16. Advancing transdisciplinary research in the Global South

Katsia Paulavets, Sarah Moore and Mathieu Denis

INTRODUCTION

Sustainability is not only, or not even, primarily a scientific or technical challenge – it is first and foremost a social and political challenge, but theories and knowledge from the social sciences relating to social change and transformation have been underutilized. Likewise, perspectives and knowledge from the Global South are crucial if we are to address interconnected, global sustainability problems, not least because the Global South is suffering disproportionately from the impact of industrial capitalism nurtured in and exported from the Global North. In addition, local, contextual knowledge is needed to address the local manifestations of unsustainability.

The International Council for Science (ICSU) and the International Social Science Council (ISSC) were collaborating from 2010 to provide more opportunities for social scientists and researchers in the Global South to lead and collaborate meaningfully in transdisciplinary sustainability research (ICSU, 2010). The ISSC worked with the Swedish International Development Cooperation Agency (Sida) to design an international global environmental change programme led by social scientists. The publication of a white paper (ISSC, 2012) and of the 2013 World Social Science Report on global environmental change (together with UNESCO and the Organisation for Economic Co-operation and Development [OECD]; ISSC/UNESCO, 2013) helped demonstrate the unique and necessary contributions made by the social sciences to respond to the problems of global environmental change. Launched in 2014, the Transformations to Sustainability (T2S) program was the first international funding scheme for transdisciplinary (TD) projects led by social scientists addressing sustainability challenges. Inspired by this initiative, in 2017 a coalition of 12 institutions from the Belmont Forum and NORFACE networks, together with the International Science Council (ISC), launched a larger-scale T2S program.

In 2016, in response to the need for TD capacity building highlighted during the establishment of the Future Earth (2014) platform, ICSU launched the Leading Integrated Research for Agenda 2030 in Africa (LIRA 2030) program to foster TD research among early career researchers in Africa.

These three TD programs – T2S I, T2S II, and LIRA 2030 – were launched within only a few years of each other. Despite their shared origins and the shared intention of the program designers to promote TD research, they differ significantly on key aspects and represent three distinct approaches to designing and running international TD programs. This chapter summarizes some of the program-level learning from T2S I, T2S II, and LIRA 2030 that could be useful in the design of future TD research funding programs. The chapter is written by the program coordinators of the two T2S programs (Sarah Moore) and the LIRA 2030 program (Katsia Paulavets) and by one of the principal program designers and Steering Committee
members (Mathieu Denis). It is based on both internal and externally commissioned independent analysis of the program and of feedback from program participants and stakeholders. Learning and reflections on five dimensions of program design and how they promote or inhibit TD research are shared: funding criteria, application and selection processes; building capacity and skills; monitoring, evaluation, and learning approaches; influencing the institutional environment; and resourcing.

THREE APPROACHES TO PROMOTING TRANSDISCIPLINARY RESEARCH IN THE GLOBAL SOUTH

Two Transformations to Sustainability Programs

The T2S programs were two closely related research programs with much in common, but also significant differences. For the purposes of this discussion, they are designated T2S I and T2S II.

T2S I was launched by the ISSC in January 2014 with the aim of increasing the contribution of the social sciences to generating solutions to the challenges of sustainability. The program had a total budget of about €5 million, with which to fund 30 seed grants and three three-year projects and to fully cover the staff costs of implementing the program. Foundational assumptions of the program were that TD research and North–South research collaboration and leadership were two key levers to accelerate the production of actionable knowledge for transformations to sustainability. The program design was based on three pillars of activity:

1. **Supporting research** that was:
   - led by social scientists and focused on social dimensions of global sustainability challenges;
   - interdisciplinary, TD, and solution-oriented;
   - led or jointly led from the Global South; and
   - international, involving at least three countries (including at least one low- or middle-income country) in two world regions.

2. **Facilitating synthesis of knowledge and network building.** The program promoted the participation of early career researchers, and facilitated cross-project knowledge exchange and skill building. The program organized five major events and several activities (virtual and in-person) to encourage collaboration and to support the development of skills for doing interdisciplinary and TD research.

3. **Sharing knowledge on transformations to sustainability.** Program coordinators actively disseminated knowledge about transformations and worked to build the community of researchers and to advocate for TD sustainability science.

T2S II, launched in 2017, was a joint program involving 12 national research funders from two research networks (the Belmont Forum and the NORFACE network of social science funders in Europe), together with the ISC (funded by Sida) and the European Commission (which provided top-up funding through the ERA-net Cofund instrument). The funded projects had a combined research budget of €11.5 million, while coordination and cross-project activity costs were funded separately by the participating organizations. The program secretariat was
provided by the Netherlands Organization for Scientific Research (NWO). The ISC opted to coordinate the knowledge exchange and communication activities of the program.

While the call for proposals for T2S I was thematically wide open, T2S II defined three broad topics within the theme of social transformations to sustainability (Table 16.1).

The Leading Integrated Research for Agenda 2030 in Africa (LIRA 2030) program

The LIRA 2030 research funding program was launched in January 2016 to catalyse the generation and use of integrated (interdisciplinary and TD), solution-oriented, and policy-relevant knowledge required to address complex sustainability challenges in Africa, especially in the urban context. The knowledge produced was to provide the evidence and create tools for decision-making to advance the implementation of the Sustainable Development Goals (SDGs) on the continent. The program was extended by one year due to the COVID-19 pandemic.

LIRA 2030 was designed as a capacity-building program to advance TD research in Africa. It sought to:

- Build a new generation of scientists in Africa with the ability, capacity, and skills to produce and communicate integrated and policy-relevant knowledge on sustainable development in African cities; and
- Increase institutional recognition and financial support for TD research in Africa (and globally) by holding strategic meetings with science funding agencies, science policy makers, and scientific institutions.

To achieve its objectives, the program supported two-year, internationally collaborative projects led by early career African researchers (with no more than ten years of work experience following their PhDs). Each project conducted research across cities in at least two countries in Africa to foster research collaboration across African research institutions and learning across cities. A particular emphasis was on ensuring the participation of low-income countries in research collaboration.

The program budget was about €5 million. In summary, it:

- supported 28 projects, involving 22 countries and 38 cities across Africa;
- delivered TD training for Principal Investigators (PIs) and workshops with modules on, for example, theory of change, the ethics of doing TD research, strategies for publishing TD work, project and financial management of TD projects, science advice to governments, science–policy interactions, and science communication and scientific writing, and brought together representatives from all projects in annual knowledge-sharing meetings;
- provided eight grants for cross-project collaboration;
- provided multiple opportunities for African researchers to take part in international scientific and policy processes and conferences; and
- supported project outreach to the broader public via ISC-led production of blogs, videos, and webinars.

LIRA 2030 also organized two global fora to discuss with science funders how to increase the impact of science on the implementation of the SDGs, during which the critical role of TD research and building associated capacity in the Global South was emphasized.
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<th><strong>Table 16.1  Key program characteristics</strong></th>
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<td><strong>Program and project life spans</strong></td>
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<tr>
<td>Program: 2014–19 (6.5 years, including 1.5-year no-cost extension)</td>
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<tr>
<td>Projects: 3 years plus 5-month no-cost extension</td>
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<td><strong>Lead implementing agency and partners involved in program delivery</strong></td>
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<td><strong>Target audience</strong></td>
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| **Thematic focus** | The call for research proposals was thematically open within the broad theme of understanding the social dimensions and dynamics of transformation to sustainability | The call was structured around three themes:  
- Governance and institutional dimensions of transformations to sustainability  
- Economy and finance of transformations to sustainability  
- Well-being, quality of life, identity, and social and cultural values in relation to transformations to sustainability | Sustainable urban development in Africa with three distinct calls for proposals:  
- Advancing the implementation of SDG11 in cities in Africa (2017)  
- Pathways towards Sustainable Urban Development in Africa (2018) |
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<th>T2S I</th>
<th>T2S II</th>
<th>LIRA</th>
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<td><strong>Program goals</strong></td>
<td>To accelerate the emergence of a significant body of knowledge on social transformations that could inform the development of equitable solutions to urgent sustainability challenges, and to increase use of that knowledge</td>
<td>1. To strengthen the role of the social sciences in interdisciplinary sustainability science 2. To develop understanding of and promote research on transformations to sustainability 3. To build capacity, overcome fragmentation, and have a lasting impact on both society and the research landscape by cultivating durable research collaboration across multiple types of borders</td>
<td>1. Strengthen capacity of early career scientists to undertake inter- and transdisciplinary, solutions-oriented knowledge on sustainable urban development in Africa 2. Increase the production and use of this knowledge to promote sustainable urban development in Africa 3. Foster African scientific leadership for the implementation of the global Agenda 2030 4. Foster research collaboration within Africa 5. Mobilize institutional and financial support for TD research and capacity building in Africa</td>
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<tr>
<td><strong>Definition of TD research applied</strong></td>
<td>TD research concerned the co-design, co-production, and co-dissemination of knowledge with the relevant academic and non-academic knowledge partners</td>
<td>Involving civil society and stakeholders in the research, from problem framing and objective setting through to the communication of findings</td>
<td>TD research was understood as a knowledge co-production process with key stakeholders that generates knowledge on societal problems as well as actionable knowledge for problem solving The program took the approach that there is no ‘right way’ of doing TD research and that the African context might result in practices that have not been extensively documented in the literature</td>
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<td>Geographical scope and South–South and North–South collaboration</td>
<td>T2S I</td>
<td>T2S II</td>
<td>LIRA</td>
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<td>Global: collaboration was required across at least three countries (including at least one low- or middle-income country) and two world regions. In practice, the three funded projects involved an average of eight countries across four or more world regions</td>
<td></td>
<td>International: projects had to involve at least three of the participating countries. Collaboration with the Global South was encouraged but not required Participation of researchers in low- and lower-middle-income countries was supported by the ISC</td>
<td>Africa: research collaboration between African countries and academic institutions, especially ensuring participation of low-income countries. Each project brought together cities in at least two countries in Africa</td>
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<tr>
<th>Key selection criteria in relation to transdisciplinarity</th>
<th>T2S I</th>
<th>T2S II</th>
<th>LIRA</th>
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<tr>
<td>● Co-design and co-production were explicit requirements ● Previous TD experience was required</td>
<td>● Co-design and co-production were welcomed but not mandatory ● Previous TD experience was not a requirement</td>
<td>● Co-design and co-production were explicit requirements ● TD experience was not a requirement</td>
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## Program governance and management

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<th>T2S I</th>
<th>T2S II</th>
<th>LIRA</th>
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<td><strong>Multi-stakeholder program Steering Committee</strong>, chaired by President of ISSC – selected the projects, met annually and advised on opportunities to enhance impact</td>
<td><strong>Program Board representing participating funding agencies, meeting annually to monitor progress</strong></td>
<td><strong>Scientific Advisory Committee composed of African scientists with TD expertise, early career scientist, and leadership representatives of all partners involved, met once a year until 2019 to define the program’s scientific strategy, shape research calls, make research funding decisions, and advise on the further development of the program</strong></td>
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<td>Program coordination team facilitated cross-project interaction and program-level dissemination and outreach</td>
<td><strong>Management team of funding agency representatives, with some funding agencies responsible for ‘work packages’, in regular communication with each other</strong></td>
<td><strong>A management team composed of representatives of ISC, the ISC Regional Office for Africa, and the Network of African Science Academies</strong></td>
</tr>
<tr>
<td><strong>An ISC team responsible for coordinating the ‘Knowledge exchange and communication’ work package</strong></td>
<td><strong>An ISC team responsible for coordinating the ‘Knowledge exchange and communication’ work package</strong></td>
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### Funding

1. **Sida**, with budget of approx. €5.2m.
   - Ad hoc support of a total of €120k for eight seed grants from the Economic and Social Research Council (UK), the National Research Foundation of South Africa, the Dutch Research Council, and the Swedish Research Council

2. Original budget breakdown:
   - co-design seed grants €900k
   - research €2.55m
   - capacity building, networking, and dissemination activities €250k
   - program support (including communications) €1.5m

3. Seed grants of €30k each; main projects of €850k each

### Project budgets

1. **Sida**, 12 national/regional funders (including the ISC) and the European Commission
   - Budget breakdown:
     - research: €11.5m
     - capacity building, networking, and dissemination activities €245k
     - program support €624k (of which €224k provided in kind by the funders)

2. Project budgets: upper limit of €1.5m in principle – in practice, average of just under €1m

### LIRA

1. **Sida** with budget of approx. €5m; the Robert Bosch Foundation with €100k for additional capacity-building activities

2. The original program budget was structured as follows:
   - 63% for TD research grants
   - 15% for TD capacity-building activities and peer learning
   - ~2% for participation in international scientific and policy processes
   - ~1% for communication activities
   - 1% for strategic discussions with science funders
PROGRAM DESIGN FEATURES AND HOW THEY PROMOTED OR INHIBITED TRANSDISCIPLINARY RESEARCH IN THE GLOBAL SOUTH

Funding Criteria and the Application and Selection Process

T2S I
Integral to the T2S I program was a seed-grant phase intended to provide the time and resources for an emerging consortium to co-design a research proposal with academic and non-academic partners. Thirty-eight teams were awarded a seed grant of €30,000 to spend within six months. Within that period, a conference in Potsdam gathering all seed grantees and numerous scholars of transformations to sustainability was convened, to take stock of the state of knowledge on transformations to sustainability and allow the grantees to network and learn from each other.

The subsequent call for full proposals, for grants to the value of €850,000, was open (i.e. not restricted to seed-grant winners). The three selected projects had all benefited from a seed grant, suggesting that the seed grant and the Potsdam conference had been of value in co-designing a proposal. The benefits of the seed grant/co-design phase were captured in a special issue of a journal by the seed grantees. Among the lessons learned was that: ‘even a 6-month collaboration period was often not long enough to establish solid, trustful working relationships to bridge the vast differences in orientation, background, goals, and skills. This is why many teams chose to rely on existing partnerships, and those who launched new partnerships faced a steep learning curve’ (Moser, 2016).

The projects were selected by an international, multi-stakeholder Steering Committee, including academics and non-academics experienced in TD research. A key selection criterion at the seed-grant phase was the extent to which the funding would be used to extend or build new multi-stakeholder networks involving Global South partners. At the full proposal stage, the selection process emphasized the depth and appropriateness of the TD approach and the internationally comparative design, as well as the potential contribution to knowledge.

The funding criteria and selection process produced some expected and some surprising results. The leadership of the three projects was, on average, well balanced across North and South, with one coordinated exclusively from the Global South and two led jointly across North and South. Of the 23 main partners in the three projects, 15 were based in low- or middle-income countries, which could be considered a success, although the internal distribution of funding within projects reflected the significantly higher costs in high-income countries. The equitable participation of Global South partners in T2S I was often cited by the project members as a novelty and a strength of the program.

One of the three projects was jointly coordinated with a non-academic partner; and although few of the 23 main partners were not professional researchers, the involvement of non-academic (nongovernmental organization [NGO] or other societal) partners was strong. All three projects were more complex in structure than anticipated, involving on average eight main partners/countries/research sites. Comparison and synthesis of knowledge across sites and cases was extremely challenging and, in some cases, not achieved in the timeframe of the program.
T2S II
Project selection in the T2S II program was a standard two-phase process involving panels of mostly academic experts. Thirty-nine teams selected in the pre-proposal phase had about three months to prepare a full proposal.

Each of the funding partners determined the eligibility criteria for their target research community. Most of the funders were restricted to funding academics in their own countries, with the ISC funding researchers in low- and lower-middle-income countries (with most upper-middle-income countries ineligible to participate). Projects had to include at least three participating countries, including preferably at least two participating European countries. The combined budget for any one project was not to exceed €1.5m.

Like T2S I, T2S II funded international, interdisciplinary, and TD research projects, as well as cross-project interaction for learning and knowledge synthesis purposes. However, T2S I, which was funded by a development organization and managed by one global science organization, required that each project be led or co-led by a PI from a low- or middle-income country and have low-income-country partners. T2S II, by contrast, was funded by multiple national funding organizations, mostly in the Global North, most of which could not fund researchers outside national research institutions. It was through ISC participation in the funding consortium that researchers (from academic and non-academic research institutions) in low- and lower-middle-income countries had the possibility to lead T2S II research projects. For this reason, the program encouraged but did not stipulate the involvement of researchers from low- and middle-income countries.

The funding structure had a clear impact on the types of configurations that were possible and the positioning of the Global South and non-academic partners in the projects. The greater flexibility of the ISC to fund potential partners in Global South countries and non-academic institutions seemed to produce a pattern of Northern academic partners proposing research focusing on the Global South, often in collaboration with NGO partners. Of the 12 projects funded, only one was coordinated from the South; of the 56 main partners in the 12 projects, 13 were based in the Global South and three in non-academic research institutions. Some projects involved research and fieldwork only in sites in the Global South, despite having a majority of partners in the North.

Although it was not mandatory to take a TD research approach, all selected projects involved non-academic partners. However, national funding conditions generally prohibited the use of funds to remunerate non-academic partners in the research. Project members reported that this created an imbalance in the relations in the consortia.

LIRA 2030
LIRA 2030 supported 28 collaborative projects with grants of up to €90,000 over the course of three calls. The calls were developed by a Scientific Advisory Committee composed of African scientists, some with experience in TD. The calls explicitly asked for TD projects, requiring participation of social and natural scientists and engagement of stakeholders in research co-design and knowledge co-production.

The program used a two-step application process that included pre-proposals and full proposals, with a five-day TD training course for shortlisted applicants held before submission of the full proposal. The two-step process was intended to provide time for applicants to build genuinely interdisciplinary and TD teams, undertake initial co-design of research questions, improve the quality of the full proposals, and build the necessary skills and knowledge to
practice TD projects. It proved very valuable for the quality of the full proposals and the development of a common understanding of TD research and methods and the program’s ambitions among the grantees.

The initial six weeks for developing pre-proposals were quickly expanded to ten, to provide more time for the development of new partnerships. After the workshop, the applicants had about two months to develop the full proposals, integrating the feedback provided by experts and undertaking additional discussions with stakeholders. Identifying enough reviewers with TD competencies was a challenge. Each proposal was reviewed by thematic experts from different relevant disciplines and by practitioners – in total, three reviewers per proposal. The selection criteria focused on research quality, societal relevance, and the adequacy of the science–society–policy engagement approach. Each project also had to demonstrate how the proposed team comprised the relevant mix of interdisciplinary skills.

Research collaboration across African countries was another requirement for LIRA 2030 projects. Each project had to engage at least two African academic institutions in different countries. The PIs had to transfer funds to their partner institution in the other country (Box 16.1). In this process, they often encountered administrative hurdles, causing delays in project activities. While research collaboration across countries was enriching, differences in languages, institutional, economic, and political contexts made the management of the projects even more challenging for early career scientists. Likewise, involvement of non-academic partners was innovative but cumbersome because of divergent interests, expectations, and motivations.

BOX 16.1 CROSS-PROGRAM LEARNING – PROGRAMME DESIGN

It is clear that eligibility and funding rules determine who participates in research projects and in what roles. There is a need for more unrestricted international research funding that is inclusive of or directly targeted at the Global South and at non-academic partners, to foster more equitable relationships between partners and to counteract the risk of supporting ‘extractive research’ dominated by academic traditions and partners from the Global North.

The three programs demonstrated, in different ways, the importance of offering opportunities for inclusive co-design of research proposals (whether through seed grants or enhanced two-step application processes) and of nurturing ideas and skills for TD work in the early stages of a program. Co-design is a difficult process, especially with new partners, and it is important to ensure that research program design provides enough time and support for this critical step.

The evaluation of TD research proposals remains a challenge, as the community of TD research experts in fields of sustainability is still relatively small, and evaluation processes must still contend with prevailing beliefs about the incompatibility of scientific excellence, societal relevance, and inclusivity.

All three programs showed, at quite different scales, that internationally comparative project designs add a great deal more, and sometimes unnecessary, complexity, workload, and risk to TD research. Research funding programs should carefully design project structures and selection criteria and processes to minimize unnecessary complexity and increase project feasibility.
Building Capacity and Skills for Transdisciplinary Research

T2S I
The T2S I program demanded a significant level of experience in TD research among the lead researchers but also, by design, facilitated exchange and learning between the projects through annual knowledge-sharing workshops. These helped strengthen a community of practice in TD research on transformations to sustainability. The high level of cross-project engagement was considered very valuable by the project members.

In addition to the annual in-person meetings, the T2S I program encouraged and supported activities emerging from the projects, such as a research school organized by the early career researchers and a stakeholder workshop demonstrating methods of TD research. The program provided a valuable platform for many dozens of early career researchers in the Global South and North to develop skills and competence in TD sustainability research, leadership, collaboration and communication and to enter the international research scene with confidence.

T2S II
This tradition of regular exchange and training was continued with T2S II, with capacity building based largely on facilitating community building, peer learning, and exchange through in-person and virtual meetings. The midterm evaluation of the T2S II program found that those activities were possibly the most important added value of the program for the grantees. The turn to virtual engagement with the onset of the COVID-19 pandemic had certain advantages in terms of extending participation to more project members.

The ‘how to’ of engagement with stakeholders was a perennial topic of interest for the projects in T2S I and II. Even though many of the senior project members were already experienced in co-production methods, every new engagement and new context seemed to demand and produce new learning and experience. Project members regularly and consistently expressed interest in learning more about each other’s methods and experiences of engagement with stakeholders throughout the course of the programs.

LIRA 2030
As a program designed to increase capacity building for TD research in Africa, LIRA 2030 dedicated significant efforts to developing training and exchange between projects. The five-day TD training mentioned above was particularly appreciated by all participants. Originally this training was only provided to the PIs on the assumption that they would transfer their acquired knowledge to other research team members, which proved not always to be effective. At the request of the PIs, similar training was offered to co-PIs. In addition, the program developed coaching workshops for PIs and co-PIs that included modules on theory of change, the ethics of doing TD research, strategies for publishing TD work, and project and financial management of TD projects.

To foster community building and peer learning, the program organized annual three-day research fora. These fora brought together PIs and co-PIs of all projects, TD and urban experts, as well as representatives of global research initiatives. Capacity-building modules were integrated into the meetings, for instance, on science advice to governments, science–policy interactions, science communication and scientific writing. The opportunities for exchange were highly valued by the grantees.
Furthermore, to foster learning across projects, the program funded cross-project collaboration (Box 16.2). Cross-project collaboration grants made it possible to compare and synthesize knowledge from different LIRA 2030 projects as well as experiences of TD research in different African contexts.

The program supported LIRA 2030 grantees in establishing themselves as TD experts by nominating LIRA grantees for international scientific conferences, expert working groups, intergovernmental policy processes, and global reports (e.g. at the UN Science, Technology, and Innovation fora; High-Level Political Forums on Sustainable Development; the Intergovernmental Panel on Climate Change Cities and Climate Change Science Conference; and international TD conferences).

According to feedback from participants, the program has helped them work outside academic silos and become reflexive TD researchers, developing leadership skills and enabling their involvement in local, national, and global policy processes, and has led to increased recognition in their universities. However, while several grantees were rewarded with direct career promotion and funding, securing long-term career development as TD researchers remains a challenge in Africa and elsewhere (ISC, 2023).

**BOX 16.2 CROSS-PROGRAM LEARNING – BUILDING CAPACITY**

Even with previous experience, expertise in TD research skills cannot be taken for granted. The skills required for TD research need constantly to be tested and strengthened. Therefore, knowledge exchange, training, and capacity-building activities should be an integral part of any TD research funding program, and particularly for early career scientists, for whom introductory modules on science communication, meeting and group facilitation, and project management should be also considered.

Furthermore, providing opportunities for peer learning and exchange, cross-project collaboration, and participation in international conferences and science–policy fora, as demonstrated by all three programs, is key to enabling TD learning and to giving early career researchers in the Global South the means to access and engage with international communities and stakeholders.

**Monitoring, Evaluation, and Learning to Support Transdisciplinary Research**

**T2S I**

The T2S program reporting framework, which took the shape of a ‘logframe’ (a monitoring framework typically used in development interventions), was based on assumptions about the inherent value of international, North–South, socially framed, interdisciplinary and TD research for sustainability, and relied on proxy indicators of the program’s influence on national and international research agendas, research funding, and wider policy. In 2017, T2S I voluntarily underwent an independent evaluation to help gauge how well the program was meeting its objectives. Data on activities, outputs, and partnerships were collected from the projects on an annual basis, and a follow-up report was requested one year after the end of the projects.
Cognizant of the nature of TD research for sustainability as frequently normative, action-oriented, open-ended, and experimental, the ISC asked about and valued non-academic and non-quantifiable outputs (e.g. photo exhibitions, mobile applications, theatre productions) and outcomes (such as the emergence of personal and collective agency, the development of relationships, networks and skills among the researchers and communities, the production and use of non-academic outputs with and for communities, signs of change or transformation in communities including of double- and triple-loop learning, and unintended and unwelcome developments). The ISC recognized the difficulty for TD projects themselves to define indicators of impact and baselines against which to measure the effect of interventions and the unpredictable timeframe for results of TD work to appear (possibly years after the end of funding; see Pathways Network, 2021). This is part of the challenge of demonstrating the value of TD research, as discussed below.

Project members were regularly asked for feedback on program activities and their needs and wishes for program support or interaction with other projects. This feedback influenced the organization of subsequent activities, including the provision of training, although not all needs could be met. In retrospect, it would have been desirable to reflect and decide collectively on the monitoring, evaluation, and learning approach at the outset of the program.

**T2S II**

Monitoring and evaluation in the T2S II program was multilayered. Projects were monitored by the Belmont Forum and NORFACE consortium, but individual funding organizations, including the ISC, could also monitor and evaluate their own funded researchers. The implementation of the program was evaluated by a specially appointed panel at midterm and final stages.

The Belmont Forum (2009) reporting captured numbers of researchers and early career researchers doing TD research for the first time, and the various kinds of audiences targeted by outputs, to demonstrate that the funding mechanisms were promoting TD research, capacity building, and dissemination to various audiences.

The ISC monitored its grantees in T2S II (who were all in the Global South) to understand how they were contributing to the whole projects, what types of stakeholders they were engaging with, and how they were benefitting from the project. The reports showed the value of hearing from individual partners in international collaborations, rather than only from the project.

The potential for learning in and across the two T2S programs, about designing and supporting TD research for sustainability, was rich, but was not systematically addressed until towards the end of the T2S II program, when a study was launched to analyse how program design fostered or inhibited TD research for sustainability.

**LIRA 2030**

The LIRA 2030 program emphasized monitoring, reflection, and learning and continually adjusted its activities in line with projects’ needs. The annual program report (responding to a logframe) included quantitative data about progress towards project objectives, the activities undertaken, outputs developed, partnerships built, as well as reflecting on researchers’ experiences in undertaking and managing TD research projects. The annual reports helped to better understand projects’ needs and challenges and fed into the adjustment of program activities, for example, the development and the delivery of TD training activities for co-PIs and project...
coaching workshops and the introduction of the cross-project collaborative grants. However, opportunities to give feedback targeted researchers and not non-academic stakeholders.

Mid-way through its lifespan, the program undertook a learning study to capture the diverse experiences of practicing TD researchers in different contexts, to identify key enabling factors and challenges for TD research in the African context and the range of results emerging from the LIRA projects, and to understand the role of TD in achieving project objectives. The learning study also assessed the role of program design and activities in building researchers’ capacities to undertake TD research (ISC, 2023). This study was based on surveys, inputs by the grantees, and annual self-reflection workshops by each project team. The workshops were a useful tool for research teams to reflect on their theory of change, research methods and processes, and adapt, and they were useful for the learning study (Box 16.3).

On an annual basis, the program management team organized site (or virtual) visits to several projects and their institutions. These visits made it possible to witness projects’ progress on the ground and to discuss management issues, needs and challenges, and maintain strong links with the projects’ leadership and partners.

The projects’ progress, challenges, and needs were discussed at the annual meetings of the Scientific Advisory Committee (SAC). The SAC played an important role in reflecting on the program’s progress and learning and ensuring that it was developing in line with projects’ needs and challenges. A final evaluation meeting was held (virtually) with all teams to assess the program’s outputs and impact.

**BOX 16.3 CROSS-PROGRAM LEARNING – MONITORING, EVALUATION, AND LEARNING**

Both the T2S and LIRA 2030 programs had the advantages and disadvantages of being relatively small, unique, even pioneering programs. It was possible (and necessary) to listen attentively and be responsive to the needs of the projects and researchers, and to gather and reflect on qualitative information about their progress and achievements. On the other hand, it was harder to translate learning into improvements in program design for the T2S programs, which each had only one round of funding. LIRA showed the value of having several rounds of funding, which allowed for timely adjustments to the program design.

Both the ISC and Sida, the funder of the T2S and LIRA 2030 programs, were open to and even expected unconventional kinds of outputs and outcomes from TD research and were aware that the results of TD research might not be evident until long after the projects ended, or indeed that impacts might never be attributable to the projects. At the same time, the projects and the ISC were all conscious of some pressure to produce outputs and demonstrate results within the short time span of the programs. Some of the evaluation methods used, such as the self-reflection workshops in LIRA 2030, and the learning studies in T2S and LIRA 2030, proved more creative and appropriate for TD research than conventional evaluation methods.

Despite being conscious of the need to keep the reporting burden light, both for the projects and for the program managers, in hindsight all three programs could have done better to streamline and lighten the monitoring and reporting processes. More could also be done to understand the experience of the non-academic partners in the research process.
Changing the Institutional Environment for Transdisciplinary Research

T2S I and II
The ISSC was a strong advocate for international research funding for TD research on transformations to sustainability; the design and launch of the T2S I with the support of Sida was instrumental in mobilizing the support of the Belmont Forum and NORFACE network for the T2S II program.

The ISSC envisaged a growing community of knowledge and practice around transformations to sustainability, which would be sustained by the establishment of a knowledge hub for scientific literature and other resources on transformations to sustainability. The T2S I program developed a website to showcase outputs of the projects and to link to other resources on research for transformations to sustainability. The program managers established links with other initiatives in the domain of transformations to sustainability, such as the Future Earth Knowledge–Action Network on Transformations to Sustainability and the SDG Transformations Forum, and currently the ‘Transformations Community’, which also sees its role as sustaining a global network of researchers and practitioners.

The ISC established a partnership with the journal *Current Opinion in Environmental Sustainability* to collect up-to-date syntheses of knowledge on various aspects of transformations to sustainability in a virtual special issue that covers methodological aspects of doing this kind of research, including TD approaches (Moore et al., 2021). The papers are followed up with Knowledge Briefs, separate publications that disseminate the conclusions of the academic papers to wider audiences.

The program has also undertaken a range of standard dissemination activities to raise the profile of TD research for sustainability, such as sessions at scientific events and contributions to scientific works, nominations of experts for international policy processes or speaking opportunities, advocating for TD research in policy fora, and sharing findings about its benefits.

The appetite for TD sustainability research is growing globally, but the opportunities for unrestricted North–South research collaboration are still few, and all projects reported perceiving risks for the early career researchers in their projects in terms of career progression, despite TD research being one of the exciting frontiers of science at the current time.

LIRA 2030
Similar to T2S, the LIRA 2030 program advocated for TD research and supported several synthesis activities to showcase the projects’ experiences in doing TD research in African contexts (ISC, 2020). The program and projects were also invited to showcase projects’ results and the value of TD research in different conferences and fora. It also communicated projects’ results and the associated role of TD through blogs and videos via the ISC website and global networks. LIRA 2030 grantees also promoted TD research within their universities, through their projects, capacity-building activities and involvement of master’s degree students in their projects.

Despite significant efforts by LIRA 2030 and other similar initiatives to produce articles, syntheses, and capacity-building activities, current institutional conditions in Africa are still not conducive to TD research. Limited institutional recognition, unyielding disciplinary siloes, inflexible institutional policies and processes, inadequate administrative support for internal
grant management, and limited opportunities for long-term TD career development are among factors that still inhibit TD research from becoming a more widespread practice (ISC, 2023).

Despite these challenges, several LIRA grantees indicated that there was a positive dynamic in how TD research was perceived within their institutions, acknowledging the importance of TD research in responding to complex challenges. Several grantees stated that, through the implementation of the projects, the administration learned a lot about how to facilitate TD projects.

Creating an enabling environment for TD research is critical in Africa and globally. In this context, in 2019, under the LIRA framework, the ISC launched an initiative known as the ‘Global Forum of Funders’ to convene science funders representing national research funding agencies, international development aid agencies, and private foundations and to explore collaborative actions to maximize the impact of science and science funding on the achievement of the UN 2030 Agenda for Sustainable Development. This initiative emphasizes the critical need for science funders to increase support for TD knowledge creation globally (ISC, 2021). While the awareness among science funders of the need to create an enabling environment for TD is growing, opportunities for practicing TD are still very limited (Box 16.4).

BOX 16.4 CROSS-PROGRAM LEARNING – THE INSTITUTIONAL ENVIRONMENT

Experiences of the LIRA 2030 and T2S projects demonstrate that existing institutional practices and reward systems remain unconducive to TD research. Turning TD research into a mainstream endeavour cannot be achieved solely by experimental research programs like T2S and LIRA 2030. Such programs can demonstrate the value of TD research in dealing with complex sustainability challenges by synthesizing and making visible TD experiences and achievements. However, making TD a truly common practice would require a transformation within the science system itself, requiring bold action from science funders, science policy makers, universities, and scientists. There is movement in this direction, but it needs to be accelerated and scaled up if science wants to play a relevant role in addressing sustainability challenges.

Resourcing

T2S I and II

T2S I and T2S II both supported research projects of three years’ duration. Both sets of projects had to be extended, for reasons unrelated to the fact of being TD in nature. However, even with an extension (of five months), the T2S I projects all reported severe challenges in accomplishing their objectives within the given lifespan, partly because of the time needed for careful co-design and co-production and partly due to the complexity of the international project set-up and related administrative and financial management. All T2S I projects reported challenges with winding up their work with communities after several years of collaboration and managing the expectations of those stakeholders, some of whom were among the most vulnerable in society. All projects searched for funding to continue their collaborations after the end of T2S I financing, and some partners within the projects were successful. The major academic outputs of the projects appeared up to three years after the end of the projects (with
delays due to the COVID-19 pandemic). More time would have allowed for deeper and wider synthesis within and across the projects, including more significant contributions to theory, rather than primarily to methodology and praxis.

The importance of resources for cross-project exchange and learning cannot be underestimated. T2S I had a dedicated program manager, a part-time administrative officer and a part-time communications officer to organize annual in-person meetings and facilitate multiple other forms of cross-project interaction, learning and dissemination. Resources committed by the participating funding organizers for such services in T2S II were lower, making it more challenging to meet the need for cross-project exchange, learning, and skill building.

The administration of international research funding is always complicated, and T2S I proved to be highly demanding in this regard. Funds were transferred from the ISC to one host organization in each project, which then redistributed the grants to the project partners and was responsible for financial reporting to the ISC. In practice, the need to put in place international consortium agreements, the numerous and continuously evolving exchange rates, bank transfer charges, and disparate accounting and auditing practices made the administration of the projects and program extremely onerous for the grant beneficiaries and the ISC.

Grant management in T2S II was somewhat simpler, as funding stayed largely within national boundaries for most funders. The ISC funded eight national partners in different low- and lower-middle-income countries. Challenges in grant management for the ISC and its grantees included difficulties in transferring funds to certain of those countries, and especially to NGOs, due to restrictions on foreign financing of NGOs, as well as tense political situations in many of the grantees’ countries, which made engaged, TD research difficult to pursue. In several cases the auditing requirements were unfamiliar to grantees’ institutions, and perseverance was required from all parties to accomplish the financial reporting and auditing. A lack of alignment in the timing of payments by the different funders also posed problems.

LIRA 2030
The LIRA 2030 program allocated about 65 per cent of its budget to TD research grants, 15 per cent to TD capacity-building activities and peer learning, 5 per cent to program development and governance, policy engagement and communication, and 15 per cent to program management and overheads for three partners.

The ISC was responsible for overall program funding administration. Funds were transferred from the ISC to the Network of African Science Academies, which then redistributed the grants to the projects and was responsible for verifying projects’ financial reporting and undertaking audits. To streamline a demanding process, the program developed templates for grant agreements and for projects’ financial reporting. Securing sufficient administrative staff support both at the program and project levels was vitally important.

The LIRA 2030 grants were structured to support research co-design and co-production with stakeholders. Up to 40 per cent of grant funding could be utilized for activities aimed at knowledge co-design and co-production and science–policy interfaces (e.g. workshops, learning labs, development of policy briefs). This project funding structure and the two-year project timeframe were sufficient for building relevant partnerships and co-producing the required knowledge, although for many it was difficult to publish their results within the given timeframe. Securing the availability of funds for open access fees to ensure that the research findings are published is important even beyond the program lifespan.
Several grantees raised concerns that the amount of funding and its lifespan were not sufficient to put the knowledge generated into use (Box 16.5). Most of the projects had to ask for no-cost extensions to advance the implementation of their projects and publish their results. The LIRA 2030 experience shows that to witness long-term transformative change in cities, research projects and their funding would need to be sustained over longer periods of time. The PIs indicated that at least three years would have been needed to advance the implementation of projects’ goals.

**BOX 16.5 CROSS-PROGRAM LEARNING – RESOURCING**

T2S and LIRA 2030 showed that project lifespans of between two and three years are often not sufficient for careful co-design and co-production in international, TD projects, nor for publishing TD research results, not to mention synthesizing learning across projects. Longer project and program timeframes should therefore be considered. At the least, securing funds for open access fees beyond the program timeframe would be helpful. Generally, there is a need for a shift in research and capacity-building funding from short-term and project-based to a more sustained long-term process. The prevailing approach often does not allow for the synthesis of or application of knowledge on sustainability, for development of theory or for continuity of engagement with communities. Knowledge products could be considered the start, not the end, of research.

Funders as well as funding mechanisms should be flexible enough to accommodate changes that occur during the TD research process given its emergent nature. In this context, the responsiveness of Sida to projects’ needs and their flexibility and openness to experiment was highly appreciated.

Generally, international TD research program management confronts some general and some specific administrative challenges. It is important to have sufficient resources for program management, coordination, and administrative support. Administrative and financial reporting capacities in institutions also need strengthening. Project budgets should also include sufficient resources for administrative support.

To reduce complexity, transaction costs, and bureaucratic obstacles associated with managing the international TD research programs, it is critical to improve coordination and strategic collaboration between funders and to create more opportunities for common pot or other funding mechanisms that would increase opportunities for scientists from the Global South to participate equitably.

**CONCLUSION**

The experiences of the two T2S programs and the LIRA 2030 program were rich in learning about how to advance TD research in the Global South. Both T2S and LIRA 2030 experienced the contradictions of different logics and expectations at play in TD research – on one hand, embracing emergence, bottom-up project design and the slow fusion of different kinds of knowledge, and on the other, wanting to demonstrate results within the framework of a grant-funded program. For example, how was a project to be assessed that did not achieve its intended cross-case analysis in the time allowed but was richly generative in unexpected
ways? How were the researchers to balance the pressures to produce academic publications for career purposes with the responsibility to produce outputs that could be used by non-academic partners and audiences?

The different funding modalities of the three programs, and their outcomes, suggest that there is a keen demand for North–South and South–South collaboration in TD sustainability research, but that funding needs to be carefully targeted to avoid Northern, academic predominance, and that bureaucratic obstacles to collaboration need to be further reduced, and capacity for leading and conducting international TD projects increased. The design of funding calls needs to acknowledge the relatively slow pace of co-design and co-production and to avoid creating overly complex projects and programs.

Both programs showed that TD research projects require support structures, from inception to closure. Funding programs promoting this type of research should therefore not only include project grants but also integrate support for co-design, capacity building, peer learning, and science–policy interfaces. Creating an enabling environment within academic institutions and ensuring that institutional practices and reward systems are more conducive for TD research is also key.

The United Nations 2030 Agenda for Sustainable Development calls for all stakeholders – government, academia, civil society, the private sector, and others – to contribute to its implementation. The 17 SDGs further emphasize the critical role of global partnerships and cross-sector collaboration in project implementation. Despite this, global challenges are still managed through traditional organizational structures in government, planning, and academia. Each of these often acts in a siloed manner. T2S and LIRA 2030 projects demonstrated the value of co-design and co-production in breaking down this silo mentality by providing space for dialogue, learning, and collaboration across different types of partners.

Despite the relevance and a strong demand for TD, both institutional and financial support for it is still insufficient, and sometimes totally lacking in many institutions, particularly in the Global South. Turning TD research into a mainstream practice is beyond what can be delivered by experimental research programs like T2S and LIRA 2030. Making TD a truly common practice would require fundamental shifts within the science system itself, requiring bold action from science funders, science policy makers, universities, and scientists. There are movements in this direction, but they need to be accelerated, coordinated, and strengthened for science to play a relevant part in addressing sustainability challenges.

NOTES

1. In 2018 the ISSC and ICSU merged to form the International Science Council (ISC).
2. The views expressed in this chapter represent the views of the authors and not of the ISC or the funders of the programs.

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