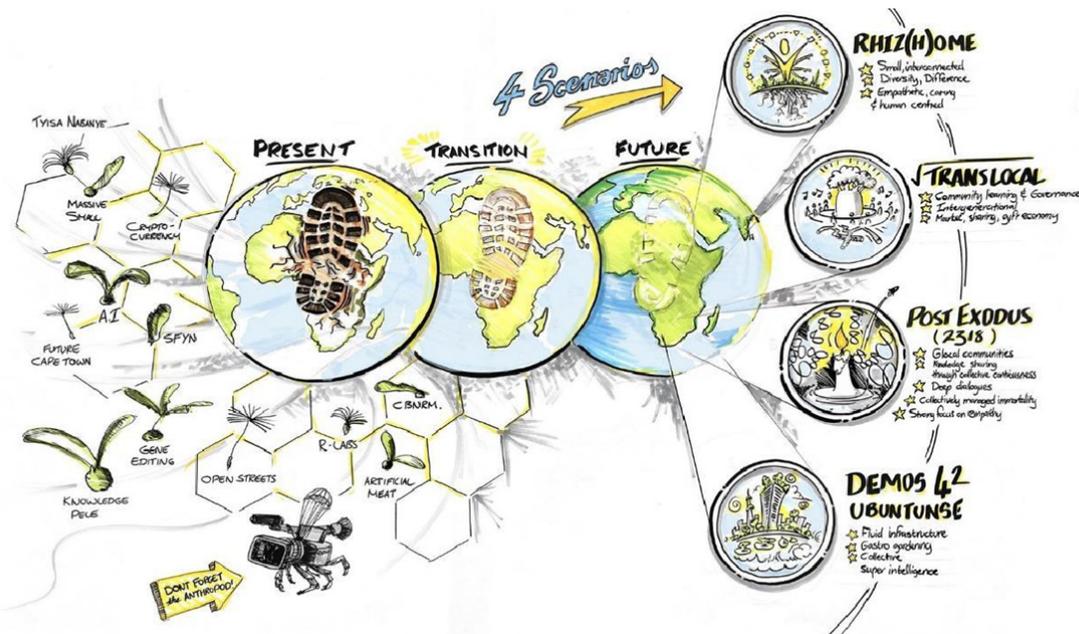


Guidance for Resilience in the Anthropocene: Investments for Development (GRAID)

Annual Report: 1 January - 31 December 2016

Contribution by the
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Prepared by:

Rika Preiser, Laura Pereira, Oonsie Biggs
Scott Drimie, Luke Metelerkamp, Maïke Hamann, Kristi Maciejewski, Deon Cloete
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1. Introduction

The [Centre for Complex Systems in Transition](#) (CST) at Stellenbosch University is one of the GRAID partners in the Stellenbosch Hub, South Africa. The CST component of GRAID has been funded since October 2015. This report summarises the activities, main achievements and key learnings in the CST component of the project for the period 1 January – 31 December 2016. In order to contextualize our contribution we first provide a brief introduction to CST and outline our conceptual framework and approach. We then report on the key achievements and insights over the past year.

1.1 Situating the CST as an Institute

The CST was established in January 2016 as a Flagship Initiative of [Stellenbosch University](#), endorsed by the [National Research Foundation](#) of South Africa (NRF), to address the intertwined challenges of environmental and social sustainability by creating an inter- and transdisciplinary centre of research and teaching. The initiative is motivated by the recognition that it is not possible to comprehend the ‘polycrisis’ we face - and develop appropriate responses - by applying only, or in isolation, traditional disciplines. New modes of engagement are required to build a better understanding of the interlinked social, economic, institutional, political and ecological dimensions of the unsustainable use and distribution of ecosystem services and their benefits, and bring about deeper systemic transformation to address these challenges. The aims of the CST are to facilitate and coordinate such work through post-graduate training, research projects, community building activities, as well as policy work. The CST builds on a strong legacy of work on transdisciplinarity, complexity and sustainability at Stellenbosch University, and provides the institutional framework and infrastructure for experimenting with new forms of knowledge production and collaborative action that engage with the complexity of the sustainability challenges facing society.

The CST has commonalities with other emerging transdisciplinary research centres around the world, but is one of the only such centres on the African continent, and focuses specifically on informing long-term, sustainable solutions to the challenges facing contemporary African societies. It does so through new ways of understanding and producing knowledge, particularly of interacting natural and social systems as they exist and are experienced in the southern African and wider African context. The CST aims to co-create scientific knowledge about how communities and institutions can respond to the complexities of the Anthropocene through working with decision makers, practitioners and communities to integrate scientific knowledge into policy decisions at the city to regional scale, particularly decisions relating to water, energy, food and urban governance. The CST is specifically designed to work across disciplines and to foster strong collaboration between researchers and government officials, parastatal organisations and other key decision makers.

1.2 Situating GRAID within the CST

From the above it is clear that the goals of the GRAID project align very well with those of the CST, and that the CST is well positioned to provide the intellectual and institutional platform from which to carry out various GRAID activities. The CST is structured around five major conceptual research areas: Transition and Decoupling; Social-Ecological Systems and Resilience; Governance innovation; Complexity, Systems Modelling and Anticipatory Intelligence, and; Transformative transdisciplinary research. These research themes are investigated across four major thematic cases: food systems, river systems, urban systems and energy systems. The GRAID project is primarily located within the Social-Ecological Systems and Resilience theme and focuses mainly on the food systems case at this stage, but draws on and connects to the research under all the other themes and cases at CST.

Through being situated within the CST, the GRAID project has also been able to leverage the CST's wider networks of partners and institutional arrangements within Stellenbosch University, as well as with other partners such as the [Sustainability Institute](#) (SI), the [Southern Africa Food Lab](#) (SAFoodLab), the [Southern African Program on Ecosystem Change & Society](#) (SAPECS), and the [Council of Scientific & Industrial Research](#) (CSIR). The project has also been able to leverage various platforms for capacity building, especially through programs offered by the SI, the [University of Stellenbosch Business School](#) (USB) and the [African Climate Change Adaptation Initiative](#) (ACCAI) Network. These programs aim to foster active links with business- and societal partners, as well as universities in Africa, especially in Ethiopia, Nigeria and Mali (through the ACCAI network), and the CST has been active in leading and contributing to courses on complexity and resilience within these programs. The programs are attended by a substantial number of policy-makers and practitioners from across Africa and focus on cross-cutting development challenges of governance, food security, ecosystems and resource use, by looking at a wider set of policy, research and economic interventions.

Two full-time CST researchers have been funded through the GRAID project, along with several part-time researchers and ad hoc positions that related to the facilitation, convening and hosting of multi-stakeholder events; media support (by creating short films and articles for online content, short policy briefs, as well as a social media presence); curation of art exhibits; and logistical support for meetings. Although not an explicit planned outcome of the GRAID project, the development of these skills and capacities has played an important role in building and developing the CST during its initial year, and has had knock-on effects on the work of the CST more broadly.

2. Using resilience and complexity thinking to inform theory and practice for doing development differently

As stated in the Sigtuna report¹ in 2016, the dual challenges of increased social and environmental turbulence in a globalized world, and the urgency of meeting development needs of the poor and vulnerable while maintaining the planet's life-supporting ecosystems, highlight the necessity of

¹ GRAID workshop report May 2016 - *Sigtuna February 2016: Collaborative activities: Building the GRP learning agenda*. A publication of the Stockholm Resilience Centre.

employing conceptually and practically relevant development paradigms. A resilience-based approach to development is founded on a conceptual understanding of social and ecological systems as intertwined, complex adaptive social-ecological systems, and presents a fundamentally different worldview to that upon which conventional development approaches are founded. This in turn has substantial implications for how development interventions are carried out. The primary goal of GRAID is to translate this alternative conceptual understanding of the world as comprising complex social-ecological systems (SES) at multiple scales into practical, operational approaches that can be employed to do development differently – that is, in a way that fosters systemic transformation that addresses the pressing social and ecological sustainability challenges society faces.

The CST-GRAID team's placement within the CST proved to be an ideal fit for engaging with development issues from a complexity and resilience perspective, as it comprises leading researchers in both fields, and has a tradition of embedded, transformative, development-focused research. The conceptual framework for all work at the CST is based on a complex adaptive systems (CAS) view of reality. This view emphasizes the relational nature of systems, conceptualizing them as highly interlinked networks of changing relationships (rather than focusing on system elements) where surprising patterns of behaviour may emerge through non-linear organizational processes and feedback loops that span across multiple spatial and temporal scales. From this relational understanding of the nature of systems, resilience can be understood as an emergent property that results from a specific relational configuration of the system. The process of building resilience or having resilient systems – that is systems that have the capacity to deal with change, especially unexpected and unknown change – then relies on understanding and engaging with the processes that govern these relational configurations.

This understanding of the nature of reality has direct implications for the way in which researchers at the CST carry out research and engage with academic and non-academic actors. The work of the CST focuses on developing practical, complexity-based approaches that can engage and “dance with” the unfolding, uncertain and emergent nature of SES to nurture development along more sustainable pathways. This approach entails a radical shift in the conventional view of the world and how we think about the problems and the values that inform our actions. Recognizing that SES are embedded systems that have dynamic and rich interactions, the research and engagement activities at CST are designed in ways that allow us to engage with the connections and dynamics of the system, and draw in the variety of views and worldviews of the different actors. Collaborative processes of engagement are therefore central to our work to study, operationalise and build resilience in African SES.

Within this context, the overall aims of the CST component of the GRAID project are:

- To advance understanding of how resilience thinking can be practically applied to complex development challenges in a Global South context
- To provide evidence to help support resilience-based development interventions that could lead to transformative change out of poverty and into more sustainable livelihoods
- To operationalise resilience approaches in practice through novel modes of engagement with the aim of effecting change through multi-stakeholder interventions
- To build awareness and understanding of complexity and resilience, and influence the worldviews of researchers and societal actors

In order to situate our work and the approaches we adopted to meet these aims, we first provide a short overview of the key relevant aspects of the conceptual framework we are using to understand SES, how transformation comes about, and how to intervene in SES to foster development.

2.1 Towards a new Relational Theory of Change

Conventional theories of change assume that change comes about through the effects of a linear causal chain of events that can be traced back to a specific origin. A CAS approach assumes that change comes about as a result of simultaneous multiple causes that produce non-linear feedback effects in the system. Any change affects multiple feedback loops across different scales to produce both intended and unintended consequences. Due to interacting feedbacks it is possible for small changes to have large effects in relation to the dynamics of the system as a whole (or, in other cases, for large changes to have little effect on the overall dynamics of the system). This understanding of how systemic changes in CAS happen has direct implications for how we engage with and intervene in SES to effect change.

In particular, this understanding of change in CAS means that small pockets or niches of innovation have the capacity to trigger transformative change in systems if they are strategically linked and combined with other innovation niches and feedback processes to produce cascading systemic effects. However, the “opportunity contexts” that enable innovation niches to trigger larger-scale, emergent, systemic impacts typically need to be strategically fostered, and do not simply arise by themselves. Although chance events often play a significant role, the system needs to be “prepared” to effect and take up change. Fostering opportunity contexts typically requires working with “slow variables” such as people’s worldviews and attitudes, and fostering new connections between niches. Bringing about transformative change therefore requires attention both to fostering pockets of new innovation, as well as new connections and opportunity contexts that enable pockets of innovation to trigger larger systemic changes.

Based on this conceptual understanding of transformative change processes, much of the work of the CST-GRAID team has focused on understanding and creating ‘transformative spaces’ where actors can test and further develop new concepts and practices that might foster resilience and transformation in relation to key systemic challenges, such as production and access to food. Because agency in CAS is decentralised (meaning that agency is not located in one central or overarching capacity), various elements in a system (e.g., individual people or organisations) have the potential to change the relational configurations and contribute to systemic transformation. Enabling this transformative potential requires fostering new connections amongst like-minded, or sometimes conflicting, actors to help build new feedbacks and constellations. Such new constellations are emergent and generate new kinds of agency, whether it is through gaining more power, more information, or the capacity to act in more dimensions or across different scales.

From this perspective, the notion of resilience can be defined as the generative capacity that regulates the relational configurations within the system. If all the relations stay the same, resilience would be defined as the capacity to bounce back; if some of the elements change in the system to allow it to maintain the same functions, resilience would be the capacity to adapt. However, for the system to

transform itself, new relational configurations between elements are needed, and therefore resilience could be described as the capacity to create these new relational configurations. Hence, from a complexity and resilience thinking approach, a relational theory of change suggests that transformation comes about by reconfiguring the relational structure of systems, and creating opportunity contexts that allow the new relations to grow and develop new and accumulative agencies so as to reinforce the effects of new feedback loops across multiple scales. In this theory of change, resilience is defined as the generative capacity that regulates the relational configurations within the system.

From a practical perspective a relational theory of change suggests the following two important principles: i) relations matter, and ii) context matters. A relational theory of change builds on the assumption that relations are units of analysis in CAS; relations can be defined as processes of engagement, as well as the outcomes of such processes. Contrary to *elements* of systems, relations are defined by functions and contexts – when the context (system environment or structure) changes, the relational configurations change, thus influencing the functions that components have within a certain context. Agents possess multi-functionality that is context-dependent, and these different functions can be in conflict or reinforce one other. For example, a small holder farmer in Africa has little agency in terms of the larger food system because of the limited quantity of food she produces, but in her local village she might be an activist for food security issues and serve on the regional community forum that meets with governance agencies. In this context, her agency is well recognized and her experience as a small holder farmer is valued highly and can influence decision-making at a regional scale.

A relational theory of change offers a new conceptual framing for how we conceive of how change and transformation comes about and has real implications for how to study and understand CAS and resilience, which in turn has important implications for knowing what capacities are necessary to bring about resilience and transformation in systems, and how we should plan development interventions. Much of the CST-GRAID team’s work over the past year has been focused on identifying these capacities and experimenting with how they can be fostered.

Capacities needed: space for safe-to-fail experiments; innovative modes of engagement; individuals and institutions that are willing to take risks; the ability to navigate multiple and contested normative agendas; the ability to work together across areas of expertise to develop and explore new ideas and practices; processes and opportunities that build trust between people and institutions; openness and sensitivity to building new collaborative relationships.

2.2 Beyond research as usual: from extraction towards ‘co-exploration’ (or why relations matter)

Informed by the overarching aims of the CST-GRAID project and supported by the relational theory of change, we argue that the roles and modes of engagement as envisioned by conventional scientific practice, need to be revised.

The role of the conventional scientific researcher is marked by modes of engagement that are based on methods of knowledge extraction, where the researcher takes on a position of being the ‘expert’ with

the relevant skills and empirical methods to analyse real world problems. Inspired by a complexity and resilience thinking paradigm, the role of the researcher can be re-imagined and a shift of emphasis emerges. There is a change from the role of being extractors and curators of knowledge towards being facilitators of relations and curators of transformative spaces. For the researcher, this means not seeing one's role as that of extractors and analysts, but to rather aim for being embedded in processes of network building, experimentation, learning and sharing.

It also means that there is an emphasis on participatory processes and modes of engagement that allow relationships between researchers and other actors to be built and fostered to create a joint understanding of what kinds of knowledge and tools are needed for assessing and building resilience. As such this process of 'co-exploration' is one of operating at the interface between science, policy and practice². Engaging in participatory processes of co-exploration enhances the process of reconfiguring relations that can foster opportunity contexts for transformative change, especially when involving bridging agents who know the contexts and are embedded in wider networks or in nodes that are highly connected to game-changers and leverage points.

As a result, one can also argue that the role of conventional science changes from not only verifying and legitimising objective empirical analysis, but also integrating knowledge and experiences from stakeholders and influencing policy and decision-making through expanding its modes of engagement and translating scientific findings into publicly accessible reports, policy briefs and multimedia.

Capacities needed: ability to integrate different types and scales of knowledge and worldviews across multiple boundaries; to be able to bridge knowledge domains; an in-depth understanding of how certain outcomes and facts can be translated into decision-making arenas and what the impact could be; blogging; film-making; curating; facilitation skills; conflict mediation; ability to navigate experimental and emergent processes and outcomes; be able to adapt to new challenges; high levels of social competency to build new relationships and participatory processes.

2.3 From restrictive to transformative spaces (or why context matters)

Based on the Relational Theory of Change discussed above, the notion of 'transformative spaces' is conceptualised as spaces in which new relational configurations can be nurtured or strengthened so as to create new forms of agency and transformational potential – i.e., they are holding spaces for relational reconfiguration. An 'opportunity context' can be conceptualized as the conditions that enable the transformative potential of transformative spaces to be realized, and must itself be nurtured through the relational reconfiguration that occurs in the transformative space or associated spaces.

In practice, facilitating relational reconfiguration requires that the process of co-exploration should be facilitated and executed through modes of engagement that are cognisant of the conditions and capacities that are needed to nurture and foster the process of relation-building and networking. Seeing

² The idea of "co-exploration" was developed by researchers in the FRACTAL project at the University of Cape Town. Publication is currently under review and more information is available here: <http://www.csag.uct.ac.za/2016/11/11/whats-the-difference-between-knowledge-co-production-and-co-exploration/>

that the process of reconfiguring relations is in itself the result of a complex process, it means that the conventional practices of convening meetings and multi-stakeholder workshops have to be re-imagined. The way in which we re-think space and how that space allows for the building of trust, connectivity and the exchange of new ideas is paramount in creating transformative spaces. Conventional practices where meetings are structured around a board-room table with experts facilitating stakeholders according to programmes that are designed to assume linear interaction and predictable outcomes, are too restrictive for allowing innovation and the reconfiguration of relations.

Building on the principles for creating innovative spaces for engagement as explicated in the Social Innovation Lab literature³, we support the view that effective transformative spaces “emphasize not only imagining high potential interventions, but also gaining system sight, redefining problems, and identifying opportunities in the broader context with the potential to tip systems in positive directions” (Westley & Laban, nd.). As such, transformative spaces should support the generative mechanisms of resilience-building, which means that the spaces, facilitation processes and design of the modes of engagement need to foster the following resilience building capacities⁴: To deal with a diversity and redundancy of worldviews, values, meanings and interpretations; To manage connectivity; To manage slow variables and feedbacks; To foster CAS thinking; To encourage learning; To broaden participation.

By re-appropriating the resilience principles into capacities that are necessary for building resilience, we argue that transformative spaces are marked by design and facilitation processes that allow for novel modes of engagement. As a result, there is a strong focus on process and this is closely linked to facilitation processes and environments that foster resilience by allowing participants the agency to engage with the complexity of their situations/positionality. As such, in our work in the CST-GRAID team, content and process are not separated but mutually inform one another through careful planning, and allowing reflexivity and adaptation to happen. Furthermore, there is a shift from relying on ‘best practice’ strategies to exploring processes of sense-making, emergence and involving the participants cognitively *and* emotionally.

Capacities needed: transformative spaces that can allow participants to become aware of their skills, connections and position within the larger system; a readiness to be uncomfortable; the ability to connect strategy with personal insights; high levels of personal reflexivity; ability to embrace novel methods; fostering of collaborative networks; the ability to anticipate impact and possible leverage points.

³ Examples are:

SiG@MaRS Solutions Lab: Torjman, L. (2012). “Labs: Designing the future”. http://www.marsdd.com/wp-content/uploads/2012/02/MaRSReport-Labs-designing-the-future_2012.pdf

Waterloo Institute for Social Innovation and Resilience: Westley, F., Laban, S. (nd). “Social Innovation Lab Guide”. https://uwaterloo.ca/waterloo-institute-for-social-innovation-and-resilience/sites/ca.waterloo-institute-for-social-innovation-and-resilience/files/uploads/files/10_silabguide_final.pdf

⁴ As developed and explained in Biggs, R., Schlüter, M., and Schoon, M. (2015). *Principles for Building Resilience. Sustaining Ecosystem Services in Social-Ecological Systems*. Cambridge: Cambridge University Press.

3. CST GRAID Flagship activities

The CST-GRAID conceptual framing presented above, links to and supports the overall aims of GRAID, namely to **increase the awareness, understanding, and use of resilience** to address the intertwined social-ecological challenges of the Anthropocene. An improved understanding of the relationality and inter-connectivity of SES allows us to re-think conventional conceptual frameworks that inform how we define what development is, how transformation comes about, and how we can intervene in such systems. As such, the resilience approach can be understood as a new paradigm for understanding what sustainable development is, and how it might be fostered.

The CST-GRAID conceptual framework directly influenced and shaped the three GRAID flagship activities that the CST is leading. These flagship activities include:

1. Tipping points and surprise in a turbulent world
2. Creating transformative spaces
3. Building an African GRAID Resilience Changemakers network

Below we describe each of these flagships and the activities we carried out during 2016. Our main focus over the past year was on flagships 2 and 3. Table 1 provides an overview of the flagship projects and how they link with the GRAID modules⁵. In describing our activities, we particularly highlight how we approached our scientific practice and engagement with societal actors through implementing the three main components of our conceptual framework, namely: a relational theory of change; modes of engagement that foster 'co-exploration'; the convening of transformative spaces. For each of these, we also discuss the capacities that we have been building.

Table A1 in Appendix 1 summarized the full list of the activities, audiences and key learnings within each of these flagships. Appendix 2 gives a list of publications and presentations based on our work. The remainder of the appendices provide products, photos, target group surveys, and meeting agendas.

3.1 Tipping points and surprise in a turbulent world

Flagship in brief: There is substantial evidence that SES can exist in several self-organizing states or regimes. Shifts between regimes occur when a critical threshold or tipping point is crossed that triggers a reorganization of the dominant feedbacks in the system, leading to large, abrupt, nonlinear changes. Regime shifts, for example the collapse of an important fishery, frequently have substantial impacts on ecosystem services and human well-being and often are expensive or impossible to reverse. Feedbacks that lead to regime shifts can also generate traps that keep the system in an undesirable regime that leads to degradation of ecosystem services and human well-being.

⁵ The GRAID modules are listed as follow:

Module 1 develops a resilience framework by generating knowledge and synthesizing it, with a focus on different approaches, metrics, models, and data.

Module 2 provides methodologies and training for assessing and building resilience in the targeted regions of the Sahel, Horn of Africa and South and Southeast Asia.

Module 3 focuses on policy and communication to increase the awareness of how to incorporate resilience thinking into development investments.

<http://www.stockholmresilience.org/policy--practice/graid.html>

Table 1: General CST Flagship activity description within GRAID for 2016

Flagship Name	Related to GRAID Modules & GRP Program Features	Main Objectives (outputs)	Achieved by (activities)	CST-GRAID Activities in 2016	Key Achievements (outcomes)	Audiences engaged
1. Tipping points and surprise in a turbulent world	<p>GRAID modules: 1, 3</p> <p>GRP programmatic feature: Measurement & diagnostics</p>	<p>2.1.4 To synthesize insights from a diverse body of work on social-ecological tipping points and surprise that particularly impact on the poor and vulnerable, and are especially relevant to developing country contexts.</p>	<p>- Maintain and expand a searchable online database of tipping points in SES: www.regimeshift.org</p>	<p>- Database development</p> <p>- Website management</p>	<p>- Through synthesis of new examples of tipping points specifically in a developing country context, we were able to advance understanding of the types of non-linear change that can occur in different systems, their drivers, impacts on ecosystem services and human well-being, and potential governance interventions.</p>	<p>Researchers, students, bridging agents and policy-makers in conservation and development agencies</p>
2. Creating transformative spaces	<p>GRAID modules: 1, 2, 3</p> <p>GRP programmatic feature: Learning and convening</p>	<p>1.1.5 & 1.3.1 To advance understanding of the conditions and processes that facilitate emergence and development of initiatives and projects that have deep transformative potential in terms of realizing poverty alleviation, gender equality, human rights and biosphere stewardship.</p>	<p>- Convene networks of transformative initiatives.</p> <p>- Design alternative methodological interventions designed for transformational change</p> <p>- Synthesize insights and learning across different projects.</p> <p>- Pilot new methods for convening and building transformative networks for change.</p>	<p>- Anthropocene Visioning Workshop</p> <p>- Food (R)evolution Photo exhibitions</p> <p>- Learning Journey Event on Food Access Domains & Transformation Lab</p> <p>- Transformative Spaces Special Issue Writing Workshop</p>	<p>- Convened events that enable processes of co-exploration for anticipating and imagining alternative futures that might allow alternative development pathways to emerge.</p> <p>- Piloted new methods for convening and facilitating engagements that allow alternative system-wide relational reconfiguration.</p> <p>- Built capacity of participants to navigate multiple and contested normative agendas.</p>	<p>Key actors from development agencies, government, non-profits, researchers, and transformative seed projects e.g. UNEP, SAFoodLab, Slow Food Network, artists, ACCAI,</p>

<p>3. Building an African GRAID Resilience Changemakers network</p>	<p>GRAID modules: 2, 3</p> <p>GRP programmatic feature: Learning and convening</p>	<p>2.2.4 To build and capacitate a network of resilience changemakers working in Africa, located at multiple scales and across diverse organizations.</p>	<ul style="list-style-type: none"> - Develop platforms for knowledge-sharing and networking. - Offer targeted training courses. - Make resource materials available and distribute through various policy relevant platforms. 	<ul style="list-style-type: none"> - Southern African Resilience Practitioners Scoping Dialogue - ARThropocene Art-Science Dialogue - Anthropocene Dialogues Seminar Series - Training courses: Complexity and Resilience Thinking - Pathways transformative knowledge network 	<ul style="list-style-type: none"> - Created awareness for systemic reflection and deeper understanding of CAS dynamics and resilience thinking to enable paradigm shift to perceive Anthropocene development challenges to be systems problems that call for development interventions based on systems approaches. - Fostered collaborative networks that can respond to opportunity contexts favourable to anticipate opportunities for transformation and change. - Built capacities of changemakers to work together across areas of expertise to develop and explore new ideas, practices, processes and opportunities that build trust between people and institutions. 	<p>Development agencies, governmental actors, researchers, and social-ecological entrepreneurs:</p> <ul style="list-style-type: none"> - Dept of Science and Technology - FAO -ICLEI Africa -SAFoodlab -Institute of Natural Resources -RIASCO Southern Africa -Santam - UNDP - WWF - SA Universities
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This flagship synthesizes a diverse body of work on regime shifts that particularly impact the poor and vulnerable, advancing understanding of their drivers, impacts and potential governance interventions.

Activities during 2016:

Key activities under this flagship over the past year included further expansion of the database through synthesis of new cases specifically relevant to developing country contexts. New examples include several regime shifts associated with invasive species (working together with the Centre of Excellence in Invasion Biology at Stellenbosch University), bush encroachment, and agricultural development. We also liaised with the SRC to add examples of regime shifts from the Arctic Resilience Assessment.

A new postdoc was hired at the end of 2016 to carry out a synthesis of regime shifts in drylands over the coming year, and advance methods for assessing regime shifts. We are also in the process of developing two policy briefs/talking points, one focusing on what regime shifts are and why they are important, and a second one specifically on regime shifts related to invasive species and their impacts.

3.2 Creating transformative spaces

Flagship in brief: The theory of social-ecological transformations has to date largely been formulated and debated in the context of the Global North. Critical questions and applied transformation experiments for developing countries undergoing rapid social-ecological change are still relatively unexplored. This flagship draws on the emerging scholarship on sustainability transitions and resilience that investigates how social-ecological innovations can contribute to large-scale sustainability transformations in developing country contexts. There is comparatively little work in the developing world despite the critical role that emerging economies will play in setting future development trajectories.

The approach in this flagship is embedded within an action research approach that aims to facilitate ‘transformative spaces’ by bringing diverse groups of people together in workshops and dialogues. In addition to workshops, rigorous academic engagement with the literature and theoretical underpinnings of sustainability transformations and social-ecological innovations are being undertaken with the aim of developing a set of approaches that are relevant to the Global South, and an African context specifically. A significant component of the approach outlined here is to bridge science and activism through the use of mixed media and public engagement methods, not only to communicate research findings, but also as a research method.

Under this flagship, the CST-GRAID team experimented with novel facilitation techniques, and creative design processes for engaging and convening collaborative, multi-stakeholder meetings in enabling venues - all with the aim to explore what conditions, capacities and processes are more suited to facilitating transformations within specific contexts. We tested new methods and tools to engage researchers, policy makers, bridging agents, activists and strategic partners in the region to develop a shared understanding of resilience and complexity thinking. Through the facilitated processes we created opportunities and platforms to co-explore what implications such a shared framework for ‘doing development differently’ might have for specific contexts, and reflected on the transformative potential of these newly created collaborative spaces and initiatives.

The key events undertaken in this flagship during 2016 include:

i. Food (R)evolution Photo exhibitions (April-May 2016, Western Cape and Stockholm)

Attendees: more than 2000 public viewers in Cape Town and Stockholm from visitors from all over the world seeing that it was situated in popular tourist locations; in Cape Town +200 interviews were done with passers-by to illicit responses.

The [Food \(R\)evolution](#) Exhibition was an African outdoor art installation consisting of 29 photographs and 4 short films by over 12 different artists from around the world, and built on an exhibition developed for the PECS 2015 conference. The images on show tell the story of the daily diets of citizens from all walks of life in different parts of the Africa and elsewhere. This story of dietary transition is interspersed with specific themes about the global food system. The installation emerged as a collaboration between the CST and the Sustainability Institute, Stellenbosch University and the [African Climate Change Adaptation Initiative \(ACCAI\)](#). It aimed to present knowledge visually and at the same time capture the audience's knowledge and response to the exhibition. The exhibition was based on the premise that art (in this case photography) can work as a powerful vehicle for stimulating dialog around complex and interconnected challenges in ways which allow for inclusion of a wide range of academic and non-academic stakeholders in generative dialog. The exhibit was shown at the Company's Garden in Cape Town in April 2016, the Rooiplein at Stellenbosch University (SU) and Stellenbosch University Museum (SUM) in May 2016 and at the Stockholm Resilience Centre in June 2016.

At the Company's Garden, 29 panels were installed along the Government Avenue in downtown Cape Town. Government Avenue is alongside the Parliament buildings and has a large homeless population. A surveying event to collect audience responses was organized with Cape Town Partnership's (CTP) monthly City Walk. Homeless people were hired from *Khulisa*, a food garden job creation initiative. They served soup donated by a local soup kitchen as an enticement for passers-by to participate.

In Stellenbosch 25 panels were installed on the Rooiplein, the central square on the main campus of SU. Also as part of this installation, exhibition images were installed at SUM. A workshop event at SUM was designed to enable a cross-section of people interested in food to engage with the exhibition and to follow particular lines of inquiry in small groups.

The intention for the Stockholm exhibition was to foster new research collaborations, knowledge exchange and network building between Swedish and South African practitioners, researchers and students. The full range of photographs were printed onto easy-to-transport canvas and hung around the SRC courtyard. A range of events were organised around the exhibition: a Public exhibition opening and lecture "Food Art and Science Pairing", a practitioner workshop "Practicing the Art of Disruption" and finally student presentations and workshops.

Different themes emerged from each location. At the Company's Garden, with poverty and power as the background, responses were concerned with inequality. At Stellenbosch University Museum, the University's ties to apartheid's legacy of land dispossession was prominent in the responses. The events in Company's Garden and the installation on Rooiplein revealed the key role partnerships play when

interacting with diverse groups of people. Overall, knowledge around the use of public art as a vehicle for dialogue and collective learning was improved.

Capacities built: the ability to connect strategy with personal insights; space for safe-to-fail experiments; innovative modes of engagement; individuals and institutions that are willing to take risks; the ability to navigate multiple and contested normative agendas; the ability to work together across areas of expertise to develop and explore new ideas and practices; processes and opportunities that build trust between people and institutions; openness and sensitivity to building new collaborative relationships; film-making; curating; facilitation skills; ability to navigate experimental and emergent processes and outcomes.

Products: A paper synthesizing the responses from the interviews conducted at the different exhibitions, and reflecting on the use of art as a means of fostering transformative spaces is in preparation. A short video capturing participants reflections at the SUM event (available here: <https://vimeo.com/179168461>). The photographs used in the South African exhibitions have been installed in the garden at the Sustainability Institute, where they are used to gather and engage visitors and students in dialogue around issues of food security in Africa. In Sweden these images can be used in future to be installed in a variety of settings such as workshops and mobile exhibitions due to their durable but mobile format.



ii. The “Anthropocene Visioning Workshop” (15-18 November 2016, Cape Town)

Attendees: 31 social entrepreneurs, policy-makers, scientists and artists from South Africa, Kenya, Lesotho, Namibia, Sweden, United Kingdom

The Visioning Workshop focussed specifically on generating positive visions of the Anthropocene for the southern African region. This workshop was linked to the global Future Earth Fast Track “Seeds of Good Anthropocenes” research initiative, which aims to solicit, explore, and develop a suite of alternative visions for “Good Anthropocenes” – positive futures that are socially and ecologically desirable, just, and sustainable. The foundation for these positive futures are the “seed”, i.e. initiatives, projects or organizations that are working towards sustainable solutions in the here and now.

The workshop used a process and methods that were custom-designed, meaning they were novel and experimental, but grounded in futures research methods and methodology. The reason for this is that the complexity and radical differentness of the Anthropocene, particularly in southern Africa, requires new, different ways of working and thinking. Merely extrapolating from present trends, or working with existing ideas of what the future might look like, may not be worthwhile or useful in this context. The objective of the exercise was to generate visions (scenarios) of potential Good Anthropocenes in southern Africa from a divergent set of “seeds”. This required a method for building scenarios that starts with weak signals of change (i.e. the “seeds”), and focuses on maximizing the degree of difference from the present, thus exploring how emerging issues can stretch the future.

Since such an exercise had not been conducted before, we had to experiment with new approaches and methods. The intention is to use the learnings and insights from this southern African exercise to run a larger scenario development exercise for the global “Seeds of Good Anthropocenes” project. Another important objective of the exercise was to bring together people from different “seed” initiatives, scientists, artists, policy-makers, and practitioners, to learn from one another, connect, and be inspired to work towards a better future within the region.



Capacities built:

Ability to embrace novel methods; the ability to anticipate impact and possible leverage points; space for safe-to-fail experiments; innovative modes of engagement; the ability to work together across areas of expertise to develop and explore new ideas and practices; ability to integrate different types and scales of knowledge and worldviews across multiple boundaries; capacity to bridge knowledge domains; film-making; facilitation skills; ability to navigate experimental and emergent processes and outcomes; high levels of social competency to build new relationships and participatory processes.

Products: We have developed two short videos describing the process and participants reflections (available at https://youtu.be/3_pnVBdkhek). We are also finalizing a workshop report describing the four scenarios and the process by which they were developed, and two scientific papers based on the workshop. We also plan to potentially develop a whiteboard seminar and some artistic representations of the different scenarios, as well as a policy brief describing the scenario development process.

iii. Food Systems Transformation-Lab (Western Cape, 27-30 November 2016)

Attendees: 35 diverse participants from South Africa, including chefs, academia, an indigenous food forager, a food scientist, slow food movement actors, bakers, and informal food traders.

The T-lab was a carefully curated 4-day event held at Fynbos Retreat located deep in Grootbos Private Nature Reserve, Western Cape. It was focussed on connecting alternative food system actors as they are vital transformational change agents of the food system and aimed to connect these actors with one another, and to provide a safe space for discussion around the food system in the South African context around food system challenges such as social and economic injustice, poverty, food insecurity and power dynamics. Key activities included using the Three Horizons tool to envision a desired future and what processes will enable its establishment, a collaborative visioning exercise and commitment to action points towards collaborating with one another and/or improving their work. Key discussions included questions such as ‘What innovations can be implemented to help address food system challenges’, ‘How can people of all ages be included in food dialogues and action that can promote mindset shifts’, ‘What choices do people have that challenge the dominant food system – i.e. foraging for food, exchange of resources and information, building a strong network of food system activists’?

The T-Lab served as a platform for dialogue to harness the potential for food system transformation in the broader Cape Metropolitan area. By bringing together a diverse group of actors that are actively engaged in creating alternatives in the food industry, such as restaurateurs and chefs, producers, informal food traders, indigenous food foragers, food scientists, and academics, the T-lab sought to create bridges between people that would never otherwise have interacted. Connecting alternative food system actors provided an opportunity to re-imagine the ways in which food is produced, processed and consumed. This enabled participants to become more embedded and strategically aligned to influence the dominant food system.

By bringing together various stakeholders and actors from different backgrounds and sectors of society, the T-lab served as a tool to recognize and address the consequences of an unsustainable current food system. As each initiative was empowered with information, participants came out more inspired as they learned from practices implemented by others that they could adapt in their own work. The event also aimed to serve as a platform for transformative processes which can result in the alternative food system becoming more mainstream or exerting more influence in the dominant food system. This was done through dialogue and coming up with solutions to the challenges participants face, thereby strengthening them and enabling them to navigate these as best as possible. Actors made a commitment to work with each other and to improve some aspects of their work. As of the report, an artisan baker collaborated with informal food traders to plant a primary school in a township area, and chefs from the Reserve’s Hotel resorted to include indigenous and locally-sourced foods in the menu. One of the chefs from an informal settlement also started to work with chefs at a 5 star resort hotel. Other expected outcomes are that relationships will strengthen the networks that were formed at the T-lab. Although most actors have similar goals, they are often working in isolation from each other. By bringing them in the same space, the T-lab was a chance for them to get familiar with each other and to recognize this common ground

Capacities built: transformative spaces that can allow participants to become aware of their skills, connections and position within the larger system; a readiness to be uncomfortable; high levels of personal reflexivity; ability to embrace novel methods; fostering of collaborative networks; the ability to anticipate impact and possible leverage points; space for safe-to-fail experiments; innovative modes of engagement; the ability to navigate multiple and contested normative agendas; processes and opportunities that build trust between people and institutions; openness and sensitivity to building new collaborative relationships; blogging; facilitation skills; conflict mediation.

Products: We are working on a paper that will form part of a special issue in *Ecology and Society* on Transformative spaces, where the experiences from the T-Lab will be described. There is also a Masters student completing their thesis on monitoring the outcomes from this event. A blogpost describing the event is available here: <http://bit.ly/2l6RIOe>



3.3 Building an African GRAID Resilience Changemakers network

Flagship in brief: This flagship aims to engage with a wider set of stakeholders from government, business, the NGO sector and civil society that have an interest in operationalising resilience thinking and assessments to support and enhance their development policies, practices and impacts. It aims to build and capacitate a network of resilience changemakers working in Africa, located at multiple scales and across diverse organizations, to start shifting towards deep transformative social-ecological change that reduces poverty, gender inequality and environmental degradation.

These networks include key actors from development agencies, government, non-profits, researchers, and transformative seed projects. Furthermore, through previous events, it is clear that there is a pressing need for the development of such a network to provide a platform for sharing and discussing the latest international thinking in social-ecological and resilience research for sustainability, focusing specifically on opportunities and constraints for sustainability transformations in southern Africa.

Key activities undertaken within this flagship during 2016 include:

i. Scoping Dialogue: Advancing resilience thinking and practice to support sustainable transformations in southern Africa (4-5 August 2016, Stellenbosch, South Africa)

Attendees: 36 social entrepreneurs, policy-makers, corporate managers, government officials and scientists from South Africa, Zimbabwe and Australia

The scoping dialogue focused on engaging with a wider set of stakeholders from government, business, the NGO sector and civil society that have an interest and experience in using resilience concepts. Invitees were suggested through a consultation process with the CSIR and SAPECS community to identify key regional “bridging” agents or “connectors”: people working at the science-policy interface, who are agents of change in the region and may be interested and inspired to take some of these ideas and insights generated at the dialogue into their domains of practice.

The dialogue was a scoping event that aimed to gain a better understanding of 1) who is working with the notion of resilience in the southern African region, and in what settings (academia, policy-making, corporate field, NGOs and para-statal), 2) how they are utilizing the concept in these various domains, and 3) what challenges and opportunities they are encountering and how they could be supported to further their work. The event was therefore exploratory in nature and aimed to get people together, share their experiences of how they are using the concept, and to assess how they may be supported, for instance by establishing a regional network of resilience scholars and practitioners, hosting training workshops, etc.

The event was purposefully designed and facilitated to allow sufficient time for participatory processes through which participants could gain a deeper understanding of the ways in which resilience are being used (both by scholars and practitioners) and to reflect on the potential contribution it can make to advance sustainable transformations in the various domains in which the concept is being utilized. From the discussions and reflections in the participatory discussions it became clear that participants are using the notion of resilience in the following ways:

- to formulate resilience frameworks and implementation plans in a variety of domains
- to develop tools and frameworks for operationalizing resilience thinking, especially in areas where participants are working on vulnerability and disaster risk reduction
- to apply resilience theory to guide planning and investment in natural resource management activities by various stakeholders, including government and private sector
- to enhance the adaptive capacity of stakeholders or communities as a desired collaborative development outcome.

Capacities built: ability to integrate different types and scales of knowledge and worldviews across multiple boundaries; to be able to bridge knowledge domains; an in-depth understanding of how certain outcomes and facts can be translated into decision-making arenas and what the impact could be; facilitation skills; high levels of social competency to build new relationships and participatory processes; transformative spaces that can allow participants to become aware of their skills, connections and

position within the larger system; the ability to connect strategy with personal insights; openness and sensitivity to building new collaborative relationships.



Products: We have established a mailing list amongst the group, and plan to develop a website with resources linked to the GRAID website. All participants have also been invited to the SAPECS-GRAID Resilience Colloquium in May 2017.



ii. Anthropocene Dialogues and ARThropocene event (Stellenbosch)

Attendees: more than 200 artists, scientists, corporate actors, social entrepreneurs, policy makers and activists from South Africa, Namibia, Ghana, Sweden, United Kingdom, Italy (over 7 seminars and 1 workshop)

The Anthropocene brings with it a critical imperative, namely that we need to rethink our role as humans in shaping our joint future, and learn to engage with this challenge while acknowledging a diversity of perspectives? It is with this in mind that the CST embarked on a dialogue series that aimed at

bringing different perspectives together through regular discussion, debate and dialogue to foster the potential for novel ways of thinking and engaging with the challenges of the Anthropocene. The CST-GRAID hub hosted 7 Anthropocene Dialogues spanning the year. Leading scientists were invited to present a 20 minute presentation on a topic and then the participants engaged in a dialogue to broaden and enhance a shared understanding of the topics under discussion.

The following dialogue events were hosted:

- 22 February: *Looking for the "good" in the Anthropocene*. (Reinette Biggs, Rika Preiser and Laura Pereira, CST)
- 1 April: *Anticipation and the future*. (Roberto Poli, UNESCO chair in Anticipation)
- 15 May: *Food Scenarios in Southern Africa*. (Laura Pereira and Scott Drimie, CST and SAFoodLab)
- 2 June: *Wellbeing economy*. (Lorenzo Fioramonti, Centre for Governance Innovation at University of Pretoria)
- 27 September: *Changemakers in the Anthropocene*. (Per Olsson and Michelle-Lee Moore, Stockholm Resilience Centre)
- 4 October: *The Anthropocene: views from the Humanities*. (Johan Hattingh, Stellenbosch University)
- 23 November: *Food Sovereignty*. (Wilmien Wicomb and Anna Bulman, Legal Resources Centre South Africa)

Linked to the dialogue series, the CST hosted an “ARThropocene” event called “Re-imagining the Anthropocene” where a group of artists, scientists and academics was convened at the SI for an afternoon of conversation and creative encounter, exploring how their combined perspectives and collaborations might help to enrich and enlarge the ways in which the Anthropocene is conceptualised and engaged with. Activities included a curated and embedded lunch in the organic garden at the SI, a dialogue session, an exhibition of the work of 6 artists and a plenary on the role of the Humanities in the Anthropocene. Artists and scientists often use similar modes of inquiry in their work. Through creating spaces where they can connect and exchange ideas about their different perspectives and methods of inquiry and analysis, there is expanded potential to think differently and create different stories of the future. The importance of collaboration and partnership in producing art and science was highlighted.

The *Anthropocene Dialogues* and the *ARThropocene event* are based on a recognition that we cannot predict and calculate with certainty what changes are needed to create a better world. Now, more than ever, we need collaborative engagements between a range of disciplines and practitioners to start conversation across the boundaries to share ideas and experiences and to work more closely with each other so that we can start re-imagining sustainable and just Anthropocene futures. Engagement with the arts and humanities invites us to situate ourselves differently in space and time and this engagement offers a profound potential for transcending old stories of human exceptionalism, and fosters possibilities of reflecting on how we can re-connect to the biosphere.

Capacities built: curating; ability to navigate experimental and emergent processes and outcomes; be able to adapt to new challenges; high levels of social competency to build new relationships and participatory processes; capacity to bridge knowledge domains; the ability to work together across areas of expertise to develop and explore new ideas and practices; transformative spaces that can allow participants to become aware of their skills, connections and position within the larger system.

Products: In collaboration with the SI, an art exhibition called “Kindred” by artist Sujay Sanan was sponsored for the period from 29 September – 29 October. This exhibition was installed at the main hall at the SI and aimed to create a space where viewers could reflect on the importance of how every



individual species is supported by the inter-relationships between many life forms and that none can exist in isolation. It formed the back-drop for the “Re-imagining the Anthropocene” one day exhibition during which 5 other artists also exhibited artwork and installations that allowed participants to reflect on the impact of humans on nature and how sustainable development can only be imagined in terms of our embeddedness in the biosphere. This event was received very positively and we plan to host another follow-up event in 2017. We also aim to host an artist in residence at the CST to work more closely with us and to link their work with the GRAID themes.

iii. Training: Complexity and Resilience Thinking Courses

Attendees: approximately 150 students (comprised of NGO workers, social entrepreneurs, corporate managers, government officials, policy makers, scientists) from South Africa and many other African countries

As a research centre within the Stellenbosch University, the CST also has teaching and training function. During 2016 the CST-GRAID team staff led or contributed to 5 post-graduate degree courses, including:

- Postgraduate Diploma in Sustainable Development on “Complexity Theory and Systems Thinking” at the School of Public Leadership
- Interdisciplinary MSc in Sustainable Agriculture on “Complexity Theory and Systems Thinking” at the Faculty of AgriSciences
- Postgraduate Diploma in Business Management and Administration on “Systems Methods” blended course and
- Postgraduate Diploma in Business Management and Administration on “Systems Methods”

modular course at the University of Stellenbosch Business school

- African Doctoral Academy Winter School on Systems Thinking on the “Transdisciplinary Research Methods – Science for Sustainability with Society” module.

These post-graduate, immersive learning experience courses are mostly designed to enable mid-career professionals (mining directors, government officials, UN officials) to either gain better qualifications in their fields of work, or for practitioners such as NGO and development agency staff, SES entrepreneurs or project leaders in conservation organisations, to be trained in a certain methodology or theoretical framing. The students are often self-funded or funded by their organisations and are mostly over the age of 30 and come from all over the African continent. Especially challenging are the contemporary “wicked” challenges such as climate change, resource constraints, unemployment, poverty and inequality. These issues impact in all domains and spheres of governance and they demand sophisticated governance solutions and they provide the context as well as special focus of teaching and training initiatives. Several of the courses were done in collaboration with the [ACCAI network](#). Stellenbosch University is a core partner in the ACCAI network of universities that forms a collaboration between the University of Ghana (Ghana), Mekelle University (Ethiopia), University of Dar Es Salaam (Tanzania) and the University of the Witwatersrand (South Africa). This initiative aims to build increased capacity in inter- and transdisciplinary knowledge co-production methodologies for conducting food systems/climate change research.

Training the next generation complexity and resilience thinkers and practitioners by building academic and practical capacity should not be underestimated. Through the assessment opportunities and embedded learning processes, students responded in their journals and formal feedback forms that these courses contributed to a change of thought processes and how they view the complex problems they are dealing with. The courses provided them with a conceptual framework to re-think the Anthropocene development challenges and intervention opportunities from a complexity and resilience perspective.

Capacities built: ability to integrate different types and scales of knowledge and worldviews across multiple boundaries; to be able to bridge knowledge domains; an in-depth understanding of how certain outcomes and facts can be translated into decision-making arenas and what the impact could be; the ability to navigate multiple and contested normative agendas; the ability to work together across areas of expertise to develop and explore new ideas and practices; processes and opportunities that build trust between people and institutions

Products: We plan to use some of the materials developed for these courses to present a training week on resilience targeted at officials in the SADC Regional Vulnerability Assessment Committees (RVAC) in 2017. In 2018 we hope to potentially launch an accredited short course on resilience for municipal and government officials. The School of Public Leadership (SPL, formerly Public Administration) within which the CST is based, already runs many such courses as it is specifically aimed at training public officials. The SPL provides solutions through unique research, graduate, postgraduate and executive programmes adding public value for the public good within a global and African context.

4. Key achievements, impact and learnings

In the following section we provide a brief overview of the key achievements and learnings under the 3 CST-led flagships during 2016. Conceptualising the SDGs and Anthropocene challenges as systemic problems arising from relational dynamics provide a different lens for investigating and understanding these challenges. Complexity and resilience thinking provide some general principles that, as highlighted in section 2, enable us to start identifying capacities that need to be fostered in order to enhance resilience and the potential for transformative change. Such understanding can in turn provide a basis for exploring how to do development differently, as illustrated by the exploratory events described in section 3. This section provides some overall synthetic insights and reflections across all our activities and events that we hosted.

4.1 Key achievements and outputs

The key achievements under each of the flagships are summarized in Table 2. In terms of more tangible outputs, the following products were generated in relation to the different GRAID modules:

GRAID Module 1 Knowledge Generation and synthesis

- Further development of the regime shifts database with African-relevant cases
- Four visions/scenarios of alternative development pathways toward “Good Anthropocenes” in southern Africa
- Training material for courses and workshops
- Images from the art and photo exhibitions (also serve as communication materials, but in themselves also represent an alternative form of knowledge synthesis)
- Synthesis articles published in scientific journals (see appendix)

GRAID Module 2: Methods and tools

The following methods were piloted during collaborative and co-exploratory events to enhance the creation of transformative spaces and network building:

- Three Horizons Framework for scanning future SES pathways
- Adapted Manoa scenario building method for generating scenarios from seeds
- Graphic harvesting of scenario process to facilitate dialogue and reflection
- Embedded learning journeys
- Transformation Labs in contested, developing country contexts
- Dialogues and critical conversations
- Various facilitation methods: appreciative enquiry, artful inquiry, paired walks

GRAID Module 3: Communication

The following communication platforms were used:

- Websites
- Short films
 - 2 x Anthropocene Visioning Workshop films
 - 1 x Food (R)evolution film
- Conference presentations
- Articles for blogs and websites

- Feedback reports to workshop participants
- Mailing list for Resilience Changemakers network
- 3 x Public art installations

Table 2. Key achievements under the CST-led GRAID flagships in 2016.

<p>Flagship: Tipping points and surprise in a turbulent world</p> <ul style="list-style-type: none"> - Added additional examples of regime shifts from developing country contexts to work towards a larger synthesis in 2017.
<p>Flagship: Creating transformative spaces</p> <ul style="list-style-type: none"> - Convened a series of creative processes that enabled the co-exploration of radical, positive futures for southern Africa, which could contribute to the emergence of alternative development pathways for the region - Piloted new methods and tools for convening and facilitating engagements that could contribute to new system-wide relational reconfigurations. - Built capacity of participants (regional changemakers) to navigate multiple and contested normative agendas, so that they can - in turn - support multi-stakeholder groups in developing transformative innovations as a response to complex social-ecological problems.
<p>Flagship: Building an African GRAID Resilience Changemakers network</p> <ul style="list-style-type: none"> - Fostered collaborative networks that can respond to opportunity contexts favourably and anticipate opportunities for transformation and change. - Built capacities of changemakers to work together across areas of expertise to develop and explore new ideas, practices, processes and opportunities that build trust between people and institutions. - Created awareness for systemic reflection and deeper understanding of CAS dynamics and resilience thinking to foster a paradigm shift to complexity and resilience-based approaches to engaging with the challenges of the Anthropocene.

Based on the quotes and feedback from participants (see section 4.4 and appendices), our efforts in having convened various exploratory network building and transformative spaces events have enabled participants to develop improved capacities to:

- deal with a diversity of worldviews, values, meanings and interpretations
- live with uncertainty
- manage slow variables and feedbacks (e.g. trust-building, establishing new relationships, creating space for dialogue and reflection);
- engage with and adopt CAS thinking;
- encourage learning;
- broaden participation.

4.2 Emerging lessons

The following key lessons are emerging from our work:

- The role of facilitating multidisciplinary cooperation is one of fostering, supporting or reconfiguring relations. This often means building new coalitions or focussing on strengthening existing alliances, and working with them to co-construct and mobilise impact-oriented evidence.
- Transdisciplinary researchers provide a critical link between experts and practitioners. Even though dialogues are time consuming, knowledge sharing is of critical importance.
- Working at the science-policy-practitioner interface requires researchers and facilitators to be able to bridge knowledge domains and to have in-depth understanding of how certain methods and concepts can be translated into decision-making arenas.
- We realise that we are working with key people that have busy lifestyles and are under pressure in many different ways, so the engagement efforts need to be worth their while.
- Engaging with stakeholders across various fields of expertise draws not only on time and organisational resources, but also involves emotional maturity from organisers and facilitators, especially as one needs to integrate different types and scales of knowledge and worldviews across multiple boundaries.
- Organising transformative engagements take a lot of time before and after for which no outputs can be accounted.
- Being mostly researchers, we were challenged to try our hand at alternative modes of engagements like blogging, film-making, curating, facilitating, conflict mediation, and needed to hone our ability to navigate experimental and emergent processes and outcomes, as well as our ability to adapt to new challenges. Juggling & fulfilling multiple roles is challenging, but very fulfilling.
- High levels of social competency are required to build new relationships and participatory processes.
- Negotiating the products or deliverables of a knowledge co-production process is an emergent process of navigating expectations of participants, resources, and skills of grant holders.
- It is very important to communicate what research we do through the spaces we convene. In all our workshops and events that we organised, we introduced participants to the scholarly literature and theory that forms the foundation for the methodological or intervention strategies.
- More funding should be channelled into supporting capacity building in facilitation processes.
- It seems that participatory engagements allow stakeholders to engage with new ideas and methods not only on a cognitive and practical level, but also on an emotional level. This was very evident in much of the feedback we received.

4.3 Signs of impact

There are already indications of impact from our work, not only in terms of personal growth and change

within the individuals with whom we interacted, but also manifested in tangible outputs.

The visioning workshop was a particularly emotional engagement and resonated with all of the individuals who attended (see reflection video). Several participants have followed up asking for help and guides to run similar processes in other contexts, particularly amongst under privileged communities. There has also been interest from UNEP in communicating the scenarios we developed more widely on the continent. The novel approach by which we designed the participatory scenarios are also infiltrating other global agendas, such as the Global Environmental Outlook (GEO) project and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). Further impact will be demonstrated through 2017 as these processes move forward.

The T-lab was in itself designed to generate tangible outcomes and we have a researcher who is tracking the progress of the commitments to action that were made during the event. Already there have been engagements between participants around a bakery in Khayelitsha township as well as shifts in the strategies employed by some of the bigger players in the Western Cape food system to recognise their role in promoting more sustainable and socially just food.

The T-lab was informed by an earlier process of developing a new conceptual framework on food access in the broader food system, which allowed different disciplinary experts (researchers) and practitioners to engage with the interconnections between different “domains” in the system. This “boundary good” further informed the design of a learning journey and dialogue focused on Stellenbosch, which succeeded in enabling conversations between people that would not normally engage because of ideological or practical issues. What emerged from this dialogue inspired the underlying basis of the T-lab particularly the selection of key actors in the Western Cape food system. Processes have been set in motion that will likely unfold for some time: participants expressed more appreciation of each other’s perspectives and more robust relationships with each other, which can turn the T-Lab interactions into catalysts of more strategic conversations and interactions in the future. This is being monitored.

The food photo exhibition was a particular success and we secured ongoing partnerships with key change-makers in the Western Cape food system through these events and the realisation that art was a particularly striking way through which to communicate the complexity of the food system. Some of the images now sit at the Sustainability Institute where they are used to engage with the diverse audience of students and visitors that go through each day. The Southern Africa Food Lab has also integrated these images into a number of their dialogue processes including as a provocation at the beginning of a high level workshop on the South African food system in November 2016. This uptake of art and photography as a key medium through which to communicate development challenges and solutions is an important result of the work that we undertook in 2016.

Support from the Southern African FoodLab in conjunction with CST research and facilitation assisted stakeholders within the organic sector building momentum around sustainable farming and food sovereignty in the Western Cape. This is part of an ongoing research engagement by the food systems group within the CST. The emphasis on support in process design and facilitation illustrates the dual role which academics in social change processes are increasingly being asked to fill. The demand for academics to provide support in this dualistic nature is a clear entry point for embedding researchers

into processes that can foster larger societal transformation. Collaboration with the varied constellation of actors that make up the organic sector in the region is continuing as the sector begins to formalise and organise itself.

The scoping dialogue on “advancing resilience thinking” brought together a wide set of stakeholders from government, business, the NGO sector and civil society that had an interest and experience in using resilience concepts. Noteworthy is the engagement with the Regional Inter-Agency Support Committee (RIASCO), comprised of international agencies such as the World Food Programme, UNDP, DfID, FEWSNET, FAO, UNICEF amongst others. They are engaged in supporting the Southern African Development Community with various issues including vulnerability assessment and analysis and early warning. On-going consultation with the person who led the development of the RIASCO Resilience Strategy ensured key actors from these organisations were included. This scoping event aimed to gain a better understanding of who is working with the notion of resilience in the southern African region, and in what settings. We now have a much clearer concept about who to target for tailored-made processes in the future.

4.4 Quotations from stakeholders and participants

We compiled some of the feedback from the Visioning workshop and the Food(Rev)olution exhibition into short video clips. These can be viewed here:

- Anthropocene Visioning Workshop Reflection video: https://youtu.be/3_pnVBdkhek
- Food(Rev)olution Exhibit Reflection video: <https://vimeo.com/179168461>

A selection of feedback submitted via post-event questionnaires include:

Visioning workshop:

- *I cannot express how honoured I was to participate in last week's workshop. It has fundamentally transformed the way I think and I have every intention of maintaining this new consciousness. I write to further the conversation about how we can collaborate to include under-privileged South African communities in the global effort to rethink the Anthropocene.*
- *“Promise this is the last time I am pressing "Reply All"....;-) I just had to do this. It was super GREAT meeting and interacting with you all and what great and amazing minds. THANK YOU Maïke and the team for bringing together an amazing mix of people. Lets Do this!!!! a lovely week all and certainly excited about the future.”*
- *“I hope that this email finds you all well after such a refreshingly different kind of meeting of minds....well at least for me. It was great meeting you all (again in the case of Laura...;-)) and thanks for inviting me to this great meeting.”*
- *“As per my final comments on the last day - I promised that I would do the following:
1. Send you a list of events in 2017 across Africa and perhaps beyond - that we could*

strategically plug into and share the outcomes of this meeting. On that comes to mind immediately is the AU Summit in January - I will have to find out from my contacts if its possible to be engaged even in some side events or simply share materials.

2. I could also share a list of possible partners we will need to linking to in the region;

3. I thought it may be exciting and interesting to connect with Safaricom here (as a private entity) thats getting into conversations about the realities of SDGs for local folk...;-). I think they would benefit greatly to this kind of thinking and perhaps be the trigger for other businesses in the region and further south. Just a thought."

- *"The most valuable part of this whole process [...] was really the idea of freeing our imagination of what simply was available to us at this moment in time. And I think it is really critical that we remember that the output, the futures that we designed are still actually present futures because even if we didn't imagine them at the beginning of this process, we have now added them, and so they have become in a sense part of the world that we are tangibly engaging with."*
- *"It's been hard work. Emotionally difficult work. To think into the future and in that process to kind of really try very hard to let go of some of your pet ideas, things that make you feel comfortable. Some of your unquestioned ways of engaging with the world."*

T-Lab:

- *"I work directly with communities that have been marginalised - this has given me a much greater sensitivity towards their issues and has equipped me with tools to work through these things with them."*
- *"As a food activist to listen to other people that I was against the way of doing things, but now we were all trying to get a common ground understanding of the threats and what to do to take it forward."*

Resilience Scoping dialogue:

- *"I saw resilience as an important passenger (or maybe discourse shorthand or placeholder) - was really about the overall way of thinking - complexity closer to capturing overall mood."*
- *"It (the workshop) confirmed that what I am trying to develop is an intuitive attempt at putting resilience thinking into practice. But I have a foot in all the worlds and if resilience is going to be useful to on the ground practitioners, a way of the various participating parties (from top to bottom) interfacing on equal footing needs to be facilitated with a set of practical and simple tools, so that concepts, intellectual language barriers and power positions are not an obstacle to building functioning resilient relationships."*
- *"There is a great need among people implementing resilience as an approach to doing their work, as well as programmes aimed at building resilience, for greater guidance on measuring resilience of whom/what, and evaluating the impact of these programmes, establishing the benchmarks of the status of communities 'resilience' etc."*

- *“I think there is a lot of work still to be done here. For example, how does the resilience concept align with global initiatives such as the Sustainable Development Goals?”*

4.5 SIDA Priorities

The GRP emphasises persistence, adaptation and transformation as key pillars of a resilient future. Whilst not focussed on the key regional areas of concern to the GRP, the tools, methods and learnings arising from the work in the CST hub can contribute to furthering knowledge of how to do development differently. Working in a developing country context, especially one like South Africa where inequality is so evident, is critical for coming to terms with the nuances of development in diverse contexts.

We have been able to experiment with some cutting-edge ideas and methods that will enable the GRP to have more effective impact in the communities where they work. At the heart of our work is the idea of transformative spaces; where networks of concerned individuals (from informal settlements, from business, from activist groups), can come together in a safe space to start deciding what ‘development’ means for them. It is important to recognise that agency is fundamental in building resilience because initiatives need to be self-sustaining and have momentum to move forward. Empowering diverse groups of people- especially women- is critical to the effectiveness of development interventions that aim for long-term sustainability. Our work suggests that it is at this level of interacting with individuals and communities where the most impactful and long-term sustainable work on poverty alleviation, food-energy-water security, and job creation will likely emerge.

We have linked to SIDA’s priority topic of rights by focusing on the right to food as a starting point for achieving the other SDGs as well as poverty alleviation. Through the lens of the food system, we are able to unpack complex issues around identity, production and consumption patterns, health, inequality, poverty, natural resource use (both terrestrial and aquatic) and sustainable livelihoods. By using novel methods and tools like learning journeys and T-labs, we have been able to create spaces for learning about what processes are most likely to have impact. By actively engaging a diverse group of stakeholders from across the food system, we were able to surface tensions that were not otherwise explicit or often discussed, but that are holding back the system from adequately fulfilling the needs of the most vulnerable. Sharing stories and experiences, being uncomfortable and recognising one’s agency in the system is a powerful tool for enabling systemic change. Whilst transformation does not happen overnight, reconfiguring how key nodes in the system operate can have exponential impact.

These engagements represent alternatives to business-as-usual practices where stakeholder participation is limited to meetings and workshops where a variety of factors like power dynamics, and time constraints often limit true engagement. Engaging participants in novel spaces, embedding them in new environments where they are actively learning about issues (e.g. learning journeys), or capturing them in imaginative futures (e.g. scenarios) has shown to be effective for reaching not only transformation at the level of the individual, but also with their ability to build sustained connections that have the potential to be transformative. The critical aspect is that it is the participants themselves that are at the centre of the process and therefore are also the ones to take agency over further initiatives.

5. Work plan - reflection and learning

Our work plan for 2016 went largely according to plan, and we were able to carry out all the activities we planned for the year. Going forward, it is helpful to be able to package and make sense of the work we are leading in terms of the three flagships. Below are some further reflections on specific issues.

5.1 How can we capture, understand and use what happened?

- Often the results of our workshop/outcomes can't be captured by traditional indicators and are not measurable in tangible ways. We need to develop better monitoring mechanisms and indicators to gauge how to measure the intangible capacities that are developed during these processes like trust, sense of empowerment, sense of inclusion, awareness-making, commitment, accountability, organisational and planning capacity.
- Preparation before workshops (like doing dry-runs, visiting sites, engaging with the venue hosts, ensuring logistical support) are very important to ensure that the creative processes run smoothly and that participants feel safe, that they can trust the process and that they are open to new experiences. However, they take a lot of time, so the number of events needs to be kept manageable.
- We need better approaches, methods and tools for identifying, monitoring and tracking possible transformative pathways over time. Here much innovation is needed.

5.2 Work plan – contributions and connections to outcomes

Our work plan for 2016 went pretty much according to plan and we were able to deliver all the GRAID activities that we planned, and believe they achieved many of the intended outcomes. Most of the focus was on facilitating transformative spaces and it was interesting to see how over the course of the year seemingly disparate projects actually had a lot to learn from each other in terms of convening a diverse set of people that is representative of the context in which we operate. The idea of 'transformative spaces,' previously used for a smaller set of our work objectives became an accurate description of much of the work that the team undertook over 2016, including the photo exhibitions, the visioning workshop and the T-lab. This realisation enabled us to share more broadly between the project team and we will take this knowledge into the work plan for 2017.

We also recognised that we needed to be innovative in the methods that we employed in terms of engaging people and this is reflected in the emergence of the idea for the ART-thropocene event as a result of interacting with artists and recognising the important work that they play in communication and alternative forms of synthesizing knowledge. The adapted scenario method in the Visioning workshop also emerged from previous events linked to the "Seeds" project where we realised that we needed something fundamentally different in order to engage people in truly radical thinking.

The reflexive aspect of the GRAID project approach allowed us to learn from our experiences in past events and by the end of the year we had undergone significant changes in how we went about convening and facilitating these events. It would be great over the course of 2017 to engage more with

the other GRAID teams so that this learning can be more widely shared.

It is important to recognise that many events get shifted towards the end of the year as calendars fill up and so in future planning, it is important to recognise this and plan accordingly so that there is no burn-out from the team trying to fulfil too many projects right after the other. This is important for reflection and learning purposes too.

5.3 Identified gaps

When it comes to development interventions, engaging with trusted local partners and networks could prove be the most effective way of building transformative change. It is also important to recognise that sustained change needs to happen within the affected communities themselves and without empowering them to change their situation from the beginning, development will continue to be tokenistic transfers of resources without marked impact. Engaging directly with vulnerable groups requires an ethical appreciation of your role within a particular context- where you must be open to creating spaces where participants can set their own agenda. This is not an easy thing to learn and requires ongoing careful reflection. This is particularly important when finding answers for questions such as “building resilience of whom and to what?”

We have found that working with bridging organisations is very fruitful. These role-players have substantial skills in navigating multiple knowledge and skill domains and know how to translate and link different knowledge and practice domains with each other. Understanding how a small number of highly connected regional players can shape transformation and change at multiple scales are important. Identifying where the most potential for transformative development lies - what is required if we are to achieve the SDGs- is an important gap in knowledge. Only by engaging in these processes and tracking them over time will we be able to ascertain what initiatives are potentially more transformative than others.

APPENDIX 1 – TABLE A1: CST Activities and key learnings for 2016

Table A1. GRAID Stellenbosch CST Hub list of Activities for 2016					
Activities under CST- GRAID Flagships	Date	A brief explanation of the activity/product, including target group	Number participants	Key learning & results	Network linked to
1. Tipping points and surprise in a turbulent world					
Database development and website management		The Regime Shift Database (RSDB) (www.regimeshifts.org) currently contains 30 generic types of regime shifts and provides a synthesis of about 300 case studies. Over 150 contributors have contributed to this database on case studies covering a wide variety of social-ecological systems. The main audience are researchers in universities, government, conservation and development agencies; policy-makers and practitioners.	NA	The RSDB provides a platform that synthesizes regime shifts across a variety of social-ecological systems in an easy to use format. The key drivers, underlying feedbacks and management options of each case study is clearly outlined in and accessible to researchers, policy-makers and practitioners.	SRC, Resilience Alliance, PECS
2. Creating transformative spaces					
Anthropocene Visioning Workshop	15-18 November 2016	Convening a diverse group of changemakers to envision positive futures for southern Africa. Scientists, artists and social entrepreneurs came together at the Cellars Hohenort Hotel for 3 ½ days of intense discussions and creative visioning. Participants were divided into four groups, each tasked with developing a unique and positive scenario for southern Africa in the Anthropocene. Unlike other scenario planning exercises that tend to categorize futures into desirable and non-desirable, this visioning exercise drew from the values and features of existing “Seeds of Good Anthropocenes”. The seeds initiatives formed the foundation upon which to build positive visions for southern Africa. Seeds were identified as initiatives, projects or organizations that are already making positive changes in the southern African region, piloting sustainable solutions to address the many challenges of the Anthropocene. Examples include projects on urban gardening and renewable energy, as well as technological advances like gene therapy. Four distinctly different scenarios were created, which nevertheless shared common ideals of decentralized decision-making and strong local communities, paired with a globally connected, highly active citizenry. Traditional values of Ubuntu and the common good featured strongly in these southern African futures, as well as high	31	Events such as this Visioning Workshop can help counteract the negative storylines about the future that currently dominate our consciousness. Participants were inspired to take the ideas and methods from the workshop to their own places of work and influence. Many participants reported a profound sense of personal transformation and re-imagining of the future because of the workshop. The diversity among participants, and the resulting profound engagement with different world-views and perspectives, led to a deepening of mutual understanding and optimism for the future. The positive visions that were created will be shared with the public, through videos and other publications. The hope is that the workshop itself will form a Seed, showcasing how science, art and enterprise can come together to create positive visions that inspire transformations towards sustainable futures in southern Africa.	Seeds of Good Anthropocenes Project, Future Earth

		levels of flexibility and changeability in terms of education, employment and urban infrastructure.			
Food (R)evolution Photo exhibition (Cape Town, Stellenbosch)	April & May 2016	This exhibition was shown as a public art outdoor installation. The Food Systems Centre (FSC) at the Sustainability Institute, Stellenbosch, designed the exhibition in partnership with the CST. The main exhibition consisted of the American photographer, Peter Menzel's 'What I Eat' series of the daily diets of citizens from all around the world. The remaining images are of aspects that influence the global food production system such as climate change. The exhibition aimed to present knowledge visually and at the same time capture the audience's knowledge and response to the exhibition. The exhibit was shown at the Company's Garden in Cape Town in April 2016, the Rooiplein at Stellenbosch University (SU) and Stellenbosch University Museum (SUM) in May 2016.	>200 direct participants 2000 viewers of exhibition	Of the 186 people surveyed, there were more than 15 nationalities represented. People from all over South Africa were also surveyed. The majority responded positively when asked if the exhibit had led to the sharing of new insights and that the exhibit caused them to think differently about the food system. Different themes emerged from each location. The project engaged with diverse stakeholders in a wide range of activities that required curator, designer, researcher, negotiator, project manager, publicist, event planner skills. The project was dependent on the successful design and physical installation of 29 large-scale images fabricated on significantly sized outdoor panels. What worked well were the partnerships that were established in all steps of the process. The events in Company's Garden and the installation on Rooiplein revealed the key role partnerships play when interacting with diverse groups of people. It became evident that plans to intervene in public space need a large degree of flexibility and must be responsive to context. This requires intuition and decisions based on hunches in the planning process.	SRC, Poverty alleviation NGOs in Cape Town
SRC Food Festival	8- 10 June 2016	<p>With a growing focus on the central role of food in the resilience and transition agendas, as well as an emerging collaboration between the Stockholm Resilience Centre and a cluster of food related actors connected to the CST (including the Sustainability Institute, Stellenbosch University and the Southern African FoodLab), the Food (R)evolution was used as a focal point for organizing a multi-stakeholder North-South knowledge exchange and learning event.</p> <p>The objective was to foster new research collaborations, knowledge exchange and network building between Swedish and South African practitioners, researchers and students. While at the same time continuing with the methodological experimentation of using public art installations as centre points for multi-stakeholder dialog and social learning.</p> <p>Three events were hosted, a public exhibition opening and lecture, a practitioner workshop, and a series of student workshops. Students, practitioners and academics from both Sweden and South Africa participated these.</p> <p>The exhibition was also on show publically for a week.</p>	725	<p>Ties between South African and Swedish researchers were developed and strengthened.</p> <p>Good interdisciplinary dialog and knowledge exchange between Swedish practitioners and academics took place, particularly during the Art of Disruption event on the 9th June.</p> <p>Knowledge around the use of public art as a vehicle for dialog and collective learning was improved.</p>	Sustainability Institute, African Climate Change Adaptation Initiative, SRC

<p>Complex System in Transition & Southern Africa Food Lab - Learning Journey Event on Food Access Domains</p>	<p>21-Jul-16</p>	<p>A statement of enquiry guided the learning journey: The broader Stellenbosch food system provides glimpses of a future system that is more sustainable, and ecologically and socially just. A set of questions were developed to guide the open, participative process: 1. How could these glimpses be envisioned into a longer term reimagining of the Stellenbosch food system? 2. What will it take to achieve this vision? 3. Could this inform a broader vision for the country? The event brought together a diverse group of actors from the Western Cape food system - from academia, government, business and civil society - to participate in an open dialogue about future configurations of this system.</p>	<p>36</p>	<p>The dialogue succeeded in convening and bringing together a mixed group of people to address the broad statement of enquiry. The main objective of facilitating a learning journey that would stimulate thinking about alternative, more positive visions of the food system was achieved. The group first engaged with the STIAS hospitality team to gain an understanding of their food operations as one domain that serviced participants of academic conferences and events. The group divided and visited three sites, which depicted other diverse domains of food access in the Stellenbosch region, and included: SPAR Simonsrust, Green Road, and FoodPods Kayamandi. The learning journey reconvened with lunch in Kayamandi at Amazink, followed by a short, guided walk. On return each group debriefed and explained their observations of each domain. This led into a discussion about key issues that needed attention in establishing a future system: strong inclusion of youth, building consumer power to influence the direction of the food system, supporting diversity in the system to underpin consumer and producer choice, and addressing the actors between consumers and producers (the “missing middle”). These four issues were used in the design of the T-Lab, as a follow up to this learning journey. This focused on connecting alternative food system actors and proponents to create bridges, by for example, linking chefs to producers, restaurateurs to informal traders and academics to work on the ground.</p>	<p>SA Foodlab</p>
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Transformation-Lab (T-lab)	27-30 November, 2016	T-lab was a carefully curated 4-day event held at Fynbos Retreat located deep in Grootbos Private Nature Reserve, some 131 km away from Stellenbosch. Participants were a diverse group of young, middle aged and older stakeholders, including chefs, academia, an indigenous food forager, a food scientist, slow food movement actors, bakers, and informal food traders. The T-lab was focussed on connecting alternative food system actors as they are vital transformational change agents of the food system. The T-lab aimed to connect these actors with one another, and to provide a safe space for discussion around the food system in the South African context, i.e. difficult discussions around food system challenges such as social and economic injustice, poverty, food insecurity and power dynamics. Key discussions included: What innovations can be implemented to help address food system challenges? How can people of all ages be included in food dialogues and action that can promote mindset shifts? What choices do people have that challenge the dominant food system – i.e. foraging for food, exchange of resources and information, building a strong network of food system activists. Key activities included using the Three Horizons tool to envision a desired future and what processes will enable its establishment, and commitment to action points towards collaborating with one another and/or improving their work.	35	A T-lab is an evolving process, and it is essential that facilitators constantly feed these into and adapt the program accordingly. Bringing together a diverse grouping of people within the same system can help address issues at different levels, as each actor tackles it from a different perspective. A T-lab process requires skilled facilitation to help navigate the emotional and difficult discussions that arise. Holding the event at a neutral space i.e. outside of everyone's work or living space helps to minimize distractions. Group activities such as food preparation promotes communication and sharing of interests between individuals. Actors made a commitment to work with each other and to improve some aspects of their work. This has influenced the direction of at least three organisations that were represented in terms of strategic direction. Other practical examples of collaboration and linkages are emerging including an artisan baker collaborating with informal food traders to plant a primary school in a township area, and chefs from the Reserve's Hotel including indigenous and locally-sourced foods in the menu.	SRC, FoodLab, Slow Youth Network
Transformative Spaces Special Edition Writing Workshop	30 November – 2 December 2016	Following a meeting held in Stockholm in April 2016, it was decided that to put together a special issue in Ecology & Society on Facilitating Transformative Spaces. In this issue, we are looking for papers by researchers that are deeply embedded within projects that look to convene 'safe spaces' that have transformative potential in developing country contexts. The complex social-ecological challenges facing the planet has resulted in an increased focus on co-creation/co-production of knowledge and solutions to these global challenges. Action research and the increase in trans-disciplinary approaches are indications that the role of the researcher working in these complex systems is changing as social-ecological challenges demands more of researchers. Likewise, researchers are now part of these processes and have different outputs that they want to get out of the process. We welcome contributions from authors that are actively engaged in facilitating the creation of these kinds of transformative spaces. In order for the authors to get on the same page in terms of how their own work contributes to our understandings of 'transformative spaces', we held a writing workshop for contributing authors in Cape Town in order to decide on a way forward for the issue, as well as to get started on the first draft of the text. The editors were also to consolidate their vision for the special issue and to discuss the meta-analysis that will be the final paper in the session.	23		STEPS Centre Transformative Knowledge Network, SA FoodLab

3. Building an African GRAID Resilience Changemakers network

<p>Scoping Dialogue: Advancing resilience thinking and practice to support sustainable transformations in southern Africa</p>	<p>4-5 August 2016</p>	<p>The objectives of the dialogue were to bring together leading thinkers and practical users of the concept of resilience to reflect on, interrogate and explore the concept of resilience, how it is being practically applied in a range of settings to advance sustainability, and how resilience thinking and practice can be supported and advanced in the southern African region in future. Four goals guided the structure and focus: Foster a deeper understanding of resilience and resilience thinking; Explore and share how resilience ideas are being used in practice; Scope the possibilities and needs for building a regional partnership on resilience thinking; and Develop an agenda for how resilience concepts and practices can be used towards realizing transformative sustainable development pathways in Africa. Attendance was by invitation only and focused on engaging with a wider set of stakeholders from government, business, the NGO sector and civil society that have an interest and experience in using resilience concepts. Invitees were suggested through a consultation process with the CSIR and SAPECS community to identify key regional “bridging” agents or “connectors”: people working at the science-policy interface, who are agents of change in the region and may be interested and inspired to take some of these ideas and insights generated at the dialogue into their domains of practice.</p>		<p>The dialogue succeeded in convening and bringing together a mixed group of academics and practitioners. Participants were very positive about creating a platform of engagement with other resilience scholars and practitioners and we received overwhelming support to further pursue the four objectives of the meeting. Having received positive support for these objectives, the hosts have committed to establish a “Complexity and Resilience Thinking Network” (name to be confirmed) through which we can offer a platform for sustained engagement, sharing of resources and create future opportunities for training and supportive workshops to build and develop regional capacity to engage with and operationalize the notion of resilience.</p>	<p>SAPECS and RIASCO</p>
<p>Re-imagine the Anthropocene: Art-Science Dialogue</p>	<p>4th October 2016</p>	<p>A group of artists, scientists and academics was convened at the Sustainability Institute for an afternoon of conversation and creative encounter, exploring how their combined perspectives and collaborations might help to enrich and enlarge the ways in which the Anthropocene is conceptualised and engaged with. Activities included a curated and embedded lunch in the organic garden at the SI, a dialogue session, an exhibition of the work of 6 artists and a plenary on the role of the Humanities in the Anthropocene.</p>	<p>> 30</p>	<p>Artists and scientists often use similar modes of inquiry in their work. Through creating spaces where they can connect and exchange ideas about their different perspectives and methods of inquiry and analysis, there is expanded potential to think differently and create different stories of the future. The importance of collaboration and partnership in producing art and science was highlighted. Engagement with the arts invites us to situate ourselves differently in space and time and this engagement offers a profound potential for transcending old stories of human exceptionalism, and fosters possibilities of reflecting on how we can re-connect to the biosphere.</p>	<p>Sustainability Institute</p>

Anthropocene Dialogues (6 events)	February – November 2016	Hosted by the CST, this interdisciplinary series of dialogues aimed to explore the notion of the ‘Anthropocene’, and how different perspectives on this concept can help inform transformations to more just and sustainable futures. List of events: 22 February: Looking for the "good" in the Anthropocene 1 April: Anticipation and the future 15 May: Food Scenarios in Southern Africa 2 June: Wellbeing economy 27 Sept: Changemakers in the Anthropocene 4 October: Anthropocene and Humanities 23 November: Food Sovereignty	approx 150	We organised 7 dialogue events that brought different perspectives together through regular discussion, debate and dialogue to foster the potential for novel ways of thinking and engaging with the challenges of the Anthropocene. International and local scholars engaged in this open forum with students, practitioners, SES entrepreneurs to discuss important topics related to our 3 flagship events. Through these events, knowledge sharing, networking and the opportunity to engage in deep dialogue with each other across disciplinary boundaries were enabled.	Centre for Governance Innovation, WITS; SRC; Law Resource Centre; SA FoodLab
Training: Complexity and Resilience Thinking Courses	March-May 2016	4 Full-time post-graduate level modules on Complexity and Resilience Thinking were delivered in 3 different academic departments at Stellenbosch University. In these modules students (who in the African context are SES entrepreneurs, NGO and Development agency employees, managers and government officials) were introduced to the theoretical principles and then assessed in terms of how they could apply it to a practical real-world problem.	130	Training the next generation complexity and resilience thinkers and practitioners by building academic and practical capacity. Through the assessment opportunities and embedded learning processes, students responded in their journals and formal feedback forms that these courses contributed to a change of thought processes and how they view the complex problems they are dealing with. The courses provided them with a conceptual framework to re-think the Anthropocene development challenges and intervention opportunities from a complexity and resilience perspective.	

<p>Pathways’ transformative knowledge network</p>	<p>24-27 April, 2016</p>	<p>The ‘Pathways’ transformative knowledge network represents one of the key collaborative activities between STEPS consortium hubs in Argentina, China, Kenya, India, Sweden, USA and the UK. The network’s main goal as “to generate transformative innovations in social science research and practice for understanding, negotiating and constructing pathways to sustainability across local to global scales.” The broad objective of our project is to help to understand and build alternative pathways to address key sustainability problems in specific locations. To do so more specifically the project proposes: To experiment in processes of research, engagement and impact. To explore ways of learning from differences across contexts, challenges, approaches, disciplines, etc. When we developed the project we proposed to experiment in processes linked to the idea of T-Labs. T-Labs are a new concept based on existing work on social innovation laboratories which have sought to design and facilitate creative processes intended to support multi-stakeholder groups in developing transformative social innovations as a response to complex social problem. The aim of the inception workshop in Buenos Aires was to bring all the partners together to develop future research project plans as well as to explore more in-depth what T-labs are and how they can be used to help build alternative pathways to sustainability.</p>	<p>21</p>	<p>During the preparation for the first inception workshop and during the meeting itself we had several discussions with the team and researchers at Stockholm, to understand better the extent to which this idea and associated methods can help us with the objectives of our research. During the workshop we also discussed with all the network members how each hub plan to operationalise this concept to address their specific sustainability challenge. Based on these discussions and the background material we prepared for the inception meeting we have advanced significantly our common understanding of the idea of T- Labs, how we will apply it and also adapt it to each context. We realised that T-Labs are still a rather abstract idea and overlap with a number of other ideas and methods that have been used to deal with sustainability challenges. The members of our team have extensive experience in these other methodologies, and discussed with these overlaps and the novelty of the idea of T-Labs extensively. We came to the conclusion that we will complement the methodologies of engagement and impact that our team possess with the novel aspects of T-Labs which is their emphasis on co-producing innovations with multi stakeholders groups. A synthesis of the most salient features of the introduction to T-labs circulated in advance of the workshop, the social innovation lab guide and the discussions at the inception workshop has been produced by the CENIT team.</p>	<p>STEPS Centre Transformative Knowledge Network, SRC</p>
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APPENDIX 2 – PUBLICATIONS AND PRESENTATIONS

Journal articles

1. Bennett E, M Solan, **R Biggs**, T McPhearson, A Norström, P Olsson, **L Pereira**, G Peterson, C Raudsepp-Hearne, F Biermann, S Carpenter, E Ellis, T Hichert, V Galaz, M Lahsen, M Milkoreit, B Martin-López, K Nicolas, **R Preiser**, G Vince, J Vervoort, J Xu. 2016. Bright spots: Seeds of a good Anthropocene. *Frontiers in Ecology and the Environment* 14(8): 441-448. doi:10.1002/fee.1309
2. **Biggs R**, WJ Boonstra, GD Peterson, M Schlüter. 2016. The domestication of fire as social-ecological regime shift. *Past Global Changes (PAGES)* 24(1): 22-23.
3. Faber, M and **Drimie, S.** (2016). Rising food prices and household food security, *South African Journal of Clinical Nutrition* Editorial, 29(2).
4. Folke C, **R Biggs**, A Norström, B Reyers, J Rockström. 2016. Social-Ecological Resilience and Biosphere-Based Sustainability Science. *Ecology & Society* 21(3): 41.
5. Freeth, R and **Drimie, S.** (2016). Participatory Scenario Planning: From Scenario 'Stakeholders' to Scenario 'Owners', *Environment: Science and Policy for Sustainable Development*, <http://dx.doi.org/10.1080/00139157.2016.1186441>
6. Hamann MH, **R Biggs**, B Reyers. An exploration of human well-being bundles as identifiers of ecosystem service use patterns. *PLoS ONE* 11(10): e0163476.
7. **Pereira, L** and **Drimie, S.** (2016). Governance Arrangements for the Future Food System: Addressing Complexity in South Africa, *Environment: Science and Policy for Sustainable Development*, <http://dx.doi.org/10.1080/00139157.2016.1186438>
8. Von Loeper, WJ; Musango, JV; Brent, AC and **Drimie, S.** (2016). Analysing challenges facing smallholder farmer participation in modern agricultural value chains in South Africa: A system dynamics approach, *South African Journal of Economic and Management Sciences*, Vol 19, No 5 (2016), <http://www.sajems.org/index.php/sajems/article/view/1588>

Books

1. Cilliers, P. 2016. *Critical Complexity. Collected Essays.* **Preiser, R.** (ed.). Berlin: De Gruyter (Ontos).
2. Cirolia, L. R., Görgens, T., van Donk, M., Smit, W., & **Drimie, S.** (eds.) (2016). *Upgrading informal settlements in South Africa: A partnership-based approach.* Cape Town: UCT Press.

Books chapters

1. **Drimie, S.** (2016). Aligning Policy to Address Food Insecurity: Institutional Challenges and Political Will in South Africa, in Sakiko Fukuda-Parr and Vivienne Taylor (eds), *Food Security in South Africa: Human Rights and Entitlement Perspectives.* University of Cape Town Press, Cape Town.
2. **Drimie, S** and Yosef, S. (2016). Reducing Risk, Strengthening Resilience: Social Protection and Nutrition, Chapter 7, *Nourishing Millions: Stories of Change in Nutrition*, International

Food Policy Research Institute, Washington DC.

3. **Drimie, S** and **Pereira, L.** (2016). Advances in Food Security and Sustainability in South Africa. In: David Barling, editor, *Advances in Food Security and Sustainability*, Vol. 1, Burlington: Academic Press, 2016, pp. 1-31.
4. Nisbett, N., Elise Wach, Lawrence Haddad, Shams El Arifeen, Samantha Reddin, Karine Gatellier, Namukolo Covic, **Scott Drimie**, Jody Harris and Sivan Yosef. (2016). Championing Nutrition: Effective Leadership for Action, Chapter 18, *Nourishing Millions: Stories of Change in Nutrition*, International Food Policy Research Institute, Washington DC.
5. **Preiser, R.**, Woermann, M. 2016. "Introduction". In Cilliers, P. *Critical Complexity. Collected Essays*. Preiser, R. (ed.). Berlin: De Gruyter (Ontos).
6. **Preiser, R.**, Cilliers, P., Human, O. 2016. "Deconstruction and complexity: A critical economy". In Cilliers, P. *Critical Complexity. Collected Essays*. Preiser, R. (ed.). Berlin: De Gruyter (Ontos), pp. 225–245.

Popular scientific publications

1. Pereira, L., Coetzee, D., Hamann, M., Biggs, R., Preiser, R., Hichert, T. "Incubating ideas on how southern Africa can manage the Anthropocene." Article for *The Conversation*, January 5, 2017. Online: <https://theconversation.com/incubating-ideas-on-how-southern-africa-can-manage-the-anthropocene-69916> - <https://theconversation.com/incubating-ideas-on-how-southern-africa-can-manage-the-anthropocene-69916>.

Other Communication products:

1. Anthropocene Visioning Workshop, process video: <https://youtu.be/K7A7phZvzqE>
2. Anthropocene Visioning Workshop, reflection video: https://youtu.be/3_pnVBdkhek
3. Food(Rev)olution Exhibit, reflection video: <https://vimeo.com/179168461>

Presentations

1. **Biggs, R., Preiser, R., Pereira, L., Hichert, T.** "Seeds of Good Anthropocenes". Joint presentation at the 15th *International Winelands Conference*, Stellenbosch, South Africa, March 30–31, 2016.
2. **Biggs R.** 2016. Seeds of Good Anthropocenes. Opening keynote presentation at the Anthropocene Visioning Workshop. 15-18 November 2016, Cape Town, South Africa.
3. **Biggs R.** 2016. Tackling the Anthropocene Challenge. Invited keynote presentation at "There is no Planet B/Daar is geen Planeet B nie" colloquium of the Afrikaans and Dutch Department at the University of Stellenbosch, South Africa. 11 August 2016, Stellenbosch, South Africa.
4. **Biggs R.** 2016. Tackling the Anthropocene Challenge: The Resilience Thinking approach. Keynote presentation at the Resilience thinking and practice for development: Supporting sustainability transformations in southern Africa Scoping Dialogue. 4-5 August 2016, Stellenbosch, South Africa.
5. **Biggs R.** 2016. Seeds of Good Anthropocenes. Invited guest presentation at World Wildlife Fund (WWF) South Africa. 19 September 2016, Cape Town, South Africa.
6. **Biggs R.** 2016. Tackling the Anthropocene Challenge: The Resilience Thinking approach. Invited

- presentation at the Cosmopolitan Karoo Research Forum, hosted by Prof Cheryl Walker, South African Research Chair (SARChI) in The Sociology of Land, Environment and Sustainable Development, University of Stellenbosch, South Africa. 18 August 2016, Stellenbosch, South Africa.
7. **Biggs R.** 2016. Social-Ecological Systems and Resilience Research Program. Invited presentation at the South African Research Chair Initiative (SARChI) Stellenbosch University Regional Workshop. 10 June 2016, Stellenbosch, South Africa.
 8. **Cloete, D.** “Co-creating complex transformative praxis with co-operative inquiry methodology”. Paper delivered at the *International Sustainability Transitions conference*, Wuppertal, Germany, September 7-9, 2016.
 9. **Pereira, L.M.** 2016. EAT Competence Forum: Presentation on Positive Food Futures.
 10. **Pereira, L.M.** 2016. Keynote presentation at Mountain Futures Conference, Kunming China. 1-4th March 2016.
 11. **Pereira, L.M., and Preiser, R.** 2016. Finding Nemo: can there be a ‘good’ in the Anthropocene? Stoking the Anthropocene session, 4S/EASST conference, 31st August – 2nd September 2016, Barcelona.
 12. **Pereira, L.M.** 2016. “The right to food in the Anthropocene: Equality and sustainability in the South African food system,” Cambridge Global Food Security Conference, June 23-24 2016, University of Cambridge, U.K.
 13. **Pereira, L.M., Mello, F., Mintz-Habib, N., Cesano, D. & Zambrano, A.** 2016. “Food Security and Sustainability: Operationalising SDG 2” Sustainability Science Symposium, Harvard Kennedy School of Government, 20-21 May 2016, Cambridge, USA.
 14. **Pereira, L.M. and Drimie, S.** 2016. “Mapping Domains of Food Consumption: a conceptual tool for appreciating multiple perspectives within food system governance”, ICAS Colloquium on Global governance/politics, climate justice & agrarian/social justice, International Institute for Social Studies, The Hague 4-5 February 2016.
 15. **Preiser, R.** “Ways of becoming: exploring how a relational theory of change could inform transitions research”. Paper delivered at the *International Sustainability Transitions conference*, Wuppertal, Germany, September 7-9, 2016.
 16. **Preiser, R.** “Towards a paradigm of complexity Complexity”. Invited talk at the *Adaptive systems & resilience thinking research stream lunch meeting*, Stockholm Resilience Centre, Stockholm University, Sweden, October 27, 2016.
 17. **Preiser, R.** “A complexity perspective to the study of SES: Towards a mechanism-based understanding of SES as CAS workshop”. Invited talk at the *Social-ecological systems as Complex Adaptive Systems - Implications for analysis and governance workshop*, Stockholm Resilience Centre, Stockholm University, Sweden, September 9, 2016.
 18. **Preiser, R.** “Complexity thinking: a new paradigm”. Invited talk at the *Resilience thinking and practice for development: Supporting sustainability transformations in southern Africa scoping dialogue*, Stellenbosch, August 4–5, 2016.
 19. **Preiser, R.** “Systems thinking: The difference that makes a difference”. Invited talk at the Systems analysis for sustainable development panel discussion, *Southern African Systems Analysis Centre (SASAC) Capacity Development Programme*, University of the Western Cape, South Africa, May 25, 2016.
 20. **Preiser, R.** “Like finding Nemo: can there be a ‘good’ in the Anthropocene?” Invited talk co-presented with Laura Pereira at the *Anthropocene Dialogues Seminar Series*, Centre for Complex Systems in Transition (CST), Stellenbosch, February 22, 2016.