range of different definitions, concepts and approaches are subsumed under the term.[47]

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[45] See UN Habitat (2016). The New Urban Agenda. https://www2.habitat3.org/bitcache/99d99fbd0824de50214e99f864459d8081a9be00?vid=591155&disposition=inline&op=view, p. 6.

[46] Among others: Calls of the BMBF Zukunftsstadt-Program; Schäpke, N., Singer-Brodowski, M., Stelzer, F., Bergmann, M., Lang, D. J. (2015). Creating space for change: Real-World Laboratories for sustainability transformations: The Case of Baden-Württemberg. GAIA – Ecological Perspectives for Science and Society 24(4), 281-283; WBGU (2016). Humanity on the move: Unlocking the transformative power of cities. WBGU (German Advisory Council on Global Change), Berlin; Schneidewind, W. (2014). Urbane Reallabore – ein Blick in die aktuelle Forschungswerkstatt. PND Online III. http://www.planung-neu-denken.de/images/stories/pnd/dokumente/3_2014/schneidewind.pdf; Behr, F., Alcántara, S., Ahaus, B. (2016). „Partizipation als Trumpf?!" – Ein Workshop-Bericht über die Reflexion partizipativer Prozesse im Kontext der „Großen Transformation". pnd-online 1. http://www.planung-neu-denken.de/images/stories/pnd/dokumente/1_2016/pnd-online_2016-1.pdf.

[47] Nevens, F., Frantzeskaki, N., Gorissen, L., Loorbach, D. (2013). Urban Transition Labs: co-creating transformative action for sustainable cities. *Journal of Cleaner Production* 50, 111-122; Voytenko, Y., McCormick, K., Evans, J., Schliwa, G.

In order to answer the question whether Urban Real-World Laboratories are indeed an adequate instrument for urban sustainability transformation – as often assumed – a first step needs to be conceptual clarity. Therefore, the aim of the working group was to shed light on the term Urban Real-World Laboratories (RWL) and to discuss the potentials, pitfalls and limits of this approach with researchers based in transformation studies as well as urban studies. While some members of the Working Group were already actively involved in RWL-initiatives, for others the RWL approach is rather new and has not yet explicitly addressed in their research. Thus, inputs based on practical experiences but as well as more theoretical aspects of urban studies in general were part of the WG. Furthermore, connections to the topics of the other WGs of the Workshop were established by addressing the question of how RWL on an urban level can interact with other elements to an overall sustainability transformation.

Setting the scene

The existence of different understandings of Urban RWL, the unclear differentiations between RWL and other concepts such as living labs or transition labs and the need to find common grounds for the discussion in the working group were the starting points for the discussion. Matthias Wanner from the Center for Transformation Research and Sustainability (TransZent) in Wuppertal gave an input presentation on RWL. Urban RWL are understood as "a normatively framed research perspective for sustainability science, producing knowledge and systems innovation within real-world intervention or real-world experimentation with distinct scientific and practical roles".[48] Following this input presentation, various discussion topics emerged.

Rather than depicting the complete course of the discussion in the working group, the main results of the discussion and new research questions on Urban RWL are listed below:

No Common ground: What are urban sustainability transformations and what are the objectives of Urban RWL?

The WG discussed how urban sustainability transformations (UST) are actually defined, what objectives are included and what the differences between sustainability transformations and sustainable development are. Furthermore, the issue of what might be appropriate indicators to measure the success of UST was touched. The discussion displayed the findings of the literature: UST can be considered as a fuzzy concept and contains a wide range of objectives, which might even be divergent.[49] Examples range here from sustainable concepts for urban mobility, social cohesion or implementing resource efficiency on an urban level. A general definition of UST does not exist. In contrary, if the term UST is used, a definition of what is actually addressed and how the term is framed seems to be necessary. This also makes it difficult to evaluate when UST are actually achieved and what indicators could be used. Concepts such as the OECD concept for well-being or the Sustainable Development Goals are considered as helpful to define and operationalise UST.[50]

(2016). Urban Living Labs for sustainability and low carbon cities in Europe: Towards a research agenda. Journal of Cleaner Production 123, 45-54.

[48] Wanner, M., Hilger, A., Westerowski, J., Rose, M., Schäpke, N., Stelzer, F. (forthcoming). Towards a cyclical concept of Real-World Laboratories. Manuscript submitted for publication.

[49] Wolfram, M., Frantzeskaki, N. (2016). Cities and Systemic Change for Sustainability: Prevailing Epistemologies and an Emerging Research Agenda. Sustainability 8(2), 144. doi:10.3390/su8020144; Koch, F., Krellenberg, K., Kabisch, S. (2016): How to achieve Urban Sustainability Transformations (UST) in real life politics? Policy Brief for the UNs. Global Sustainable Development Report. https://sustainabledevelopment.un.org/content/documents/961514_Koch%20et%20al._How%20to%20achieve%20Urban%20Sustainability%20Transformations%20%28UST%29%20in%20real%20life%20politics.pdf.

[50] OECD (2016). Measuring Well-being and Progress: Well-being Research. http://www.oecd.org/statistics/measuring-well-being-and-progress.htm.

The fuzziness of UST has also direct implications for Urban RWL: If no clear objectives of UST are defined, it is also not possible to evaluate if RWL are an adequate instrument to achieve them. As a consequence, the empirical cases of already existing Urban RWL in the German federal states North-Rhine-Westphalia and Baden-Württemberg have different orientations and different objectives. While the RWL in the city of Wuppertal focuses on "the good life" and a how to define "well-being" (Wohlstand), another RWL approach (in the city of Bottrop) focuses more on business models for energy-efficient retrofitting and a third approach in the City of Stuttgart tackles the topic of Space Sharing. Therefore Urban RWLs need to be considered foremost as a methodological tool and not as coherent concept to achieve a general, well-defined objective.

Another issue, which has been only very briefly discussed, was the territorial orientation of RWL. Not all RWL are located in urban areas. Examples such as the Reallabor "Nordschwarzwald" have a regional and non-urban focus. Further research seems to be necessary to identify differences and commonalities between "Urban" and "Non-urban" RWLs.

Unrevealing Urban RWLs 1: Actors

Despite the different specific objectives of Urban RWL some common aspects of all RWL can be defined. Besides the general orientation towards sustainability, another common aspect of Urban RWL is a broad inclusion of local actors in the sense of a co-production approach as developed by the Future Earth Initiative. Urban RWL are considered as open spaces, where institutions and people participate on a voluntary basis. They are territorially defined (for example neighbourhoods, urban districts) and are often established in areas where already civil society initiatives existed before or where local actors search for new methods on how to develop the neighbourhood/urban district. Municipal actors are also part of Urban RWL as many measures can only be implemented in cooperation with them. Nevertheless, the way how municipalities are involved and act in RWL varies considerably in existing empirical cases. Also, the way how institutions/persons express their interest in participating in the RWL differs. One common problem is that the participants of RWL are the "usual suspects" – those who have been always active and that other groups/individuals are not achieved through the RWL approach and did not participate. Thus, the RWLs do not have per se an inclusive character. In this sense, Urban RWLs are not very different from other existing community development approaches and also programs such as "Soziale Stadt" which encounter similar problems concerning the inclusiveness of the approach.

What makes RWLs different from other approaches is the systematic inclusion of academia. Scientists form a crucial part of Urban RWLs and consider the RWLs as object of study. According to the WBGU "researchers contribute to the project their scientific knowledge, their methodological expertise, and an ability to reflect and evaluate, which, compared to practitioners, is disengaged from praxis" [51].

At the same time, the involved scientists' work is normative, as they try to contribute to a more sustainable development. This makes the role of the scientist a contested one and tackles general issues as how normative should science be and how this kind of research needs to be carried out (see minutes of working group II by Silke Beck).

[51] WBGU (2016). Humanity on the move: Unlocking the transformative power of cities. WBGU (German Advisory Council on Global Change), Berlin, p. 512.

Unrevealing Urban RWLs 2: Processes

There is no silver bullet how to establish Urban RWLs. The decision if an Urban RWL is established and what area is selected as Laboratory depends on various factors. “Nosing around” has been the main method for selection: Investigating local contexts, evaluating existing cooperation, personal preferences but also the question, if this place can “tell a story” are decisive for the selection. The WG discussed also if the label “Laboratory” stigmatises a neighbourhood and transmits the image of inhabitants who need external help from scientists do develop their living environment. Also the notion of “Laboratory” could create the image of inhabitants as “laboratory rats” that are used for experiments. Nevertheless, this seems to be largely an issue raised by academia. In the empirical cases, which were familiar to the WG participants, the inhabitants have not complained about this.

A recent publication has identified an ideal-type flowchart for Urban RWL[52]:

1) Constituting principles and overall aim
2) Co-Design (Forming Transdisciplinary Team, problem definition, system analysis, generating ideas)
3) Co-Production (cyclical process of learning through “experimentation”, reflection and calibration; real-world interventions leading to direct results in practice)
4) Co-evaluation (Co-interpretation and evaluation of outcomes: transfer back into the systems of science and practice)

Further research is needed in order to evaluate empirically, to which degree RWL processes follow these ideal type. Still, the design of existing RWLs also depends on the respective funding schemes. Currently, RWL are funded frequently only for a period of around three years. This is rather short, considering the complexity of the tasks (Co-Design, Co-Production, Co-Evaluation and real-world interventions). Therefore in its recent flagship report, the WBGU has proposed funding periods for 50 years for RWL (“50 Labore für 50 Jahre”).[53]

Additionally, RWLs are explicitly designed as experiments and failure can be one possible outcome. Failure is a valuable result in science and helps to falsify certain hypotheses. Failed processes can be researched and conclusions on why a RWL in a certain urban area did not work can be published in science journals. Furthermore, the results emerging from a failed RWL process can help to initiate learning processes for RWL in other neighbourhoods/cities. Nevertheless, for the people directly involved in the RWL (inhabitants, institutions) a failure of the RWL will most probably lead to disappointments, the perception of a loss of time and resources and limited willingness to get involved in further transformation activities.

The role of science

Much of the WG discussion has been on the role of science in Urban RWL. Very general issues such as: ”Is research on Urban RWL ‘real’ research?” and “How can research results on a very context-specific (i.e. unique), not repeatable constellation such as an Urban RWL be generalised and published in scientific journals?” were discussed. Many of these issues are related to the broader discussion on the role and specifics of transformative science in general. But the WG also discussed very practical questions such as “How long does it take to get publishable results out of a RWL?”, “In what kind of research environment/institution research on RWL is supported?” and “Do I limit my personal career options in academia through research on RWL?”. Also the contribution of scientists to local development was questioned: If practitioners have more knowledge on what is actually needed in RWL and scientists only want to realise their research using the RWL as a study object, what is the

[52] Wanner et al. forthcoming (*op. cit.*).
[53] WBGU 2016 (*op. cit.*).

non-scientific benefit of the inclusion of science? Does this lead to a more sustainable development or trigger sustainability transformations? In order to discuss these issues in more detail, the WG agreed to merge with WG 2 "What role(s) for research in sustainable transformations?" on day 2 (see minutes by Beck and Koch). This discussion can refer to and build upon recent work on this topic[54].

Emerging research questions

The WG identified research questions which are seen as crucial in order to understand the potentials and limits of Urban RWL to contribute to sustainability transformations:

- Are there systematic ways to identify and find RWL? What approaches beyond a "nosing around approach" might be better suited?
- What is the role of scientists in Urban RWL?
- Who should initiate Urban RWL: the inhabitants who are affected by RWL or science?
- In which contexts is it useful to implement RWL? (why and to what end?)
- Do RWL get better results concerning sustainability issues? Or are other instruments better?

[54] Wittmayer, J. M., Schäpke, N. (2014). Action, research and participation: roles of researchers in sustainability transitions. Sustainability Science 9 (4), 483-496; Scholz, R. W. (2011). Environmental Literacy in Science and Society: From Knowledge to Decisions. Cambridge University Press, New York, USA.

Working Group V: Bottom-Up Initiatives

The role of Bottom-Up initiatives in Sustainability Transformations

Martin David, Alena Bleicher

Bottom-up transformations: exploring the framing and conception of a great promise

The term *bottom-up transformation* in Transformation Research (TR) is often heralded to firstly offer innovative solutions for societal change towards sustainable futures as incubator of new ideas and innovation beyond the dominant regime and secondly, have great democratic appeal. In sustainability transformation research 'bottom-up' often carries a normative connotation, suggesting a panacea for change. The very notion of bottom-up transformations promises that citizens can engage in activities that may have the potential to fundamentally change the world around them. Research on bottom-up transformations aims to understand how societal change is initiated by small groups of actors and how change evolves in space and time. Scholars highlight the effectiveness of bottom-up transformation in levelling societal change towards sustainability.[55]

However, bottom-up transformation approaches have been criticised for fostering tokenism, mystifying community levels as a governing unit, and remaining on weak levels of organization.[56] This raises questions about organisational characteristics and about the endeavours of bottom-up transformations as such. *Who* participates and *how* is participation organised? So far, answers from TR have remained ambivalent, as it is not clear which stakeholders make up the "bottom". Some authors argue that bottom-up transformations evolve in neighbourhoods and do not include municipal or regional governments[57]; others explicitly stress the importance of governmental actors and argue that they initiate change and bottom-up initiatives, thereby paving the way for change.[58]

The aim of this working group was twofold. First, the discussion aimed to comparatively assess and evaluate experiences with bottom-up settings in the face of sustainability endeavours. Second, the normative and somehow romanticised connotation of the bottom-up concept in TR was to be critically revised.

The findings were structured along three guiding questions: What are the most interesting research questions or issues that came up? What other actor groups are involved and how? How could these questions be addressed (e.g. through specific disciplines, methods, and approaches)?

In their own research, the participants of the working group primarily dealt with citizens' initiatives in the context of technical projects related to energy transitions in Germany as well as social movements in a broader sense. Therefore, the focus was on civil society bottom-up movements and forms of so-called *uninvited participation*[59] in energy contexts in Germany. The group did not discuss bottom-up initiatives that could be found within enterprises or the role of actors such as trade unions (that have so far been largely neglected in TR, according to the keynote speech by Ulrich Brand).

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[55] Flaccavento, A. (2016). Building a Healthy Economy from the Bottom Up: Harnessing Real-World Experience for Transformative Change. University Press of Kentucky.

[56] Smith, J. L. (2008). A critical appreciation of the "bottom-up" approach to sustainable water management: embracing complexity rather than desirability. Local Environment 13(4), 353-366.

[57] Wallner, H. P., Narodoslawsky, M., Moser, F. (1996). Islands of sustainability: a bottom-up approach towards sustainable development. Environment and Planning A 28(10), 1763-1778.

[58] Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. Environmental Innovation and Societal Transitions 1(1), 24-40.

[59] Welsh, I., Wynne, B. (2013). Science, Scientism and Imaginaries of Publics in the UK: Passive Objects, Incipient Threats. Science as Culture 22(4), 540-566.

To what end? Bottom-up movements as a corrective element in the German Energy Transition

The working group focused on citizens' movements, e.g. as conceptualised in the Multi-Level-Perspective (MLP) Model[60]: small groups of citizens that become influential in technology development and in the modification of social structures. Such groups, notably in the German context, engage in locally highly relevant issues. These issues are linked to contexts such as renewable energy infrastructures, projects that modify the local environment in general, or questions of urban development. Citizens' initiatives can act in favour of an issue, but more often they take a critical position. In the discussion it became obvious that the motivation for building such a bottom-up initiative often lies in the contestation of a concrete (infrastructure) project (siting conflict) or of a dominant discourse, like for instance shown for the case of the *Elektrizitätswerke Schönau*. This German energy-coop which became active in 1987, opposing German energy policy at the time later engaged in a concrete project of energy supply for Schönau, a small city in South Germany, where it was able to take over the grid as well as electricity supply and to supply its customers with renewable energy[61]. These initiatives are convinced that local interests are being ignored when decisions that impact local living environments are taken outside their area of influence. Thus, these bottom-up initiatives in the moment of their appearance often have the form of local protest movements and can be seen as uninvited intervention:[62] Some cases show that local actors struggle with the fact that the only possible way to participate in state projects is through consultations which eschew discussions on the particular project. Some initiatives claim that they are not given enough space for articulation.

Knowledge production and utilisation seems a central part of bottom-up initiatives. The following functions were discussed: local engagement yields in gathering of knowledge (discussed in depth for very long in knowledge sociology). As it is known from controversies on risk technologies, knowledge takes the form of *counter-expertise* challenging the position of experts, project managers and state actors. Often the translation of own interests into the language of science, for example by engaging counter-experts is the 'last chance' to be heard at all. Knowledge and experts hold great power over the bottom-up movements since they can be used as a last resort. However, recently experts claim that actors of citizens' initiatives increasingly avoid fact based controversies, that they are not accessible for rational, science based argumentation and rely on emotions as well as easily accessible knowledge that supports the own opinion but do not comply with scientific criteria. So far; no research exists that proves this tendency empirically. Furthermore research is needed to clarify if this observation originates in the well-known *deficit model* or if elements of *post-truth argumentation*[63] are at work in these controversies.

As has been shown for the case of *Elektrizitätswerke Schönau*, local protest movements can transform into innovators by mobilising local knowledge capacities and engaging in dominant discourses[64]. So far, processes, dynamics and structures of these transformations (especially in regard to the production of knowledge) are understudied[65]. However, as it was shown, the production of local sustainability knowledge became relevant for other actors later; this is especially true for local politics, engaging in sustainability projects (David, 2016). Although citizens' initiatives are primarily focused on locally relevant issues, in some cases initiatives grow and gain transformative power beyond the local level. Thus, for example villages transforming their energy system and relying on renewables

[60] Geels, F. W., Schot, J. (2007). Typology of sociotechnical transition pathways. Research Policy 36(3), 399-417.
[61] David, M. (2016). Bürgerenergiewende: Wissen durch Handeln? Nomos.
[62] Welsh and Wynne 2013 (*op. cit.*).
[63] For a first conceptualization see Tallis, M. (2016). Living in post-truth: power/knowledge/responsibility, CEE new perspectives, 30.7.2016. http://ceenewperspectives.iir.cz/2016/07/30/012016-editorial-living-in-post-truth-powerknowledge responsibility/.
[64] David 2016 (*op. cit.*).
[65] David, M., Schönborn, S. (2016). Die Energiewende als Bottom-Up-Innovation. Oekom.

may become best practice and spread the knowledge they generated.[66] Knowledge diffuses in networks, in which bottom-up movements strongly evolve. It is a crucial question how knowledge, produced by such initiatives – locally generated knowledge for transformation – is accessible for experts and scientists in transformative research, how to approve the 'scientific-ness' of such expertise and how to translate it into scientific knowledge?

The discussion revealed: the role of local protest movements in sustainability transformation essentially depends on the precise context but has not been an issue in TR so far. Local initiatives that focus their protest on unsustainable practices, such as gas fracking or brown coal mining, can be understood as catalysts in sustainability transformations. In contrast initiatives that criticise renewable energy infrastructures (wind mills, power transmission lines, biogas plants, geothermal energy etc.) or projects that are related to climate change in the wider sense, such as CCS, rather confuse transformative research. Often these bottom-up initiatives focus on the preservation of the status quo rather than on changing or transforming it. So far, it is an open research question how local initiatives that often aim to protect the local environment, deal with the apparent contradiction that their goals (e.g. prevent wind mills on the fields) conflict with the larger goals of climate policy.

To what extent can uninvited publics[67] at the local level 'correct' a nationally decided transformation project (such as the energy transition in Germany) and adjust it to local conditions? Ironically, the implementation of the German energy transition suffers from a lack of participation, and bottom-up protest movements are legitimate forms of participation. Thus the question is how to respond to these initiatives in a way that fits with the ideals of a sustainable society?[68]

With regard to no-fracking and no-coal movements the question was raised how far the uptake of transformative issues enables an interregional mobilisation (in the sense of social movements).

The group concluded this part of the discussion by highlighting the need for a sound conceptualization of bottom-up initiatives and their transformative power in order to understand bottom-up-transformations.

How? – Mobilization and Legitimacy of bottom-up initiatives

Regardless of the specific issue bottom-up initiatives deal with, recent research revealed that socio-demographic patterns of local protest groups are very similar: they often consist to a large extent of well-educated people who are economically secure.[69]

Individuals, leaders of initiatives, can be understood as change agents as they are needed to initiate and lead bottom-up movements. Bottom-up initiatives often start by mobilising the local neighbourhood, by making citizens feel affected by the issue in question as well as being part of the initiative (inclusive strategy). Although they often claim it, goals of bottom-up-movements (do not necessarily represent the opinion of "the local citizens". The so called "silent-majority", those individuals who could be engaged for or against an issue but are currently not, is wooed by bottom-up movements as well as project initiators[70]. Bottom-up-movements might appear very inclusive from their own standpoint, but might appear very exclusive to outsiders. Once a group is established, it is often enlarged

[66] Späth, P., Rohracher, H. (2010). „Energy Regions": The transformative power of regional discourses on socio-technical futures. Research Policy 39, 449-458.

[67] Welsh and Wynne 2013 (*op.cit.*).

[68] See, e.g., Böschen, S., Pfersdorf, S. (2014). Partizipation von zivilgesellschaftlichen Organisationen in Innovationsentwicklung und Risikobewältigung. Forschungsjournal Soziale Bewegungen (FJ SB) 4/2014, 50-59.

[69] See, e.g., Klatt, J. (2012). Partizipation: Ein erstrebenswertes Ziel politischer Bildung? Aus Politik und Zeitgeschichte 62(46/47), 3-9.

[70] We discussed that the concept of "silent majority" that is often addressed in discourses from a social scientific perspective does not exist at all.

through bonds of friendship or family. Such strong ties can lead to segregation or non-involvement[71]. However, the discussion showed that a prevailing trust towards 'the locals' can be observed. Research reveals that trust towards local initiatives is high, whereas trust towards 'outsiders' and 'ideas from outside' (local vs global) is rather limited. Thus, the crucial question is who is represented by citizen's initiatives? On what is the legitimacy of such initiatives grounded? The limits of their democratic potential have already been discussed in social movement studies. These issues should be taken up in TR[72].

Initiatives often professionalize during their activities. This can cause conflicts: new professionals entering a group/organization can be perceived as intruders, and the first movers might be pushed out. Professionalization can furthermore relate to mainstreaming in the sense of using means (e.g. press relations or expertise in campaigning) of established organisations such as environmental NGOs. Bottom-up-movements even engage in coalitions with powerful actors in order to make use of their influential positions, for example through *infiltration*, i.e. members of bottom-up initiative 'overtake' established organizations with their goals.[73] Actors of established organizations may also become engaged in bottom-up initiatives and bring in goals of the organization. Such processes may cause conflicts that become influential in the development of bottom-up movements.

Research questions arising from these observations are:

- How do bottom-up movements emerge, mobilize fellow campaigners, and evolve?
- How do the potentially changing goals during this process relate to sustainability transformation?
- What are conflicts within bottom up initiatives and between societal actors?
- What are appropriate terms and concepts to address them?
- Which conflicts are not addressed?

Interestingly, *new coalitions,* that nobody had thought of, can emerge and tremendously change the conditions from the outset. Such coalitions were described for the local energy transition at the Lake Constance pushed by Solarcomplex AG: the local division of one of the biggest German environmental NGOs positioned itself for siting large scale projects, an organization which usually opts against it for reasons of the conservation of nature.[74]

Local governments play a crucial role for bottom-up movements since they can block or enhance endeavours. Bottom-up movements can rely on national policy but national policy can be at the same time a reason to engage in protest or proactive action. Coalitions between bottom-up movements and local policy are quite common and have been analysed in social movement studies. An open question with regard to sustainability transformation is: What is the transformative potential of these coalitions?

Two more trends have been discussed in the working group: the use of bottom-up movement and protest structures by industries (business) and organizations ("protest industry"). Industrial actors increasingly make use of bottom-up mechanisms to pretend the existence of a supporting public in order to feign public support. A phenomenon that recently has been called "astroturfing": industries conceal their own endeavours within grass root initiatives[75]. Furthermore, organisations acting at the

[71] See, e.g., Granovetter, M.S. (1973). The strength of weak ties. American Journal of Sociology 78(6), 1360-1380.
[72] See, e.g., Klatt 2012 (*op. cit.*).
[73] Rink, D., Haase, A., Grossmann, K., Couch, C., Cocks, M. (2012). From long-term shrinkage to re-growth? A comparative study of urban development trajectories of Liverpool and Leipzig. Built Environment 38(2), 162-178.
[74] David and Schönborn 2016 (*op. cit.*).
[75] See, e.g., Cho, C. H., Martens, M. L., Kim, H., Rodrigue, M. (2011). Astroturfing Global Warming: It Isn't Always Greener on the Other Side of the Fence. Journal of Business Ethics 104(4), 571-587. doi:10.1007/s10551-011-0950-6; Beder, S. (1998). Public Relations' Role in Manufacturing Artificial Grass Roots Coalitions. Public Relations Quarterly 43(2), 21-23.

international level, such as the German organization *Campact*[76], make protest and opposition their business ("protest industry"). Concerning the self-understanding of these organisations this business is to reach a more sustainable society. Research should analyse to what extent this goal indeed guides the action of these organisations or if protest becomes an end in and of itself.

In some cases it seems that local interests and impacts on local environment become the pretext for national and international mobilization.[77] This is often the case when the issue of concern is part of national (and even international) discourses such as climate change (e.g. in the context of protest against fracking technology and brown coal mining in Germany). Such international mobilization runs danger of detaching from the local interests; this could cause a lack of legitimation: how are bottom-up movements legitimated? In how far can established NGO represent bottom-up initiatives?

Furthermore, depending on their goals, bottom-up-transformations can leave behind a battlefield and can cause new conflicts which are barely addressed and reflected upon in the shadow of potential 'victory'. This has been shown for the *Elektrizitätswerke Schönau*: after years of campaigning, the city of Schönau was polarized in two fractions, one opting for the *Elektrizitätswerke Schönau* and the other fraction voting against it (David, 2016).

Two research questions regarding bottom-up initiatives in sustainability transformation derived from these observations: Which new and unexpected coalitions can be observed? Examples are citizens' initiatives and industries (active engagement of industries – e.g. "astroturfing") and nature conservation NGOs and government agencies as well as citizens' initiatives. What role has local government regarding bottom-up initiatives?

Impacts? Some bottom-up initiatives gain impact on the wider society

Climate protection as a goal of sustainability transformation materialises for example in infrastructure for renewable energy. But sometimes the necessary installations oppose interests of local actors and nature conservation. It was discussed to what extent this is based on a 'clash of paradigms'.

Some bottom-up initiatives have influence beyond the specific local situation (anti-fracking movement, EWS, renewable energy villages etc.). However, the participants of the working group agreed that the impacts of many other bottom-up movements are limited and remain local. This is not least due to the fact that the issue of concern is often not part of the debate. While the local population is for example invited to discuss where the high voltage power grid shall be located, the questions of: do we want a transformation of the energy system at all, in which way (using which technology) do we want it, and what is our specific role for the region - are not up for debate and out of local influence. More research is needed on impacts of best practices such as renewable energy villages.

Sometimes actors other than civil society initiate a bottom-up movement as a form of mobilisation and in order to exploit the legitimacy that public participation grants, in order to push their own interests.[78] The use of such methods is subject to critique: of being a tokenism if bottom-up-mechanisms are used to justify actions and do not leave room for deep and open discussion. Sometimes citizens' movements are even suspected of only pretending to be participative and to abuse the bottom-up nimbus for their concern.

[76] https://www.campact.de/.

[77] Zilles, J., Schünemann, W. (2016). Wie findet man als Gegner statt? In: Hensel, A, Kallinich, D., Kiegeland, J., Lorenz, R., Mueller-Stahl, R. (eds.) (2016). Demokratie in Aufruhr. Jahrbuch des Göttinger Instituts für Demokratieforschung. Stuttgart, 58-64.

[78] Nicolaus, K., Jetzkowitz, J. (2014). How Does Paying for Ecosystem Services Contribute to Sustainable Development? Evidence from Case Study Research in Germany and the UK. Sustainability 6(5), 3019-3042.

The overall question remains: what is or what could be the contribution of critical bottom-up movements to transformation of society?

Transformation research should take environmental conflicts, technological controversies, and findings of social movement studies into account more carefully in order to explore the role and the impact of bottom-up initiatives in transformation processes.

The discussants found methods such as open and semi-structured interviews, focus groups as well as action research useful to inductively address bottom-up transformation. But also more quantitative methods such as panel studies can reveal structures and dynamics.

Working Group VI: Individuals

The notion of transformation at the individual level

Christine Polzin, Ines Thronicker

Radical changes towards sustainability have been analysed from many perspectives and in relation to a number of actors, e.g. the state, experts/transformative research, companies. So far, however, not much research has applied the notion of transformation to the level of individuals. This working group explored this gap by asking (1) **why** there might be a (theoretical as well as practical) link between transformations at the individual level (sometimes also called "inner change") and transformations at the societal level, (2) **how** such links could be analysed empirically and (3) **what consequences** the exploration of the links between transformation at the individual and societal level entails.

What do we mean by the notion of "transformation at the individual level"?

Addressing the three guiding questions requires some common ground on what the notion of "transformation at the individual level" could entail. In a first attempt, it was suggested that it hints to the idea of radical, substantial change that remains effective in the long term and may be observable through pro-sustainable behaviours, but is rooted at a deeper personal level, involving elements such as values, worldviews, and attitudes. At its core, it might involve a different way of seeing, understanding and relating to oneself and one's environment. Within the working group, there was no fundamental opposition against this broad sketch of the term. Delineating it more carefully and precisely, however, would have required a workshop on its own. Given the inherent subjectivity of the term, it is likely to remain a challenge for research to work with it.

Although this question was not directly asked in the workshop, one might be tempted to ask how far this term is useful or necessary at all for the purpose of shedding light on the roles and agency of individuals in sustainability transformations.

Could individual transformations be linked to sustainability transformations, why and how?

> *"Problems cannot be solved with the same mind set that created them."*
>
> *Albert Einstein*

A number of general arguments were put forward for why there might be linkages between transformations at the individual level – notably through mindfulness-based approaches – and at the societal level.

One line of reasoning suggests that mindfulness practice – if understood as a potential "technique" to foster inner transformation – could foster sustainable behaviours through its effects on subjective wellbeing[79] and other mediators (see Question 3). Several controversial issues were raised about this hypothesised link. First, it seems to be based on two major underlying assumptions: (i) a seemingly linear and mechanistic relationship between mindfulness, wellbeing, sustainable behaviours that is common to conceptual models but may not reflect the dynamic and complex character of both indi-

[79] See also Ericson, T., Kjønstad, B. G., Barstad, A. (2014). Mindfulness and sustainability. Ecological Economics 104(0), 73-79. doi: http://dx.doi.org/10.1016/j.ecolecon.2014.04.007.

vidual transformation and sustainability; and (ii) the idea that without individual transformations there can be no fundamental transformation at the societal level. It was consequently regarded as very difficult to draw and measure the causal linkages hypothesised in the model.

Secondly, it was cautioned that an individualistic understanding of the process and elements of transformation at the individual level needs to be interrogated. Inner transformation is not necessarily an individual process and should not be conceptualised in terms of a division between "life in here" and "life out there". Such a division may lead to a misconceived focus on individual-level variables such as personal wellbeing, which may not be a meaningful concept to someone whose transformation has led her to equate personal with planetary wellbeing.

Third, the focus on "outcomes" might lead us astray and have unintended consequences. Aiming to demonstrate that something "works", if possible through outcome analyses, is a typical concern in debates about sustainability transformations. It follows a utilitarian logic, which one should at least acknowledge and be aware of, even if we might not be able to escape it in trying to make the case for inner transformations. The effects of such a framing on the process and pathways of individual transformation are yet unknown. Related to the concern about the effects of a utilitarian framing the critique was raised that approaches to individual transformation fit well into the logic of an individualistic society, in which we witness an increasing shift of responsibility from the state towards citizens and consumers. Are we thus giving up the idea of a strong state and society? Is mindfulness feeding into the trend of increasing individualisation?

A more general reason for investigating approaches to individual transformation is the lack of promising approaches that may be able to create long lasting behavioural changes that are rooted in a context-independent motivation for sustainable behaviour. There was common agreement among the participants that current patterns of overconsumption are difficult to change significantly. Regulating or even forbidding high-impact consumption practices such as animal-based diets or flights is difficult. New ideas are needed to induce behaviour change. Nudging can hardly be considered "transformative". But while mindfulness and other approaches to inner transformation might be interesting to explore in more detail, the critical question is: Does the polity have the mandate to try and change deeper mindsets? In view of historical examples, this is highly questionable.

Given the size and challenge of overconsumption, concern was expressed by some participants with regard to the effect size of individual transformation. Is this just a drop in the bucket, or is there more to the old philosophical and religious idea that in bringing about a radical change in oneself, one naturally brings about a radical change in the structure and the nature of society? How can we analyse and conceptualise these ripple or positive spill-over effects, and do we indeed need to? This leads us to the second question.

Overall, the discussion summarised above left most participants unconvinced that we were able to delineate clear linkages or causal relationships between inner transformation and related "techniques" or pathways and sustainability transformations. Thus, the question we set out to explore in the first part of the workshop still needs critical thinking and analysis.

How to "attain" inner transformation and measure the effects on sustainability?

This question was illustrated through a short presentation of the research project BiNKA (education for sustainability through mindfulness training)[80], which analyses and measures the effects of an 8-week mindfulness training tailored towards the goal of reducing consumption. This was followed by a short brainstorming on alternatives to mindfulness trainings that may be interesting in fostering or

[80] See http://achtsamkeit-und-konsum.de.

supporting inner transformations, such as Bohm dialogues[81] and other group-based forms of reflection as well as nature-based experiences.

Closely related to the question of methods, we inquired into the quality of settings, teaching and research: What difference do the teacher and the quality of teaching make on the results of particular approaches or methods? This question is especially relevant when inquiring into possible ways of upscaling such approaches.

What settings and sources would be considered legitimate and acceptable to provide the space for such approaches? Would the state face problems of trust and legitimacy if it was directly promoting approaches that have the potential to change people's mindsets? The answer is likely to depend on the goals of the approaches and how transparently they are expressed. In schools, hospitals, parliaments, prisons and other public institutions, mindfulness courses aimed at reducing stress and building resilience are already being offered. Would mindfulness-based courses that aim to foster sustainability-related goals receive the same interest and openness? – If so, where and why? So far, to the best of our knowledge, relatively few courses have tried to create and analyse this link (the BiNKA project is one of them). There was no doubt that participation in any such course would need to be voluntary.

It was debated whether or not inner transformation needs to be a conscious or even intended process. On this issue there was no agreement. Some participants thought it needed to be both conscious and intended while others argued that the outcome of the process was more important in the context of sustainability transformations.

The question of measurement was perhaps the most controversially discussed question of all. It was introduced by an illustration of the possible causal linkages one could investigate between mindfulness and sustainability (see figure 1).

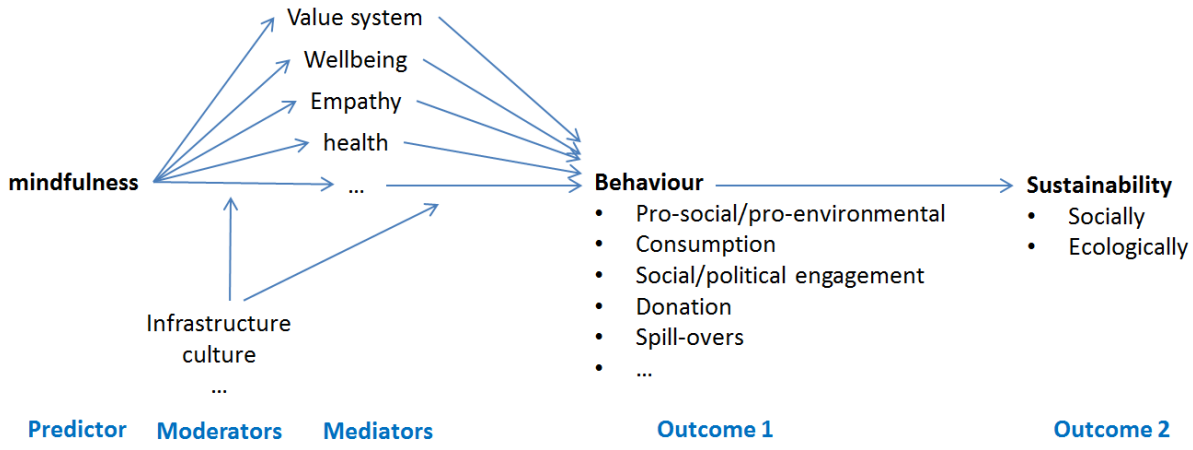

Figure 1: Conceptual model of the effects of mindfulness on sustainability

For the purpose of the discussion, it was assumed that mindfulness was a predictor for sustainable behaviours.[82] This relationship is likely to be mediated through various factors such as wellbeing, empathy, health, or intrinsic values, i.e. higher mindfulness yields effects such as higher wellbeing or higher empathy, which may, in turn decrease unsustainable behaviours. At the same time, this mediated relationship is assumed to be moderated through influences from the family, infrastructure, belief systems in society, norms and the like. For example, higher mindfulness may only yield higher

[81] See, e.g., http://www.david-bohm.net/dialogue/.
[82] See also Ericson (2014: 75, *op. cit.*) for a similar depiction.

wellbeing if there is support from family members or a societal norm of an accepting attitude towards mindfulness training. In other words, the mediators influence HOW mindfulness influences behaviour, while the moderators are the conditions under which mindfulness influences behaviour. Finally, sustainable behaviours are only a first level outcome of enhanced mindfulness. It is a questionable to what extent these behaviours lead to sustainability as the ultimate outcome.

How the different variables are measured can make a huge difference. Subjective versus objective measurements, for example, may lead to different conclusions. The same is true for measures of impact versus intent-oriented behaviours. It was stressed that one needs to be very careful in choosing variables and measurements.

Another area of contestation was the question of outcome measurement. If we are indeed interested in measuring sustainable behaviours, the question is how to operationalise this outcome. What is considered to be "sustainable"? In psychology, a typical outcome measure is so called "pro-environmental behaviour", which only covers part of a more complex term. It was thus suggested that pro-social behaviours would need to be considered as well, including behaviours such as donating money or time to charities, political engagement, or product-sharing. Moreover, the measure should ideally be able to account for the complexity of individual behaviour as a whole and thus take into account spill-over and rebound effects, changes over time and other intended and unintended effects. The second (and arguably more important) outcome, sustainability, is often assumed to result seemingly automatically from the aggregation of individually sustainable behaviours. However, given the complexity of the problems involved in measuring the sustainability effects of behaviours at the individual level and at measuring sustainability at a societal or even global level – which requires an approach that is both long-term, wide in scale and broad in scope – it is far from evident how these hypothetical linkages work out in practice and how they can be analysed in the real world.

At a first glance, such a conceptual model on the effects of mindfulness looks helpful in shedding light on the hypothesised assumptions and relationships. Many assumptions that are usually implicit in debates about inner change can be made more explicit and tested. However, upon closer examination, we encountered a number of doubts. To what extent is it possible or appropriate to simplify the complexity of transformations within individuals through such a model? What kind of model, if any, could adequately capture the idea of individual transformation, or at least "change" or "transition"? Since an "inner transformation" is by definition a process that is highly personal and unique to each individual, how can findings be generalized meaningfully? How can we assure proper control groups? Given that individual change always happens within a complex and adaptive system and that this context may have varying degrees of impact on the individual, we have to carefully design research settings and critically interpret findings without falling prey to reductionism or mechanistic thinking. While it was clear that questions of measurement could only be addressed through mixed-method-approaches and context-sensitive methods, it is open to debate what impacts and risks attempts at inducing and measuring inner change and its effects on sustainability might bring along.

Finally, the group discussed what might be appropriate criteria of a "successful" inner change. It was concluded that success is context sensitive and has no "cookbook answers". How meaningful is the measurement of "success" in terms of inner change at all? Is there any change of being unsuccessful? It was suggested that the process of change itself was an important part of learning, which we currently know very little about. A focus on behavioural outcomes may be more realistic than any attempt to measure inner change.

So what?

The personal, inner dimension of sustainability transformations is likely to remain a topic of growing interest. The current debates about sustainability transformations tend to focus on the roles of different actors such as the state, business, or experts at various levels and their interactions. Important as these external perspectives may be, this working group concluded that a focus on "us" or "I" is a gap in our understanding and acting on sustainability that is worth filling with new ideas and insights.

In doing so, however, many questions are still open, and many more could be asked, for example:

- Is it desirable or legitimate to instrumentalise mindfulness or other approaches to individual transformation for political ends?
- Talking about pathways towards change at the individual level is typically met by charges of shifting responsibilities from the state to the individual. To what extent is this a legitimate concern, and how could it be addressed?
- What are the unintended consequences of these discussions and approaches?
- If approaches to inner change became more popular, how could the quality of teaching and research be ensured?
- What ethical responsibilities do teachers have? Are we seeing new forms of paternalism?

Day 2

Working Group I: Bottom-Up Movements and the State

The relation between bottom-up movements and the state: How can their interactions be shaped in order to foster transformation processes?

Alena Bleicher, Martin David, Sabine Weiland

The goal of this discussion was to analyse the relation between bottom-up movements and the state, and to see how it can be shaped in order to foster transformation processes.

Bottom-up movements can only be understood through their interactions with other actors, such as the state. From the perspective of state actors, any efforts in fostering transformation remain in vain if these are not supported by societal actors. Therefore, "merging" these two working groups raised interesting research questions. The following issues were discussed in detail:

Learning. How do sustainability transition elements (e.g. innovative practices) spread and how can others learn from them? Which role do both actor groups, bottom-up movements and the state play in this? These questions are based on the idea that bottom-up movements are able to successfully push transformations once they are provided with supportive structures being created by state action.

Impacts of bottom-up initiatives. How can impacts be evaluated and strengthened on grounds of sustainability? The participants of the working group agreed that more scientific research is needed in order to understand the impacts of bottom-up movements on transformation processes and their underlying causal relationships. How can these questions be addressed by science?

State. Is the state facilitating or prohibiting transformation processes? How should bottom-up movements react on these state politics vis-à-vis transformation? Normally, the state come into play and interacts with bottom-up movements at the local level. This means, any analysis of the interaction of state and societal movements should focus specifically on this level.

Different state structures (central vs federal). What are the opportunities and challenges of different state structures? Of course the authority and competencies of a local government in Austria differ from those in France. In relation to bottom-up movements, the question is how different local governance structures account for particular trajectories of bottom-up transformations.

Who? Who influences whom? Particular constellations between bottom-up movements and the state can lead to a dominance of either bottom-up movements or the state in this specific constellation. A related question is: who needs whom: Does the state need bottom-up movements, or do bottom-up movements need the state in order to achieve changes? Who needs whom to which degree?

Perceived rooms for cooperation. A key insight was that bottom-up movements normally direct their protest against the state/state policies. For this reason, any cooperation between the two actors might not be easily possible or willingly pursued. Taking a strategic perspective, it is nevertheless worthwhile asking how rooms for cooperation could be initiated and/or enlarged? For instance, are public arenas a good tool for contention? Can a climate of consensus always help to solve a conflict? Which role does conflict play for cooperation? The discussion highlighted that bottom-up move-

ments should enhance their abilities to explore such arenas, and the state should actively strive to create such arenas.

Participation and joint decision-making. Beyond cooperation, the question also is how bottom-up movements could participate in state policy- and decision-making. Oftentimes, different forms of consultation exist, but the question remains what happens afterwards with the collected societal opinions and knowledge. How could forms of joint decision-making look like to foster transformation processes? The state should develop instruments suitable therefore. It should be clear that such instruments also require (not little) resources.

Established and vested interests opposed to transformation. How can these interests be anticipated and taken into account in strategic terms? This question concerns for instance the way the state acts according to bottom-up movements. The state is far from being a neutral actor. Moreover, (local) governance structures can be supportive, but they can also oppose bottom-up movements. The issue of accommodating established interests remained an open question during the discussion.

Growth coalitions. How can such coalitions promote sustainability transformations? Can they do so at all? The last financial crisis triggered contractions on many markets and led to new coalitions for economic growth. The question was debated if such coalitions could become "green" and if and how they would contribute to transformations. Here, bottom-up movements could either be part of such coalitions or oppose them.

Winners and losers. Transformation processes always create winners and losers. This in turn means that not everybody will be in favour of such transformations. Therefore, it is necessary to consider ways how potential hardships might be mitigated. On the other hand, societal transformation toward sustainability is necessarily a process with fundamental changes in all areas of societal living – incremental or mere 'cosmetic' changes will in the end not deliver a state of sustainability.

Working Group II: Urban Real-World Laboratories and Transformative Research

Silke Beck, Florian Koch

The WG discussed Urban Real-World Laboratories (URWL)[83] as one possible form how transformative research can be realised. It followed the distinction between *transformation research* (basic research on sustainability transformation) and *transformative research* (research for sustainability transformation – TR)[84] and focused on the latter. URWL offers a showcase and thus also an empirical object of study to exemplarily explore the challenges, potential, pitfalls and limits of TR and to reflect on the lessons learned in real-world research projects, advancing the understanding of the role of scientists and experts in societal transformation. One of the guiding questions was how TR affects the concepts of the (social) sciences: of what they are, of what they ought to do, and of the ways in which they should be organised to live up to challenges of doing TR.

To what end?

In order to put TR into practice, it is important to take into account how TR is defined, e.g. in current funding streams and science policies (such as the BMBF-call "Zukunftsstadt"[85])? In national and international research calls, forms of transdisciplinary knowledge production (including TR) are introduced as one of the criteria to be fulfilled to receive funding. At the same time, it is often not clearly defined how and to what end TR has to be performed and evaluated: Is TR applied in order to secure public acceptance for local planning of big infrastructure projects? Or is TR considered as a new instrument of knowledge production that includes a wide variety of stakeholders to enhance local democracy? At the same time, it remains open how TR is integrated into research projects: Is it still an add-on located at the end of a research cascade? Or is systematically included into research projects? And if this is the case, the question remains: how, where and when?

This also leads to the question what counts as TR: Real-World Laboratories, Grassroots Innovation (UK), transdisciplinary social-ecological research (SOEF), Living Labs, transition experiments etc.?[86] It is also an open question how TR relates to real-world experimentation.[87] And in a historical perspective, what are similarities and differences to urban planning processes as part of the local Agenda 21? All these questions call for future research. Understanding how different forms of knowledge production differ and interact and identifying factors that enable them may also inform the design and evaluation of real-world labs.

[83] Schäpke, N. et al. (2015). Creating Space for Change: Real-world Laboratories for Sustainability Transformations. The Case of Baden-Württemberg. GAIA 24(4), 281-283.

[84] http://www.wbgu.de/fileadmin/templates/dateien/veroeffentlichungen/hauptgutachten/jg2011/ wbgu_jg2011_en.pdf.

[85] See https://www.bmbf.de/foerderungen/bekanntmachung-1166.html (in German only).

[86] http://www.isoe.de/projekte/aktuelle-projekte/transdisziplinaere-methoden-und-konzepte/begleitforschung-reallabore-baden-wuerttemberg/; http://www.isoe.de/projekte/aktuelle-projekte/transdisziplinaere-methoden-und-konzepte/transimpact/.

[87] Krohn, W., Weyer, J. (1994). Society as a laboratory: the social risks of experimental research. Science and public policy 21(3), 173-183.

How?

Taking the idea seriously that research is actively involved in societal transformation processes, what are the conceptual and methodological challenges of TR? What are appropriate forms and processes? What are best practices and promising advances for future research in this field?

Former participation experiments in knowledge production demonstrate that questions of representation and inclusion matter.[88]

They highlight to put attention to questions as follows:

- *What role(s) do scientists and experts play in real-world transformations (such as RWLs)?*[89] *How can TR contribute to achieve, monitor and evaluate sustainability transformation?*
- *How can TR trigger and support societal transformation processes (for example on the urban/neighbourhood level)?*
- *Do science-based efforts to prepare and evaluate planning and decision-making contribute to render the politics of transformation more rational, effective and legitimate? Does the participation of experts contribute to promote and affect change toward a society-wide sustainability planning?*

Can the wider community become part of transformative research, how, why and with what effects? There is broad agreement that expanding the debate with publics is important for developing a credible way forward in sustainability transformation.[90] Long recognised as a tool for advancing democratic decision-making in technical arenas, public engagement exercises are participatory processes through which members of diverse publics express their views, concerns and recommendations about a techno-scientific issue and thus shape technologies and their trajectories. There are a variety of normative, substantial and empirical reasons for public participation in TR:

- Non-experts identify issues, risks and solutions missed by experts.
- Incorporating diverse perspectives strengthen the relevance of knowledge produced and the utility of policies.
- Public participation increases the perceived credibility of expertise, legitimacy of a policy, enhancing trust between scientists, policy-makers and lay publics. TR is more effective when its rules and representatives are perceived as accountable and legitimate.

Whatjustification is used by TR? What are the rational for and challenges by including divers, heterogeneous groups? The experiences from the RWL in Baden-Württemberg demonstrate that no unique form exists how RWL deal with issues of inclusiveness. They also raise the question how representative these experiments are: Do TR only include a small group of well-educated, privileged green citizens that already actively participate in local politics? How to deal with the inclusion of social groups and movements reluctant to participate in TR? Can TR convince them to participate? What are the reasons for their reluctance to participate in TR: Are these scientific results that are uncomfortable to their politics, inconsistent with their moral values and beliefs or broader issues such as the lack of autonomy and capacities to participate?

Do real-world experiments constitute a *bubble* of its own right, fully decoupled from politics at the ground? Are there factual asymmetries of power with regard to which views are presented in TR and

[88] Chilvers, J., Kearnes, M. (eds.) (2015). Remaking participation: Science, environment and emergent publics. Routledge.
[89] Wittmayer, J. M., Schäpke, N. (2014). Action, research and participation: roles of researchers in sustainability transitions. Sustainability science 9(4), 483-496.
[90] Winickoff, D. E., Flegal, J. A., Asrat, A. (2015). Engaging the Global South on climate engineering research. Nature Climate Change 5(7), 627-634.

what access exists to the resources necessary to express those views through the conduct of scientific expertise? Which groups – such as NGOs and other civil society organizations – have virtually been excluded from TR processes? Are they accountable to a wider, potentially excluded and potentially 'irrational' public?

If the wider community becomes part of TR, does this form of extension undermine the authority of experts? Empirical findings indicate that public trust into experts cannot be reduced to a function of information and fixed by more and better science. Climategate, for instance, turned out to be not only a question of the quality and integrity of climate science but also one of public confidence. It shows that public trust in experts is related to the performance and persuasive power of the people and institutions who speak for science. The climate controversies also show that even when scientists, politicians and publics agree on the basic principles, there is still plenty of room for disagreement about what the implications that science are for action.[91] Comparative studies show that disagreement expressed in public disputes about scientific evidence is often rooted in more fundamental differences over values. Based on these findings, the question calls for more research why different social groups (mis-)trust experts and what roles values, worldviews and framings play?

Is TR facing novel challenges in a post-factual era – in comparison to the politicization of climate science? How does the rise of populism coincide with the denigration of expertise and elites who are accused of having disconnected from 'the People'? Do categories and boundaries once established through the world ordering that underpinned science have become blurred? What role do technological developments play? Do social media add an additional dimension, as the networks that users create can become *echo chambers* (possibly emphasized by the filter bubble) where one political viewpoint dominates? Is world ordering increasingly delegated from science to algorithms that confirm already pre-existing views?[92]

Populist attacks might well spill over into attacks on academia as well. After all, populists not only attack political and economic elites; they also target 'snobby intellectuals' in academia. As a result, the credibility of evidence and expertise may become fiercely contested.

How are novel forms of knowledge production enabled and constrained by institutional arrangements (including membership, lines of accountability and rules of procedure)? Novel forms of research often are ad-hoc and short-term activity, it is an open question what happens when funding is running out.

The following research topic emerged from the discussion:

- What role(s) do state actors/public authorities play in supporting transformative research?
- How can science policy approaches and funding schemes support transformative research?

So what? Impacts and Implications of TR?

What are the impacts and implications of TR? What is transformative nature of TR? How can we evaluate the societal impacts and implications of TR?

Does TR tend to introduce a new form of 'environmental instrumentalism' where "all research is transformed into a practical tool to work out scientific solutions to problems that society has already

[91] Beck, S., Forsyth, T., Kohler, P., Lahsen, M., Mahony, M. (2016). The Making of Global Environmental Science and Politics. In: Felt, U. et al. (eds.): The Handbook of Science and Technology Studies, 4th edition. MIT Press, Cambridge, MA, 36.

[92] Rooduijn, M. (2016). Simply studying populism is no longer enough. Nature 540, 317 (15 December 2016). doi:10.1038/540317a, http://www.nature.com/news/simply-studying-populism-is-no-longer-enough-1.21145.

defined"?[93] Social science scholars have observed an increase in symbolic (or even simulative) participation (Chilvers and Kearnes 2015). While some can be considered successful others have been tokenistic. They often turn out as their opposite: often paying lip-services to the importance of divergent perspectives, but used as social technologies (mis-)used to maintain the acceptance of contested expertise, thus asking people to represent others in a way that's not always legitimate.[94] As a result, do they reduce the potentially endless range of questions and issues that researchers may legitimately deal with to one single overarching purpose – as Strohschneider warns?[95]

This also leads to general questions about the nature of "transformation management": how do transformations actually take place, thus tapping into the dynamics, controllability and direction of societal transformation?[96] Can processes and outcomes of TR be measured and controlled, as the term "management" indicates, and can transformation processes in general be managed and directed into a sustainable direction? Or, do transformation processes occur, un-planned and autonomous? Does the concept of transformation contain any adjustment in behaviour or societal structure, whether passive, incremental, reactive (autonomous) or pro-active anticipatory and planned? Relatedly, what are the connotations of concepts such as "laboratory" or "experiments"? Can RWL be planned in advance, and is their dynamic controllable? Does such a form of instrumentalism underestimate the complexity of the transformation challenges and the importance of surprising scholarly insights? Or, as an alternative does TR also produce surprising insights and is emergent, open and contingent and thus enhance uncertainty and ignorance? Does new, unpredictable knowledge create the real transformative breakthroughs that change the ways of society's thinking and acting?[97] Do experimentalist approaches such as the idea of "real-world experimentation", where problems and solutions are widely debated, framed in an open-ended way, and subjected to periodical revision on the basis of local experience offer robust alternatives in dealing with uncertainty and multilevel distribution of power? How can TR appraise its own performance in the light of the novel demands and expectations and how does it adjust procedures and structures both in response to scientific developments and as a result of lessons learned over the years?

TR may also change the way in which relationships between research and society are conceptualised. What lessons can be learnt from former research? First of all, we need more emphasis on the context in which knowledge is used and understand the rationalities of target groups as potential users.

Second, it is important to understand how TR and transformation research work together in order to be able to contribute to sustainable development. If transformation research mainly focusses on the measurability and implementation of Sustainable Goals, nexus challenges and effective science-policy relationships, what are adequate objects, concepts, methods and innovative approaches for the evaluation of TR?[98] What is the state of the art in evaluation research in social sciences? Can TR also contribute to make local planning and decision-making more responsive to societal needs and values and reflexive to its own assumptions and limitations and render open to change?

[93] According to Peter Strohschneider, president of the German Science Foundation, TR tends to a particular of technical instrumentalism by conceptualizing research as a matter of predefined problems and predictable solutions (http://www.dkn-future-earth.org/aktuelles/news/deutschland/new-dkn-future-earth-report-out-now-the-contribution-of-science-in-implementing-the-sdgs.html).

[94] http://steps-centre.org/2015/blog/time-to-reign-back-the-anthropocene.

[95] http://www.dkn-future-earth.org/aktuelles/news/deutschland/new-dkn-future-earth-report-out-now-the-contribution-of-science-in-implementing-the-sdgs.html.

[96] Gross, M. (2015). Experiments beyond the Laboratory. Chemistry World 12(11), 39.

[97] http://www.dkn-future-earth.org/aktuelles/news/deutschland/new-dkn-future-earth-report-out-now-the-contribution-of-science-in-implementing-the-sdgs.html.

[98] http://www.dkn-future-earth.org/aktuelles/news/deutschland/new-dkn-future-earth-report-out-now-the-contribution-of-science-in-implementing-the-sdgs.html.

Based on the themes raised during the discussion, the following main research topics concerning inclusion and participation were identified:

Comparative research on different forms of transformative research explore issues:

- *Are categories and criteria to conduct research on and evaluate novel forms of knowledge production still fit for function: Does the differentiation between "top-down" and "bottom-up" approaches to knowledge production still make sense? What is the heuristic value of the distinctions between formal and "invited" and informal "uninvited" participation?*
- *Most real-world initiatives of knowledge research are indeed hybrid: Grass-roots organisations are supported by scientists, turning to activists? Are novel categories required?*

How do social scientists and TR researchers position themselves vis-à-vis a science system in transition and a reordering of science and democracy or accelerate transformation? Will they remain as neutral as possible in their academic work, but feel a moral obligation to take part in the public debate to protect liberal democracy? Does promoting social and political pluralism produce the circumstances under which researchers can do their jobs and science can flourish?

Working Group III: Individuals in Business

The role of inner change in transformations of businesses and individuals

Christine Polzin, Julian Rode, Jenny Schmidt

As the first day of the workshop revealed, sustainability transformations require us to look at different actors in relation to each other. For example, while different actors and perspectives can be analysed separately, the more concrete and empirically oriented questions regarding the complex processes of change that constitute sustainability transformations emerge within their intersection. Here, we look at how individual change and business efforts towards sustainability are intertwined and what type of questions can emerge from this entanglement.

For group VI ("individuals") this session offered a valuable context for narrowing down some of the questions that had been discussed previously. One of the main bridges was the question what mindfulness – as a practice that has been associated with individual transformation towards sustainability – might mean in different contexts and to different people and what it might involve, for example in terms of institutional design. Mindfulness in the workplace has received growing attention in the literature in recent years as more and more companies offer specific trainings to their staff.[99] Little is known, however, about the extent to which such trainings may also contribute to sustainability transformations, either directly or indirectly within the companies and regarding society as a whole. To our knowledge, no mindfulness course exists that is specifically designed to enhance the understanding of the relationship between one's own behaviour and sustainability issues and foster behaviour change towards greater sustainability.[100] Trafo Workshop Group III ("business") had considered what organisational conditions within companies could affect transformational efforts. Hence, the focus on such efforts at the level of individuals was a useful concretisation.

The ensuing discussion revealed that the topic was understood in two main ways. For some participants, the main focus of analysis was "individual transformation" towards sustainability. Resulting questions in relation to the business context looked at the conditions that companies could help create in which individuals (as staff members or customers) could live and work more mindfully and contribute towards sustainability (see part 1 of this chapter, below). For other participants, individuals as actors in sustainability transformations were the main unit of analysis, i.e. the ways in which individuals could contribute towards sustainability in a business context, typically as managers or employees within companies. This interpretation was less focussed on intrapersonal dimensions and more on questions of power, influence or agency (see part 2, below).

Part 1: Business as a context for individual transformation

While business environments may be characterised by diverse sets of logics and organisational cultures, the main attributes that are generally associated with them in a market economy – competition and profit maximisation – may not be deemed fertile ground for individuals seeking transformation towards sustainability based on supportive states of mind, such as compassion and mindful-

[99] For a review of mindfulness research in organisational science, see Good, D. J., Lyddy, C. J., Glomb, T. M., Bono, J. E., Brown, K. W., Duffy, M. K., ... Lazar, S. W. (2015). Contemplating Mindfulness at Work: An Integrative Review. Journal of Management. doi:10.1177/0149206315617003.

[100] Exceptions outside the business context include Alison Armstrong's approach of using mindfulness to address compulsive buying (Armstrong, A. (2012). Mindfulness and Consumerism: A Social Psychological Investigation. Doctor of Philosophy PhD Thesis, University of Surrey) and Rachel Lilley's work on mindfulness and pro-climate behaviours (Lilley, R. (2012). Behaviour Change and Personal Empowerment: A Study of the Application of Mindfulness Training in the Development of Pro-Climate Behaviours. Master of Philosophy (MPhil) Thesis, Aberystwyth University, Aberystwyth).

ness. A number of questions that were consequently raised within the working group reflected the possibility of such contradictions between the logic of inner and outer change:

- What factors influence the in-/compatibility of business culture with inner change processes of the individual? Which outside aspects (e.g. current economic paradigms, legal restrictions) have positive or negative effects on inner change?
- How does business culture influence the individual in its perception of sustainability, or the need for (inner) change?
- What role does it play in transformation processes when individuals have to work against their inner belief systems? Does it spark the will to change something?

It would be short-sighted and biased, however, to portray business environments only as constraints to processes of inner transformation towards sustainability. Companies can also be dynamic and influential sources of change within modern societies, and a growing number of sustainability-oriented companies already work with new business models, trying to shield their employees from the competition and stress that dominates the market place.[101] Related to this more positive framing of possibilities for mutual reinforcement, the following questions emerged:

- **Changing workplace contexts:** How can workplace contexts be changed to facilitate individual transformation towards sustainability? What facilities do companies offer to foster inner change and sustainable behaviours among employees (e.g. meditation rooms, parks)? How does the approach towards change within the company influence the personal transformation process, e.g. short-term vs. long-term, scientifically supported or assisted, profit-oriented vs. non-profit, etc.?
- **Methods and approaches:** What approaches are offered to foster inner change and sustainable behaviours among employees (e.g. meditation classes, talking to others on a deeper level, rituals)? Can methods such as mindfulness trainings overcome psychological barriers to pro-sustainable behaviours within companies (e.g. Tania Singer's research on loving kindness meditation and its effects on pro-social behaviours)? What are cultural differences in "mindfulness" approaches (Western vs. Buddhist) and which ones are acceptable in a workplace setting? What works for whom?
- **Leadership:** What role does leadership play? What happens when top decision makers within businesses undergo processes of inner change? How can we shift our understanding of leadership to ensure mindfulness and sustainability?
- **Motivations:** What motivations underpin mindfulness approaches? What motivations do businesses have to support inner change, for example through mindfulness programmes (e.g. Google's "Search Inside Yourself" training)? What roles can policy incentives, burnout prevention, or employee retention play?
- **Positive reinforcement:** Can a business function as a multiplier to spark transformation within its workforce? If so, under what conditions and how? Is there a positive reinforcement, a "the sum is more than its parts" of transformational power that can be detected in the interplay of the individual and its workplace?

Mindfulness trainings were seen as a potentially valuable approach of organized reflection on these matters. Mindfulness-based Stress Reduction (MBSR) courses are already being offered in business contexts. However, they are rarely (if ever) related to sustainability. While there seemed to be agreement that eventually an inner transformation of leaders can influence the transformation of

[101] The book "Reinventing Organizations" by Frédéric Laloux was repeatedly mentioned in this session because presents new forms of organising or managing organisations that aim to facilitate participation, empowerment, trust and responsibility. It would be interesting to learn more about how Laloux's work can shed light on the interlinkages between inner change and organisational design. See Laloux, F. (2014). Reinventing Organizations: A Guide to Creating Organizations Inspired by the Next Stage of Human Consciousness, first edition. Brussels, Nelson Parker.

the business, the extent to which this necessarily leads to more sustainability remains an open question. It might also be worth analysing how political support could help to develop sustainability-related mindfulness trainings.

Participants encouraged assessing the link between mindfulness and sustainability, but also how mindfulness could complement other approaches to enable reflection on sustainability issues. The interlinkages to psychoanalysis were deemed interesting to look at in more detail. For example, questions that target the content, meaning and sustainability-related consequences of one's work are not common in the workplace and may bring up uncomfortable feelings. What this implies is that approaches that are geared towards inner change and sustainability may be a challenge that requires not only openness, curiosity and voluntary participation, but also a careful choice of trainers who can show profound knowledge of psychotherapy.

Some critical comments were made concerning possible negative effects of mindfulness trainings. For instance, if only leaders, i.e., top managers of a company, had access to such methods, this could reinforce existing power relations and counteract inclusiveness and social justice. From a meta-perspective, one may be tempted to wonder if mindfulness trainings in business settings challenge or reproduce capitalism. Moreover, an individualistic approach behind "inner change" could undermine a collectivist mindset that may be better suited to addressing sustainability issues. This also led to some thinking on what actually characterises desirable (or sustainable) business, mentioning aspects of participatory decision processes and less hierarchy (see e.g. the concept of "holacracy" – www.holacracy.org). A common concern raised by the group was that sustainability-related values and inner change might get integrated in the logic of profit, which may not be compatible with sustainability transformations. Finally, the group recognized the need to further link the discussion to political implications and to be alert to t possible negative consequences of politicising the debate on mindfulness and sustainability transformations.

Part 2: Business as a context for individuals to contribute towards transformation?

Businesses are always made up of individuals, some of whom may be motivated to engage for the cause of sustainability (whether or not this is accompanied by some kind of inner change as well). In relation to sustainability transformation, the working group found the following topics and questions worth exploring:

One cluster of research questions was related to the contexts in which individuals can initiate and drive change:

- Assuming a changing working environment, which change is perceived as necessary, how can contexts be changed and what business characteristics are helpful or hindering (e.g. size, mission, sector)?
- What role does business culture play in influencing individual efforts to influence the company towards more sustainable development?
- How can change within individuals with regard to sustainability (e.g. attitudes, beliefs) spread towards the wider business culture? What kind of context may facilitate such dissemination?
- Some businesses have an explicit environmental mission but struggle to live up to their values in their day to day operations (e.g. having caterers who provide organic food, encouraging vegetarian diets, minimise resource use and maximise recycling). What challenges and obstacles do these companies face, and what effects do these internal contradictions have on employees and their motivations to initiate or drive change that contributes to sustainability?

A second obvious cluster formed around questions of power, influence, experience and agency of individuals within companies:

- What role do certain, personally motivated individuals play in companies to "push" them towards transformative activities?
- What motivates business decision makers to strive towards sustainability?
- Can work or business decisions be influenced by a better understanding of what drives unsustainable lifestyles, or can such a better understanding be influenced through work and business decisions? If so, how?
- How does individual experience, e.g. meeting inspiring people or experiencing a natural catastrophe, influence the way in which individuals initiate change within the business?
- Does the feeling of belonging to a certain group (e.g. union, farming community, eco-activists) lead to defending certain sustainability-related values at work?
- What can make employees change their way of thinking such that they would initiate a transformation towards sustainability?

Some participants suggested that instrumental reasons for considering social and environmental aspects – that is, asking how this may enhance financial business interests – could serve as an entry point for the debate with business leaders. Ultimately, however, reflection would need to go deeper around sense and meaning ("what really matters"), the role and responsibilities of business in societal progress, and to which goals and principles business abides. It was as regarded as challenging that business could have workforce management as underlying motivation to engage in awareness-raising activities or research and that the logic behind profit-maximizing economic paradigms was believed to be contrary and incompatible with a truly radical transformation. There was strong agreement that a focus on financial profit maximization cannot lead to sustainability or truly social-ecological transformation.

Challenges for research

The complexity of the system was seen as challenging by some as well as the difficulty to define timeframes within which transformation could be "measured" or researched. A more fundamental critique questioned the role and impact of research on "inner transformation" itself, in that it may destroy the necessary conditions for inner transformation, namely trust and confidentiality, by attempting to extract data on people's thoughts and experiences with inner transformation. A "scientisation" of mindfulness approaches in specific contexts such as businesses may also contribute to shifting responsibility to individuals.

Plenary: By means of conclusion – looking ahead

How can the discussions of the workshop be taken forward? What opportunities may emerge? Participants discussed a range of future opportunities for further collaboration and funding that are summarised in the following tables:

	Activities	Person(s) responsible
1	Establishing a network: setting up a mailing list (on UFZ server)	Jan Wolfrum
2	Application for a Working group at German Committee Future Earth, deadline March 2017 http://www.dkn-future-earth.org/en/community/working-groups/	Silke Beck, Sylvia Kruse, Basil Bornemann + n.n.
3	Commentary "Getting out of the green bubble" to Future Earth blog http://www.futureearth.org/blog	
4	Webinar hosted by the Future Earth **Transformations Knowledge-Action Network** series exploring research on social transformations to sustainability. http://www.futureearth.org/future-e	
5	Organize a follow-up session at a conference, e.g. **IPA 2017: Activism, Populism, and the Future of the Democratic State/ Call for Panels** 5-7 July 2017 at De Montfort University, Leicester UK, deadline 12 .12.2016 IPAconference2017@dmu.ac.uk/ **8th International Sustainability Transitions (IST)** Conference 18-21 June 2017, Gothenburg, Sweden	No responsibility assigned so far – to be coordinated through the network
6	Checking funding opportunity with Norface ERA-NET: Pre-Announcement: A Multilateral Joint Call for Proposals on Transformations to Sustainability (**T2S**)[102] http://www.norface.net/2016/10/26/pre-announcement-a-multilateral-joint-call-for-proposals-on-transformations-to-sustainability-t2s/	Sylvia Kruse

[102] T2S is a new funding programme for international, transdisciplinary projects addressing transformations to sustainability initiated by the Belmont Forum and NORFACE network.

7	**FONA** (Research for Sustainable Development) Call: "Sustainable Urbanization Global Initiative (SUGI)" – Food-Water-Energy Nexus https://www.fona.de/en/call-sustainable-urbanization-global-initiative-sugi-food-water-energy-nexus-21767.html
8	Proposal for an **edited book**: "Action Research in Policy Analysis: Critical and Relational Approaches to Sustainability Transitions" Koen Bartels (Bangor University) and Julia Wittmayer (Erasmus University Rotterdam), deadline for abstracts: 30.11.2016
9	**COST Actions**: funding for research networks, enabling cooperation and coordination of nationally funded research activities http://www.cost.eu/COST_Actions
10	**ECPR** (European Consortium for Political Research) conferences and Joint Sessions of Workshops.

Paper projects

	Paper project/title	Person(s) responsible
1	Call for papers for special issues: Koen Bartels and Julia Wittmayer: "Action Research in Policy Analysis: Critical and Relational Approaches to Sustainability Transitions", deadline for abstract submission 30.11.2016	Niko Schäpke
2	Lea Fünfschilling, Lars Coenen and Niki Frantzeskaki: "Urban Experimentation and Sustainability Transitions" with a focus on the role of institutions, deadline for full paper submission: 12.12.2016	
3	Current opinion in Environmental Sustainability http://www.current-opinion.com/journals/current-opinion-in-environmental-sustainability/	

The organizers would like to thank all those who participated in the workshop for sharing their excellent contributions. We also welcome further comment about the workshop and suggestions on how we could continue this conversation in the course of the following years. This workshop report can also be downloaded here: www.ufz.de/index.php?en=41458

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