

Design Science and Innovation

Gavin Brett Melles *Editor*

Designing Social Innovation for Sustainable Livelihoods

 Springer

Design Science and Innovation

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Gavin Brett Melles
Editor

Designing Social Innovation for Sustainable Livelihoods

 Springer

Editor

Gavin Brett Melles
Faculty of Health, Arts and Design
School of Design
Swinburne University of Technology
Hawthorne, VIC, Australia

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Preface

We live in times of major disruption and change. The most recent 6th IPCC report paints a worrying picture about the global and regional consequences of a warming world, the COVID pandemic continues to destabilize societies and economies and nationalist, and populist and fundamentalist politics and government are on the rise. In this context, it is particularly the most vulnerable and increasingly excluded rural and urban poor who struggle and pay the price for decisions made by a political and economic elite about how development should proceed. While globally there has been progress on achieving some of the Sustainable Development Goals (SDGs), inclusive development for all remains an enormous challenge, which mainstream economic approaches have not been able to deliver. Changed perspectives and institutions are needed, and this book is a small contribution to that project.

The sustainable livelihood framework (SLF) has for thirty years proved a robust framework for understanding the many dimensions of poverty and exclusion while also identifying the particular social and institutional innovations that can enable inclusive development at the household level (Chambers & Conway 1991). The SLF is a common denominator for all the case studies in this book, which in addition looks at how the present livelihoods are and how future livelihoods might be designed by everyone (Manzini 2015). Thus, this is less a book about particular design solutions or projects—although these are discussed—and more a conversation about how livelihoods are and might be designed. It invites readers with interests in development and design to consider how we might collectively move from understanding livelihoods to intervening and redesigning the structures and processes that currently limit inclusive development. As a result, this is a book authored by researchers and practitioners trying to identify better ways of doing development.

This book looks at design writ small and large as a perspective to enable the material, social and institutional innovations that might help lead to sustainable livelihoods. In doing so, the book is oriented towards design as the broad ‘liberal art’ of the twenty-first century for applied development (Buchanan 1992). In relation to this, over the last 50 years there have been two movements in relation to design—an expansion of the expert design landscape into the fields of service, co-design and social design (Sanders & Stappers 2008) and simultaneously recognition that design

as a diffuse mode of thinking applies to many fields and practices including policy, social planning and institutional design, which are concerned with materiality and social purpose (Simon 1996). Both developments have implications for inclusive innovation, and we treat this wide design continuum in this book as relevant for sustainable development and livelihoods. We invite readers to position their current and future work in relation to the concepts and contexts discussed here.

I have been fortunate over the last decade in particular to work in various capacities as an educator, mentor and practitioner in India, Germany, Australia and more recently Nepal. Many of the organizations represented in this book have hosted me in one or other capacity over the years, and although impossible to name them all, I must include colleagues at the Centre for Social Innovation and Entrepreneurship (CSIE) at IIT Madras, and at the Department of Management IIT Madras where I have been a fellow, the Centre for Social Initiative and Management (CSIM) in Chennai—where I trained and worked as a social auditor, the Srishti Foundation and National Innovation Foundation (NIF) in India, where the support of Professor Anil Gupta has been invaluable over the years, participation in the urban green dialogues of the Indo-German Centre for Sustainability (based at RWTH Aachen and IIT Madras) and an Indian Government-Sponsored GIAN Fellowship at NIT Silchar in Guwahati. It is through these and other experiences—including postgraduate education at SOAS also—that I developed my particular interest in relating SLF to design as described above.

The book begins with a more detailed orientation to the concepts outlined above before individual co-authored case studies analyse and then propose material and institutional innovations for sustainable livelihoods. I hope you enjoy the journey as much as I did!

Hawthorne, Australia

Gavin Brett Melles

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About the Editor

Dr. Gavin Brett Melles is Professor (Adjunct) of Sustainability and Social Innovation at Swinburne University’s Design School. He is currently (2021–2022) Senior Fellow in Sustainability in the Technical Design Department of Technical University Dresden. He is a research affiliate at the Centre for Design Innovations, the Manufacturing Futures Research Institute, and the Collaborative Research Centre for Low Carbon Living (2014–2019). His research and teaching interests include design education, sustainability, social innovation and related issues. He has held numerous international fellowships, most recently at Edinburgh University (2016), IIT Madras (2019) and Technical University of Dresden (2021).

Contributors

M. Suresh Babu Department of Humanities and Social Sciences, IIT Madras, Chennai, India

Aisling Bailey Department of Architecture, State University of Bangladesh, Dhaka, Bangladesh

Sharmistha Banerjee Department of Design, Indian Institute of Technology Guwahati, Guwahati, Assam, India

Sony Baral School of Forestry and NRM, Institute of Forestry, Tribhuvan University, Kirtipur, Nepal

Erach Bharucha Bharthi Vidyapeeth Institute of Environment Education and Research, Pune, India

Bir Bahadur Khanal Chhetri Institute of Forestry, Tribhuvan University, Kirtipur, Nepal

- Sanchita Das** Tata Institute of Social Sciences, Mumbai, India
- Anamika Dey** GIAN, Ahmedabad, India
- Arun Kumar Gopalaswamy** Department of Management Studies, IIT Madras, Chennai, India
- Anil Gupta** GIAN, Ahmedabad, India
- S. Rafsana Hossain** Department of Architecture, State University of Bangladesh, Dhaka, Bangladesh
- Santosh Kadu** Tata Institute of Social Sciences, Mumbai, India
- Shamita Kumar** Bharthi Vidyapeeth Institute of Environment Education and Research, Pune, India
- Jenny Lay-Kumar** Faculty of Environment and Natural Resources, Albert-Ludwigs-University Freiburg, Breisgau, Germany;
Regionalwert AG, Freiburg, Germany
- Avinash Madhale** Centre for Environment Education, Pune, India
- Gavin Brett Melles** School of Design, Swinburne University of Technology, Melbourne, Victoria, Australia;
Department of Architecture, State University of Bangladesh, Dhaka, Bangladesh
- Sanskriti Menon** Centre for Environment Education, Pune, India
- Ravi Mokashi Punekar** Department of Design, Indian Institute of Technology Guwahati, Guwahati, Assam, India
- Santosh Rayamajhi** Institute of Forestry, Tribhuvan University, Kirtipur, Nepal
- Sunil D. Santha** Tata Institute of Social Sciences, Mumbai, India
- Devisha Sasidevan** Tata Institute of Social Sciences, Mumbai, India
- Lisa Schneider** Faculty of Environment and Natural Resources, Albert-Ludwigs-University Freiburg, Breisgau, Germany
- Petra Schweizer-Ries** University of Applied Sciences Bochum, Bochum, Germany
- Pankaj Upadhyay** Department of Design, Indian Institute of Technology Guwahati, Guwahati, Assam, India
- Peter Volz** Forschungsgesellschaft Die Agronauten, Freiburg, Germany
- Christoph Woiwode** Indo-German Centre for Sustainability at RWTH Aachen University, Indian Institute of Technology Madras, Chennai, India

Kranti Yardi Bharthi Vidyapeeth Institute of Environment Education and Research, Pune, India

Ulrike Zeshan University of Central Lancashire, Preston, UK;
University of Central Lancashire, UK and Shikha Eco-Learning, Binka, Odisha, India

Chapter 6

Indo-German Cross-Cultural Collaboration: Sharing Experience and Co-creating Knowledge for Sustainable Urban Livelihoods Design



**Christoph Woiwode, Lisa Schneider, Erach Bharucha, Shamita Kumar,
Jenny Lay-Kumar, Avinash Madhale, Sanskriti Menon,
Petra Schweizer-Ries, Peter Volz, Kranti Yardi, and Ulrike Zeshan**

1 Introduction

In recent years, sociocultural dimensions have stepped more into the limelight as a necessary factor for a global transition to sustainability. Equally, cities and towns have assumed an important role in action addressing global climate change at the local level. The twenty-first century will be dominated by the phenomenon of urbanization,

C. Woiwode (✉)

Indo-German Centre for Sustainability at RWTH Aachen University, Indian Institute of
Technology Madras, Chennai, India
e-mail: woiwode@igcs-chennai.org

L. Schneider · J. Lay-Kumar

Faculty of Environment and Natural Resources, Albert-Ludwigs-University Freiburg, Breisgau,
Germany

E. Bharucha · S. Kumar · K. Yardi

Bharthi Vidyapeeth Institute of Environment Education and Research, Pune, India

J. Lay-Kumar

Regionalwert AG, Freiburg, Germany

A. Madhale · S. Menon

Centre for Environment Education, Pune, India

P. Schweizer-Ries

University of Applied Sciences Bochum, Bochum, Germany

P. Volz

Forschungsgesellschaft Die Agronauten, Freiburg, Germany

U. Zeshan

University of Central Lancashire, Preston, UK

University of Central Lancashire, UK and Shikha Eco-Learning, Binka, Odisha, India

as approximately two-thirds of the population across the globe is expected to live in cities by 2050 (UN 2018).

UN Habitat¹ also recognizes the ‘transformative power of urbanization’, with the emergence of cities as loci not only of productive activity and resource consumption, but of social and technological innovation. A report by the German Advisory Council on Global Change strongly supports this view (WBGU 2016). Recent debates on climate change mitigation and adaptation strategies as well as on efforts to achieve the Sustainable Development Goals (SDGs) have reached a significant turning point, with the acknowledgement that technical solutions alone will be insufficient. It is essential that social practices of consumption and usage, routines and lifestyles are taken into account (Liedtke et al. 2015). Changes in lifestyle and consumption will also be needed to effect just or equitable transitions to sustainability. Across the globe, we witness innumerable grassroots initiatives and individuals pioneering novel lifestyles, consumption patterns and ways of living. They acknowledge humanity’s global interconnectedness and intend to be more economically fair, socially responsible, ethical and ecologically sustainable. Yet, another report of the Advisory Council on Global Change stresses the significance and need of such a global citizens’ movement to combat climate change (WBGU 2014).²

We place these challenges in relation to the co-creation of knowledge within the design for sustainable livelihoods. Originally, the sustainable livelihoods framework (SLF) has been associated with leveraging capabilities through existing assets (natural, human, financial, social, cultural, etc.) that individuals, households and communities are endowed within their specific locations. Over the years, the SLF has been adapted to specific areas of intervention (e.g. not only rural but also urban) and enriched with a widening array of these assets, e.g. in India notably by including ‘spiritual capital’ (see IFAD no date; Höegger 2004; Woiwode 2013). The core focus of SLF is on reducing vulnerabilities and understanding institutional structures as enabling or hindering change and development (Scoones 1998; Shackleton et al 2021). Therefore, SLF has primarily been a tool that provides a rationale for development interventions employed to analyse existing conditions and diagnose ‘development issues’ in order to advance appropriate livelihood strategies. While knowledge and skills fall within the ambit of human capital for the successful pursuit of different livelihood strategies, another kind of asset has been less in focus so far: the role and types of modes of knowledge that may inform or aid in processes of institutional, systemic innovation that leads to transformative change with respect to innovative new institutional designs of social, cultural, economic and other systems. Likewise, processes of knowledge co-creation for sustainable livelihoods are a relatively underexplored area especially in urban(izing) contexts such as in India.

Consequently, this paper’s focus is on transnational and intercultural knowledge exchange and sharing of socially innovative approaches to enable sustainability transitions. It deals with the challenges and design of a process of knowledge exchange

¹ <http://unhabitat.org/habitat-iii/>.

² See also the World Action Programme to support Education for Sustainable Development <https://en.unesco.org/themes/education-sustainable-development>.

and possible transfer, or adaptation. It also describes the experience of an open-ended, intentionally inclusive and co-creative process of interaction, exploration of various types of knowledge and values, modes of knowing and knowledge cultures in the two participating countries. This thinking inevitably puts participation on the agenda. Yet while it includes participation, co-creation transcends and goes beyond it, for we understand by co-creation a transdisciplinary approach of stakeholder involvement across knowledge domains in society including the corporate, community, grassroots, civil society, government and academic sectors, to name a few. Such approaches of collaboration and learning that activate collective *power with* (Partzsch 2017) have become increasingly popular in recent years as a promising response to wicked, globally intertwined challenges of climate change and sustainability. We consider such activities as contributions to SDG 17 that generate worldwide collaboration based on the intent of creating mutual understanding which results in co-created outcomes to achieve the other SDGs.

2 Background: The Indo-German Dialogue on Green Urban Practices in a Nutshell

Transnational, cross-cultural sharing of local experiences gathered in processes of social innovation is an important factor in global learning for sustainability transformations. The Indo-German Dialogue (short IGD) on Green Urban Practices was initiated in 2017 by one of the authors (C. Woiwode) at the Indo-German Centre for Sustainability in Chennai. It is conceived as a series of annual events to establish a platform of exchange, sharing of experiences and knowledge transfer on urban, socially innovative change between academic and non-academic actors in Germany and India. Besides mutual learning, another key objective of the platform is to leverage action towards transdisciplinary projects. Moreover, we view this interaction as a trans-cultural project of change to address the challenges of urbanization and sustainability from a broad perspective that also includes rural–urban linkages and relationships.

The overall objectives of the dialogue series are as follows:

- To facilitate cross-cultural experience, knowledge transfer about mutual perspectives and offer fieldtrips/exposure visits;
- To complement this series of dialogues with ongoing research by participants and the organizers; and
- To conduct research that emerges from the dialogue networking process, potentially resulting in collaborative research proposals.

Hitherto, four such IGDs have taken place in alternating locations in India and Germany. Additionally, every year a new focus theme is identified by the delegates, with the Indo-German Centre for Sustainability (IGCS) collaborating with

a local host and supported by various funding partners.³ The first IGD held in Chennai in 2017 emerged from a pilot project⁴ on urban sustainability initiatives studied in Bangalore and Chennai (Hackenbroch and Woiwode 2016; Woiwode and Selvakumar 2018) entitled ‘Social Innovation and Change Agents towards Sustainable Lifestyles and Consumption’ (Woiwode and Bienge 2017). At the 2nd IGD in Freiburg in 2018, the focus theme was ‘Education, Learning, Training and Awareness for Sustainable Development’ (Woiwode and Lay-Kumar 2018), which led to the 3rd meeting in Pune in 2019 on ‘Co-creation of the Living Environment’ (Woiwode and Schneider 2020), and finally the 4th one co-hosted with the University of Applied Sciences Bochum but as an online event in 2020 about ‘Wellbeing and The Good Life: The human being in sustainability transformations’ (Woiwode et al. 2021). The series’ design principles highlight its character of a learning journey with an open-ended, evolutionary process that facilitates co-design of the event and allows for an emergence of topics relevant to the delegates and their work (see below section Design and Learning).

3 Framing and Conceptual Foundations of the IGD Approach

We place the activities of the IGD within several interrelated theoretical approaches grounded in transformative sustainability transition research (Geels 2002; Grin et al. 2010; Loorbach et al 2017; Wittmayer and Hölscher 2017). Within this research, a rapidly growing body of the literature on social change and transformation focuses on grassroots agents of social change (Haxeltine et al. 2017; Seyfang and Smith 2007), as ‘grassroots innovations constitute ‘innovation spaces for bottom-up forms of socially just and environmentally sustainable technological futures’ (Ramos-Mejía et al. 2018: 222). As the WBGU (2011: 391) states, they are those ‘actors who play a central role in the initiation and shaping of change processes. Initially, these are usually single individuals and small groups fulfilling various tasks or functions in transformation processes, including the identification of alternatives, development, communication and mediation, synthesis, investing, optimisation, diffusion, etc.’. Actors not only benefit from the windows of opportunity that open but are frequently actively involved in the opening. Transition research thus assumes that, for the most part, transformation processes commence in niches, where they are initially confined and almost invisible.

While transition research has greatly gained in popularity across many Western countries, its application in and potentially added value for countries of the Global South are relatively recent (Berkhout et al. 2010; Hansen et al. 2018; Wieczorek

³ Heinrich Boell Foundation India, German Consulates General Chennai and Mumbai, German House for Research and Innovation (DWIH) New Delhi, German Academic Exchange Service (DAAD) through IGCS at RWTH Aachen University.

⁴ With seed funding from The Indian Institute of Human Settlements (IIHS), Bangalore.

2018). High levels of inequality, poverty and a large informal sector call for a more pronounced balancing with environmental issues (Ramos-Mejia et al. 2018). Interestingly, Hansen et al (2018) suggest with regard to countries in the Global South that 'innovation may often include less formalised 'shop-floor' based activities as has been expressed in concepts such as 'frugal innovation', 'grassroots innovation' and 'inclusive innovation', which utilize local assets and involve indigenous knowledge systems located outside R&D [Research & Development] laboratories' (ibid. 2018: 199). Clearly, a main challenge for sustainability transition studies lies in connecting the environmental sustainability agenda with the agendas of poverty reduction, local community development and capacity building (Romijn et al. 2010). Some authors suggest socio-institutional sustainability should be at the centre of transition studies in the Global South because the role of socio-technological innovation is not only about becoming more resource-efficient, but about reconfiguring the existing power balance within production–consumption systems (Ramos-Mejía et al. 2018). It is here that we identify the potential of SLF as a 'bridging' concept which offers added conceptual value to transition research.

Our second conceptual field, related to the previous one, revolves around cross-cultural global learning, knowledge co-creation and transdisciplinarity (Clemens et al. 2019; Mauser et al. 2013). All of these are 'heavy' terms in ongoing research debates and practice. Scholz and Steiner (2015) conceive of transdisciplinarity 'as a facilitated process of mutual learning between science and society that relates a targeted multidisciplinary or interdisciplinary research process to a multi-stakeholder discourse for developing socially robust orientations about a specific real-world issue (either a problem or a case)' (ibid. 2015: no page). Experimentation in so-called living laboratories or real-world laboratories has become a prominent methodology to facilitate such processes of learning and co-creation of knowledge for transformative sustainability transitions (Parodi et al. 2018; Puerari et al. 2018; von Wirth et al. 2018). In the socio-ecological systems literature, and especially in the context of collaborative resources management, learning has emerged as an important element (Armitage et al. 2008; Krasny et al. 2013).

In the context of the IGD, three learning theories are of particular relevance, i.e. social learning (Argyris and Schön 1978), experiential learning (Kolb 1984) and transformative learning (Mezirow 2000), emphasizing collaboration and group learning but also the fact that individuals learn within a social context in a changing environment (Armitage et al. 2008). In addition, the report of the 2nd IGD states that learning academically is not enough; instead, nature- and place-based learning opportunities like urban gardening are necessary to demonstrate interdependencies. This also involves emotional and social learning as well as thinking about how we connect with and depend on nature (Woiwode and Lay-Kumar 2018). Mezirow's theory helps to understand the learning processes of intercultural competency (Taylor 1994). One approach that brings transformative education and intercultural learning together is Global Citizenship Education (GCE). With its focus on global interconnectedness, GCE provides a normative background as to why cross-cultural communication can be essential. GCE strongly relates to the need for global sustainable transformation (UNESCO 2015) and describes conceptions of how exchange could happen at that

scale. Consequently, participatory decision-making processes, mutual knowledge sharing and collective self-awareness are crucial for GCE (Carvalho da Silva et al. 2012). Presumably, such learning processes result in knowledge about transformation and transformative knowledge being co-produced in a transdisciplinary process of interaction known as Mode 3 science and learning (Schneidewind and Singer Brodowski 2015; WBGU 2011) or, even going beyond this, deeper into awareness-based action research (Scharmer and Kaufer 2013) also known as Mode 4 science (Iser et al. accepted). The IGD process aims to offer such an inclusive approach of co-creation to integrate processes of knowledge production, policy and action towards sustainable futures.

Returning to the role of designing sustainable livelihoods (SLs) in the light of the above, we highlight the importance of social innovation as a key element of transformative intervention. Mulgan (2006: 146) proposes: ‘Social innovation refers to innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly diffused through organizations whose primary purposes are social’. However, our concept of social innovation extends explicitly to the ecological, ethical and economic realms, too. Hence, we take into account the overarching goal of sustainable societies that are generating livelihoods based on fair, just, economically viable and normative principles through ethically guided behaviour. In our context, we may understand SLF as relating to the redesign of specific economic domains through social innovation. Some of the examples in both India and Germany highlight the intrinsic interdependencies of ecological, economic and social factors, and the attempt to find an integrated solution to existing challenges (see the case of Nallakeerai and the increase of organic food shops in Chennai; or The Good Food shop in Cologne and examples of community-supported agriculture in Freiburg). While these often address livelihood vulnerabilities, their main characteristic change impulse lies in institutional innovation by creating novel systems of socio-economic interaction with the goal of achieving higher levels of ecological sustainability. By doing so, these ‘new ways of doing’ seem to offer more integrated, holistic responses to local challenges (such as employment and livelihoods) as well the more profound ones (such as climate change and sustainability). The above discussion may be summarized in a triangular relationship linking (a) SLF, (b) knowledge co-creation and (c) social innovation for sustainability transformation (Fig. 1).

4 A Two-Pronged Methodology

IGD delegates originate primarily from higher education, research, civil society organizations, socio-ecological enterprises and not-for-profit organizations with a clear focus on grassroots initiatives (Table 1). However, while the intention is to be inclusive, there has not been any delegate so far from government or local authorities as such. Therefore, the connection to the policy level is limited. Furthermore, given the intention of the dialogue to bridge disciplines and sectors, the distinction of academic

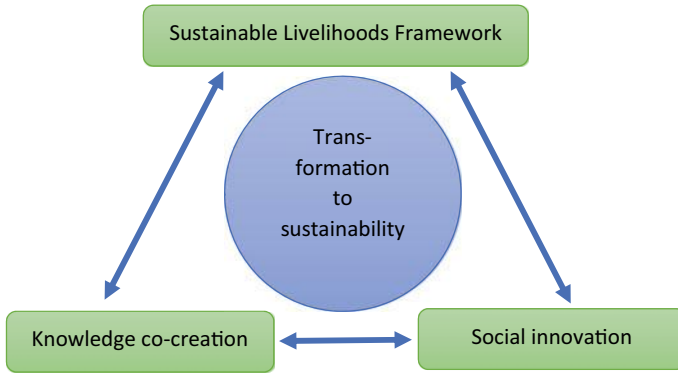


Fig. 1 Interplay of SLF with knowledge co-creation and social innovation for transformation to sustainability (source authors’ own)

Table 1 Composition of participants at IGDs—place and type of organization

IGD	Indian	German	Non-academic organization	Academic organization	Total
1st	25	15	18	7	40
2nd	20	19	27	12	39
3rd	20	12	15	17	32
4th	22	31	26	26	53 ^a

^aThe number of participants is higher because of the online format

and non-academic organizations in Table 1 is somewhat artificial, especially when keeping in mind that many organizations and/or delegates are transgressing these boundaries through action and transdisciplinary research activities. From its inception and by design, participation is by invitation only with a maximum of 40 people. The rationale for this is to protect the specific approach and to enable the highly interactive workshop character.

A two-pronged methodology is geared to support the primary goal of knowledge sharing and exchange on the one hand, as well as co-creating knowledge about the focus themes of the IGD series on the other hand.⁵ The first methodology concerns the facilitation and moderation of the IGD series itself and centres on core principles which may be described as experimental, open ended, emerging and evolving, transnational and intercultural. The varying methods of the research accompanying the IGD series constitute the second methodological strand. These methods are wide ranging, qualitative in focus and experimental (interviews, questionnaires, videos, embodiment practice).

⁵ We presume that both these processes influence the work of the delegates in their own organizations, at least partly. However, we have not yet done a survey specifically of those participants who attended more than one or all the IGDs.

In addition, we conducted supplementary research involving participants of the IGD during the second and third events (Schneider 2019 and 2020). The first study, resulting from the 2nd IGD, is based on seven qualitative interviews that were conducted during the event. The interview schedule comprises ten open-ended questions out of which three questions are on gardening, and one each on food production, daily life issues, global justice, mutual understanding and personal exchange. Interviews were conducted with participants from India (5; 4 males, 1 female) and Germany (2; 1 male, 1 female). They were analysed with the help of an adapted model of ecosystem services (ES; Potschin and Haines-Young 2011) and in relation to the approach of Global Citizenship Education (GCE, e.g. UNESCO 2015).

The study on the 3rd IGD was built on findings from the previous research about the 2nd IGD (Schneider 2019) by applying an action research approach with emphasis on observation and reflection. The familiarity of the researcher with most participants of the dialogue series was an important prerequisite for conducting action research during the 3rd IGD. Empirical data were derived from participant observation and a voluntary and anonymous survey that was filled in by 17 out of 32 participants. Conducting the survey had the character of an intervention (cf. intervention research in Real World Labs: Parodi et al. 2017). From the beginning of the dialogue, the participants were confronted with the questions, and the idea of the research was explained to them before the first interactive session. It is assumed that this influenced participant behaviour and individual reflection during the course of the dialogue. Key strategies used for analysis were informed by reflexive grounded theory (cf. Breuer et al. 2019), encompassing assumptions of self-disclosure and the use of detailed reflection, whereby survey answers are seen as self-disclosures by the participants that are meaningful to their own actions. Additionally, detailed field notes from participant observation were mindfully combined with the survey answers to create field memos.

5 Design and Learnings from the Process of Co-created Transnational Dialogue

The overall IGD process has evolved and was developed further ‘on-the-go’, with each event building on previous experience and feedback. Consequently, from the 2nd IGD onwards it became established practice that the topics for the subsequent IGD were identified in an emergent manner by the participants during the meeting. This condition may be considered the foundational framing which allows maximum involvement of delegates in steering this process in a co-created, open-ended fashion. Table 2 summarizes the IGD process so far.

Table 2 Evolution of a process—features and outcomes of each event

Event and place	Topic	Salient features (highlighting new elements in <i>italics</i>)	Action points/outcomes/results
1st IGD, Chennai, 2017	Social Innovation and Change Agents towards Sustainable Lifestyles and Consumption	– Collaboratory as method of facilitation – 2 external facilitators – Exposure visits	Experimenting with specific co-creation method in a cross-cultural setting Laying foundation for the IGD series
2nd IGD, Freiburg, 2018	Education, Learning, Training and Awareness for Sustainable Development	– <i>Self-facilitated</i> (by hosts and select participants who naturally stepped in) – Exposure visits – <i>Identification of next focus theme</i>	Consolidation of an emerging core theme: urban gardening/farming/food Beginning process to develop a collaborative action research project including IGD participants
3rd IGD, Pune, 2019	Co-creation of the Living Environment	– Self-facilitated – Exposure visits – <i>Event website</i> – <i>Public event</i> – <i>Framework for collaborative research</i>	Consolidation of a sort of IGD community Outreach beyond closed IGD delegates Indian–German links begin to function: IGD delegates begin to meet/collaborate outside the event
4th IGD, online, 2020	Wellbeing and The Good Life: The human being in sustainability transformations	– <i>Combination of self and external facilitation</i> – <i>Full online event</i> – <i>Facilitation method: art of hosting</i> – <i>Videos replace exposure visits</i> – <i>Experimenting with methods of inner personal and collective transformation during the event</i>	Create a proper IGD homepage (in process) A research proposal was submitted that builds on the IGD network and core theme

The 1st IGD followed a specific facilitation process designed and conducted by two external moderators.⁶ The dialogical gathering was set up as a Collaboratory (collaboration laboratory)—a temporary space of co-creation in which diverse

⁶ The first moderator, Markus Molz, was responsible for running the Collaboratory format and process overall. The second moderator and one of the co-authors, U. Zeshan, has been working in India for many years and brought to this exercise the necessary familiarity with the Indian context. She has also developed several serious games which she contributed to the process.

Table 3 Salient features of the collaboratory

Background	Collaboratory phases	Methods used during 1st IGD
<ul style="list-style-type: none"> • <i>Temporary co-creation space</i> • <i>Issue-based stakeholder involvement methodology</i> • <i>Created for a side event of the Rio + 20 conference in 2012</i> • <i>Implemented >200 times in many countries on many issues ever since</i> • <i>Flexible, adaptable and scalable vision-to-action choreography</i> • <i>Works with 30 to 300 participants, for 2 h to several days to series of events</i> • <i>Combines key practices of time-tested holistic approaches</i> 	1. Invitation (attracting diverse stakeholders)	Wall of expectations
	2. Sharing (exploring the issue from multiple perspectives)	Fishbowl Meet and greet marketplace
	3. Visioning (whole person sensing of desirable futures)	Co-creating a mural
	4. Backcasting (identifying feasible next steps)	Turntable game, wall of feasibility (Zeshan 2020: 127)
	5. Teaming (gathering around concrete endeavours)	Open space
	6. Prototyping (developing actionable solutions)	Living diagram game (Zeshan 2020: 135)
	7. Planning (committing to tasks and timelines)	Breakout groups and plenary
	8. Follow-up (executing next steps and reporting back)	<i>Not applicable</i>

stakeholders engage with each other around a complex, burning issue. The Collaboratory is a collaborative multi-perspective, multi-stakeholder dialogue forum aiming at engaging relevant actors in a collective visioning process around ‘big’ social challenges (Muff 2014; Fein 2018). A Collaboratory process leverages collective intelligence based on the genuine concerns and dreams of the participants. The facilitators support their emergent process of mutual learning and shared inquiry into desirable futures. The Collaboratory methodology merges several time-tested holistic approaches, such as Appreciative Inquiry, Bohmian Dialogue, Design Thinking, Open Space, Theory U and Whole Person Learning, into a stimulating vision-to-action choreography (Bohm 1996; Curedale 2019; Scharmer 2009; Woolf and Corrigan 2020; Table 3; Fig. 2).⁷ We added the element of serious games to the set of methods in the Collaboratory process, which was to become a more regular feature in subsequent IGD meetings with the continued participation of one of the facilitators (co-author U. Zeshan).⁸

The use of serious games was motivated, first and foremost, by the diversity of participants (see Zeshan 2020 for a detailed account of the event). Such a diverse

⁷ For more information, see <https://collaboratorybook.wordpress.com> and www.leadership-for-transition.eu.

⁸ A serious game is a game that is played for purposes other than mere entertainment, for example, for awareness raising, education, or group facilitation. The activity is framed as a game, so that people may feel relaxed and motivated, but the purpose is serious.



Fig. 2 Fishbowl session during the sharing phase of the collaboratory, 1st IGD in Chennai 2017 (credit: C. Woiwode)

setting can take people out of their comfort zone, and introducing a game framework acts as a counterbalance. People are often prepared to interact more openly when the situation can be framed as ‘just a game’ because this constitutes a non-threatening environment. Moreover, unlike the other approaches mentioned above, playing games is universal across all cultures at least in some form. Serious games have a strong impact on communication and interaction in a group. In IGD, a particular challenge is the diversity of communication styles—different accents when speaking English, academic jargon and country-specific norms need to be navigated. In the Living Diagram game, where groups created three-dimensional diagrams from props, communication was supported by the shared visual context. Communication was also slowed down because people followed the turn-taking rules of the game, for example, taking turns to get up from the table and place index cards onto the Wall of Feasibility. This gave everyone more time to catch up with the dialogue.

Games also support equitable group interactions. The feedback from later IGD events shows how important it has been for participants throughout the IGD series that all voices can be heard equally (see the analysis of feedback in the next section). In many serious games, this equity is built into the game rules. For instance, the Turntable game, used for brainstorming during the 1st IGD, requires everyone to comment on an idea written by another player, after which the originator of the idea comments back. This procedure ensured that everyone had an equal opportunity for their contribution to be heard. The game also included a fun element of chance because each idea was discussed by a new randomly constituted pair of players. In

fact, laughing together in a group is an excellent way of bonding, and games license emotional responses like laughter.

Finally, the series of games in the 1st IGD created both a visual record of sessions and improved the coherence of the event because each new game relied on output from the previous game (see Fig. 3). One of the aims of a Collaboratory is to generate concrete proposals that are actionable (at least in principle, if not in practice), and the outputs from the successive game sessions could be interpreted as visual milestones of a project planning process, although this was not necessary in order to participate fully.

With the participation of co-author Zeshan in further events, the use of serious games continued, and the 3rd IGD featured an ‘Ecosystems’ game as part of the exhibition that was organized for the general public (Fig. 4). This was a board game

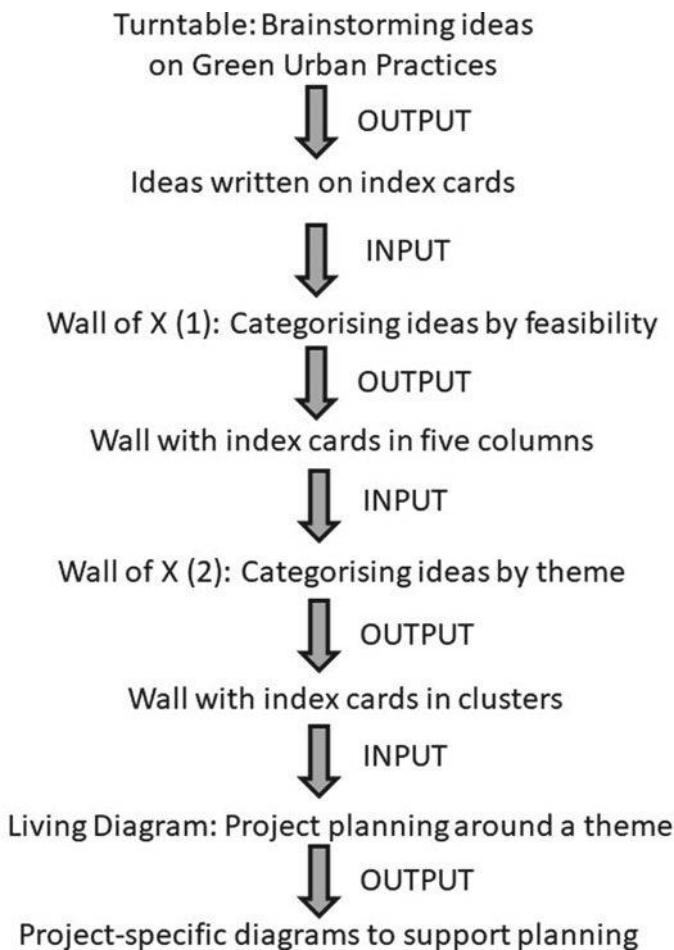


Fig. 3 Successive stages of serious games used at the 1st IGD (Zeshan 2020: 110)



Fig. 4 Students enjoying the ‘Ecosystems’ game during the public event at the 3rd IGD in Pune 2019 (credit: C. Woiwode)

with dice, pawns and cards to prompt discussion of risks and remedies in relation to different ecosystems. In the 4th IGD, one online breakout group explored alternative ways of work outputs (e.g. designing a risk assessment as a theatre play or an annual report as an artwork) in the ‘Work-Play Conversion’ game. This fit in with participants’ motivation to ‘get out of their heads’ from time to time, which was a recurring topic in the 4th IGD.

This series of bi-country dialogues on sustainable practices is conceived as a learning journey. Applying the Collaboratory method as a workshop moderation technique during the first dialogue generated a highly interactive environment, which spurred on many discussions and critical reflection. Beyond this, importantly, it actively facilitated the production of concrete project ideas to continue further collaboration between groups and participants beyond the meeting. However, feedback from participants of the 1st IGD suggests that additional time for sharing and understanding each other’s perspectives and situations in greater depth is a required prerequisite for durable and continuous interaction between diverse participants. Subsequently, the 3rd IGD placed co-creation centre stage attempting to capture two aspects: (a) focus on cross-cultural dialogue and participation to retain continuity of the process between the participants of the two countries, and (b) exposure to methodologies of co-creation towards sustainable futures (Pel et al. 2015). A wide array of approaches towards co-creation are relevant here such as action research and learning in different contexts (Osuteye et al. 2019), transdisciplinarity (Popa et al.

2015; Tobias et al. 2019), real-world/living laboratory projects for sustainability transitions (Puerari et al. 2018; Schöpke et al. 2018; von Wirth et al. 2018) and citizen science (GEWISS 2016).

Importantly, these methodological fields open up a debate about different knowledge domains, whether and how they are being considered or included in the development and/or research activity. By knowledge domain, we refer to modes of knowledge such as scientific, scholarly academic, local phenomenological, indigenous, experiential or even spiritual-intuitive. The themes of co-creation of the living environment address crucial challenges of global sustainability transformations by asking how change is being implemented in specific local–regional contexts, for example, in view of local livelihoods.

6 Supplementary Research 1: Theme-Based Learning for Cross-Cultural Knowledge Co-creation

During the 2nd IGD, four interrelated topics emerged through discussion in a plenary session: (i) agro-food systems and food sovereignty (relating to livelihoods, production and consumption); (ii) cross-cultural issues in Indian and German contexts (including the relevance of various knowledge domains); (iii) tools and techniques for participation and governance (facing sustainability transitions); and (iv) Indo-German relationships (referring to person-to-person contact) (Woiwode and Lay-Kumar 2018).

As mentioned in the methodology section, a supplementary study on natural resources management with a focus on urban gardening was conducted to identify the role of cross-cultural learning and education by applying the concept of Global Citizenship Education (GCE, e.g. UNESCO 2015). The study used a structured model of Ecosystem Services (ES) to identify possibilities for cross-cultural knowledge exchange in urban gardening. For this purpose, the Ecosystem Cascade Model (ECM) by Potschin and Haines-Young (2011) was adapted to the ecosystems services communication model (ESCM, Schneider 2019). The ESCM includes ecosystems, their components, non-human and human interactions happening within this ecosystem, outputs of the ecosystem and the values that people ascribe to all of them (Fig. 5).

This study aimed to answer two questions: 1. Who can be included in cross-cultural knowledge exchange on gardening and sustainability?, and 2. which are the media and topics of exchange in an urban farming/gardening context? From the statements of the interview partners, a range of stakeholders were identified. An overview of the mentioned subgroups can be found in Table 4. All age groups, starting from kindergarten, were named by participants.

GCE issues related to the participating learners can be found in daily life issues, issues on mutual understanding and exchange, and issues on global justice. Daily life issues raised by respondents refer to who has access to gardens, *‘for example the*

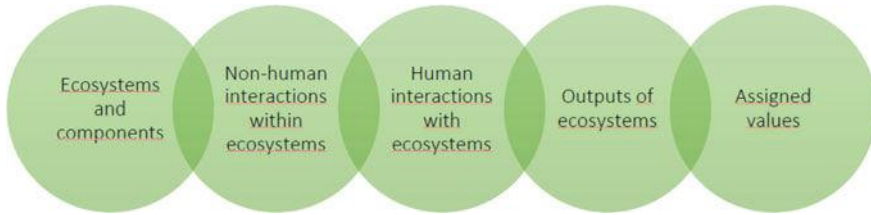


Fig. 5 Ecosystem services communication model, adapted from the Ecosystem Cascade Model (Schneider 2019: 12)

Table 4 Identified stakeholder groups and subgroups mentioned by interview respondents (adapted from Schneider 2019: 31–32)

Group name	Mentioned persons, groups and institutions
Geographic groups	Migrants, the West, Global South, people from different countries, tourists
Societal level	Society, citizens, residents, public, each person, volunteers, activists, NGOs
Education-related groups	Education organization, kindergarten, rural/urban/corporation school, university, botany department, eco clubs, biologists, social scientist, research associations
Governmental bodies	UN, FAO, state, local/central government, municipality, city manager, horticulture department, agriculture department, ministry of forestry, political parties
Economy-related groups	Private sector, CEOs, vendors, farmers, supermarkets, corporations, factories, employing organization, media workers, community-supported agriculture, farmers, gardeners, food consumers
Health institutions	Institutes, health funds
Cultural groups	Muslims, Hinduism, vegans, tribal people
Persons with personal relations	Family members, colleagues, neighbours

university botany garden is not open for citizens’ and to the topic of ‘who produced [the food]?’. Issues regarding mutual understanding and exchange also involved food. Especially, cultural aspects are of interest to the respondents like the *‘strong philosophical or religious background to [...] production of food [in India]’*, the *‘huge bottom of the pyramid who can only survive by eating non-vegetarian [in Africa or India]’* and *‘different food choices [in different cultures within the same country in India]’*. According to the respondents, understanding other cultures is possible in the same country by *‘integrating, in this case [Germany] for example, refugees’* and also when *‘people come from different countries [...] because people can see from a different perspective’*.

Garden products were suggested to be used in addressing the issue of gender in *‘a values clarification and value education lecture [...] [where] you can actually have a discussion and debate around [...] whose labour should be respected, [...] ‘Is it only*

the physically strong boys that do the work, girls who do the work?'. Additionally, power relations related to financial ability play a role with respect to global justice, for example, when there is the interest 'to copy the west and become multi-industrial, farmers [are pushed] out'.

Interviewees also mentioned a range of spatial and social agricultural ecosystem types (Table 5) that can be suitable for engaging with educational activities. Different media and resources can be used for learning (Siebert 2010), and in nature-based pedagogy natural materials are incorporated (Bolay and Reichle 2007). Garden components as well as outputs of gardening ecosystems are such natural materials. Components of garden ecosystems about which exchange may take place that were mentioned are 'weather', 'water', 'soil and seeds'. Material outputs from gardens are 'food', 'produce' and 'waste'. By talking about the '[local] production and consumption cycles', daily life issues come up, and issues on climate change can be elaborated on: *'Gardens can provide you a great laboratory, lab to actually potentially observe what is happening as an impact of climate change in your city. Is the produce coming earlier, is the produce coming later? Usually, this information is available with farmers. But that could be still available within citizens and yourself, as your experiential learning'.*

The immaterial outputs from gardening ecosystems comprise mainly cultural achievements like 'peace of mind', 'sense of attachment', 'stress reliever', 'knowledge', 'awareness' and 'social skills' (Fig. 6). For example, mutual understanding can be based on agreeing on debates about specific garden types: *'There were a lot of case studies [...] about what is happening in Kigali, Rwanda, or what is happening in Colombia, what is happening in Cuba... That kind of mutual understanding really helped us also to build a stronger case about rooftop vegetable gardening for our city'.* However, it is of concern whose knowledge is considered for education. When talking about global justice, one of the interviewees brought up: *'I realize how rapidly [tribal] cultures are being destroyed by homogenization and the way we teach things in formal schools. It is a very big concern. Much of this cultural traditional knowledge is linked to people who live out in forests or wetlands or rivers and are highly dependent on natural resources around them. That knowledge and that culture is actually being wiped out by formal education'.*

Table 5 Agricultural ecosystem types mentioned by interviewees (Schneider 2019: 34)

	Rather small	Rather big
Rather private	Pots of plants, small plot with gardening, small garden, terrace garden, rooftop garden, balcony garden, backyard garden, front yard garden, kitchen garden	Urban agriculture, crop land, farm, farming project
Rather public	Public garden, school garden, community garden, urban garden	Community-supported agriculture, community farm
Unspecific	Garden, land, green around, space that you can grow in, where it grew, where the food comes from, seed project, tree walk	



Fig. 6 Experiential learning through exposure visits—‘Der Wandelgarten’, an intercultural urban garden, during the 3rd IGD in Freiburg 2018 (credit: C. Woiwode)

7 Supplementary Research 2: IGD Experience of Creating Collaborative Learning Settings

The IGD series opens possibilities for collaborative and collective learning on sustainability issues. To instantiate this aim, it was decided to get a participatory, transdisciplinary research project underway. The starting point for this project was a facilitated World Café session during the 3rd IGD. It resulted in diverse themes of interest, with topics related to the role of citizens in the city and their impact on land use. The topics included neighbourhood engagement, the circular economy and sustainability education, with examples such as urban gardening and food as well as waste management and repair culture, and the establishment of information systems (Woiwode and Schneider 2020).

The 3rd IGD was accompanied by action research, with the aim to shed light on how citizens can be included in this planned research project. Interviews which were taken during the 2nd IGD identified the need to take power relations and structural inequalities into account with regard to involvement of individual knowledge and competencies in gardening projects (Schneider 2019). A fundamental principle of participatory research in order to avoid power imbalances is the concept of ‘safe space’. Here, this is defined as a space where participants can disclose their personal

views of the situation, opinions and experiences in an atmosphere ensuring that nobody would suffer any disadvantages if they express critical or dissenting content (Bergold and Thomas 2012). To avoid structural inequalities, a social justice perspective emphasizes treating participants equally for legitimate representation in collaborative settings (Emami et al. 2015). Therefore, the action research concentrated on two questions with the aim to identify characteristics of collaborative learning settings: (a) What constitutes a 'safe space' for exchange? and (b) how can all voices be heard equally?

The answers to question (a) and (b) turned out to be very similar. *'Hearing all voices equally'* turned out to be an essential precondition for *'constituting a safe space for exchange'*. This is also illustrated by one response: *'a safe space would give an opportunity to all to contribute equally'*. For this reason, the answers to both questions were analysed together, with the findings of this action research presented below.

7.1 Collaborative Learning Participants: Roles and Personal Attributes

According to Herrmann and Jahnke (2012), position refers to formal roles (e.g. student or moderator) and informal roles (e.g. opinion leader) that an individual holds within a group. Roles are dynamic and can be actively shaped. Because of this reason, each individual can fill the same role in a different way. While individual participants who took part in the IGD held various formal roles, their informal, specific roles were dynamic and changed from session to session. The formal role of the facilitator was the only one which was described in more detail by the survey participants. Some of the answers highlight the role of personal characteristics: *'people who are more silent'*, *'people who are more introvert'*, *'people who are more extrovert'* and *'people from many different backgrounds'*. According to the survey, IGD participants acknowledge that in a *'diverse group'*, members carry *'expertise and capacities'* and have their own *'points of view, opinions and approaches'*. In reference to *'individual, diverse'* and *'different backgrounds, experiences and reference'*, they suggest to be *'aware, open-minded'* and *'respect each other, especially when you have different opinions'*, be *'compassionate'*. Being *'non-judgemental'* was mentioned, and the wish to *'not let male/female differences matter'*. Space should be made for *'non-academics'*, *'age differences'* and persons with *'social differences'*. Everybody should be able to express themselves in *'their own way and language'*, while *'accepting a collective goal or a shared vision'*. This requires a commitment to *'deeply democratic values'* and the ideal of *'no hierarchies'*.

Other answers included *'living the "we"'*, *'worshipping diversity'*, *'complement each other's expertise and capacities'* and to *'learn as a learning network'*. These answers reflect the appreciation of the group process during the 3rd IGD. Moreover, *'mixing groups'* was suggested by a survey member to create a safe space for

exchange. The IGD participants formed new groups throughout the course of the dialogue resulting in varying compositions of participants in each of the sessions that were conducted in smaller groups. The wish to grow together as a team seemed to be supportive of a planning session about the action research project:

First, we had a feedback round, where one of the participants suggested that we should plan for team-building activities in the next dialogue. I suppose she felt that we were growing together as a group and wished to strengthen the bonds between each other. Her suggestion was welcomed by other members. Shortly after the feedback round we had a world café session with the aim to plan a common research project. Everybody seemed very concentrated and during coding I labelled all of the members to be in the ‘project planning group’ together.—(field memo L. Schneider)

7.2 *Collaborative Learning Interactions: Communication and Process Attributes*

The survey answers express what participants expect a role holder to do or not to do (cf. Herrmann and Jahnke 2012). They include specifications on what should happen at the beginning of group interaction. These comprise ‘*introduction*’, ‘*talking about equally heard voices*’ and using ‘*icebreakers, were all can laugh a bit together and bond*’.

The activities of individuals within a group can be seen as tasks of a specific role (Herrmann and Jahnke 2012). According to the participant observation, IGD participants were involved in diverse communicative activities, which involved listening, talking, introducing, presenting, asking, giving feedback, sharing opinions and ideas, engaging in dialogue and conversations, clarifying and discussing. The survey answers focused on talking and speaking on the one hand and listening on the other hand: all participants, including the ‘*more introverted*’ ones, should have an ‘*opportunity to talk*’, but everyone should ‘*wait for their turn*’. In case of disagreement, ‘*finding compromises*’ is recommended. ‘*Deep listening*’ should be practised, which could include a readiness to ‘*listen patiently and try to understand the things from other points of view*’. The ‘*listening skill*’ should be improved by ‘*consciously learning to listen*’ and having ‘*inputs on deep listening*’. Listening should go together with ‘*learning and integrating*’. Altogether, communication should be ‘*non-violent*’, there should be ‘*no adverse comments on anyone’s ideas/inputs*’ and there is the wish to ‘*take care of each other*’. One remarkable example of taking care of each other while communicating was happening during one of the field visits:

We were visiting an informal settlement, where the walls of houses had been painted as a place-making activity in order to raise awareness on waste. We were invited to the local community learning center. There, local community members answered the questions of IGD participants. To overcome language barriers and provide transparency, one IGD participant asked to not only translate the community members’ responses to IGD participants, but also translate the discussions of IGD members to the locals. I felt that involving all voices was something not only on my agenda but that at least some participants must share the same approach.—(field memo, L. Schneider)

Survey answers go into detail on the tasks of facilitators. They should ‘*consciously facilitate*’ the communication process and ‘*concentrate on the actual task*’. Facilitators should be ‘*fully oriented towards dealing with complexity and conflicting views*’, and ‘*monitor and (de)prioritize speakers in a group*’. ‘*Freedom of the mode-style*’ is recommended and the possibility to ‘*make all group members coaches and moderators over time, who take turns equally*’.

7.3 Collaborative Learning Environments: Spatial and Structural Attributes

Day one and three of the 3rd IGD took place in a university setting. Here, the spatial on-site conditions were characterized by an auditorium, seminar rooms with group tables, whiteboards and beamer-setting, and a patio. According to the participant observation, the degree of interaction which was allowed by these settings was very different. Later in the survey, participants stated that having ‘*smaller groups*’ and ‘*face-to-face communication*’, as well as ‘*bringing everybody to the table*’ and then ‘*always sit in a circle*’ can help to create a safe space. Besides spatial settings, the availability of catering and resource of food as a material requisite were observed to be of value for participant observation because this provided informal possibilities for personal exchange.

The survey answers supported this. For having a safe space, ‘*good food*’ was named. More specifically, to ‘*have enough tea breaks, shared meals so that everyone can connect to various people*’ contributed to hearing all voices.

8 Conclusion

This paper has presented an exploration of the conceptual triangle of SLF, social innovation and the co-creation of knowledge for sustainability transformations as one approach to designing meaningful interventions. We illustrated this with the example of a transnational, cross-cultural process of the Indo-German Dialogue on Green Urban Practices, highlighting the evolving processes and thematic focus areas. There is an expanding literature gradually building a body of such transdisciplinary, experimental methodologies particularly in urban studies. Fokdal et al. (2021), for instance, do not only present insightful case studies from across the world but also generated—in a co-creative process of several years of transdisciplinary interaction—a set of enabling factors which would support inter- and transdisciplinary knowledge co-creation. In their review of lessons learned from this collection of essays and experiences, Woiwode and Bina (2021) point out the pivotal capacity of building trusted relationships between participating stakeholders.

In our experience of the IGD process, the collective development of procedures contributed to the creation of a safe environment for trust to emerge, which develops when processes/procedures are perceived as legitimate, transparent and/or binding by all actors (Stern and Coleman 2015). Natural resources management that focuses on learning, as in our example in the contexts of urban gardening and farming, requires building of trust in order to be effective (Keen and Mahanty 2006). Therefore, the emergence of trust in the form of new social networks is an outcome (Van Mierlo and Beers 2020) that might be evaluated by research and for which a certain amount of time is required. The evolution of closeness, empathy and emotional involvement over time could be used as indicators here (Bergold and Thomas 2012). The role of trust emphasizes participants' emotions in collaborative learning. Feeling comfortable to share individual perspectives and confident of being respected are success factors of both social learning in natural resources management and action research (Wicks and Reason 2009). In the survey that was conducted during the 3rd IGD in 2019, perceptions of a welcoming or warm atmosphere, or of the appropriateness of a setting are related to such emotions. Research might increase collaboration by identifying attributes of an atmosphere that is conducive to holistic well-being and creation of a sense of belonging in collaborative learning settings.

Power is yet another dimension relevant in transdisciplinary processes of co-creation and knowledge production, even more so in often highly unequal settings of livelihood development interventions. Low-threshold and everyday-life-related formats might be suitable for enabling safe and more equal collaborative spaces. While our survey responses mention game activities, Real World Labs in Germany uses repair cafés as vehicle to support equal collaboration between academics and practitioners (Parodi et al. 2017). From a perspective that addresses societal sustainability challenges, urban experiments such as community gardens, climate-friendly makeovers of streets, green roofing of bus shelters (Dignum et al. 2020) or the urban art initiative in low-income settlements at the Pune Biennale that was visited during the 3rd IGD are emerging concepts that could serve as new types of urban commons. Similarly, formats such as festivals, local markets, urban gardens or pedestrian-friendly spaces that are related to management of natural resources (IGD participants 2019) could easily relate to the everyday lives of participants while having a low threshold for participation. However, they must fulfil the criteria of visibility, accessibility and addressability that are important for participatory formats (Parodi et al. 2017).

Interestingly, the process of the IGD led one of the hosting universities—Bharati Vidyapeeth Institute of Environment Education and Research—to explore their teaching–learning methods by delving deeper and more systematically into the process of co-creation of knowledge as an important tool in building student capacities for social innovation. Apart from the regular roles of a university, institutions of higher education have a mandate to usher in social change and innovation. The concept of co-creation furthered through their participation in the IGDs has led some institutions to the introduction of this concept as a research methodology tool to encourage students to design their master's thesis using a co-creation approach

where feasible. To date, there are hardly any guidelines or frameworks that demonstrate how universities can address social innovations in curricula that demonstrate the role of universities in contributing to social innovation. The restrictions and challenges in university structures and functions often create a barrier in attempting social innovation. The IGD through its approach of transdisciplinarity, learning theories and collaborative facilitation has demonstrated a pathway of integrating it within curricula, thus enabling the next generation of students to be exposed to these new approaches to facilitating social innovation that may impact on sustainable livelihood design as well.

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