# Transformative Research: Knowledge and action for just sustainability transitions

DIT working paper 1, 2021

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## About DIT

The Design Impact Transition (DIT) Platform at Erasmus University Rotterdam aims to transform the university by empowering radically new ways to do research, education and engagement for a just and sustainable future.

As a platform, we bring together academics, students, non-academic staff and external stakeholders around complex and persistent societal challenges. We aim at building a strong and engaged community and a collaborative, experimental and design-based culture of transdisciplinarity. DIT is in the heart of the EUR Strategy, living the Erasmian values of global citizenship, social commitment, an open and critical mind-set, cooperation and entrepreneurial spirit.

Our team consists of dedicated Erasmians that work on building the DIT platform and transforming the university from the ground up. The core team consists of three quartermasters, an organisational and an academic lead, complemented by affiliated academics from different Schools and Institutes. You can always contact the core team if you have questions, remarks or if you want to contribute to the platform. For more information and contact details, please visit our website.

## About DIT working papers

The DIT working papers publish collective academic output from DIT academics and developed with the support of DIT. With our working papers we aim to stimulate academic dialogues and collectively work towards strengthening the academic basis for transformative research, education and engagement. The papers present research results that we aim to develop further towards academic publications in journals or books.

## Suggested citation

Wittmayer, J.M., Loorbach, D., Bogner, K., Hölscher, K., Hendlin, Y., Lavanga, M., Vasques, A., von Wirth, T., and de Wal, M. (2021) Transformative Research: knowledge and action for just sustainability transitions. DIT Working paper for positioning transformative research. Rotterdam, Design Impact Transition Platform, Erasmus University Rotterdam.

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# Transformative Research: knowledge and action for just sustainability transitions

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## 1. Introduction: persistent societal problems challenging science

Our societies today face severe and persistent problems including continued structural injustices, climate change and biodiversity loss. While much knowledge is being developed on all fronts concerning the nature and impacts of these problems, a gap exists concerning which insights offer viable ways forward. Is this gap due to the type of knowledge being produced? The way it is developed? Or the way it is translated to others? We believe it is all the above: our current academic system is organized in a way that supports the status quo rather than processes of societal change. In academic environments, knowledge is usually created within disciplines, lacking inter- or even transdisciplinary approaches. The knowledge production process is focussed on academic output, publications and citation scores. Societal impact often remains an afterthought or additional burden. The linear way of producing knowledge within disciplines leads to narrow insights that are then presented through recommendations or some form of popularisation to an 'outside' world but do not represent co-created shared visions of the future or solutions to pressing persistent problems. Climate change is a prominent example: Since the first Club of Rome report in 1972 (Meadows et al., 1972), we have gathered an incredible amount of knowledge about the role of humanity in climate change – but we are still far from reducing it effectively.

Such persistent problems constitute a specific category of problem, also referred to as 'wicked problems' (Rittel and Webber, 1973) or even as 'super wicked problems' (Hisschemoller and Hoppe, 2001; Levin et al., 2012). Such problems are *complex* in that they have multiple causes and consequences; *uncertain* in that it cannot always be reduced by knowledge, and possible solutions change the perception of the problem; *difficult to manage* due to the high number of interacting actors involved that might not agree on values or facts, *hard to grasp* because it is unclear how to structure these; and *deeply rooted* in our current structures and institutions (Loorbach, 2007; Rotmans, 2005; Schuitmaker, 2012). What is more, we are facing many of these problems and social dilemmas at the same time, such as e.g., inequality and inclusive development, health care crises, or climate change

(Hölscher and Frantzeskaki, 2020). By their very nature, persistent problems pose challenges to how we produce knowledge about them.

Academia itself is part of why solutions to persistent problems evade us: On the one hand, academia has lost societal credibility and legitimacy (Saltelli and Funtowicz, 2017). On the other hand, it produces a wealth of data and knowledge that is not taken up in ways that support transformative efforts. It remains for large in an ivory tower. Some of this is inherently necessary to focus on a particular disciplinary, analytical-descriptive, or quasi-experimental research project, while part of this lack of porosity is based on anxious misunderstanding of impact as 'translating science to practice', rather than working directly with (parts of) society to co-create desirable visions of the future and to develop more fundamental alternatives to what is not desirable, just or sustainable. Rather than working from the ideal and abstract and trying to force these perfect circumstances into an imperfect world, academia needs to start working with the messy untameable variables of real-world conditions, embrace uncertainty and collaborate as partner with those at the forefront of solving daily and existential challenges. Based on the characteristics of the persistent problems at hand, they cannot be addressed through a project-by-project or sector-by-sector approach. Rather, sustainability transformations are best conceived as a whole-society learning and search process (Grin et al., 2010) and science can fulfil a role in facilitating these societal learning processes.

By no means are we at the Design Impact Transition (DIT) platform the only ones thinking this way. For some decades already, there has been a loose movement emerging in academia with perspectives and approaches that take different starting points: starting points of 'not knowing', of acknowledging deep uncertainties that cannot be rationally reduced, of encouraging social learning and reflexivity, of fostering action-oriented research and of promoting democratic social change. This movement includes approaches which use existing quantitative and qualitative research methods in collaborative processes of knowledge co-production. Such knowledge co-production for sustainability is situated in particular contexts, builds on and captures the plurality of knowing and doing, is problem driven and goal oriented as well as interactive and collaborative among diverse actor groups (Norström et al., 2020). It can create space for experimental processes in which different types of scientific and practical knowledge are combined to rethink existing situations, redefine desired futures and reposition short-term action. Knowledge is not created for its own sake (or mere career advancement), but with the explicit purpose to support normative aims of democracy, justice or sustainability including the emancipatory intent for communities and organisations to take control of their own lives and the structures within which these are embedded (Greenwood and Levin, 2007). At DIT, we chose to refer to such knowledge co-production as *transformative research*[1] (see Textbox 1), since it transforms the way we research, and it is aimed at supporting just sustainability transformations.

Researchers who use transformative research approaches, often do research differently. They go out, talk to, and discuss with others about societal challenges, thereby reframing those very challenges. It is often together with stakeholders based on different kinds of expertise and knowledge that transformative researchers construct their hypotheses about what is problematic about the situation at hand. Thus, rather than starting with a clearly delineated research problem and question, transformative researchers start in a broader way to co-construct what is problematic and to find different perspectives, values and types of knowledge that can provide inputs to a more differentiated and reflexive problem understanding. In addition, transformative researchers also engage in a more facilitating and structuring role when stimulating processes of co-creation, (social) design and experimentation in real-life projects and contexts. This way, new knowledge and understanding is created within and for a community of actors who provide researchers with deeper insights into their empirical context that also serve as a basis for action. Being involved in those processes of deconstructing old and reconstructing new system understandings is that everybody involved is being influenced while empirical insights are generated. As has become obvious by now, such a way of working is often at

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[1] In our understanding of transformative research, we explicitly go beyond the definition of, e.g., the National Science Foundation (2007) and are more in line with how the term has been used by the German Advisory Council on Global Change (2011) or Schneidewind et al. (2016). We do so, as we are not only concerned with research dedicated to fundamental change processes in general, but explicitly concerned with research dedicated to fundamental change processes of societal systems towards sustainability.

odds with the dominant discourse in (social) science and how academic institutions work.

This working paper affirms that transformative research represents an important emerging new discourse and practice in the current academic system that challenges institutional structures, underlying values and accompanying routines. For our home base, Erasmus University Rotterdam (EUR) is boldly creating space for and encouraging transformative research to actualize its current strategy 'Creating positive societal impact'. More than just lip service, transformative research can enable EUR to become a driving force for just and sustainable change in a region that is troubled by persistent challenges ranging from structural deprivation and poverty to unsustainable economic activities. The DIT Platform at the EUR aims to provide an ecosystem for Erasmians and beyond to start exploring the meaning and value of transformative research more generally and within the EUR and the kind of institutional environment that would foster it. This working paper is meant to kick-start debate and discussion: a process of making transformative research have real meaning: what it is, how it is done, what it can achieve and what not, when it makes sense and when not. As such, this paper focuses on the basics and sets the scene by describing a set of principles for transformative research (section 2), provide a handful of inspiring project examples from the EUR (section 3), explore the process and implications of being a transformative researcher (section 4) and outline the challenges of doing transformative research (section 5). We end this working paper by inviting you to join us in our exploration of transformative research.

## 2. Principles for transformative research: a generative orientation towards persistent problems

Transformative research is part of a broader and loose movement in science towards more relevance, robustness and engagement that includes a diversity of perspectives and approaches[2]. These perspectives and approaches can be considered seeds of change within the academic system and include Mode-2 knowledge production (Gibbons et al., 1994; Nowotny et al., 2001), post-normal science (Funtowicz and Ravetz, 1994; Wesselink and Hoppe, 2011), transdisciplinary research (Hadorn et al., 2008; Lang et al., 2012), phronetic social science (Flyvbjerg et al., 2012), science and technology studies (Dankel et al., 2017; Funtowicz and Ravetz, 1994; Saltelli et al., 2016), knowledge co-production in sustainability science and sustainability transitions research (Caniglia et al., 2021; Miller, 2013; Miller et al., 2014) and different forms of action research (Greenwood and Levin, 2007; Reason and Bradbury, 2008).

Such perspectives and approaches have been taken up in (emerging) research fields which share a focus on transformations or transformative change, including sustainability science (Kates et al., 2001), sustainability transitions research (Grin et al., 2010; Köhler et al., 2019; Loorbach et al., 2017), or resilience research (Folke, 2016; Olsson et al., 2014). Such research on transformations has emerged as an important research lens over the last years, one with the explicit aim to understand and contribute to sustainability transitions by acknowledging the persistent and systemic nature of societal problems and fostering radically alternative ways of doing, thinking and organising our world (Hölscher et al., 2021). Research on transformations has both advocated for descriptive analytical as well as for more transformative research approaches (Hölscher et al., 2021; Popa et al., 2015; Wiek et al., 2012).

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[2] Here, we name some of the main perspectives, research strands and approaches that we consider to be part of what can be understood as a loose movement. However, it is beyond the aim of this positioning paper to detail these or relate them systematically. For the interested reader, we have included references to the original publications and also would like to point to the very informative work by Hessels and van Lente (2008).
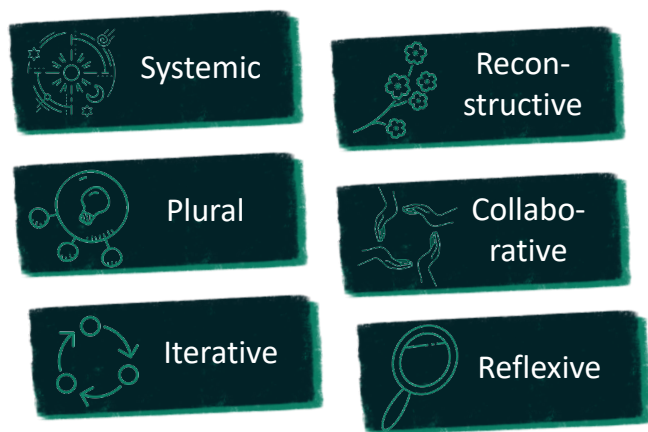
Figure 1:Principles of Transformative Research.

In the following, we suggest six principles for transformative research that are based not only in our understanding of the nature of persistent problems, but also in the orientation towards contributing to transformative change and addressing these problems (see Textbox 2). These principles, also presented in Figure 1, build freely on existing work on transformative research (Fazey et al., 2018; Hölscher et al., 2021; Schneidewind et al., 2016), and on specific elements from different perspectives and approaches that advocate for more relevance, robustness and engagement of research as introduced above. This is to provide a starting point for positionig transformative research and for the shared meaning-making process that we envision with the EUR community and beyond – and will become more systematized in the time to come. These principles relate to the way transformative researchers work with persistent problems (section 2.1), the nature of knowledge involved, (section 2.2) and the orientation and nature of the knowledge production process (section 2.3).

## Textbox 2

**Transformative research** is committed to understanding and analsing persistent problems and to generate alternative ways of doing, thinking and organising social life that address these problems. It is based on these two commitments that we formulate six main principles for transformative research: it is based on a systems understanding and oriented towards reconstructing new systems; it acknowledges a plurality of understandings and the collaborative nature of societal action and reflection; and finally it is best conceived as having an iterative process-based nature and focuses on reflexivity.

## 2.1 Transformative research is systemic and reconstructive

Transformative researchers take a systems perspective to persistent problems that is dedicated to understanding the system at hand, and first deconstruct its ongoing dynamics before reconstructing and generating new ways of doing, thinking or organising the system. Approaches to transformative research begin from the observation that certain dynamics of a societal system, such as the energy system or a city, are locked-in and prevent movement towards more just and sustainable states. In an expanded sense, this aspect of transformative research is an extension of humanism and the Enlightenment project, insofar as researchers admit that things could be better from the outset, and an assumption that things can be improved through human effort. The notion of progress for transformative research is a plural, bottom-up, and updatable notion of progress, rather than one with a fixed historical beginning and end.

As introduced, the starting point is the systemic nature of persistent or wicked societal problems. A transformative research endeavour therefore starts with **delineating and analysing a societal system**, and how its structures, cultures and practices sustain persistent problems related to justice and sustainability. There are multiple frameworks available to do so, for example, analytical frameworks from sustainability transitions studies (Grin et al., 2010; Loorbach et al., 2017). Two of their main assumptions are: first, current dynamics are a result of historical constellations and their future hinges on a certain path dependency, i.e. previous states and dynamics influence which future states or dynamics are likely or even possible. And second, seeds of change are already present in the system. Pertinent questions are: What are the transition dynamics at hand? What are broader societal developments and trends interacting with the challenge? Which structures, cultures, practices, and actors keep the dynamic stability of the system? What are new ways of doing, thinking, or organizing elements of the system (and their interactions), and do these elements have the potential to challenge, alter and/or replace parts of the current system? Current mobility systems in the Netherlands, for instance, strongly focus on private car ownership and use, shaping how we build cities and think about distances. Changes for this mobility system have to challenge our way of thinking about mobility, but also replace the dominant (physical and intangible) infrastructures for

cars by ones that are more in favour of alternatives (such as bike lanes or sidewalks).

However, from this acknowledgement of the systemic nature of persistent problems also stems the insight that after a certain point more (disciplinary) knowledge about the problem will not lead to better solutions (Miller et al., 2014; Sarewitz, 2004). Linking it to critical social sciences, a system analysis is essentially **deconstructive** – aimed at interrupting ongoing constructions of the social order by those responsible for creating and maintaining dysfunctional power concentrations (Avelino and Grin, 2017). This deconstruction is rooted in a normative orientation towards just sustainability transitions. Both justice and sustainability are considered essentially contested and ambiguous concepts, requiring further contextual interpretation and translation into action (Kasemir et al., 2003; Rotmans, 2005).

Based on a systems analysis, i.e., an as-good-as-necessary understanding of the persistent problem at hand, and deconstructive analysis of the current social order, transformative researchers aim to support the development of alternatives to contribute to just and sustainable futures and to understand their ways of working. Transformative research thus carries a future- and solutions-orientation (Miller et al., 2014). It is a phase of **reconstruction** of new or adapted structures, cultures and practices that can then potentially replace the deconstructed systems understanding – a focus on that which 'can be'. According to Avelino and Grin (2017) such reconstruction combines an understanding of how things are at a certain point in time, with how they ought to be in the future, and crucially, how things 'can be' at any point in time. Transformative research also has affinities with the work of Science and Technology Studies scholars such as Sheila Jasanoff (2015, 2004), who has emphasized the necessity to frame differing narratives of the same circumstances as sets of imaginaries – stories told about facts which in turn influence how those facts are interpreted. The reconstruction is not only about visions, imaginaries and narratives, but also encompasses action through experimentation with seeds of change to see what can be learned about putting these into practice. Rather, transformative research follows the generative idea of informing the intentional design of alternative socio-ecological, socio-technical, or institutional arrangements, practices (i.e. system configurations) (Caniglia et al., 2021).

## 2.2 Transformative research is plural and collaborative

The focus on persistent problems and the aim to contribute to solutions for sustainability transitions – both of which are complex, uncertain and contested – means that transformative research needs to bring together multiple research perspectives and paradigms and to collaborate with co-inquirers from different disciplines, and from beyond academia. This opens room for a dialogue between science and society, societal learning and capacity building.

The attempt to understand, analyse and address persistent problems means that insights derived from using different research perspectives and approaches are necessary. For example, Avelino (2011, p. 22) contends that we "*cannot afford*" to choose sides between different approaches to science in the face of questions concerning persistent (complex, normative) problems and transition processes. Thus, what is needed here is the knitting together of kindred – and even conflicting – perspectives; and the refusal of letting any one of these dominate at the exclusion of all others, that is **methodological and possibly theoretical pluralism** (Midgley, 2011). It has been suggested that the interpretive research paradigm can offer the openness to accommodate such pluralism (Avelino, 2011; Avelino and Grin, 2017) as can a pragmatic stance (Greenwood and Levin, 2007; Popa et al., 2015). Such a stance requires transformative researchers to be skilled in a repertoire of research methods including qualitative and quantitative methods, and to engage in methodologically rigorous research, if only because outcomes will have a direct effect on the lives of stakeholders (Greenwood and Levin, 2007).

Clearly, combining and possibly integrating knowledge from different disciplines cannot be exhaustively investigated from within one discipline (Avelino, 2011; Donaldson et al., 2010; Klein, 2008; Rotmans, 2005). In addition, they cannot be understood from within academia alone since more than scientific knowledge is needed to frame these problems and reconstruct solutions (Flyvbjerg et al., 2012; Hadorn et al., 2008). Consequently, transformative research approaches are **inter- and transdisciplinary** and thus include the participation of and **collaboration with** societal stakeholders in addition to trained scientists from multiple disciplines (Greenwood and Levin, 2007; Kates et al., 2001; Saltelli et al., 2016). Such research approaches are necessary not only to draw on knowledge from across

disciplines and actor groups, but also to draw on normative orientations providing guidance for developing solutions, and to increase ownership, legitimacy, but also accountability, for both problem understanding and possible solutions from all involved (Lang et al., 2012).

Such research necessarily blurs the boundaries between different forms of expertise, and between science and society – it opens up an agora – where science engages in deep conversation with the public and the public talks back (Nowotny et al., 2003). By refusing a monopoly on expertise, academics gain from learning from those who are experts in their local issues and have already patched together solutions to address them. This sort of mutual social learning between civic society and academics occurs when both parties respect the unique insights each brings, and they begin to understand the priorities and commitments of the other. It supports a process of 'making sense' together by deconstructing dominant structures, cultures and practices and reconstructing possible desirable solutions in the spirit of a 'can be' orientation (Avelino and Grin, 2017). It is assumed that the collaborative nature of the shared knowledge generation itself becomes generative for triggering transformative change (Schneider et al., 2019). For instance, shared outcomes such as increased trust, motivation, joint understanding, and network building can be seen as important mediators in co-production processes (Walter et al., 2007). Increasing individual and collective agency and building societal capacity transformative research carries the inherent assumption to empower actors in realizing "*intentions in favor of new and alternative social and political orders*" (Caniglia et al., 2021, p. 96).

## 2.3 Transformative research is iterative and reflexive

Taking complexity and uncertainty as well as an orientation towards the generation of counter-hegemonic alternatives as starting point demands an **iterative process of knowledge co-production** which requires and increases the **reflexivity** on parts of researchers and co-inquirers.

In order not to reproduce unequal power relations, taken-for-granted framings or habitual practices through its system analysis or its experimental and generative practice, transformative research practice needs an outspoken orientation and commitment to increase overall **reflexivity**. There is a range of ways through which reflexivity can be engaged in research

processes: from accounting for the positionality of the researcher, allowing differences to be voiced to attending to the broader contexts within which results are produced and shared (Finlay, 2002). At its fundament, it acknowledges the impossibility of researchers being positioned 'outside' of their research (Schwartz-Shea, 2006). Going beyond, reflexivity in transformative research also concerns the capacity of individuals and groups to not only diagnose persistent problems but also to confront the approaches, structures and systems that reproduce them (Hendriks and Grin, 2007; Voß et al., 2006), which is often related to modernity (Beck et al., 2003). As a capacity, the reflexivity of a transformative research project can then be considered as its "*ability to interact with and affect the institutional setting in which it operates*" (Beers and Mierlo, 2017, p. 418). Such a view on reflexivity allows for agency of individuals and also for systems change, and is thus generative of alternative structures, cultures and practices.

Developing a pragmatist perspective on reflexivity in transdisciplinary sustainability research (Popa et al., 2015), suggest four aspects of such research processes: 1) Deliberation on the overall normative and epistemic orientation the research, 2) Deliberation on the socially relevant framing of research problems; 3) Generation of reflexivity on values and understandings in concrete problem-solving and social experimentation processes, and 4) Generation of reflexivity on normative commitments and ideological orientations in social transformation processes. Taking this up means that reflexivity can be stimulated by mutual inquiry and dialogue; processes of searching, learning, and experimenting; capacity building and interactive learning, or learning-by-doing (Bartels and Wittmayer, 2018; Beers and Van Mierlo, 2017; Greenwood and Levin, 2007; Loorbach, 2010). This relates not only to the collaborative but also the **process character** of transformative research – fostering societal learning and creative generation of new ways of doing, thinking and/or organising society is not done by a one-off engagement. It requires iterative, dynamic and collective processes including action and reflection (Greenwood and Levin, 2007) and is constituted through exploratory cycles of theory-driven intervention, shared reflection and impact-oriented evaluation to identify feasible, socially acceptable and legitimate action pathways (Caniglia et al., 2021).

Transformative research **processes relate** to specific context-bound problems and can have different foci.

By way of example[3]: 1) meaning-making, de- and reconstruction of realities – using methods such as participatory scenario development, backcasting or appreciative inquiry (Hebinck et al., 2018; Ludema and Fry, 2008; Quist et al., 2011) ; 2) experimenting with or putting into practice alternative solutions, and/or creating viable ecosystems for these – using methods such as urban or living lab approaches, action science (Dick, 2004; Voytenko et al., 2016); or 3) learning from such interventions – using methods such as participatory evaluation, reflexive monitoring or participatory rural appraisal (van Mierlo et al. 2010) or 4) a combination of these – think of participatory action research, collaborative inquiry or transition management (Greenwood and Levin, 2007; Wittmayer et al., 2014). Often, the setting up of these processes is based on explicit or implicit working propositions or hypothesis derived from (collaborative) analysis and deconstruction. The intensity and interaction of the different co-inquirers depends on the phase, goals and content of collaborative knowledge co-production (Pohl et al., 2017).

Building on a pragmatist understanding, transformative research approaches strive to overcome the separation between action and knowledge, considering knowledge-building a social activity that is deeply embedded in and specific to the contexts within which it takes place. As put by Greenwood and Levin (2007, p. 6): "*valid social knowledge can only be derived from practical reasoning engaged in through action.*" Reflexivity is thus entailed in processes of collaborative knowledge production: where critical positions are joined by a shared normative direction to become generative for social change.

# 3. Doing transformative research

Based on such principles as suggested in section 2, there are manifold ways in which (elements of) transformative research can be put into practice: the respective methods and ways in which these are applied depend on the research questions and the situation at hand. For this first working paper, we introduce four examples from different EUR researchers to speak to our imagination of how it could look like in practice.

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[3] In the following we outline a number of exemplary methods that can be used. This is by no means an exhaustive list – rather it is a starting point for follow up publications focusing on actual methods and approaches. See also Textbox 3 for resources which provide more detailed insights on many of these methods

## Case 1: Research project ARTS

The research project ARTS (Accelerating and Rescaling Transitions to Sustainability) was funded by the European Union with the **overall goa**l of understanding and supporting local sustainability transition initiatives in cities.

**Persistent problem:** The project aimed to address sustainability problems in cities and urban regions, e.g., equitable human development within planetary boundaries, issues of social cohesion, social injustice, housing shortage, and the cooperation of policy and civil society in addressing these.

**Who?** In this project, nine research institutes (Dutch Research Institute for Transitions, Leibniz Institute of Ecological Urban and Regional Development, Sussex University, Flemish Institute for Technological Research, Boğaziçi University, Stockholm Resilience Centre, Austrian Institute of Technology, Central European University), cooperated with actors from civil society, economy, administration (BEE Environmental Communication, Local Governments for Sustainability).

**Output:** The project created knowledge about the mechanisms and conditions for facilitating transitions, as well as actionable knowledge on the role and impact of initiatives that is context-dependent for involved actors. In each involved city, research processes unfolded including many local stakeholders, such as the Stockholm Art Dialogue to present and discuss ideas and insights on how to better transform towards a more sustainable Stockholm, the Dream Budapest campaign to promote partner civil initiatives summary visions or the Open Minds City Debate Genk about a sustainable, entrepreneurial and cosmopolitan city. Beyond the project team, knowledge had also been shared in fact sheets, reports, scientific papers, multimedia and other presentations.

**Methods**: ARTS is an integrated, inter- and transdisciplinary project using scientific methods such as systematic literature reviews, case studies, comparative analysis, as well as action research through transdisciplinary work in the five city regions, using workshops, policy dialogues, or citizen bloggers.

## Case 2: The Global Diplomacy Lab

The Global Diplomacy Lab GDL is founded and funded by a public-private partnership between the German Federal Foreign Office, the BMW Foundation Herbert Quandt, the Global Leadership Academy, the Stiftung Mercator and the Robert Bosch Stiftung. It is a strongly member-driven platform exploring a new and more inclusive diplomacy which goes beyond traditional politics.

**Persistent problem:** GDL aims to advance more inclusive and agile formats of diplomacy and

international cooperation to deal with cross-border and global challenges., such as climate change, biodiversity loss, increase in social distance, and brings together experts from a wide range of sectors and disciplines, tapping into their knowledge and skills, thus forming creative and interdisciplinary communities that could function as a global taskforce. As the nature of diplomacy is evolving, we can no longer rely on the strict purview of national governments and international organisations. But we must commonly build new and more inclusive diplomacy.

**Who?** The Global Diplomacy Lab combines 23 founding, knowledge and network partners and more than 200 members from all around the world. The Partnerships Resource Centre (PrC) of Rotterdam School of Management of Erasmus University worked together with the Global Diplomacy Lab (GDL) to support the future strategy development of the GDL.

**Output:** The project with PrC created knowledge on global diplomacy, as well as actionable knowledge for the different partners and further stakeholders, such as, e.g., young diplomats. GDL's strategy document includes a vision on a new, innovative Diplomacy – Diplomacy 4.0 –, an impact statement, and a call to action. Some of the many activities of GDL include a GDL-led discussion on international climate diplomacy at COP26, training young diplomats in communication, mediation and leadership and GDL co-creation workshops at the prE-Summit. Beyond the project team, knowledge had also been shared in activity descriptions, articles, and videos.

**Methods:** In this joint action research project, new approaches and tools of communication were developed in a transdisciplinary research group. Methods such as literature reviews, in-depth semi-structured interviews, co-creation workshops and work sessions to work on the strategy were used for re-formulating an agenda for collective action.

## Case 3: The research project Living Lab spatial adaptation Dordrecht

The research project **Living Lab spatial adaptation Dordrecht** is a project with the overall goal to explore measures that increase the climate resilience of the island, therewith making it future-proof. Simultaneously, the project aims to research how the outcomes can be applied on a wider scale. The project was funded by the Dutch Ministry of Infrastructure and Water Management.

**Persistent problem:** The project addresses the challenge of making cities liveable and at the same time climate resilient, by exploring how measures for climate adaptation can be coupled with improving the biodiversity, liveability, ecology, and water quality within an area. Next to improving the sustainability of

the physical environment, the project addresses the problem of upscalability and practicability of the pilot outcomes by looking at ways to enable both experimentation and large-scale sustainable change.

**Who?** The project was a collaboration between the municipality of Dordrecht, the province of South-Holland, the Hollandse Delta district water board, Deltares, GovernEUR and the Erasmus University Rotterdam (EUR). Stakeholders were also invited to collaborate on the pilots.

**Output:** The project created theoretical and partner-related practical knowledge on both the internal success of the pilot itself, as well as the external transferability and lessons for pilots and living labs in general. Activities of the project include the set-up of two pilots (Waterkraan and Vogelbuurt), and the monitoring and support of these pilots. The project also contributed to the implementation of sustainability principles throughout the involved organizations, by the development of a green-blue vision and a Plan of which is also generating new projects and administrative support. Beyond the project team, knowledge has been shared in reports and interviews.

**Methods:** This project used a combination of research, innovation, and practice methods in the field of green-blue measures. Pilot projects are supported in their concrete activities through active monitoring and knowledge co-development. Specific methods used are literature reviews, analysis of the living lab, and monitoring.

## Case 4: The research project Migrant Labour in Dutch Agriculture: Regulated Precarity

The research project Migrant Labour in Dutch Agriculture: Regulated Precarity is funded by the Open Society European Policy Institute (OSEPI) with the **overall goal** of exploring the causes, forms and possible responses to unfair labour practices affecting migrant workers from CEE Central and Eastern Europe (CEE) in the Dutch agricultural sector.

**Persistent problem:** The project addresses the unfair labour practices, including structurally poor wages and living standards, insecure contracts and hazardous working conditions experienced by migrant workers from Central and Eastern Europe (CEE) in the Dutch agricultural sector.

**Who?** The project is led by the European University Institute's Robert Schuman Centre for Advanced Studies. From the side of ISS, Dr. Karin Astrid Siegmann with support from ISS PhD candidate Julia Quaedvlieg and ISS graduate Tyler Williams conducted collaborative research with workers organizations. The research is part of a broader comparative EU study focusing on supply, demand

and practices in migrant agricultural labour in Northern Europe. The other two countries examined are Sweden and Germany.

**Output:** The research revealed that there are a variety of institutional, structural and associational mechanisms that disempower migrant workers in the Dutch agricultural sector which are set out in the final report. These findings were included in a policy brief which recommends a series of steps to strengthen the position of migrants in the entirety of the agricultural chain. The brief was presented at a multi-stakeholder event in October 2020 opened with a keynote from a representative of the Migrant Worker Protection Taskforce, established by the Dutch government.

**Methods:** The methodology sought to ensure that the workers' own perspectives were central in the subsequent report and policy recommendations. The research involved a desk study as well as targeted interviews with a range of (expert) stakeholders, including migrant workers, trade unions, non-governmental organisations and policy-makers.

# 4. Being a transformative researcher

Doing transformative research is, in several regards, different to engaging in descriptive-analytical or quasi-experimental research, the main difference being that co-producing socially robust knowledge and entering the agora – a relational space where traditional role understandings get blurred – changes the ways in which researchers work and engage with society (Gibbons, 1999). Researchers have to adopt new and often challenging roles (Bulten et al., 2021; Hilger et al., 2018; Horlings et al., 2020; Pohl et al., 2010; Schut et al., 2014; Wittmayer and Schäpke, 2014). Especially in process-oriented sustainability research, such as action research or transition management, we have to fulfil much more than acting as traditional provider of knowledge (Bulten et al., 2021). Pohl and colleagues even talk about the very personal aspect of "*dealing with a divided identity as a researcher in a knowledge co-production process*" (Pohl et al., 2010). This ambiguity between the epistemic culture we have inherited as researchers in the conservative academic environment, and the ego-deflating work of changing the role of fact-maker and decider to one of co-creation and facilitator, is indeed a transformative process for researchers that should not be taken lightly nor superficially. The overall challenge for transformative researchers is to open and convene the space for co-production allowing to articulate critique while building robust relationships (Bartels and Wittmayer, 2018; Miller, 2013; Pohl et al., 2010). In doing so,

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many different roles for transformative researchers have been distinguished (Bulten et al., 2021; Hilger et al., 2018; Horlings et al., 2020; Pohl et al., 2010) and we summarise some of them in what follows. Transformative researchers not only need to act like traditional **reflective scientists** that, collect, analyse and report on data, providing results to research questions, and so on. They also act as **facilitators of joint learning processes** that initiate and nurture processes of change, consciously selecting participants and encouraging the expression of different, even contradictory, viewpoints. They need to be **intermediaries** or **knowledge brokers**, who help generate socially robust knowledge, acknowledging the complexity of the system and the contested nature of concepts like sustainability. In this role, researchers have to explicitly acknowledge other actors' knowledge and normativity as well as their own. Transformative researchers often also act as **change agents,** who build and maintain networks, motivate and empower stakeholders and engage in experimental projects or policy formulation or act as a political entrepreneur. Last but not least, and decisive for working as a transformative researcher, transformative researchers have to be **self-reflexive scientists,** who not only are aware of their own normativity or morality, but also acknowledge their own part and role in dynamic processes.[4]

Surely, not every transformative researcher has to fulfil all of these roles, not at the same time nor all of the time or at all. In fact, being aware of one's own proclivities and limits is part of the reflexive process. While transformative researchers aim to be cognitively open and methodologically well versed, they honour traits and qualities in others and value partnering with complementary teammates. Empirical analysis of these roles in research projects shows that they are often taken up in different phases of the research (Pohl et al., 2017), or that roles are combined (Lummina G Horlings et al., 2020) or that roles can be in conflict with one another (Wittmayer and Schäpke, 2014). The challenges and tensions that come with being a transformative researcher in multiple roles and in doing transformative research are discussed in the following.

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[4] For a more comprehensive and detailed description of the roles and activities of researchers in sustainability research, please have a look at Wittmayer and Schäpke 2014, Table 1 and Horlings et al. 2020, Table 1.

# 5. Challenges in doing transformative research

Besides the traditional challenges all researchers face – such as providing best evidence available – transformative research activities lead to a number of additional challenges, tensions and dilemmas. Along with the distinction between **methodological and epistemological**, **social and political barriers**, as well as **institutional barriers** for engaging in transdisciplinarity made by Brouwer et al. (2018), we discuss several of the barriers (or as we call them, challenges) involved in transformative research.

**Epistemological** challenges are related to the nature, origin, scope and understandability of our co-produced knowledge. Transformative researchers have to deal with collecting, understanding and integrating different types of knowledge (e.g. indigenous knowledge, experiential knowledge) from different disciplines and backgrounds (Brouwer et al., 2018) and integrating different thought collectives and thought styles (Pohl et al., 2010). In this context, it is often difficult to explain the relevance and value of, e.g., experiential knowledge to the scientific community and there are often societal convictions about the definition and understanding of scientific knowledge and how this knowledge should be developed (Bulten et al., 2021).

**Methodological** challenges are related to if and how transformative researchers are able to co-produce scientifically valid and socially robust knowledge. Almost on a meta level, we face challenges related to the ownership of the problem at hand (Wittmayer and Schäpke, 2014), our position to the research problem and the stakeholders in the process (Horlings et al., 2020), the definition of contested concepts such as sustainability (Wittmayer and Schäpke, 2014), our own subjectivity and normativity towards these concepts (Horlings et al., 2020), or the action and the change we want to foster by intentionally intervening in the system (Horlings et al., 2020; Wittmayer and Schäpke, 2014). What is more, our ability to co-produce scientifically valid and socially robust knowledge is challenged by combining the need for scientific adequacy and the respect for different stakeholders' values and beliefs (Pohl et al., 2010). As we engage in activities that differ from more conventional research activities, we need to question the legitimacy of our interventions (Pohl et al., 2010) and the possible consequences at larger spatial and longer temporal scales. We also need new types of methods, skills and training (e.g. on dealing with group dynamics, or relating to societal stakeholders), and

face the challenge of developing and using valid and appropriate research methods (Wittmayer and Schäpke, 2014). Adequate quality criteria and evaluations of 'excellence' for how we do transformative research are just being developed (Bergmann et al., 2005; Jahn and Keil, 2014; Reason, 2006). This potentially opens the door to unwarranted fundamental criticism of transformative research in general, but also leaves open what 'scientific rigour' means in such research environments. To remain the (self-)-reflexive researchers we need to be, and reflect on our beliefs, our practices and our challenges in a systemic manner (Pohl et al., 2010) and develop appropriate vocabulary to explain and navigate the tensions and potentials that come with our 'new' activities and roles (Wittmayer and Schäpke, 2014), we have to be aware of different power structures within and outside the team (Wittmayer and Schäpke, 2014) and not let the process get hijacked by different stakeholders (Pohl et al., 2010).

**Personal, social and political challenges** are related to personal, disciplinary, and cultural values and norms of how research is done and different motivations and agendas – and hidden agendas – of participating in transformative transdisciplinary research projects. Personal barriers could be personality, internal motivation, and gender (Horlings et al., 2020), but also dealing with conflicting roles (e.g. action researcher versus other more academic roles) and the ability to combine the "old" and the "new" world (Bulten et al., 2021). This can even lead to problems of self-conception and divided identity (Pohl et al., 2010). Social challenges we have to deal with are: the underlying power structures (Wittmayer and Schäpke, 2014); differences including cultural differences or different perspectives between different disciplines or stakeholders and partners; different problem definitions; or different priorities (Brouwer et al., 2018; Bulten et al., 2021; Pohl et al., 2010). Political challenges can relate to the intervention legitimacy, i.e. what kind of intervention is legitimate, how, by whom (Wittmayer and Schäpke, 2014). Related to these challenges are those related to research integrity in transformative research – which is in need of discussion in relation to existing integrity standards.

**Institutional challenges** are related to the way the formal and informal institutions in academia work. The way we work and the roles we have to fulfil are at odds with the formal and informal academic structures (Bulten et al., 2021; Horlings et al., 2020) and the disciplinary individualistic focus. Therefore,

transformative researchers run the risk of having worse career prospects (e.g. fewer publications in high ranked journals) (Brouwer et al., 2018) and more problems with resource availability (e.g. more difficult access to funding) (Brouwer et al., 2018; Bulten et al., 2021; Horlings et al., 2020). So far, a recognition and reward system for societal engagement of researchers is only in its infant stages. Societal action is not valued as research output yet, but engaging with society and making normative statements is perceived as counteracting the objectivity and independence of research. This often makes it difficult to match internal and external expectations (Horlings et al., 2020), e.g., by project groups, the employing organization, and for ourselves. The institutionalisation of transformative research is done outside traditional structures, through communities of practices within organisations, through organising conferences, workshops or setting up international networks and resource websites (see Textbox 3 for an overview of resources).

## 6. Looking forward

This working paper has laid out our basic understanding of transformation research and what it implies in terms of underlying principles and possible challenges. There is much more to be said and we have hinted at some of the still-open questions throughout: the actual methods and approaches, how the different 'family members' of transformative research compare and relate to one another, and the challenges of institutionalisation. It is clear that a substantial engagement with transformative research at the EUR will require us to develop a broader experience and capacity basis. It also means that we need to think about (changing) the institutional conditions that allow for and stimulate transformative research. To do so, we want to invigorate the conversation and try to create a critical mass of transformative researchers.

We hope it will help us at the EUR and elsewhere to move towards starting in-person, virtual, one-to-one and group conversations about the necessities and contestations, as well as potential pitfalls and contributions, of different ways of doing research that support just sustainability transitions. And in addition to conversations in our own discipline, we hope it will kick-start shared engagements, action and learning with others in ways that use transformative research to analyse and deconstruct the current structures, cultures and practices we are embedded in, and reconstruct them in ways that allow a diversity of ways to connect research and education with meaningful societal change.

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We hope you want to join this quest, and we invite you to become part of this broader movement in doing one of the following:

- Join our **upcoming workshop series in 2022** focusing on institutional challenges of transformative research
- Becoming member of our growing **community of practice** – to share your own experiences with transformative research, to share actual transformative research cases and methods and to provide for peer learning moments and reflection.

More information on the workshop series and our community of practice will follow on our website. You can stay updated by checking the website, subscribing to the newsletter or following us on LinkedIn.

If you have questions, remarks or want to chat now, we encourage you to get in touch with us via email.

### Textbox 3: Overview with resources on transformative research

Here, we provide a non-comprehensive overview of resources on tips and tools for transformative research.

- The homepage "Research to Action: The Global Guide to Research Impact" is a collection of material useful for more strategic and effective research communication and engagement.
- The Swiss Academies of Arts and Sciences database contains methods and tools for co-producing knowledge for tackling real-world, context-sensitive societal challenges.
- The Australian National University in Canberra presents resources for researchers tackling complex social and environmental problems.
- The AR+ Action Research Foundation connects and supports action researchers for transformation and provides materials on AR.
- The homepage "CLIMATE INTERACTIVE tools for a thriving future" creates accessible, scientifically rigorous tools that help people see connections, play out scenarios, and see what works to address the biggest challenges we face.
- The Center for Collaborative Action Research offers a free online course with 12 Tutorials that allow for learning about action research.
- GAiA presents a set of eight toolkits for transdisciplinarity to exchange learnings about methods for transdisciplinary research.

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# DESIGN IMPACT TRANSITION

## PLATFORM

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