

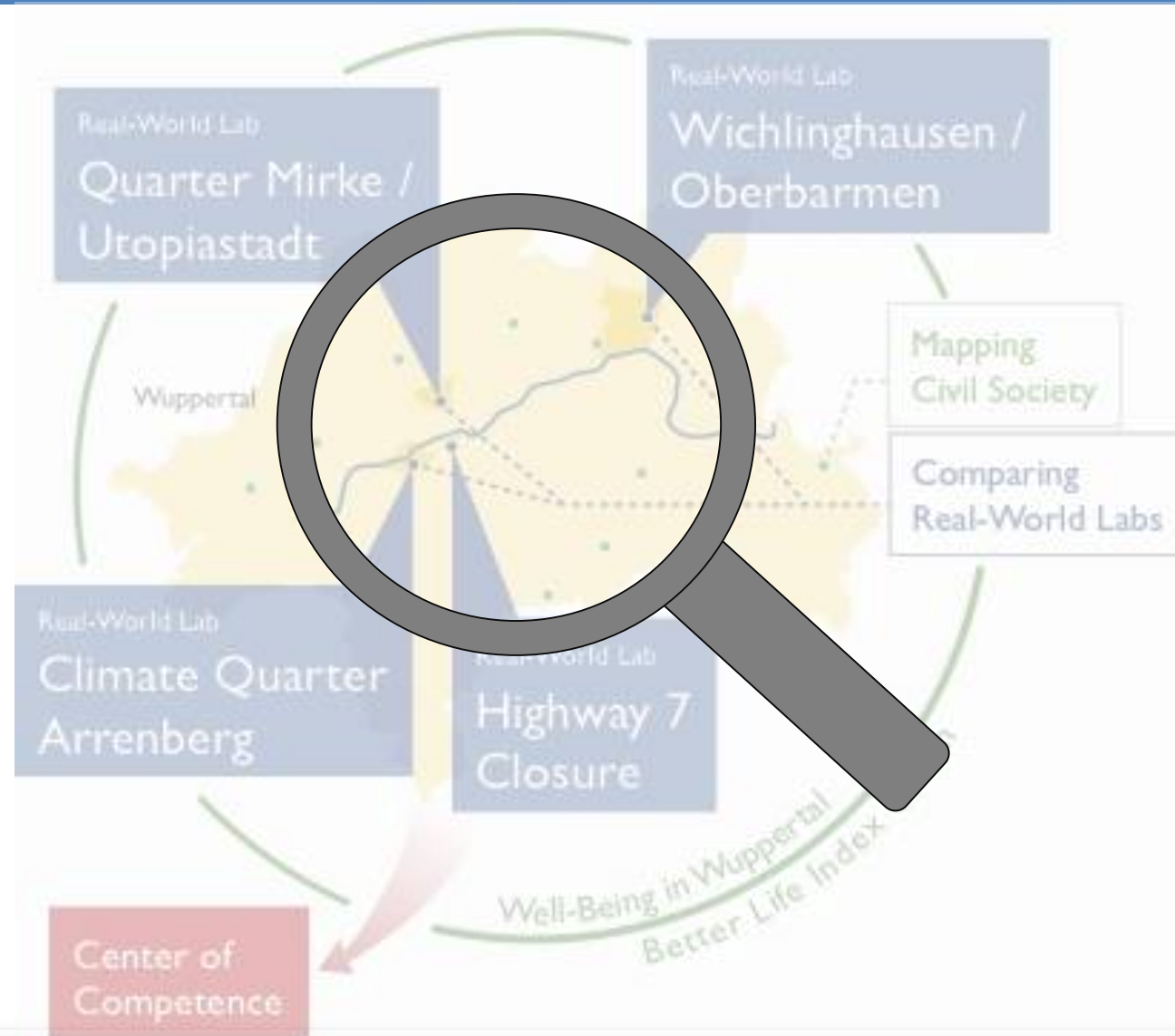
# Real-World Laboratories as a Transdisciplinary Method for Change

A comprehensive Understanding of  
Components and Central Processes

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Matthias Wanner &  
Janina Westerkowski

Well-Being Transformation  
Wuppertal

# RESEARCH FOR SUSTAINABILITY TRANSITIONS AND REAL-WORLD CHANGE



## Real-World Laboratories as a Transdisciplinary Method for Change

Matthias Wanner | Annaliesa Hilger | Janina Westerkowski | Research Fellow and PhD Student

### Humanity on the move: Unlocking the transformative power of cities (WBGU 2016: 542)

- **Setting:** spaces and possibilities for collaborative sustainability research
- **Roles:** strong science-practice interaction (shared problem understanding, concept development and project processing)
  - **Researchers:** scientific knowledge, methodological expertise, and an ability to reflect and evaluate which is disengaged from the necessity of action
  - **Practitioners:** experience and know-how.
- **Aim:** to generate systems, target and transformation knowledge through real-world interventions

## RELATED APPROACHES

- Intervention research (Krainer and Lerchster 2012)
- Participatory Action Research (Ozanne and Saatcioglu 2008, Kemmis and McTaggart 2000)
- Transdisciplinary Processes (Scholz 2011)
- Conceptual Model of Transdisciplinary (Carew and Wickson 2010, Jahn et al. 2012)
- Co-Creation of Knowledge for Sustainability (Mauser et al. 2013)
- Urban Transition Labs (Nevens et al. 2013, Nevens and Roorda 2014)
- Sustainable Living Labs (Liedtke et al. 2015)
- Real World Experiment (Groß et al. 2005)

# RELATED APPROACHES

(Transdisciplinary) methods ↔ /key aspects	Intervention-research ↔ (Krainer und Lerchster 2012)↔	Participatory Action-Research ↔ (Ozanne und Saatcioglu 2008)↔	Transdisciplinary-Processes ↔ (Scholz 2011)↔	Conceptual-Model-of-Transdisciplinary ↔ (Jahn et al. 2012)↔	Co-Creation-of-Knowledge-for-Sustainability ↔ (Mausser et al. 2013)↔	Urban-Transition-Labs-(UTL) ↔ (Nevens et al. 2013; Nevens and Roorda 2014)↔	Sustainable-Living-Labs ↔ (Liedtke et al. 2015)↔	Real-World-Experiment-(Groß et al. 2005)↔
<b>Provenance</b>	IFF-OGI (Inst. for Organization-Dev., Group-Dynamics & Intervention), Univ. Klagenfurt/A	Origin: Social-Psychology (Kurt-Lewin); Further developed by various social-scientists and institutions	IED (Institute for Environmental-Decisions), ETH-Zurich/CH	ISOE (Institute for Social-Ecological Research), Frankfurt/GER	Future Earth Initiative	DRIFT (Dutch-Research-Institute-for-Transitions), Univ. Rotterdam/NED	Living-Labs: MIT, Boston/USA Sust. LL: Wuppertal-Inst., Wuppertal/GER	IWT (Institute of Science and Technology Studies), Univ. Bielefeld/GER
<b>Theoretical foundation</b>	Enlightenment; qual. social-research; group-dynamics; phenomenol. methods; action-research; td-research (p. 12; Lerchster 2012:30)	Psychology, qualitative-social-research, group-dynamics, organisational-development	Human-environ. system (HES), based on biology, psychology, industrial-ecology, economics and sociology. (453ff)	Post-normal-science and Mode-2-science; TD is a research approach, not a theory, methodology or institution; (p. 2f)	Addressing challenges of global change by natural, social and human science (p. 421).	Multi-level-perspective (MLP) within the framework of transition-management (governance-approach)	(Social)-innovation theory; transition-research; social-practice theory; (p. 109f)	sociology of scientific knowledge and uncertainty
<b>Rationale for the specific (transdisciplinary) method</b>	Irritation of complex, non-trivial and self-referential social systems (Hübner 2012:169)	Social reality as historically constructed and therefore intertwined with power relations. Goal is helping marginalised groups (p. 423ff)	Transdisciplinary for coping with complex, socially-relevant problems and uncertainty (p. 374)	Focus on „wicked problems“, TD is required, if system, transformation and orientation knowledge are lacking (p. 8)	Addressing the grand-challenges (to forecast-observe, confine, respond, innovate) as an answer to global change (p. 421).	UTL as a new governance-structure for sust. cities (Nevens et al. 2013:120; )	Transforming society into one that features sustainable patterns of production and consumption (p. 107)	Research as an dissent on the reliability of knowledge as well as on non-action (p. 12)
<b>Aim of the process</b>	Self-Enlightenment (in-groups) through instructed self-reflection, opening new courses of action (p. 10ff; Hübner 2012:169)	Production of new theories, social-innovations, initiation of social-movement, empowerment and capacity-building (p. 424ff., 430)	Production of relevant, socially-robust knowledge that also feeds back to scientific knowledge-generation and theory-building (p. 373)	TD-processes have to produce new knowledge and facilitate Mutual-Learning between scientists and practitioners (p. 3ff)	Assisting societies to make-informed decisions (p. 422); production of useful-knowledge for society (p. 427)	UTL „provides space and time for learning, reflection and development of alternative solutions that are not self-evident“ (Nevens et al. 2013:115)	Enabling innovation processes in which users and actors actively participate in development, testing and marketing phases of sust. products/lifestyles (p. 108)	Knowledge production from former experiments for application in new experiments institutionalised learning to deal with uncertainty (p. 15, 210)
<b>Roles of scientists and practitioners</b>	Sci: Data-collection, interpretation and presentation; facilitation of practitioner's deliberation Pra: provide problems; (instructed) self-reflection and decision-making (p. 13)	Sci: Participating in the social context of the problem; data collection Pra: Involved throughout the whole research process as collaborators (p. 424f.), become empowered	Sci: Facilitating td-collaborations; shaping the process (p. 384-385); system-analysis; knowledge-integration Pra: Public at large and legitimized decision-maker; partly in-control (p. 388)	Sci: Production and evaluation of new knowledge; science facilitates the process; is critical and self-reflexive (p. 9) Pra: provides specific knowledge (p. 9)	Sci: scientific knowledge; coordination of integration-processes (p. 428f) Pra: Stakeholder and decision-maker take part in knowledge-creation (p. 427)	Sci: coordination, pooling and influencing actors and their activities (Nevens et al. 2013:114) Pra: innovative 'regime' actors and frontrunners from 'niche' contexts (ibid. 115)	Sci: system-analysis; constructing prototypes; enabling users to innovate products and behaviour; evaluation and dissemination Pra: providing data; ideating and testing prototypes	Sci: (Retrospectively) research on processes of societal change Pra: Real-world experiment exist independent of research
<b>Typical process</b>	1. Researchers build relations in soc. system 2. Data collection: hypoth.	No standardized process but similar steps (p. 428) 1. Identification of problems	1. Joint probl. definition 2. Joint probl. representation 3. Jointly initiating a process	1. Common research object (problem transformation) 2. Production of new	Framework for co-creation of knowledge (p. 427)	1. Analysing the system 2. Envisioning 3. Exploring pathways	1. Insight-research (household-analysis of material flows and patterns of ac-	Recursive Learning (p. 15) 1. System

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# RELATED APPROACHES

(Transdisciplinary) methods+ /key aspects	Intervention-research+ (Krainer und Lerchster 2012)	Participatory-Action-Research+ (Ozanne und Saatcioglu)	Transdisciplinary-Processes+ (Scholz 2011)	Conceptual-Model-of-Transdisciplinary+ (Jahn et al. 2012)	Co-Creation-of-Knowledge-for-Sustainability+ (Mausser et al. 2013)	Urban-Transition-Labs-(UTL)+ (Nevens et al. 2013; Ne-	Sustainable-Living-Labs+ (Liedtke et al. 2015)	Real-World-Experiment- (Groß et al. 2005)
Provenance	IFF-OGI (Insti-tion-Dev., -Gro-Intervention), furt/A							IWT (Institute of Science and Technology Studies), Univ. Bielefeld/GER
Theoretical+ foundation	Enlightenment research; gro-phenomenol-ogical-research; 12; Lerchster							sociology of scientific knowledge and uncertainty
Rationale for the specific (transdisciplinary) method	Irritation of co-trivial and social systems; 2012: 169)							Research as an dissent on the reliability of knowledge as well as on non-action (p. 12)
Aim of the+ process	Self-Enlightenment groups) through self-reflection courses of ac-tion; Hübner 2012							Knowledge production from former experiments for application in new experiments institutionalised learning to deal with uncertainty (p. 15: 210)
Roles of scientists and+ practitioners	Sci: Data collection and preparation of practitioners Pra: provide (structured) self-decision-making							Sci: (Retrospectively) research on processes of societal change Pra: Real world experiment exist independent of research
Typical+ process	1. Researcher reflections in soc. system 2. Data collection: hypoth.	1. Identification of problems	2. Jointly identifying a problem 3. Jointly initiating a process	(problem transformation) 2. Production of new	knowledge (p. 427): 1. Production of	2. Envisioning 3. Exploring pathways	field analysis of material flows and patterns of ac-	Recursive Learning (p. 15): 1. System

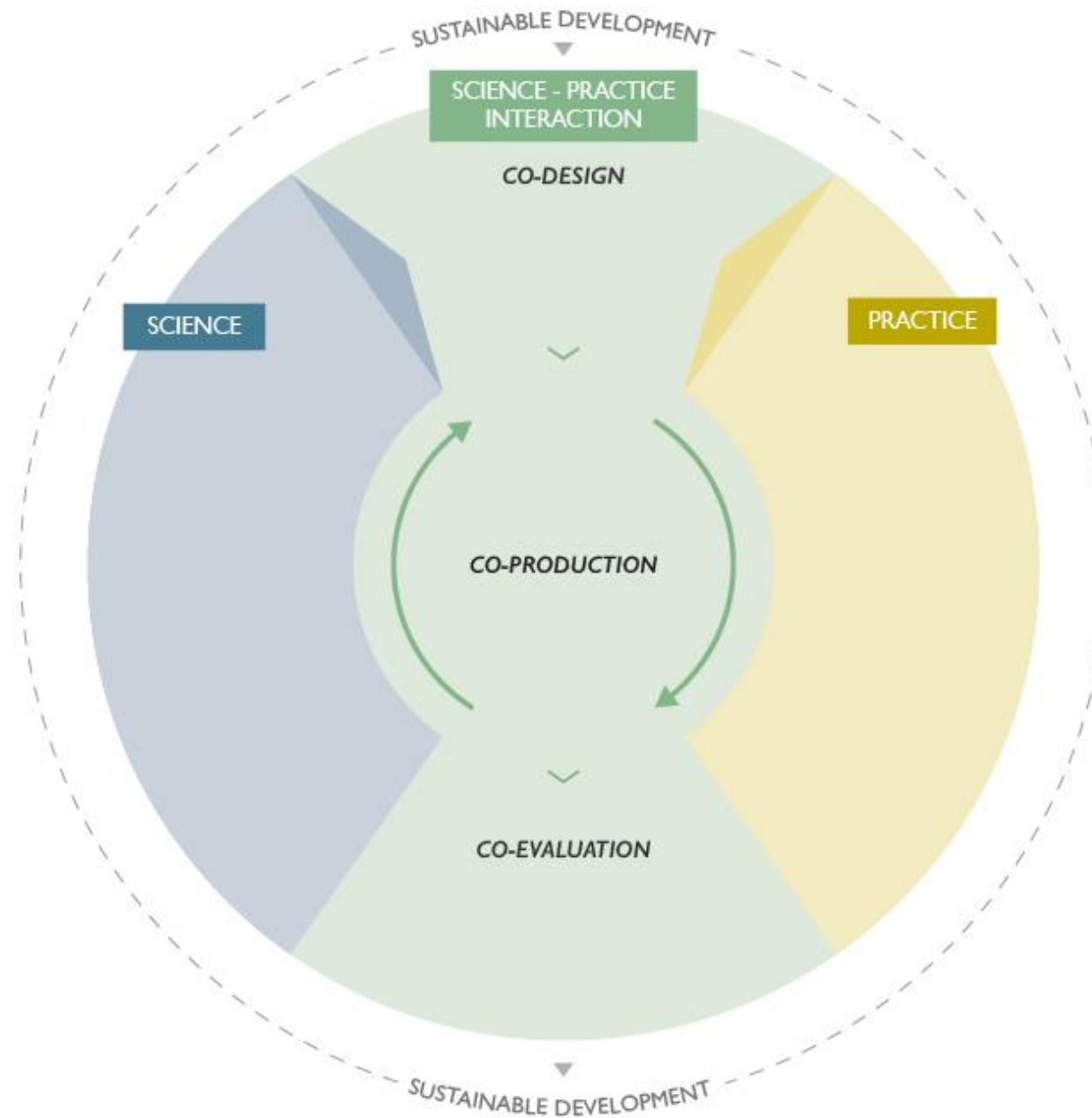
- initiation of social movement, empowerment and capacity building (Ozanne and Saatcioglu 2008: 242ff.)
- Going beyond technical incremental improvements (Kemmis and McTaggart 2000: 583; Nevens et al. 2013: 115)
- Cyclical conception of intervention and learning (Carew and Wickson 2010; Kemmis and McTaggart 2000)
- No reproducibility intended (Krainer and Lerchster 2012: 13) vs. use beyond the immediate research context (Ozanne and Saatcioglu 2008: 246)
- Several process conceptions

## REAL-WORLD LABORATORIES: KEY COMPONENTS

- Normative frame: sustainable development
- Focus on real-world problems
- “Laboratory”: Defined “Boundary Object” (content-related, areal)
- Transdisciplinary joint problem solving by practice and science (co-creation)
- Real-world intervention
- Cyclic learning processes through reflection and variation
- Empowerment and capacity building
- Production of systems-, target- and transformation knowledge
- (Limited) generalization for science and practice

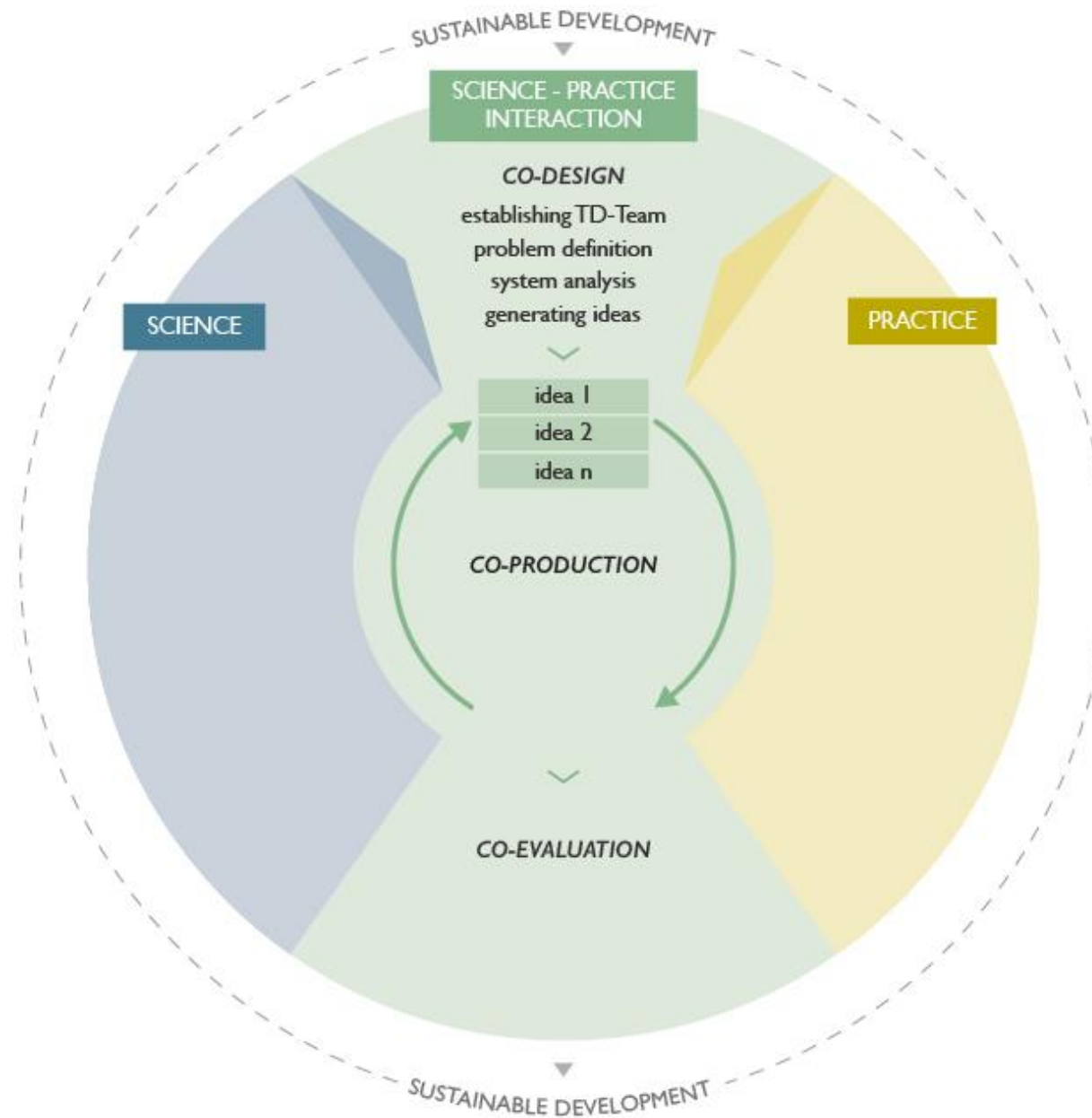


# CONCEPT: FLOWCHART

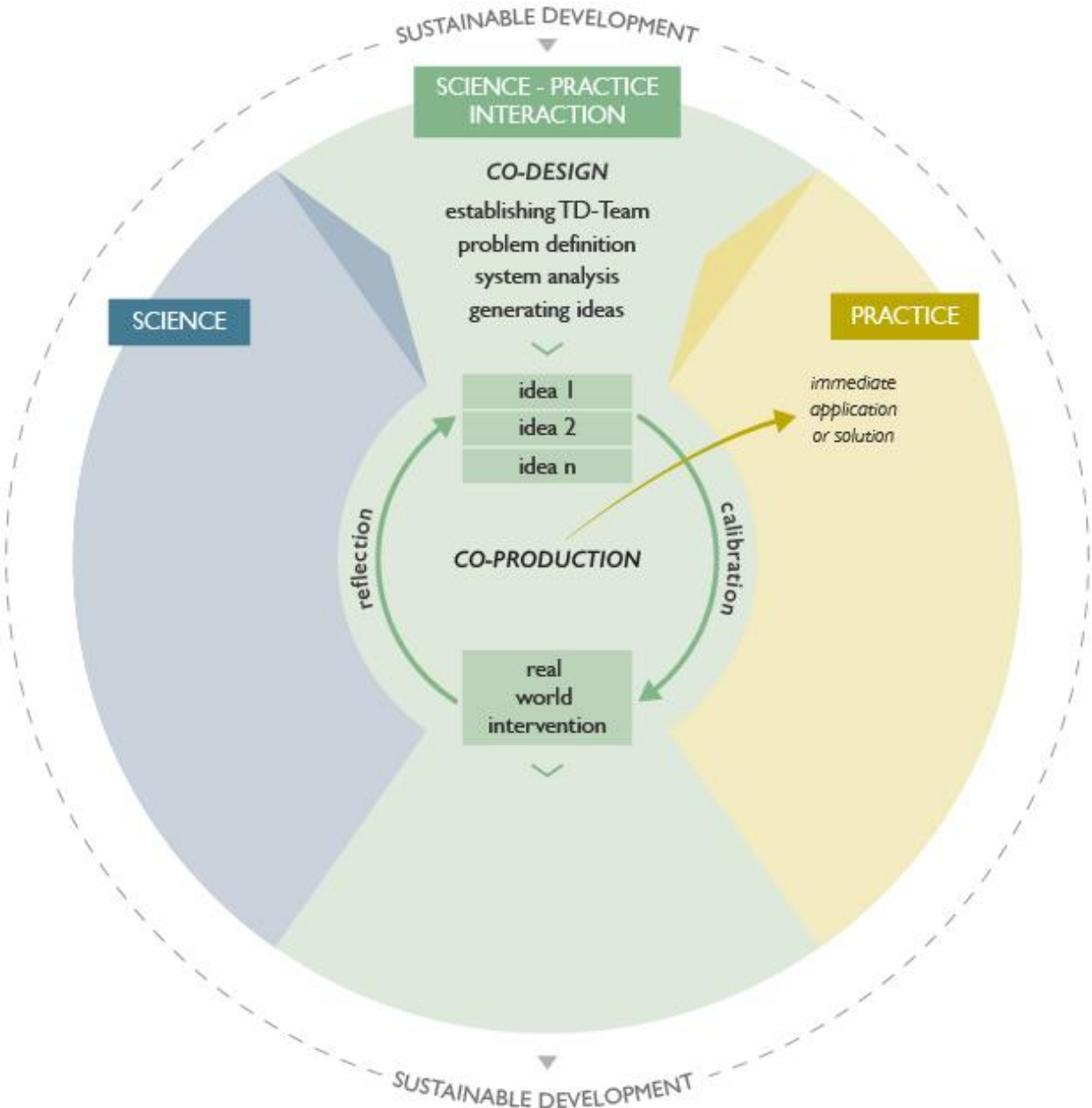




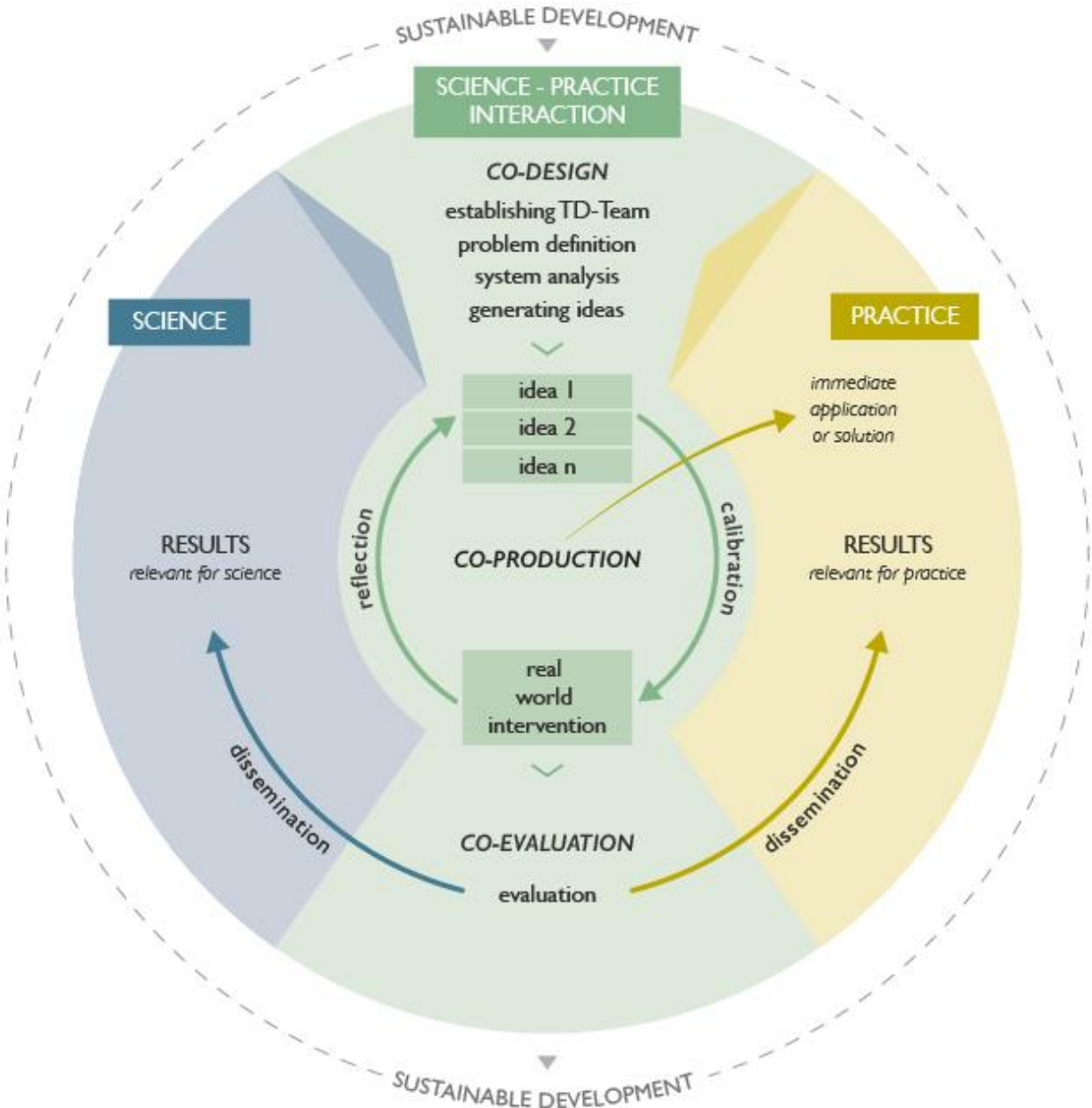
# CONCEPT: FLOWCHART



# CONCEPT: FLOWCHART



# CONCEPT: FLOWCHART



## CONCLUSION: ROLES OF SCIENCE AND PRACTICE

SCIENCE	PHASE	PRACTICE
System analysis (outside view); system model	<b>CO-DESIGN</b>	System analysis (inside view)
Reflection, disengaged from praxis (formative evaluation) Feedback	<b>CO-PRODUCTION</b>	Intervention: implementation of ideas Practical reflection
Collection and editing of data; interpretation	<b>CO-EVALUATION</b>	Interpretation

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Research for Sustainable Development (FONA)



Well-Being Transformation  
Wuppertal (WTW)

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