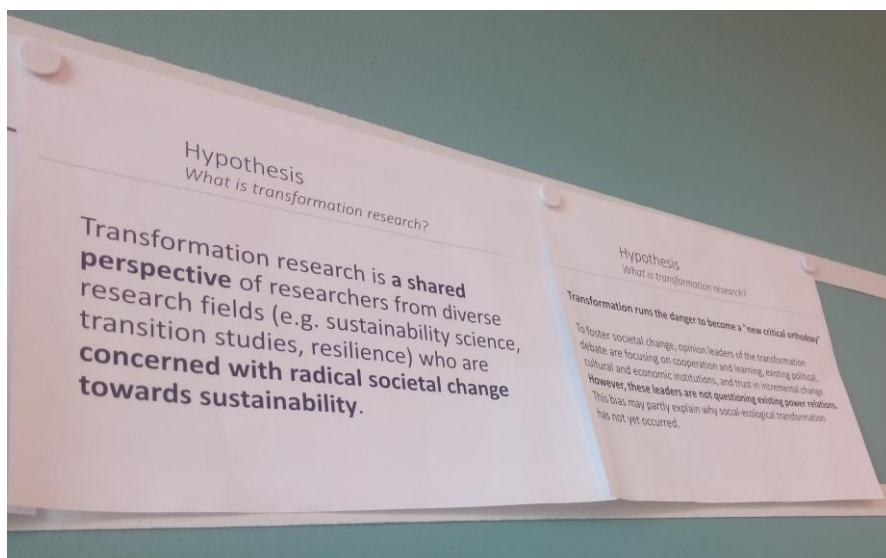DRIFT
Dutch Research Institute for Transitions

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Workshop report

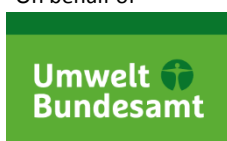# Transformation Research – Goals, Contents, Methods

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Expert workshop, June 14, 2016, in Berlin, 10 am – 4:30 pm

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Setting the workshop scene

Transformation research develops rapidly – it combines multiple research fields and approaches, converges theoretical concepts and frameworks, pursues the ambitious goal of contributing to societal sustainability transformations and advocates transdisciplinary research methods. There are some fervent debates about the legitimacy, societal impact and needs of transformation research, including its implications on the broader institutional setting of science.

During a one-day academic workshop in Berlin, about 25 scholars gathered to unpack and discuss (the development of) transformation research and to explore its goals, contents and methods from a variety of research perspectives. The workshop goals were to:
1) advance and offer structure to the current discussions on transformation research,
2) promote exchange and networking between professionals concerned with (research) interests and questions relating to societal transformations, and
3) discuss and critically reflect on the emerging field of transformation research: a) its content, societal and academic goals and relation to other fields; b) its research approaches; and c) suitable methods and their limitations.

The workshop consisted of three sessions that were oriented towards specific guiding questions. Each session started with three to four igniter presentations followed by discussions. This document provides a synthesis of main workshop insights (Section A, pp. 4-9) and describes some highlights of the presentations and discussions along the main questions (Section B, pp. 10-22). The programme and the participant list can be found in Section C (p. 23) and D (p. 24).

This workshop was part of the UBA-financed research project 'Von der Nische in den Mainstream' [From niche to mainstream]. This project seeks to better understand the mainstreaming process of social innovations and help policy makers and others to make informed decisions to support these practices. In addition, it aims to provide a definition and systematic overview of the emerging transformation research field and its objectives, foci and methodologies, embedding niche mainstreaming as a particular issue in transformation research.

The organizers hope that the discussions will be continued at events such as the International Sustainability Transitions Conference, the annual conference of the Sustainability Transitions Research Network (STRN), to take place in Wuppertal in September 2016. Another opportunity is the second project workshop focusing on evaluating systems for sustainability initiatives from civil society that is organised also in September 2016.

A | Workshop synthesis: main insights and research questions

This section provides a synthesis of the main workshop insights in five points. These insights are not meant to close but rather to add to and structure (parts of) the discussion on the development of transformation research. They refer to key discussion points that pervaded throughout the day and point to future avenues for exploring and advancing transformation research. From these we formulate a number of forward-looking research questions.

1. Defining sustainability transformations

At the most fundamental level there was a strong tendency to step back and question the meaning of 'transformation' and the term's relationship to sustainability. While transformation as a kind of change is generally conceived of as radical, what the implications of this radicality are thus far remain ambiguous. This makes it at times difficult to distinguish between (other types of) 'change' and 'transformation'. For example, transformation might occur as a result of both radical and gradual change, since transformations take place over long periods of time in which long-term gradual change might lead to rapid, radical change. In this context, an underlying question was also to what extent transformations can only be detected in hindsight. Another loose end relates to the overlapping uses of 'transformation' and 'transition', which is still not unambiguously solved. This issue, but also the question of the objects and subjects of change in a transformation highlight the need to clearly define a system focus. Polanyi's notion of a great transformation, that also the WBGU took up in its 2011 report (albeit more semantically than analytically), might provide an indication for orienting definitions of overall societal sustainability transformations within and in relation to which transformations at smaller (system) scales take place.

The conceptual ambiguity and openness of transformation bears the risk that transformation is employed as a buzzword that loses its analytical and normative value. As such, it is not able to provide a profound analysis of whether the detected change is indeed 'transformative' and hence contributes to a fundamental change of societal systems to overcome persistent unsustainability problems. The example of the green economy debate served to illustrate how in this way policies and strategies that only relate to minor changes ('ecological modernisation') can get legitimized as (allegedly) supporting desired sustainability transformations. Similarly, a narrow system focus that does not connect the analysis of (radical) change to broader societal systems might lead to the externalisation of unsustainability effects on other systems. In this context, also sustainability requires a sharper definition that extends beyond singular system foci and orients measurements of transformations.

Rather than closing the field by a too specific or narrow overall definition, a case-base approach was suggested as a way out of the impasse: telling each other about the cases and projects we work with. There is a tendency in research to not share concrete examples on the basis of which sustainability and transformation gain a specific meaning in a particular context, but rather to immediately go to the abstract level. Staying with concrete examples allows for exploring concepts in practice through situated definitions of sustainability and radicality, among others. This also enables discussing the desirability of the detected change in a context and its relationship to other contexts. Such an approach does not necessarily discount the need for global and conceptual definitions of what is a sustainability transformation, rather it

demands to step back and test our own meanings in what empirically happens on the ground. Once we obtained a better understanding of project-level change, this could be at a later stage related back to the abstract level.

From the issues raised during the workshop we formulate the following questions for future research:
- What are criteria to qualify different types of (transformative) change?
- What are suitable system foci for a transformation and what are thus the objects of transformation? How can we account for nested connections across systems and possible externalities?
- What are stories, narratives and examples of transformations? What can we learn from them in terms of how we understand sustainability transformations and externalities both in anticipating those and in recognising them in hindsight?

2. Defining the transformation research perspective and it's goals

In the report that DRIFT/Ecologic prepare for the UBA, transformation research was presented as a common research perspective that brings different research fields and topics into a joint conversation. The common denominator of that conversation is the interest in radical societal change towards sustainability based on the recognition of persistent problems. While this is not questioned in principle, other issues put on the agenda concern more precise definitions of the research perspective's goals and generated results as well as what defines its membership.

There is a broad agreement that supporting sustainability transformations marks a common goal of transformation research that is achieved through a variety of knowledge generation processes. Again, as discussed in the point above, this warrants more precise definitions of what are sustainability transformations. Challenges here go further; there is a need to sharpen the results of transformation research and improve the 'measurement' of their impact in terms of contribution to sustainability transformations. For example, transformation research projects often focus on specific and bounded case studies and it was debated whether and how such studies need to relate their insights to broader societal transformations. As there is an urgency underlying the transformation debate, research results need to be evaluated in a context in which the radicality and sustainability orientation of transformations are often marginalized scientifically and socially.

The diversity that is brought together by a transformation research perspective was appreciated. In that sense transformation research currently seems to be in a stage of 'opening up' rather than 'closing down'. For example, it has been stated that anybody who 'self-affiliates' with transformation research could be a part of and contributing to the perspective. Diversity is also embraced in terms of the results and impacts of (different types of) transformation research. There are different quality criteria and (diffusion of) outputs of transformation research in different contexts and relating to different types of research processes (e.g. science vs. stakeholder workshops). These need to be made more explicit. In this context, bringing together a large diversity of affiliates with transformation research (such as in the workshop) emerged as a great necessity to foster exchange and discussion on the goals, results and impacts of transformation research. While the diversity and liveliness of

transformation research was appreciated, there were also calls for standardization to professionalize the field.

We identify several questions that pertain to the need to sharpen the transformation research perspective:

- What are different goals of transformation research? Through what types of outputs, outcomes, impacts and research processes does transformation research contribute to those goals?
- How can transformation research be further structured and standardized for a more unified approach? To what extent is a unified approach desirable?
- How can different types of debate on transformation research be facilitated (e.g. scientific workshops, stakeholder engagement)?

3. Creating through transformation research

The foremost goal of transformation research is creating knowledge for sustainability transformation and achieving real-world impact. The latter is striven for through action-oriented research approaches and through using the knowledge generated to impact societal debate and action. Both the creation of knowledge and of real-world impact are mediated using different methods.

One of the goals of transformation research that was emphasized in the workshop was the need to contribute and support transformations through research and its results. The DRIFT/Ecologic report for the UBA proposed three different kinds of knowledge as result of transformation research, namely scientific knowledge, actionable knowledge and reflexive knowledge. Not only this categorization was intensely debated and problematized – also the suggestion of defining research results as such. One reason was that outputs such as papers or recommendations might be predictable, while outcomes or impacts might be much more

diffuse (e.g. influences on societal discourse). In addition, some knowledge might be immediately relevant while the relevancy of other knowledge might emerge only later or in a different context. Hence, next to distinguishing between different kinds of knowledge, there should also be a distinction between output, outcome and impact of knowledge and its generation processes.

The interest for knowledge generation puts emphasis on the actual process of knowledge generation as well as the research approaches. For more action-oriented research approaches (such as e.g. action research or transdisciplinary research), which claim social impact, making this impact visible is especially important – though also difficult. However, those approaches also have a challenge in building upon and improving the scientific knowledge base. This highlights how descriptive-analytical and action-oriented approaches are essentially closely related, but also how diverse the results of transformation research can be. Of main importance is hence to clearly define the intended results before the research process for all actors involved.

The focus on the processes of knowledge generation highlights the need for clearly defined quality criteria, which are mediating between the research process and its results. In order to be valid for both more descriptive-analytical and more action-oriented research approaches – different quality criteria might be needed against which to judge the merit of transformation research. Such quality criteria also need to zoom in on the research process and the methods used. There are various research methods for different ends. However, most important in how these work out is the way they are used and applied. As researchers, we continue thinking from a research perspective rather than from a more encompassing societal perspective (such as taken e.g. by transdisciplinary approaches) which also asks political questions such as who invests time in research, who is interested in the results and what is in it for involved stakeholders.

Research questions:
- What kind of societal questions are best answered through action-oriented and/or descriptive-analytical research approaches? What outputs, outcomes and impacts are achieved?
- How does critical (rather than instrumental) action-oriented research in sustainability transition research look like?
- How can quality criteria for transformation research be validated and further developed?

4. Engaging in reflexivity

A central challenge for transformation research is to boost reflexivity in various forms. This concerns primarily the research process and its results. During the workshop, reflexivity was debated as a rather unspecific concept that demands more careful attention with regard to who is reflecting, on what is reflected, for whom, and how. It takes on different meanings in relation to the researcher, research subjects and objects and the implications for societal sustainability transformations.

Firstly, reflexivity about the research object, i.e. sustainability transformation, is reflexivity that is part of the research. This is based on the assumption that our knowledge is uncertain and limited, hence research needs to ask critical questions about the normativity inherent in regarding sustainability transformations as research object (as with any other research object). It supports an opening up of debates with regard to trade-offs and risks as well as other inconvenient questions with regard to societal development, power constellations and politics.

Secondly, reflexivity also concerns the research process and its practices. This concerns the epistemological assumptions of the researchers and their normative positioning about contributing to sustainability transformations. It also relates to quality criteria for research processes, such as transparency or systematicity.

Thirdly, the results of transformation research and their impacts require reflexivity. This links back to the need to clearly identify the goals of transformation research and to define what is desirable in relation to what kind of sustainability transformation and whom the research is for, as well as to what extent the results indeed contribute to support (a specific type of) sustainability transformations.

Reflexive knowledge was also debated as a result of transformation research. As such it could converge insights on the research process, its results and impacts to foster the debate about the research perspective itself. In this sense, reflexive knowledge could relate to types of outputs, outcomes and impacts of transformation research, which feeds back a sort of 'meta-knowledge' on how to do research to contribute to sustainability transformations.

Research questions:
- Which methods support researchers in considering the legitimacy, ethics, power dynamics and political implications of their transformation research processes and results?
- How can we create a learning environment for researchers that allows for discussing sensitive issues such as researcher positioning and normativity and their implications for research process and results?
- What quality criteria support reflexivity about the research process, its results and impact, as well as underlying normativity assumptions?

5. Transforming the science system

A last recurring discussion concerned the transformation of the science system. The difference between research (as practice) and science (as system) was made. The latter includes both tangible and intangible elements such as career paths, course curricula, universities, or funding systems. There was a strong agreement that a transformation of research practice needs to be complemented by transformation of the science system, for example by changing funding structures, quality criteria and integrating considerations of sustainability and transformation more broadly in academic curricula.

It was questioned how such transformation could be supported, through e.g. creating ways in which the research feeds back into the science system. The role of reflexivity, as just discussed under point 4, should not be underestimated – as being reflexive about one's research practice can yield insights necessary for transforming the science system. One example mentioned during the workshop was a funding action in the Brussels region, which funded a specific research approach (namely action-oriented research) rather than an actual question or problem-context. One of the consequences was that a 'search' for problems began which could be addressed through such a research approach, rather than starting from an eminent societal problem and choose the appropriate research approach for addressing it. Feeding this kind of reflections back to the funders to enable an adaptation of future funding strategies increases the reflexivity of the system and possibly changes it.

Also, changes in the science system are already on the way: it was considered that the high level of reflection and analysis as well as institutional action in parts of the system would not have been possible just 10 years ago. Especially Germany has gotten to know intense debates and discussions in journal contributions as well as in workshops and conferences about necessary changes in the science system to be more equipped to address societal challenges.

Research questions:
- How do we need to organize the science system to allow for more diversity in research approaches?
- Which elements of the science system need to change and which one could be used as springboard for strengthening the change process?
- What kind of funding creates clear incentives for transformation research?

B | Highlights from paper presentations and discussions

Overview of workshop contributions

Presenter	Question	Hypothesis
Session 1: What is transformation research?		
Katharina Hölscher		Transformation research is a shared perspective of researchers from diverse research fields (e.g. sustainability science, transition studies, resilience) who are concerned with radical societal change towards sustainability.
Ulrich Brandt	What is your take on defining 'transformation' and 'transition'? What is the added value of each terms?	Transformation runs the danger to become a "new critical orthodoxy" – with the focus on cooperation and learning, existing political, cultural and economic institutions, and trust in incremental change, opinion leaders are not questioning existing power relations. A more analytical understanding of transformation can complement and correct some of these shortcomings in order to better understand the obstacles to policy change.
James Patterson	How are questions of transformation and transition addressed in diverse literatures? Is there a 'unified' approach and what is/would be the added value of such?	There is a need to cultivate a plurality of ideas that can inform vibrant debate and learning. In order to create rich opportunities for learning and critically reflecting on sustainability transformations over time, it is essential to bring diverse approaches to the table to shed light on different aspects of change processes.
Session 2: What are research approaches of transformation research?		
Julia Wittmayer		Research approaches (and methods) should be chosen pragmatically so as to increase scientific, actionable and/or reflexive knowledge about the question at hand
Tom Bauler	What are the main challenges of transformative research approaches (e.g. action research)?	Because transformative research implies to continuously reinvent the wheel, respecting the disciplinary states-of-art can be a major challenge when configuring approaches.
Carsten von Wissel	What are implications of transformation/transformative research on issues of democracy and legitimacy?	Transformation can be understood as a context of application which can strengthen scientific and democratic values. TS can be understood as changing dominant patterns of thinking, in so far it would be epistemically democratic.
Session 3: What are methods of transformation research?		
Katharina Hölscher		There is a need for bridging between individual research projects and methods and the wider societal searching and learning process in sustainability transformations.
Derk Loorbach	How do action research methods support transformation research?	To realize the potential of transformation research a transition in the science system as well as in the science-policy regime is needed. Action research needs to be empowered by reflexivity, theory development and social entrepeneurship to become transformational
Arnim Wiek	Are there appropriate research methods for transformational sustainability science (which ones)? What is missing?	Yes, there are. The following actions/attitudes are missing: combining methods in frameworks; joint learning through standardization; methodological training (incl. frameworks); feeding applications back to methodology; pragmatism to have an impact (solutions)
Klaus Jacob	What research methods are needed from the perspective of transformative environmental policy?	Transformative Policies demand for transdisciplinary knowledge on sociotechnical systems and the dynamics of their transformation

Session 1: What is transformation research?

In the first presentation, **Katharina Hölscher** provided input from the report that DRIFT/Ecologic prepare for the UBA. She outlined that transformation research starts from acknowledging converging social, ecological and economic mega trends, crisis and challenges which ask for fundamental radical societal change towards sustainability. A number of fields relate to this perspective of sustainability transformation thinking; these employ different concepts, frameworks and approaches to address a number of different research foci, namely: objects of change, dynamics of change and driving forces. While this diversity demands careful translation, sustainability transformation was emphasised in the concluding **hypothesis** as marking the common denominator:

> Transformation research is a shared perspective of researchers from diverse research fields (e.g. sustainability science, transition studies, resilience) who are concerned with radical societal change towards sustainability.

Ulrich Brand presented transformation studies – with the focus transformation towards sustainability - as an emerging field and reminds the participants that during a JPI Climate workshop in Vienna 2012/2013 they were comparing different schools of thought that contribute to transformation studies. As Katharina, he warns that ontological and epistemological assumptions need to be considered. This is not a pure academic undertaking but informs about different problem definitions, worldviews, potentials and obstacles of transformation like vested interests or deeply structures relationships of power and domination (also over nature). In particular, he points to the danger that the current transformation debate runs the risk of becoming a new critical orthodoxy: While the terminology suggests radical change towards a normative sustainability idea, semantics and proposals for solutions to solve those and address transformation often remain very close to the status quo (e.g. current policy, institutions as private companies and property rights and values implied in the green economy debate). This neglects underlying power structures and negative drivers of (always on-going, possibly unsustainability) transformations. This is also reflected in the hazy definitions of the terms transformation and transition in transformation research and hence a limited understanding of what are the objects and subjects of change. The "orthodoxy" – albeit critical of mainstream approaches that focus on technological change – tend to draw a line towards more critical understandings that look at structural obstacles. Brand distinguished between transformation as more radical change of the *form* of a system, while transition is more about considerations of governance and steering, which is often connected to more moderate discourses of change – linking for example the idea of green economy to niches that risks to result in ecological modernisation. He concluded with the following **hypothesis**:

> Transformation runs the danger to become a "new critical orthodoxy" – with the focus on cooperation and learning, existing political, cultural and economic institutions, and trust in incremental change, opinion leaders are not questioning existing power relations. A more analytical understanding of transformation can complement and correct some of these shortcomings in order to better understand the obstacles to policy change.

The last presenter in this session, **James Patterson** focused on the fact that multiple approaches on transformation research create vibrant opportunities and spaces for alternative interpretations. He presented and compared the research objects, foci, frames and interests on sustainability transformations of socio-technical systems, social ecological systems, sustainability pathways and transformative (climate change) adaptation research approaches. While he doubts the possibility of a unified approach, he found several common points of comparison. These include similar research domains like energy, food, water and climate change as well as similar underlying social variables such as power, knowledge, norms, agency and accountability. The fact that these issues are approached from different perspectives creates rich opportunities for learning, vibrant debate, space for alternative interpretations and critical reflections on how to achieve sustainability transformations over time. Because transformations are considerably complex the cultivation of multiple approaches hence sheds light on different aspects of change processes. This position is reflected in his concluding **hypothesis**:

> There is a need to cultivate a plurality of ideas that can inform vibrant debate and learning. In order to create rich opportunities for learning and critically reflecting on sustainability transformations over time, it is essential to bring diverse approaches to the table to shed light on different aspects of change processes.

Main points of discussion

A main point of discussion concerned the **kind of change** that transformation is as opposed to other kinds of change. The attribute 'radical' has been discussed and contrasted to 'gradual'. However, this dichotomy is not considered productive to clearly differentiate between 'change' and 'transformation' (or transformative change). While societies are always changing, decidedly radical change towards a normative sustainability orientation is needed to address the root causes of existing unsustainabilities. Others preferred 'disruptive' change as in

replacing current systems and leading to change in power relations. The transition perspective combines the process of change with the substance (sustainability/unsustainability): disruptive change is considered inevitable because of a situation of sustainability lock-in. Such change includes power disruptions and revolutionary changes. If we would consider a rediscovery of Polanyi's work to be at the origin of this research perspective then it is about a very specific type of change taking 50-100 years. It has been suggested to link Polanyi's idea of a great transformation to the study of smaller-scale change processes to apply a more ambitious measure and discuss how the latter contribute to the former. Criteria were demanded that would make it easier to qualify different kinds of change and to identify the elements and components of that change.

The latter also relates to the question of what needs to change to achieve sustainability, the actual **object of transformation**. It was questioned whether a transformation includes change in more than one domain: while we have reached 20% energy production from renewables nothing has changed with regard to soil sealing. Others question whether an energy transition has already taken place as e.g. the power usage remained the same and nuclear power reactors are still running. It has been argued that transformations need to explicitly consider the actors facilitating and hindering change and the power struggles involved. A main challenge in determining the objects (and subjects) of transformations relate to the complexity of change processes. Whether a transformation has taken place can (often) only be judged from hindsight; only then the concrete objects of a transformation can be described. Discussants missed an understanding of transformation with regard to cultural change and a new understanding of normality. In this context, the feminist perspective has been brought forth, which criticizes the economic system with its externalization of effects: this perspective does for example consider a system as unsustainable as long as ecological and social resources of reproduction are ignored.

A recurring point that is reflected in the points above concerned the **importance of the linguistic devices we use**. Some considered the debate to be blurry and unspecific because of the lack of precise definitions. Worries were expressed about the possibility that the transformation debate and concept would suffer the same fate as the sustainability debate: that it would lose its analytical value. This also closely connects to the underlying **normativity** of the transformation that is advocated as desirable in both policy and transformation research. More than the term 'transformation' the notion of 'sustainability' has been criticized as often lacking concrete meaning. This runs the risk of undermining the endeavour of sustainability transformations: as the ultimately desired goal is not clearly defined the kind of change needed to achieve it also remains vague and often results in too moderate results. While it was acknowledged that the concept needs to remain open for different ideas, the research field needs a clear definition as an orientation. Others considered definitions as limiting. Storytelling was brought forth as a more powerful way to start conversations: telling each other about the cases we work with. Telling stories allows for situated definitions of e.g. sustainability or radicality and also to find out whether this is the change 'we' want.

Session 2: What are research approaches of transformation research?

In the first presentation, **Julia Wittmayer** provided input from the report that DRIFT/Ecologic prepare for the UBA. Reasoning from the goals of transformation research (describing, analysing, evaluating and supporting sustainability transformations) and the desired results in terms of different types of knowledge (scientific, actionable and reflexive), she proposed that next to a descriptive-analytical also a transformative research approach is needed. While both approaches contribute to yielding all types of knowledge, the transformative approach is considered specifically apt for generating actionable results. As these approaches further blur the boundary between science and society, she also proposed five (partially new) quality criteria for transformation research, namely: scientific impact, social impact, trustworthiness, transparency and reflexivity. She concluded with the following **hypothesis**:

> Research approaches (and methods) should be chosen pragmatically so as to increase scientific, actionable and/or reflexive knowledge about the question at hand.

Tom Bauler reacted to the question about what constitutes challenges for action research (AR) in particular with respect to the nexus of knowledge construction for participants or for scientific validation. From his experience, a fundamental paradox configures many AR-exercises (using the metaphor of Sisyphus). On the one hand, during AR-exercises it is typical to encounter research subjects which explicitly voice the fact that they do not want to "reinvent the wheel", i.e. that the actual research goals should bring the whole effort beyond state-of-art, that they want to play a role in configuring new/original knowledge. Simultaneously, AR is fundamentally sensitive to procedural configurations, and collective learning, which at the level of AR-exercises often means that subjects/actors need to take a deep dive into problematique and research questions; in other words, a certain form of "wheel reinvention" is needed to get the project started, keep people on board, collectively construct a practice/knowledge base. This AR-logic evolves all too often at the expense of the construction of knowledge with some form of scientific quality/originality. If however during particular AR-exercises, actors/subjects really integrate the objective of knowledge construction (i.e. accept to give privilege to the scientific goals of the exercise), a typical move is to strive towards importing solutions from other contexts; the typical best practice solution.

Reflecting on the participants in the room – the very fact that nearly all participants introduced themselves as being attached to institutes rather than universities – raises the question as to what extent people like the ones around the table, i.e. people acquainted with AR, are actually in their very heads plain 'scientists', or if they rather consider themselves better qualified as 'researchers'. There might indeed be a distinction to be made, probably even to be fought for, between science and research. And be it only because action research is not necessarily considered – and for sure not over all disciplines - as being entirely part of scientific endeavour, as it has relatively weak links with the objective to have the disciplinary state-of-the-arts evolve by knowledge building. The inherent struggle of AR-exercises to aim for both social and scientific impacts needs be part of the discussion. One's choice for an adequate research approach depends also on one's view of the knowledge production process. He concluded with the following **hypothesis**:

> Because transformative research implies to continuously reinvent the wheel, respecting the disciplinary states-of-art can be a major challenge when configuring approaches.

Carsten von Wissel reacted to the question about what are implications of transformation/ transformative research on issues of democracy and legitimacy. While he considers science and research not as a democratic but a meritocratic endeavour, he ponders that democratic values also hold for research, namely honesty, doubt, respect for evidence, openness, accountability and tolerance and hunger for opposing points of view. However, he also questions whether this is the case with all research. While he considers science as being free in theory (theoretically free and free in its choice of theory) the practice of science is not necessarily free. He concludes with the following **hypothesis**:

> Transformation can be understood as a context of application which can strengthen scientific and democratic values. Transformative science can be understood as changing dominant patterns of thinking, in so far it would be epistemically democratic.

Main points of discussion

Most of the discussion referred to **research practice and activities**, which are changing already, rather than to science as a system. The latter was considered to be in need of change, as it influences the distribution of money, the structure of departments and careers as well as the foci of research. The field of Social-Ecological Research in Germany was considered an exception. Here researchers are educated in a transdiscplinary way from the start – creating a new normality and eye for societal relevance. However, at least in Germany the science system feels threatened by the transformation (research) debate and started defending scientific principles and funding. In a much cited contribution, the president of the Deutsche Forschungsgemeinschaft, a major German funding body, Strohschneider neglects biases of the current system (e.g. on monodisciplinary work), and problematizes that transformation research contributes to a depolitization of politics and a politization of science – meaning that researchers now take on and are considered to solve social problems, rather than politics.

However, it was also pointed out, that a change in the science system and/or decisions with regard to funding of research should not only lay with ministers or depending on social relevancy. An example from the Brussels region illustrated that due to a call for proposals for transdiciplinary research all researchers were looking for problems – thus the pitfalls of starting with a method rather than with a problem. The merit of such proposals and research in general should still be judged by scientific criteria – even if these criteria need to change as well. Another contributor emphasized this critical point questioning whether it is the science or the knowledge that should be funded, and how this relates to the knowledge of non-scientific actors. Thus, what is needed is transformative science and knowledge.

Actionable knowledge is considered necessary if research wants to support transformation. It was questioned whether actionable knowledge can cover both: the translation from scientific knowledge into for example recommendations (thus a linear approach to knowledge production) and also the generation of such knowledge by diverse stakeholders in action-oriented research processes. Another contribution wondered whether we stay inside a box with a focus on actionable knowledge as it would be counter the freedom of science to be able to fail.

Transdisciplinary research has become much more commonplace for younger researchers – also students often demand it to be taught as part of their education. For such a research, **transparency and coherence** in the selection of methods were considered important – which is against much of mainstream research practice, where the actual choice for research methods and the rationale behind it are not made explicit. Transparency is also important in relation to other stakeholders: it should be clear to them what outcomes other than scientific ones are intended. It is further critical in relation to the positionality of the researcher: we are all working from a specific interest, attitude, motivation and belief. What connects action-oriented research with more distant research is that both need to safeguard a certain process quality: both approaches do this in different ways. Using a list of quality criteria such as proposed in the DRIFT/Ecologic report would lead to funding a broader range of topics and research.

Session 3: What are methods of transformation research?

In the first presentation, **Katharina Hölscher** provided input from the report that DRIFT/Ecologic prepare for the UBA. A main focus of the UBA project is on what research methods are applied in transformation research projects and to what extent they contribute to the goals and results of transformation research. A screening of research methods led to the identification of 37 research methods that are clustered in a variety of categories ranging from data collection methods (including e.g. interviews, Delphi-method, participant observation), data analysis methods (e.g. institutional analysis and different forms of actor analyses) as well as participatory workshop tools (e.g. visioning) and participatory spaces (e.g. transition management). All of the analyzed research projects apply 'classical' descriptive-analytical research methods (e.g. interviews, literature analysis) to generate a sound (scientific) knowledge base. There is (still) less focus on contributing to actionable knowledge and critical insights (reflexive knowledge) on the research process, which is reflected in a limited use of transformative research approaches. She concluded with the following **hypothesis**:

> There is a need for bridging between individual research projects and methods and the wider societal searching and learning process in sustainability transformations.

Derk Loorbach reacted to the question of how action research methods support transformation research. Positioning himself as a social constructivist, he considers transformation research (i.e. exploring the paradigm of what is transformation) as transformative in itself by having repercussions on practices in science and in the 'real' world. He thus emphasized that transformation research and transformation are inextricably interlinked. He then presented transition management and the work of DRIFT, where he is the director, as examples of how transformation research can be employed in practice. Transition management is an experimentation methodology pioneered by DRIFT that departs from the research institute's understanding of how to deal with non-linear, systemic change while recognizing heteromonic regimes. DRIFT established a social science business model and combines research, practice, consultancy and education to explore pathways to sustainability, question current unsustainable systems and challenge incumbent paradigms, institutions and structures. Based on DRIFT's work he concluded with the following **hypotheses**:

> To realize the potential of transformation research a transition in the science system as well as in the science-policy regime is needed.

> Action research needs to be empowered by reflexivity, theory development and social entrepreneurship to become transformational.

Arnim Wiek has been asked to respond to whether there are appropriate research methods for transformational sustainability science, and what is missing. He first asserts that transformational sustainability science seeks to achieve positive change towards sustainability through the co-production of actionable knowledge. Departing from the explicit objective to support transformations through research (generating knowledge), he considers research methods as means to this particular end. It is thus important in how far they contribute to that

end, i.e. methods should be chosen after explicitly defining a function in the overall process of producing actionable knowledge for sustainability transformations. Different methods have different functions, including for analysing, crafting visions, anticipating scenarios, or designing and testing transformation strategies. While multiple methods are available, as individual, disconnected methods they are insufficient for supporting sustainability problem solving. A central challenge is therefore to combine methods in appropriate methodological frameworks that represent functional clusters of methods. The purpose of functional frameworks is to combine methods for analysing problems with methods that generate knowledge on how to solve them. Additionally, he advocated for a moderate standardisation of methods and frameworks to promote wider adoption, dialogue between researchers, and joint learning together with interested stakeholders and research funding agencies. He concluded with the following **hypothesis**:

> Yes, there are appropriate methods. The following actions/attitudes are missing: combining methods in frameworks; joint learning through standardization; methodological training (incl. frameworks); feeding applications back to methodology; pragmatism to have an impact (solutions).

Klaus Jacob reacted to the question on what research methods are needed from the perspective of transformative environmental policy. To him, transformations refer to the reconfiguration of socio-technical systems in a way so that societal needs are served in a substantial way and they involve sudden change and a new equilibrium. Transformative environmental policy thus includes processes of speeding up and slowing down (exnovations management). Starting from the aim of transformative environmental policy – supporting innovation (also including societal innovation), creating alternative visions and exnovation – he

identified system knowledge, alternative configurations, observations of societal innovations and visioning as pivotal needs of research on transformative environmental policy. Methods that deliver on these needs include system analysis, foresight and horizon scanning, assessment and experimentation. Transdiscplinarity is key to connect different types of knowledge through research methods, as monodisciplinary science cannot provide all answers. He concluded with the following **hypothesis**:

> Transformative Policies demand for transdisciplinary knowledge on sociotechnical systems and the dynamics of their transformation.

Main points of discussion

A major controversy in debating the methods of transformation research centred on their contribution to the transformation research goals and hence to their **impact**. This departed largely from the generally agreed upon goal of transformation research to contribute to actual sustainability transformations. Methods should thus deliver on an a priori defined **function**; becoming aware of such function (in terms of knowledge needs, as researchers generate knowledge) might allow for tailoring research more appropriately to specific contexts, questions and challenges and, ultimately, to produce knowledge on and for possible solutions. It was added that the proposed (institutional, behavioural etc.) changes that are needed are also linked to such functions. Otherwise, there is a risk of simply reinforcing current lock-in cycles by not being aware of deeper running problems.

Some doubts about the **roles and capacities of research and knowledge** in generating solutions and contributing to sustainability were articulated. While our current 'knowledge society' might be shaped by knowledge, i.e. knowledge producers are expected to deliver solutions, the actual impact of that knowledge is contested. There is a sensation that research results end up in a drawer without being used, even if the knowledge is actionable and not just descriptive-analytical. Shifting to a positive image, a drawer with evidence-supported solution options could be pulled out once a window of opportunity emerges. In a similar vein, scientific knowledge might not be the main driver of transitions but social understanding and framing, which is an outcome of debates, sense-making and learning, is.

Concerns were voiced on the **lacking reflexivity about impacts and research processes**. The availability of reflexive research methods was not questioned – it was stated that a variety of methods is in fact available. On the one hand, there seems to be limited space within current research designs to integrate reflexivity. Existing methods, for example interviews with politicians or participants of research processes, could be employed to induce reflexivity. However, it does depend on how such methods are applied and whether emphasis is given to such endeavours. While this might be due to limited experience and knowledge on the part of the researchers, a bigger structural issue is the set-up of research funding that allocates limited resources and recognition to reflexivity. On the other hand, there needs to be a clearer definition on what reflexivity is sought after, including who is reflecting (the researcher, the participant), and on what is reflected (on the research process, culture, results etc.). Altogether, a need for greater reflexivity and for (the employment of) reflexive research methods was advocated for injecting critical thinking into research processes, about generated

results and impacts as well as underlying roles and power issues in advancing sustainability transformations.

There were calls for **applying and recollecting a diversity of methods**. For example, it was stated that radical change also needs methods of destruction (of incumbent structures, institutions, paradigms etc.), whereas current research implies a great focus on creation and innovation. Furthermore, future studies were highlighted as avenues for exploring futures considering that radical change is about anticipating and being able to play into expected surprises to overcome path dependencies (e.g. by being able to pull out ideas from a drawer). Qualitative and quantitative modelling, horizon scanning and normative and explorative scenarios are central methods. For getting a sense of unlikely but impactful events, identifying emerging issues and wild cards could be approaches for preparing societies for coping and utilising moments of shock. There is the family of strategy-building methods, including methods for intervention research, evaluation research, and change management research. They are critical for building actionable knowledge on how to create positive change and transition from current states to sustainable futures.

Finally, the tension between **standardization vs. plurality of approaches and methods** that was already touched upon in session 1 resurfaced. Arguments were made for standardization of methodologies and frameworks in order to become more professionalized in transformation research and to develop common denominators for knowledge integration. The development of a guidance manual for transition management that was translated into many languages served as an example of how standardization might enable a larger group of people to implement the methodology. Others felt uneasy with standardization. From this perspective, while integration and standardization is certainly necessary to move forward and overcome fragmentation, there is also a need to maintain a capacity for criticism and reflexivity. Looking at the same question with different methods boosts reflection, cross-pollination and greater contextuality.

Session 4: Methods and results of transformation research: summary of the World Café

The last session was dedicated to two rounds of World-Cafés allowing for more in depth discussion on (1) Methods and combination of methods and (2) Research results as well as catering for (3) Remaining open issues.

1. Reflection on useful methods and combinations

The discussion focused not only on methods but also on the choice of approaches. It was considered that research approaches follow different phases from 1) problem analysis to 2) vision building and 3) strategy development, followed by 4) monitoring and evaluation and 5) reflection of the whole process. There are many methods for phase 1, understanding the problem. The latter parts (steps 2-5) often receive less attention and there are not enough methods to scientifically follow these steps and feed the outcomes back into the research process. However, in participatory projects also a phase 0 needs to be included: the achievement of a joint understanding of the problem and terminology.

More generally, there are good experiences with participatory formats, such as moderated expert workshop or joint problem solving; especially with communities these make more sense as they directly put people into interaction.

2. Research results

The suggested typology in the DRIFT/Ecologic report prepared for UBA that distinguishes between three different types of knowledge as results of transformation research – scientific, actionable and reflexive knowledge – was intensely debated. Research results were positioned as moving targets that cannot (and to some extent should not) be clearly defined beforehand.

For example, effects from research processes can be direct (e.g. paper, research agenda) but also very indirect (e.g. shared problem definition, translation of vision into societal discourse). Similarly, knowledge can be immediately relevant in a specific context (e.g. for project implementation), but its relevance can also only emerge at later stages when there is an opportunity for implementation. In that sense, knowledge resulting from research needs to be connected to the outputs of research and its effects.

It was hence overall felt to be more important to relate specific forms of outputs and impacts to different forms of knowledge generation processes rather than pre-defining the results of transformation research. In this vein, more scientifically-focused knowledge processes (e.g. academic workshops) lead to different types of outputs (e.g. papers) and merits than more action-oriented processes (e.g. debate, action). Then there is a need for quality criteria for the research process and in relation to the impact the results (intend to) achieve. Quality criteria for the research process concern for example questions such as: Who is involved in the agenda setting and problem definition for the research? For whom and what is the research intended? Such transparency and reflexivity also enables to identify how the results connect to action (i.e. moving beyond mere knowledge results) and what might be underlying interests (e.g. in terms of research finance). Furthermore, it might help to more clearly communicate the merits of a research project to societal actors, and therein to obtain their willingness to invest time and resources to contribute to the research.

3. Open issues

A number of issues that had been mentioned earlier were again emphasized. First of all, the question of whether or not a **sharper definition** is needed was discussed: whether or not transformation is just too broad or a buzzword only. Suggestions were to propose exclusion criteria, to consider self-declared membership as boundary or to relate it always to a specific context. Secondly, the difference between transformation and other kinds of change was debated. Thirdly, the importance of not stopping at research as an activity but also including the scientific system into the transformation was brought up. This included attention to institutional design and supportive structures of transformation research (e.g. the German Fona).

Other issues concerned the danger of going along with **hegemonic framings** of transformation as well as with hegemonic choices of methods – in whose interest are these framings and in which direction do they lead us. And a final major point of discussion concerned the **'coherence' between the researcher and his/her research topic**. One suggestion was that an internal transformation of researchers was needed if they are to legitimately study transformations: our activities (flying or not, being vegetarian or not) need to conform to our research object (sustainability transformation). Others suggested that those engaging in this kind of research consist of multiple identities and that a search for coherence would end up in neurotic personalities.

C | Programme

09:30 – 10:00	Registration & Coffee
10:00 – 10:30	**Welcome & Introduction** Presentation of the research project and goals of the workshop
10:30 – 11:30	**What is transformation research?** Impulse presentations & plenary discussion *Presenters: Katharina Hölscher, Prof. Dr. Ulrich Brand, Dr. James Patterson*
11:30 – 11:45	Coffee break
11:45 – 13:00	**What are research approaches of transformation research?** Impulse presentations & interactive discussion exercise *Presenters: Julia Wittmayer, Dr. Tom Bauler, Dr. Carsten von Wissel*
12:30 – 13:30	Lunch
13:30 – 15:00	**What are methods of transformation research?** Impulse presentations & world cafés *Presenters: Katharina Hölscher, Prof. Dr. Derk Loorbach, Prof. Dr. Arnim Wiek, Dr. Klaus Jacob*
15:00 – 15:15	Coffee break
15:15 – 16:00	**Methods and results of transformation research: ways forward** Presentation of results from world cafés & closing discussion
16:00 – 16:15	**Wrap up & closing** Final feedback and presentation of follow-up

D | Participants List

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