

# 2

## THE 'PATHWAYS' TRANSFORMATIVE KNOWLEDGE NETWORK

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### **Introduction and background**

The 'Pathways' transformative knowledge network (TKN) is an international partnership of research hubs, collaborating to explore processes of social transformation and to share insights across disciplines, cultures and contexts. This chapter describes the network, one of three funded under the Future Earth 'Transformations to Sustainability' programme, and provides some background to the various hubs, their disciplinary backgrounds and histories of engaged research. It describes the design of the network and the elements that enabled cross-learning between the experiences of each of the hubs. The chapter also provides a brief introduction to the theoretical and methodological anchors of the project, which are discussed further in Chapters 3 and 4 respectively.

The Pathways TKN represents the primary activity of the 'Pathways to Sustainability' global consortium. This grew out of an academic centre funded by the UK Economic and Social Research Council (ESRC) – the STEPS (Social, Technological and Environmental Pathways to Sustainability) Centre – and a network of partners around the world. Since the inception of the STEPS Centre in 2006, project-based collaborations between the Centre and each of the hubs helped to shape the interpersonal relationships and enhanced understanding of intellectual and political synergies that enabled a closer partnership.

In 2013, a proposal was developed, describing a consortium “bound together by common values rooted in a commitment to independent, challenging, normatively-formed, engaged research, a joint vision for understanding and supporting pathways to sustainability, and a common interest in transformative research and action”. The regional partners came together with a focus on the three activities of “research”, “impact and engagement” and “learning and exchange”, and various hubs in the consortium hosted launch events to showcase

and share research being conducted in China (April 2015), Africa (June 2015), Latin America (November 2015) and South Asia (January 2016), engaging with networks across their countries and regions, drawing on financial support the STEPS Centre's Phase 2 grant from the ESRC. Table 2.2 provides more information on the institutional host arrangements at the time of the launch of each hub. The original proposal in 2013 suggested that some of the consortium's activities would move towards rotation between hubs either annually (in the case of annual symposia) or every three years (in the case of co-ordination of the consortium), and extension and rotation between the various hubs (in the case of summer schools).

Working together across the consortium provided great opportunities for cross-learning, motivated by the search for mutual understanding of how humanity can respond to the shared challenge of sustainable development and overcome the differences that act as a barrier to its realisation (as outlined in the previous chapter). Among several attempts to secure support for these types of activities, the consortium was fortunate to be funded in two rounds (seed-funding and network grant – described in Table 2.1) of the Transformations to Sustainability Programme (T2S). The T2S programme was coordinated by the International Social Science Council (ISSC – now the ISC), funded by the Swedish International Development Cooperation Agency (SIDA) and implemented in partnership with the National Research Foundation of South Africa. In the seed-funding round, additional support came from the UK ESRC Newton Fund.

### ***Towards a Transformative Knowledge Network***

The work of the 'Pathways' Transformative Knowledge Network would have been impossible without the support (financial and otherwise) of the Transformations to Sustainability Programme. To some extent, the activities of the 'Pathways' TKN (including its conceptualisation as a 'Transformative Knowledge Network') reflect the ambitions of the T2S programme – to support an innovative, solution-oriented approach to sustainability research that:

- Is framed and led by social scientists
- Involves all relevant knowledge holders – from social, natural and engineering sciences, the humanities, civil society, media and policy domains – at all stages of the research process
- Involves researchers in all regions of the world, including low- and middle-income countries

(T2S 2019)

As a contribution to Future Earth,<sup>1</sup> the programme showed remarkable vision, recognising the role of transdisciplinary social science and a desire to build this as an international research field. Emerging from an alliance of international

environmental, biosphere, biodiversity and earth system sciences programmes, including the International Human Dimensions Programme on Global Environmental Change (IHDP, initiated in 1990 by ISSC), Future Earth foreshadowed a broader ‘coming together’ of natural and social sciences (including the merger of ISSC and ICSU – the International Council for Scientific Unions – to become the International Science Council in 2018). Unlike many of the various Future Earth initiatives at the time, the programme built primarily on thinking within the ISSC (Hackmann and St Clair 2012) and the 2013 World Social Science Report (UNESCO/ISSC 2013), and was rare in being social science-led.

A condition of funding was that the Transformative Knowledge Networks were led or co-led from the global South. The UK and Argentina teams (the authors of this chapter) had contacted each other in parallel with the idea of applying to the call, and it was decided that Adrian Ely and Anabel Marin would co-lead the proposal. Beyond ‘Pathways’, the other two Transformative Knowledge Networks supported by the programme were:

- Acknowl-EJ (Academic-Activist Co-Produced Knowledge for Environmental Justice)<sup>2</sup>
- T-learning (Transgressive Social Learning for Social-Ecological Sustainability in Times of Climate Change)<sup>3</sup>

The programme convened annual Transformative Knowledge Workshops in 2014 (Potsdam, Germany, hosted by the Institute for Advanced Sustainability Studies), 2015 (Durban, South Africa, alongside the World Social Science Forum), 2016 (New Delhi, India, hosted by the ‘Pathways’ India hub), 2017 (Buenos Aires, Argentina, hosted by the ‘Pathways’ Argentina hub) and 2018 (Fukuoka, Japan, alongside the World Social Science Forum). These contributed to creating and maintaining an international community of scholars and practitioners involved in T2S research, fostering inter- and transdisciplinary dialogue across regions and networks. The 2014 event involved a broad range of experts and also heard from the 38 projects that had been awarded seed-funding. The 2015 workshop included representatives of 8 short-listed proposed TKNs, including the three that were eventually funded. The 2016 and 2017 events were hosted and co-organised by two of the hubs of the ‘Pathways’ TKN, and primarily involved members of the three TKNs. In 2018 several members of the ‘Pathways’ network joined a workshop that brought together the three TKNs and a new cohort of grantees from the T2S programme, for which financial support had been provided by the NORFACE-Belmont Forum group of donors. Activities in the three TKNs outlived their periods of funded research, and various representatives (especially those from Latin America) gathered at the Transformations 2019 conference in Santiago, Chile, to once again share insights.

**TABLE 2.1** Key moments in the creation, organisation and co-ordination of the Transformative Knowledge Network, building on Ely et al. (2020)

<i>Month</i>	<i>Event</i>	<i>Venue(s) where relevant</i>	<i>Collaborative developments</i>
2010 onwards	Development of networks and establishment of the 'Pathways to Sustainability' global consortium	International, with notable launches of individual hubs in Nairobi, Beijing, New Delhi, Argentina.	Initial connections made, with growing appreciation of different disciplinary backgrounds and institutional histories.
March 2014	ISSC launches call for 'Transformations to Sustainability' programme seed grants	International	Collaborative proposal development
September 2014	30,000 Euros seed grant awarded		
September 2014– March 2015	Co-design workshops in each hub produce <b>case-specific concept notes</b> , feeding into TKN proposal	Argentina, China, India, Kenya, Mexico, UK	Sharing of contextual background, "problem space" and proposed transdisciplinary research projects
December 2014	ISSC launches call for 'Transformations to Sustainability' programme TKN grants	International	Collaborative proposal development, incorporating insights from seed-funding stage
October 2015	850,000 Euros TKN grant awarded		
April 2016	Inception workshop including <b>adapted PIPA processes</b> , T-Lab discussions and strategic planning	Buenos Aires, Argentina	Further sharing of ideas around Transformation Labs, 'Pathways' methods and hub case studies
June 2016	<b>Baseline survey</b> circulated for completion by all hub teams	All hubs	<i>Sharing insights and experiences across hubs</i>
May 2016–August 2017	First round of T-Lab workshops, including <b>collaborative planning process (T-Lab format)</b> and <b>internal &amp; external reporting</b>	Argentina, China, India, Kenya, Mexico, UK	Sharing of initial research data, T-Lab design, implementation and learning, as well as future plans in each hub

July 2017	<i>Mid-point survey circulated for completion by all hub teams</i>	All hubs	Sharing insights and experiences across hubs
September 2017	T-Lab training and reflection workshop, including identification of thematic insights and <b>theory of change discussions</b>	Dundee, Scotland (alongside Transformations 2017 conference)	Identification of key themes for exploration: T-Labs, theories of change, framing, innovation
October 2017–October 2018	Second round of T-Lab workshops, including <b>internal &amp; external reporting</b>	Argentina, China, India, Kenya, Mexico, UK	Sharing of further data, T-Lab experiences (positive and negative) and future plans in each hub
October 2018	Final workshop, including further <b>discussions around theory, research and action</b>	Nairobi, Kenya	Time-constrained discussions of theoretical and methodological differences, as well as emerging insights. Reflective project evaluation.
November 2018	<i>Final survey circulated for completion by all hub teams</i>	All hubs	Sharing insights and experiences across hubs
October 2019	Follow-up workshop, including reflection on lessons, planning for publications and future work	Santiago, Chile (alongside Transformations 2019 conference)	Time-constrained discussion of insights around theoretical and methodological anchors, reframing, innovations, etc.
June 2019–May 2021	Collaborative book writing, exchange of drafts, online discussions	International	Deeper appreciation of cross-learning, differences between various hubs, difficulties faced and emerging insights.

Processes and documents that directly underpin some of the hub chapters (5–10) in this book are in bold.

### ***Co-design of the 'Pathways' TKN project***

Transdisciplinary engagement with diverse partners in each of the hubs started with the seed-funding, which was awarded in 2014 and supported a process of co-design (Marin et al. 2016), defined by Moser (2016) as “first phase of the knowledge co-production process, in which researchers and non-academic partners jointly develop a research project and define research questions that meet their collective interests and needs”. This took the form of multi-stakeholder workshops in each of the six hubs of the Pathways network that identified local research foci through engaging knowledge partners/ stakeholders, identifying locally defined sustainability challenges and agreeing on tentative project activities in concept notes (which fed into the proposal for the TKN). In many cases this process of co-design built on longer relationships between the research teams and knowledge partners in their locality (explored in Table 2.1).

The locally identified sustainability challenges, organised around three broad domains, were researched in transdisciplinary projects led by the teams from each of the six hub organisations listed below:

#### Theme 1 – Sustainable agricultural and food systems for healthy livelihoods

- Transformations to sustainable food systems in Brighton and Hove/Europe hub – STEPS Centre, University of Sussex, UK and Stockholm Resilience Centre, Sweden (discussed further in Chapter 5)
- The future of seeds (and agriculture) in Argentina/Latin America hub – Centre for Research on Transformation (CENIT), Buenos Aires, Argentina (discussed further in Chapter 6)

#### Theme 2 – Low carbon energy transitions

- Low carbon energy transitions that meet the needs of the poor/Africa Sustainability Hub – African Centre for Technology Studies, Africa Technology Policy Studies Network, Stockholm Environment Centre – Africa, Nairobi, Kenya (discussed further in Chapter 7)
- China’s green transformations/China Hub – Beijing Normal University School of Social Development and Public Policy, China (discussed further in Chapter 8)

#### Theme 3 – Water and waste for sustainable cities

- Water governance challenges, Mexico City/North America hub – Arizona State University, USA and National Autonomous University of Mexico, Mexico (discussed further in Chapter 9)
- The urban system of water and waste management in Gurgaon, India/South Asia hub – Transdisciplinary Research Cluster on Sustainability Studies, Jawaharlal Nehru University, New Delhi India (discussed further in Chapter 10)

The co-design and emergence of the transdisciplinary work differed in each case. Hubs were paired as described above in order to help foster collaboration

**TABLE 2.2** Description of consortium hubs that make up the TKN, and disciplinary and transdisciplinary research history in each hub at the outset of the project

<i>Consortium Hub</i>	<i>Institutional host arrangement at launch</i>	<i>System and problem space</i>	<i>Primary disciplines represented</i>	<i>History of engagement with this problem</i>
Europe	STEPS Centre, including SPRU – Science Policy Research Unit and Department of Geography (University of Sussex) and Institute of Development Studies, UK Stockholm Resilience Centre, Sweden	System: food system in the city of Brighton and Hove, and in particular the production in the South Downs National Park and Brighton–Lewes Downs Biosphere Region. Problem space: the food system in Brighton and Hove is unsustainable because of limitations to local food supply and environmentally damaging production and consumption practices	Science and technology policy Development Studies Ecology Biotechnology Tropical agricultural ecology Environmental sciences Science and technology studies	Some non-academic engagement, but limited prior research on this specific topic. Existing relationships with local and national research community and (in some cases) civil society and local growers.
Latin America	CENIT (Centro de Investigación para la Transformación) – Centre for Research on Transformation, Buenos Aires, Argentina	System: the seed and agricultural sector in Argentina, and the functions that seeds play in maintaining agricultural biodiversity and economic and social diversity of agriculture Problem space: the risk of further loss of social, ecological and economic diversity in agriculture as a result of the increasing mercantilisation of seeds and the consequent market concentration in world and regional seed markets	Economics Agronomy Science and technology policy Intellectual property law	Over 5 years of experience in sustainability and development issues in the seed and agriculture. Sectors. Existing professional relationships with many key actors in the seed sector, especially in civil society groups, the national seed industry, agricultural extension, and government.

(Continued)

<i>Consortium Hub</i>	<i>Institutional host arrangement at launch</i>	<i>System and problem space</i>	<i>Primary disciplines represented</i>	<i>History of engagement with this problem</i>
Africa	The Africa Sustainability Hub, involving the African Centre for Technology Studies, the African Technology Policy Studies Network and the Stockholm Environment Institute Africa Centre	System: enabling sustainable and equitable access to Solar Home Systems (SHS) for all via mobile-based payment systems in Kenya Problem space: access to and payment of SHSs especially for the low-income cohort	Environment and Development Studies Environmental Sciences Economics Environmental Studies	The Africa Sustainability Hub (ASH) has been in existence for only a year, with low carbon energy a focus of work. The hub already enjoyed professional relationships with the research, civil society, government, and development partners
China	Small team School of Social Development and Public Policy, Beijing Normal University	System: S City, Hebei Province Problem space: social impacts are not taken into account in the process of green transformation in China	Anthropology Public policy Participatory research Management	The hub has been working on this problem since August 2015
North America	School of Sustainability, Arizona State University, USA National Laboratory for Sustainability Sciences (LANCIS – Laboratorio Nacional de Ciencias de la Sostenibilidad), Institute of Ecology, National Autonomous University of Mexico	System: we focus on the process of informal/irregular urbanisation of the Xochimilco wetland system, Mexico City, and the associated cultural & ecological services. Problem space: a lack of an effective strategy to slow/halt/manage the urbanisation of Xochimilco wetland socio-ecosystem	Sustainability Science Ecology Applied Mathematics and Systems Research	Previous 2 years work in the area, with members of the broader team working in Xochimilco for much longer



South Asia	<p>The South Asia Sustainability Hub &amp; Knowledge Network (SASH&amp;KN) under the Transdisciplinary Research Cluster on Sustainability Studies</p> <ul style="list-style-type: none"> <li>– involving the following Centres at Jawaharlal Nehru University, New Delhi, India: <ul style="list-style-type: none"> <li>• Centre for Studies in Science Policy</li> <li>• Centre of Social Medicine and Community Health</li> <li>• Centre for the Study of Regional Development</li> <li>• Centre for Informal Sector &amp; Labour Studies</li> </ul> </li> </ul>	<p>System: Gurgaon–Manesar urban Complex in the vicinity of National Capital Territory of New Delhi, India.</p> <p>Problem space: systemic problems of overexploitation of sources of surface and ground water, growing inequity in distribution of water, rising non-priority use of water, decreasing reliability of supply are making the water supply system of the region highly vulnerable and dependent on underground and distant sources of surface water supplies</p>	<p>Science and technology policy</p> <p>Public health</p> <p>Regional development</p> <p>Labour studies</p>	<p>Current site-specific work has started only during the last three months – civil society, researchers, government and media are being engaged</p>
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Details of the system, problem space, primary disciplines and history of engagement are drawn from baseline surveys in each hub. These evolved as the project progressed (see Chapters 5–11).

and cross-learning between countries in the global North and global South. This pairing was used at various points through the project to foster cross-learning, e.g. by encouraging participants to share their rationales for particular decisions around research and engagement (e.g. exchanging T-Lab designs in a specific format prior to the first T-Lab workshop), or to share their experiences (e.g. of positive and negative aspects of T-Labs) and lessons (e.g. relating to the specific domains in which they were working). Nevertheless, the process of co-design, and the inevitable consequences of problem reframing that often occurs in co-design processes, made the initial domain-based structure of the paired hubs less salient than other, less visible points of comparison such as approaches used in engagement or the scale or goals of implementation.

The approach to domain-specific pairing represents just one element of the design of the network that aimed strategically to foster co-learning and exchange. The next section describes various other elements of this design in more detail.

### ***Structured design to allow for co-learning and exchange***

The TKN project was designed to provide flexibility for location-specific decisions about transdisciplinary research and engagement (including methods, discussed in Chapter 4), thus allowing reflection within each individual hub around how to improve transdisciplinary practice. Beyond the independently coherent hub-based work, the project allowed for the collection of standardised (as well as hub-specific) data at symmetrical points across all hubs, in an attempt to compare and learn across contexts. In this way, the transdisciplinary research processes in each hub were integrated into the design of the wider project. Table 2.1 illustrates how the hub research was organised in T-Labs (discussed in detail in Chapter 4) and punctuated by moments for data collection, sharing and co-learning and collaborative reflection across the network.

At the inception workshop in April 2016, the representatives of each hub team undertook an adapted and simplified ‘participatory impact pathways analysis’ (PIPA) (Douthwaite et al. 2007; Ely and Oxley 2014) to map out the stakeholders that would be engaged during the course of their transdisciplinary research. This method adopted the funder’s pre-determined categories of stakeholders (defined at the outset of the project in formal reporting requirements): academia, research body, think tank, NGO, public administration, civil society and others. Some hubs found that these were insufficient in their specificity, so in those cases hubs added sub-categories that catered to their own situation. Beyond identifying the category of each stakeholder, hubs were asked to make subjective assessments of their degree of power (power over the transformation) and their degree of alignment with the research team’s own framing of the sustainability challenge. Results of each of these hub-specific processes were included in the inception workshop report, which proposed surveys (collecting qualitative data) and structured reporting on T-Labs (including qualitative data on process and quantitative

data on stakeholder participation) to provide an empirical basis for comparison and cross-learning. Bi-monthly teleconferences via Skype, Zoom or GoToMeeting were set as the primary means for TKN-wide interaction.

Structured reporting by hubs took place after each of the two T-Lab workshops (specific events in each hub that were used for data collection). Hubs were invited to produce internal reports for circulation around the network, which were similarly structured to include questions on decisions taken, methods used, changes observed, findings made and lessons learnt. At each of the two events, hubs also reported on the participation of different stakeholders across academic and non-academic groups in each hub (again drawing on the same categories as had been used in the PIPA and similar subjective measures of power and alignment). This comparative method offered a way to begin to understand the hubs' different approaches to transdisciplinary research, and to consider how these related to the disciplines, cultures and contexts that were prevalent in each of the hubs (represented, e.g. in Figures 5.3 and 8.1).

The project also conducted three internal surveys (baseline, mid-point and final, indicated in italics in Table 2.1) in which members of each of the hub teams were asked similar questions regarding their research process. These sources (reports and surveys) have been drawn on significantly in the accounts in Chapters 5–10. During the project they were uploaded to a SharePoint, which provided a document repository for these outputs and other literature (academic or otherwise) that could support analysis and comparison of the processes occurring in each hub. The SharePoint also provided a site for peer review (e.g. of T-Lab designs, on the basis of templates shared in advance) and discussion fora, offering opportunities for continuous exchange of ideas and experiences between the different hubs.

While bi-monthly teleconferences (involving individuals across up to 16 time zones) were valuable enough to be continued over a year after the project funding had ceased, the use of Microsoft SharePoint, selected largely because of problems using Google in China, diminished as the project progressed due to preferences for different platforms across geographies and generations (e.g. Slack/Zoom/Skype). This was particularly notable for the 'real-time collaborative drafting' function.

Beyond virtual interactions, a series of exchange visits were also built into the design of the network (and the budgets of each hub). These were used to aid project planning, collaborative writing (see 'cross-learning blogs' below) and planning future work and funding proposals. They were particularly targeted at early career researchers and took the form of:

- Adrian Ely (UK hub) spending over four months with the Argentina hub (April–August 2016) at the outset of the project to aid with planning and early writing
- Joanes Atela visiting China in October 2016 to exchange insights with the China team and plan future work

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- Lichao Yang visiting Kenya in April 2017<sup>4</sup>
- Representatives from the USA/Mexico teams attending the T2S programme workshop in India in 2017
- Anabel Marin visiting the UK hub (January 2019) to report on the work of Bioleft and prepare for the culmination of the project<sup>5</sup>

Co-learning blogs were incorporated into the design of the project as a prompt to paired hubs to think together and produce collaborative work. These offered the opportunity for collaborative writing without the constraints that more formal demands (e.g. co-authored journal articles) necessarily involve, e.g. the identification of a shared theoretical framework, presentation of full data, methods. All in all, seven blogs were published during the formal timeframe of the project (see below, with urls all accessed 30/9/2020.).

### *UK-Argentina hubs*

Seeding Ideas: knowledge brokering and recombination for agricultural transformations, by Adrian Ely, Paddy Van Zwanenberg, Elise Wach, Martin Obaya and Almendra Cremaschi – <https://steps-centre.org/blog/seeding-ideas-knowledge-brokering-recombination-agricultural-transformations/>

### *China-Africa hubs*

Transformations from Beijing to Nairobi and back: what can we learn from each other? by Yang Lichao, Kennedy Liti Mbeva and Jiang Chulin – <https://steps-centre.org/blog/transformations-beijing-nairobi-back-can-learn/>

### *North America hub*

What ‘agency’ do researchers have in transformative research projects? by Hallie Eakin, Lakshmi Charli-Joseph and J. Mario Siqueiros-García – <https://steps-centre.org/blog/agency-researchers-transformative-research-projects/>

### *India hub*

The Power of a T-Lab: sharing lessons on water and justice in Gurgaon, India by Dinesh Abrol, Pravin Kushwaha and Bikramaditya K. Choudhary – <https://steps-centre.org/blog/the-power-of-a-t-lab-sharing-lessons-on-water-and-justice-in-gurgaon-india/>

Beyond these co-learning blogs between paired hubs (that were incorporated into the project design), representatives of other hubs and even other TKNs collaborated on a number of blogs:

### *UK and Argentina hubs and other TKNs*

Research, Convening and Bridging: sharing insights from the ISSC’s Transformative Knowledge Networks, by Adrian Ely (with contributions from Joanes

Atela, Mirna Inturias, Dylan McGarry, Iokiñe Rodríguez and Patrick Van Zwanenberg) – <https://steps-centre.org/blog/research-convening-bridging-sharing-insights-isscs-transformative-knowledge-networks/>

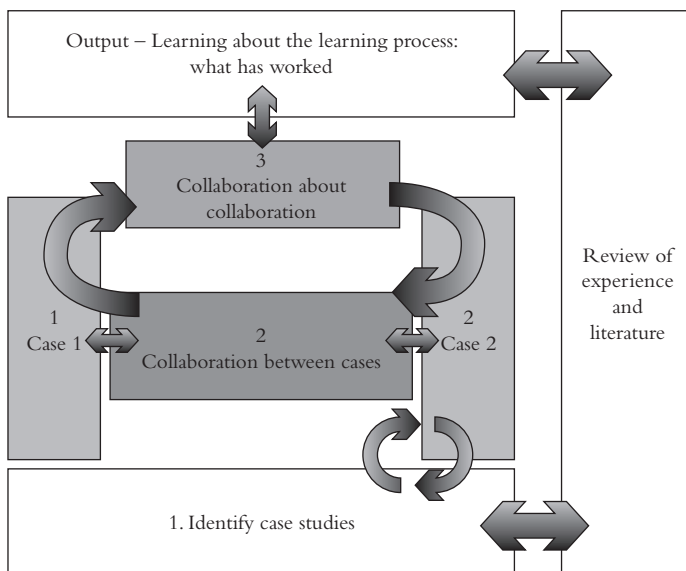
### *North America and Argentina hubs*

Living Aulas: what connects ‘undisciplinary’ research on sustainability? by Almendra Cremaschi and Rebecca Shelton – <https://steps-centre.org/blog/living-aulas-create-space-for-undisciplinary-researchers>

### *UK, Argentina and North American hubs and other TKNs*

What does transformative research for sustainability look like? by Patrick van Zwanenberg, Hallie Eakin, Ethemcan Turhan, Mutizwa Mukute and Fiona Marshall – <https://steps-centre.org/blog/transformative-research-sustainability-look-like/>

Taken together, the approach to the design of the project and the various processes for data collection and sharing described above provided the basis for a uniquely international exploration of the role of transdisciplinary social science in transformations to sustainability. From an organisational learning perspective (Argyris and Schön 1996), these approaches provided opportunities for single-loop learning (instrumental learning through theoretically informed action) and double-loop learning (questioning the underlying theories



**FIGURE 2.1** Schematic Representation of the collaboration process (adapted from Hackett and Eakin 2015).

in order to improve them). For example, in each hub, there was a process of learning about what activities or approaches were effective or not as the projects unfolded in each locale (single-loop learning) and, as described by Hackett and Eakin (2015) in work during the seed-funding stage, learning from and across collaborative contexts. The project was also designed to foster triple-loop learning, particularly through reflection on the processes of cross-hub interaction (learning about the learning and collaboration process), so that these insights could inform future networked transdisciplinary research projects.

While the network architecture and some symmetry of research design across hubs were beneficial in enabling comparison, significant flexibility was required. There was a degree of shared understanding around the notion of social transformations across the consortium (based on the years of previous collaborative work); however, the ways in which these applied to the selected sustainability challenges was open to interpretation. Further, it was difficult to anticipate what would be the appropriate approaches or methods for each context, what local collaborators would be involved, and what opportunities for action and change would materialise once the projects were initiated.

The challenge for the network then was to allow as much flexibility as possible, while adopting a process through which the decisions on theory, method or approach made within each hub could be documented and compared, if not in real-time, at a moment when the hub teams could pause for reflection. This challenge is common to projects taking a complexity-aware approach, recognising emergence, while working within institutional and funding parameters that push towards pre-defined and linear planning.

A compromise involved the adoption of ‘anchors’ that provided a common language and approach, without constraining the creativity and freedom of hubs to carry out the work that they saw as worthwhile and potentially impactful, within their chosen theoretical and epistemological traditions.

### ***Theoretical anchors***

Hubs in the ‘Pathways’ TKN favoured a diversity of epistemological approaches, differing in their theorisation of transformations, change processes and the role of researchers therein. These differences link to the different disciplines that were prominent in each hub (Table 2.2) but also the regionally specific academic and socio-political lineages on which they drew (discussed further in Chapter 3).

Individuals from all hubs had – at different points and to varying extents – collaborated with members of the STEPS Centre, whether around topics such as resilience (Leach 2008), technology regulation (Van Zwanenberg et al. 2011), grassroots innovation (Fressoli et al. 2014) and the politics of sustainable development (STEPS Centre 2010; Leach et al. 2012; Ely et al. 2013), and the wider pathways approach articulated in Leach et al. (2010). This history

provided us with a number of theoretical “anchors” that offered a basis for further collaboration:

- **Systems** – “particular configurations of dynamic interacting social, technological and environmental elements” (Leach et al. 2010).

As described in Chapter 1, the focus on *systemic* transformation was shared across hubs. This included a definition of the system (including explicit attention to how the system was framed) in the original co-design phase (see Table 2.1). Lessons that emerged from the project (discussed in Chapters 3 and 12) contributed to the delineation of “systemic” approaches to transformations research, alongside “structural” and “enabling” approaches that were also reflected in some of the examples outlined in this book (Scoones et al. 2018).

- **Framings** – “the different ways of understanding or representing a social, technological or natural system and its relevant environment. Among other aspects, this includes the ways system elements are bounded, characterized and prioritized, and meanings and normative values attached to each” (Leach et al. 2010).

Building on Goffman’s (1974) seminal work, the notion of framing has a long history in policy studies (Schön & Rein 1994; Levidow and Murphy 2003; Ely et al. 2009) and was familiar to many across the consortium. The co-design workshops and concept notes that emerged from them identified different framings and the project offered significant opportunities to explore processes of re-framing (see Chapter 11).

- **Pathways** – “the particular directions in which interacting social, technological and environmental systems co-evolve over time” (Leach et al. 2010).

Concept notes identified dominant and alternative pathways, but adopted different lenses through which these were characterised in each context. At the same time, the pathways approach (and the notion of pathways) played a different role in each case. In some cases (see Chapter 9 – Mexico) they were combined with ideas around transformative agency (Westley et al. 2013) while in others (see Chapter 10 – India) class was a more central organising concept. In some cases (see Chapter 8 – China) gender played a more central role in the work, while others (Chapter 7 – Kenya) engaged more with issues of poverty as a focus for transformational change. Taken together, these different approaches offer insights into the notion of *transformative pathways* to sustainability (Chapter 12).

As anchors, these concepts represented heuristic starting points rather than a rigid theoretical framework. The rationale was that there was at least some familiarity with them across each of the hubs, and thus they could act as a *lingua*

*franca* through which more abstract theoretical notions could be explored (see Chapter 3). The role of the project was not to test these concepts (derived from work led from the global North) for their applicability in different contexts but to explore their limitations and put forward alternatives grounded in the contexts in which the research was conducted. Indeed, a key ambition of the project was to foster transdisciplinary approaches that prioritised historical and contemporary characteristics of the hubs rather than being driven by those in the Northern-dominated literature (Van Zwanenberg et al. 2016).

### ***Methodological anchors***

In each hub locality, transformations (processes of deep systemic change) were already ongoing – understood as centred on technologies, market incentives, state-led support or citizen mobilisation (Scoones et al. 2015). The project aimed to further elucidate these processes and – through strategic use of transdisciplinary social science research and evidence – help to steer them in more environmentally sustainable and socially just directions. A previous review of transdisciplinary research in sustainability science (Brandt et al. 2013) supported the view taken within the TKN that research methods needed to be selected on the basis of local preferences, rather than standardised across the network. At the same time, some commonalities were desirable in order to support comparison and cross-learning. Based on key contributions from Stockholm Resilience Centre (Per Olsson and Laura Pereira), we adopted the overall approach of ‘T-Labs’ – processes involving research and transdisciplinary engagement to address a complex sustainability problem or challenge – around which different hubs could experiment with different methods for research and engagement. T-Labs (shorthand for Transformations laboratories) were first experimented with in the run-up to the Transformations 2015 conference hosted by Stockholm Resilience Centre, and add to the panoply of strategic approaches to enable or unleash systemic change through experimentation in ‘labs’, including living labs (Bergvall-Kåreborn & Ståhlbröst 2009; Keyson et al. 2017), transition labs (Neuens et al. 2013), social labs (Hassan 2014), social innovation labs (Westley and Laban 2015) or real-world labs (Wagner, et al. 2016; Schöpke et al. 2018). They are differentiated on the basis of their focus on transformations in social-ecological systems/ human-nature interactions and their open-endedness (being strategically facilitated to allow for emergence, as discussed in more detail in Chapter 4).

Like the theoretical concepts above, the notion of T-Labs acted as an anchor to be negotiated and experimented with, rather than a methodological tool or protocol to be implemented in a standard manner across the TKN. Chapters 4 and 5–10 provide further information on how the T-Lab concept was operationalised in different contexts.

The structured approach to collaboration outlined above (and discussed further in Ely et al. 2020) balanced the need for a coherent international project design with the need for deep context-specificity. The use of theoretical and



methodological anchors that provided the flexibility for transdisciplinary work in each hub to be locally co-designed and implemented was valued by the network team, based on a reflective self-evaluation of the project conducted at the final workshop in October 2018. T-Labs provided an opportunity for local independence in a way similar to what has been described as “framed creativity” in studies of adaptive co-management (Olsson et al. 2004).

As the following chapters describe in more detail, this approach provided insights both in terms of single-loop (learning through theoretically informed action, in this case enabling individual hubs to adopt more effective research and engagement methods in the future) and double-loop learning (questioning the underlying theories in order to improve them, in this case via shared reflection alongside teams from other hubs in the network). The experience provided a wealth of insights and mainly tacit knowledge about international collaboration in transdisciplinary social science for sustainability transformations. Only a tiny proportion of the lessons learnt from the ‘Pathways’ TKN are codifiable in a volume such as this. However, as the next chapter explains, the overriding motivation behind the project was – from the outset – much more than the production of formal research outputs such as academic publications.

## Notes

- 1 Launched in 2015, Future Earth is a ten-year initiative to advance Global Sustainability Science, build capacity in this rapidly expanding area of research and provide an international research agenda to guide natural and social scientists working around the world.
- 2 <http://acknowledgej.org/>, accessed 30/9/2020.
- 3 <http://transgressivelearning.org/>, accessed 30/9/2020.
- 4 Reported in the following blog – <https://steps-centre.org/blog/learning-across-continents-sustainable-transformations-visit-china-africa/>, accessed 30/9/2020.
- 5 Reported in the following blog – <http://bioleft.org/en/2019/01/28/bioleft-en-el-reino-unido-seminarios-academicos-y-agricultura-urbana/>, accessed 30/9/2020.

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