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Transforming Education for Sustainable Futures

Transforming Education for Sustainable Futures: Foundations Paper

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Executive Summary

Introduction

The aim of this foundations paper is to develop initial understanding based on a critical engagement with the existing literature of how key terms that are used to frame the work of the Transforming Education for Sustainable Futures (TESF) Network Plus are understood.

In particular, the paper will seek to develop working definitions of the ideas of 'sustainable development' (SD), 'sustainable futures', 'education for sustainable development' (ESD), 'education systems' and of 'transformation' that are fundamental for our work.

What is TESF?

TESF is an expanding network of researchers funded by the UK Global Challenges Research Fund (GCRF) at £4.75 million for three and a half years (November 2019 - April 2023) with partners around the world. 50% of our funding will be used to support 80 or so 'Plus funded' projects led by Southern-based researchers. Specifically, through the work of research hubs in India, Rwanda, Somalia/Somaliland and South Africa, we will mobilise capacity to co-produce new knowledge about how education can contribute to:

- skills and development of people's agency to achieve sustainable livelihoods
- development of sustainable cities and communities
- taking action for addressing climate change

In addressing these areas we are particularly concerned with the role of education in meeting the needs of historically marginalised groups most affected by poverty, including women, youth, indigenous peoples, and those living in informal urban and rural areas.

The problem we are trying to address

Partner countries are located in sub-Saharan Africa and South Asia, regions profoundly affected by sustainability challenges, although these challenges are manifested differently in each context.

Education and training systems as they are currently configured often fail to contribute to achieving sustainable livelihoods. Nor do they contribute to sustainable cities or to meaningful climate action.

At the heart of the problem is that the majority of learners in our four countries continue to be denied access to a good quality education, i.e. an education that can develop the relevant skills, competencies and capabilities which are required to support sustainable futures for learners and their communities.

The Covid-19 pandemic has disrupted opportunities for learning as formal education institutions have been forced to close for sustained periods. The pandemic has highlighted the structural nature of inequalities, in education but also, as we have argued in an accompanying background paper, the potential of public education in partner countries for supporting community learning in the context of C-19 and in future crises including those linked to climate change.

What do we mean by Sustainable Development (SD)?

The SDGs provide a context for discussing sustainable development but need to be treated critically and applied sensitively to local contexts. Within the broader literature it is possible to identify several approaches to understanding SD, each of which has strengths and limitations:

Growth-led approaches emphasise 'inclusive growth' as the goal of development. In partner countries there is often contradictions between the idea of inclusive economic growth and the realities of social inequality and environmental harm caused by extractive practices under neoliberal capitalism.

For this reason, **environmentally-oriented approaches** advocate 'de-growth' or a shift to more redistributive and regenerative economies that operate within planetary boundaries.

Human rights-based approaches have emphasised the role of sustainable development in meeting basic human needs and supporting sustainable livelihoods within peaceful and democratic societies.

The **capability approach** develops a rights-based approach. It focuses on the role of sustainable development in supporting the capabilities (opportunity freedoms) of human beings to live the lives they have reason to value and of other species and natural systems to flourish.

Decolonising approaches on the other hand, stress the Eurocentric way in which 'development' itself has been defined since colonial times including ideas about sustainable development. They often argue that sustainable development needs to be understood in relation to the diverse interests, perspectives and world views of formerly colonised, oppressed and historically marginalised peoples.

An initial definition of Sustainable Development

Based on an assessment of the strengths and limitations of each approach, we offer an initial working definition of SD as

> ***development that supports the rights, freedoms and capabilities of existing and future generations to live the lives they have reason to value whilst protecting and co-evolving in a more harmonious relationship with the natural environment of which human beings are an integral part so that natural and social systems may flourish.***

What do we mean by Education for Sustainable Development (ESD)?

Education is accorded a central position in the SDGs. The education SDG provides a context for discussing ESD but, like the idea of SD, needs to be treated critically. TESF will focus in particular, however, on the role of target 4.7 in relation to these other areas of sustainable development, i.e.

> *By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development*

Contemporary approaches to Conceptualising Education for Sustainable Development

As with SD, there are various approaches to ESD in the literature that each have strengths and limitations.

Human capital approaches are very prevalent in policy discourses and primarily see the role of education systems in producing human capital with skills that can contribute to economic growth. Human capital approaches are often criticised for emphasising a narrow set of skills and competencies linked to unequal and unsustainable models of economic growth.

By contrast **rights-based approaches** are interested in the role of education in securing rights to education, rights in education and rights through education. Through agencies such as UNESCO they have often promoted equal rights to an inclusive, good quality education, the idea of education for all and of lifelong learning and have advocated life skills that can support sustainable livelihoods and environmental protection.

The **capability approach** builds on a rights-based approach through advocating the role of education in developing the capabilities that can lead to valued functionings (ways of being and doing) but also to sensitise learners to the capabilities of other species and of natural systems.

Environmentally-oriented approaches are concerned with developing understanding of the natural environment and of the integrity of ecosystems and the role of human beings in managing natural systems. Environmentally oriented approaches sometimes emphasise the development of so-called 'green skills' and are linked with initiatives such as the eco school movement.

Decolonising approaches have sought to understand the nature of existing inequalities in access to an inclusive, good quality education including those based on race, ethnicity, class and gender in relation to the colonial legacy and have critiqued the Eurocentric nature of the curriculum. They argue the necessity of critically engaging with diverse world views and perspectives as a contribution to the realisation of decolonised, equitable futures.

Futures-oriented approaches propose a critical examination of the ideas and orientations to the future within which education is positioned. Some build on decolonial critiques to challenge the anchoring of education within the teleological temporality of coloniality-modernity. They seek to problematise the instrumental orientation of education towards (assumed) known futures and call for education to become a site of critical anticipatory practice as a means for conceiving of sustainable futures.

Towards an Initial definition of Education for Sustainable Development

Based on a critical review of the above approaches, we offer an initial definition of ESD as

> ***access to a good quality education for all that can facilitate existing and future generations of learners across the lifespan, in formal and informal settings, to realise the rights, freedoms and capabilities they require to live the lives they have reason to value and to protect and co-evolve in a more harmonious relationship with the natural environment of which human beings are an integral part so that natural and social systems may flourish.***

The meaning of transformative change

A key goal of TESF is to develop impactful research that can assist in transforming education systems so that they can contribute to SD. It is therefore important to define what we mean by transformative change. It is possible to conceive of transformative change at three inter-related levels of the system, of the institution and of the pedagogical space where learning takes place.

A starting point for thinking about change at a **system level** is to think of education systems as embracing processes of lifelong learning that takes place across formal and informal contexts including homes, communities, civil society organisations and social movements across the lifespan. Formal and informal settings are mutually implicated in supporting sustainability education in formal settings as well as processes of social learning in communities.

Education systems also need to be understood as examples of **complex systems** made up of many inter-related parts including different levels and sub-sectors of education and training that interact with each other, communicate and combine to produce systemic behaviour. This gives rise to 'wicked problems' such as how to both simultaneously overcome deep-rooted inequalities and make education more relevant for SD. Wicked problems require a systemic response. This in turn is achieved though the democratisation of educational governance, the nurturing of agency and of leadership for change at all levels of the system, and the use of non-linear, iterative processes of problem-solving and adaptation rather than a reliance on top-down, linear approaches.

A potentially useful way of conceiving the process of system transformation that also builds on the definitions of SD and ESD is in terms of 'just transitions', which refers to processes of increasingly radical, incremental changes that accumulate over time and that connect a politics of redistribution (highlighting inequalities of resources across groups) with a politics of recognition (focused on issues of identity and identification), and a politics of representation (with its questions of community, belonging, and citizenship).

It is also possible to conceive of institutions as complex systems with inter-related parts. A helpful way of conceiving transformation at an institutional level can therefore be thought of in terms of 'whole school' or 'whole institution' approach in which institutions make concurrent changes to curriculum, extracurricular activities, teacher training, human resources and infrastructure operations and processes in order to implement transformative ESD.

Transformative change at a pedagogical level can be thought in terms of nurturing **ecologies of learning**, i.e. temporary, configurations or arrangements between different groups in society that are in each other's vicinity, but usually do not see a need or a possibility to work together, as they are locked up in their own worlds and locked-in in a particular way of seeing the world. Through linking them to a common sustainability challenge and building mutual trust and social cohesion, they can become more connected and unlock new possibilities.

Ecologies of learning call for an underlying pedagogy that is: relational (allowing for, caring for and connecting with people, places, other species, etc.), critical (allowing for critique and questioning), 'actional' (allowing for agency and creating change), ethical (opening up spaces for ethical considerations and moral dilemmas) and political (confrontational, transgressive and disruptive of routines, systems and structures when deemed appropriate).

T-learning (i.e. learning that is simultaneously transformative and transgressive) requires deeply embedded and embodied social-sustainability learning processes that emerge via reflexive and ongoing transgressive co-engagements with matters of concern in the company of others over time.

These models of pedagogical transformation are potentially highly relevant for TESF in that they engage with the issues of diversity and decoloniality. They point not only to how transformative (and transgressive) pedagogy may be framed in research terms but also to processes of reflexivity and learning that have a wider resonance for how we aspire to learn as a Network Plus.

Introduction

The aim of this foundations paper is to develop initial understanding based on a critical engagement with the existing literature of how key terms that are used to frame the work of the Transforming Education for Sustainable Futures (TESF) Network Plus are understood.

In particular, the paper will seek to develop working definitions of the ideas of 'sustainable development' (SD), 'sustainable futures', 'education for sustainable development' (ESD), 'education systems' and of 'transformation' that are fundamental for our work. Rather than seeking to provide a comprehensive review of the literature, however, a task that has been undertaken elsewhere (e.g. Wals and Kieft 2010), the focus of the discussion will be on how these key terms are understood in the context of the Sustainable Development Goals (SDGs) and the implications of these understandings for the work of TESF. The paper will seek to address the following questions:

- How can sustainable development be understood in a way that takes account of the historical, geographical, political, social and environmental contexts represented by the four countries we are principally working in
- How has the idea of sustainable development emerged over time?
- What ways of understanding sustainable development are evident in the SDGs and how useful/ relevant are these for our work?
- What understandings of SD have emerged within each of the countries we are working within?
- How might SD be reconceptualised in a way that is relevant for the country contexts in which we are interested?
- How can education systems be conceptualised in a way that takes account of the range of educational contexts we seek to work across as a network plus?
- How can the relationship between education and sustainable development be understood in a way that is helpful for addressing our research questions and objectives as a network plus?
- How can the idea of 'transformation' be used to inform our understanding of:
  - the potential role of education in realising transformative social, economic and environmental change?
  - how education systems themselves can be transformed?
  - equitable ways of working as a network plus?

Given that the complex and emergent nature of the issues and debates under discussion and our commitment to working with partners across the network to co-produce new understanding of these terms, the background paper is not intended to provide definitive understandings of key terms. Rather it is intended as a 'work in process', i.e. as a contribution to an ongoing debate both within TESF and the wider communities of practice with whom we seek to engage. As such we see it as a generative 'platform' for ongoing development of the theoretical and practical foundations and contributions of the TESF network plus. The paper is invitational, and invites researchers to find spaces and opportunities for further developing aspects of the work presented below.

Nonetheless, the ideas developed in this paper are important for an initial framing of our work. In this respect, this paper also needs to be read in conjunction with other background papers in the series that deal in more detail with the country contexts, the three key areas of focus in relation to SD (education for sustainable livelihoods, sustainable cities and for climate action), methodologies (including how we use transdisciplinary research and knowledge co-production), our approach to understanding equality and inequality in education and on partnership working and capacity mobilisation. Reference will be made to these papers in the discussion below.

The paper will start off by providing a short introduction to the TESF network plus (a more detailed description of our work can be found in an accompanying briefing note). The paper will then turn to a critical consideration of each of the key concepts in turn and will conclude with a summary of key learnings from the discussion that are useful for framing our work going forward.

Introducing TESF

TESF is an expanding network of researchers funded by the UK Global Challenges Research Fund (GCRF) at £4.75 million for three and a half years (November 2019 - April 2023) with partners around the world. 50% of our funding will be used to support 80 or so 'Plus funded' projects led by Southern-based researchers. Specifically, through the work of research hubs in India, Rwanda, Somalia/Somaliland and South Africa, we will mobilise capacity to co-produce new knowledge about how education can contribute to:

- skills and development of people's agency to achieve sustainable livelihoods
- development of sustainable cities and communities
- taking action for addressing climate change

In addressing these areas, we are particularly concerned with the role of education in meeting the needs of historically marginalised groups most affected by poverty, including women, youth, indigenous peoples, and those living in informal urban and rural areas. All research projects will contribute to this interest, and rather than seeing historically marginalised groups as 'subjects' of research, the network seeks to legitimise their voices and experiences including through processes of knowledge co-production. In line with GCRF's stated objectives (Grieve and Mitchell 2020), the approach outlined above is an intentional effort to redress historical inequities in knowledge production: firstly, by commissioning research led by Southern-based actors according to locally-identified priorities; and secondly, by conducting research through multi-stakeholder partnerships, to ensure that inquiries reflect the interests of practitioners, policy actors and others outside the academy. The accompanying background papers provide guidance on our approach to partnership working, which includes an account of the

participative process of identifying hub-level priorities to inform the Call for Proposals (Mitchell et al Forthcoming 2020), and on co-production research methods (Sprague Forthcoming 2020).

What is the problem we are trying to address?

The accompanying country background papers provide a detailed overview of the challenges of sustainable development and in transforming education systems for sustainable futures. A further background paper (Batra et al Forthcoming 2020) has identified several cross-cutting themes that impact on the role of education in supporting sustainable development including those of poverty, gender and indigeneity.

Partner countries are located in sub-Saharan Africa and South Asia, regions profoundly affected by sustainability challenges, although these challenges are manifested differently in each context (see Sachs et al 2018, for a comparative overview of progress towards the SDGs). With the exception of Somalia, for which relevant data are lacking, there is evidence that each country has experienced uneven economic development characterised by high levels of poverty and inequality. All have experienced rapid processes of urbanisation. Urban and rural populations remain largely dependent on low paid and precarious employment in the formal and informal sectors, or on remittances; and a large proportion of the growing youth population is unemployed. In all cases poverty is exacerbated by natural disasters and food insecurity. In India and South Africa, rapid industrialisation and changing patterns of production and consumption linked to the emerging middle class are contributing to climate change through increased carbon emissions, whilst a dependency on mining and other extractive industries has contributed to pollution of land, air and water and the loss of biodiversity. Although the main causes of climate change lie in over-consumption in the global North, it has also been exacerbated by a reliance on fossil fuels and charcoal linked to energy poverty in partner countries that contributes to deforestation. Three of the countries (Somalia, Rwanda and South Africa) are at different stages of emergence from protracted conflict and India is also involved in conflict.

Education and training are accorded a high priority in national, regional and global policy agendas (including the SDGs) for addressing the problems of unsustainable development and promoting more sustainable futures. For many policy makers, education is often considered to be a key driver for inclusive economic growth which in turn is expected to contribute to the development of sustainable livelihoods. As we discuss below, however, the idea of economic growth provides a source of contradiction and tension with realising human development and ensuring environmental protection. It is also clear from our country background papers that education and training systems as they are currently configured often fail to contribute to achieving sustainable livelihoods. Nor do they contribute to sustainable cities or to meaningful climate action.

At the heart of the problem is on the one hand that the majority of learners in our four countries continue to be denied access to a good quality education, i.e. an education that can develop the skills, competencies and capabilities required to support sustainable futures (e.g. Moyer and Hedden, 2020; Education International, 2020).

Education for sustainable development needs to be delivered on the premises of quality and equity, both of which are influenced and affected by poverty. For example, Ferguson, Bovaird & Mueller (2007) show that poverty affects readiness for school and the cognitive abilities of students thus affecting school attainment. A lack of suitable infrastructure and facilities exacerbate these challenges. Histories of coloniality continue to marginalise indigenous cultures and languages, and some contexts are troubled by violence, conflict and associated social stressors. Communities also increasingly face the challenges posed by climate change. Women and girls continue to be denied equal access to a good quality education (Unterhalter et al 2005).

Related to the problem of inequality in accessing a good quality education is how a good quality education is defined. That is to say, a good quality education is often defined in narrow instrumentalist terms as improvements in measurable cognitive performance in high stakes examinations. In this respect the content of the curriculum often remains irrelevant to the needs of learners and their communities. Little attention is paid to the development of the affective goals, including those contained in SDG goal 4.7 required for promoting peaceful, inclusive and democratic societies or in developing curricula that are rooted in principles of social and environmental justice (below). In this sense, education systems, like the wider societies in which they are embedded, also remain profoundly unequal in terms of both educational access and outcomes.

The Covid-19 pandemic has also wrought havoc on opportunities for learning as formal education institutions have been forced to close for sustained periods and many learners have been bereft of opportunities to learn. The pandemic has highlighted the structural nature of inequalities too, in and through education but also, as we have argued in an accompanying background paper , the potential of public education in partner countries for supporting community learning in the context of C-19 and in future crises including those linked to climate change for example.

The above context is often described in global policy discourses including those of the World Bank and UNICEF in terms of a 'learning crisis'. The idea of the learning crisis is often defined narrowly however, as a crisis in measurable achievement in literacy and numeracy as well as in higher order cognitive skills. It does not take account of the extent to which education systems neglect the affective domains of education and training. The discourse of the learning crisis often also fails to adequately acknowledge the pervasive effects of different kinds of inequality including those based on class, race, ethnicity, gender and disability on the learning outcomes for different groups of disadvantaged learners. Education systems are also narrowly defined to include only formal education institutions whereas we argue below for a more expansive conception that takes account of the importance of informal and social learning outside of formal organisations and the importance of understanding the links between what is learned in formal and informal settings (below).

At the same time, new ideas about what education might be and do are emerging and we need to build on these. To respond to these intersecting concerns, there is need to strengthen learning for sustainable development, and amplify existing forms of agency for change. Such forms of learning and agency are present, even in the most complex of contexts, but are most often under-supported and under-valued, especially amongst communities and social movements, civil society organisations and education system actors that are seeking to respond pro-actively to emerging challenges in their societies.

In response, the aim of the TESF Network Plus programme is to co-create new knowledge that can assist education policy makers, practitioners, community based organisations and other stakeholders in defining, framing, generating, evaluating and implementing policies and practices in education that can support socially just and environmentally sustainable development.

Our vision of sustainable futures

Our vision, itself co-produced by partners in the development of the TESF funding proposal is for sustainable futures based on principles of social and environmental justice. Education ought to play a critical role in enabling people and communities to engage with these principles. A working definition that is currently guiding our thinking is:

> ***Social and environmental justice can be understood as putting in place social arrangements that permit existing and future generations to participate equitably as peers in social life and in the construction of viable, fairer economies, that foreground the well-being of all, while also recognising the integrity of other species and of natural systems.***
>
> *Overcoming injustice means dismantling institutionalised obstacles and normalised systems and practices that prevent many people from participating on a par with others as full partners in social interaction and the construction of viable, fairer economies, and in addressing barriers that prevent the wellbeing and flourishing of all humans along with other species and natural systems.*

In practice, this means the following:

- the co-creation of more viable, fairer economies in which resources, goods and services are more evenly distributed in society and become accessible to the poorest;
- the rights, needs and cultural identities of existing and future generations including the most marginalized are recognised, that their knowledge, agency and capabilities are valued, that their voices are amplified in co-constructing futures that are meaningful;
- and, that we learn to meet our basic needs as a species whilst operating within planetary boundaries and in harmony with each other and natural systems.

We foresee that sustainable futures can be generatively co-constructed through critically constituted, inclusive, and socially just processes of sustainable development and through the ongoing questioning of power and privilege. These challenges are enormous, and we are not naïve about what such a process may involve. We believe that education can play a role in contributing to sustainable development, but it cannot do this on its own and needs to be linked to wider processes of social and economic system transformation. If education is to play this role then education systems themselves also need to be transformed. That is to say that learners across the lifespan need to be given access to a good quality education, but that we also need to transform what we mean by quality education such that learners acquire and contribute to the co-construction of the knowledge, skills, aspirations, dispositions, and collective agency needed to achieve sustainable futures.

Objectives

Our objectives are as follows:

Objective one: *Develop a sustainable network of researchers based in universities, NGOs, government departments and CBOs with the capacity to undertake and use rigorous transdisciplinary, innovative, impactful research facilitated through the work of four national hubs in India, Rwanda, Somalia and South Africa.*
Objective two: *Synthesise and disseminate existing and emerging knowledge about the nature of SD and how it shapes the need for transformative education system change.*
Objective three: *Co-produce the evidence and arguments urgently needed to transform education and training systems so that they become drivers of socially and environmentally just development.*

Research questions

The overarching research question guiding the project is: *how can education systems be transformed so that education can drive sustainable development?* This reflects the assumption that education systems must be radically transformed if they are to become drivers of SD. Subsequent research questions focus on the need to develop evidence and arguments for how different sub-sectors of education and training can be transformed through the successful implementation and scaling of interventions aimed at transforming policy and practice. In each case the questions are designed to explore tensions between improving access to a good quality education on the one hand and the need to ensure that each sub-sector can act as a driver of SD on the other hand. In relation to schooling, for example, the central question is *how can schools be transformed to address the learning crisis and to make them drivers of SD?* In the case of Technical and Vocational Education and Training (TVET), the central question is *how can TVET provision be transformed to facilitate the development of green skills and to support youth agency in the transition to sustainable, healthy, lifestyles and in revitalizing peaceful and democratic societies?* Whilst in relation to Higher Education (HE), the question is *how can HE be transformed to support processes of social learning within civil society and amongst policy-makers to address sustainability challenges in cities and rural communities?* As indicated below, we will address these questions through synthesising existing evidence as well new evidence arising from the 'Plus' funded projects.

It is also critical to understand how different sub-sectors cohere to support transformative learning for SD across the lifespan and how the dynamics of power and inequality between stakeholders, facilitate or inhibit processes of system learning and change. Indicative questions at the system level include *in what ways is Target 4.7 understood and interpreted in national policy documents and by key stakeholder groups across different country settings? How can governments in partner countries implement Target 4.7 in ways that are consistent with contextual realities concerning education and SD? What indicators can be used to monitor progress towards SDG 4.7 at local, national and global levels?* We will answer these questions through a synthesis of available evidence generated through dedicated research undertaken by the Network Plus partners. Finally, TESF aspires to develop productive and equitable approaches to capacity mobilisation, partnership working, and the use of knowledge co-production techniques in the field of ESD that are genuinely transformative, and which build on existing successful practice. We will therefore ask *how collaborative action and learning for TESF can be facilitated and sustained in ways that are equitable and mutually enriching;* and, in the context of 'Plus' funded projects, *how can new knowledge be co-produced and engaged to support socially and environmentally just education system change?* These questions will also be addressed through synthesising existing and emerging evidence and arguments as well as through dedicated research and processes of self-reflexive learning as part of the on-going evaluation of our activities.

What do we mean by sustainable development?

The aim of this section to provide a critical overview of the evolution of the idea of sustainable development (SD). It is useful to start the discussion with an account of the development of the SDGs which provide the contemporary context for discussing SD and for considering both the strengths and limitations of the SDGs as a currently powerful policy discourse.

The Sustainable Development Goals (SDGs)

Originally proposed by the Colombian government, the idea of the SDGs was given impetus at the Rio+20 conference on sustainable development in 2012. The SDGs are the culmination of a long history of global debate and advocacy about SD. These are summarised in box 1.

A key feature of the SDGs is that they claim to set out what is described as a 'transformative' development agenda, (although in the sections below we engage critically with this assumption, particularly given the contradictory implications that arise from the emphasis on growth in the SDGs). Specifically, the *Transforming our World Report* (UN 2015b) identifies five 'Ps' that it is claimed lie at the heart of a transformative agenda, namely:

People
We are determined to end poverty and hunger, in all their forms and dimensions, and to ensure that all human beings can fulfil their potential in dignity and equality and in a healthy environment.

Planet
We are determined to protect the planet from degradation, including through sustainable consumption and production, sustainably managing its natural resources and taking urgent action on climate change, so that it can support the needs of the present and future generations.

Prosperity
We are determined to ensure that all human beings can enjoy prosperous and fulfilling lives and that economic, social and technological progress occurs in harmony with nature.

Peace
We are determined to foster peaceful, just and inclusive societies which are free from fear and violence. There can be no sustainable development without peace and no peace without sustainable development.

Partnership
We are determined to mobilize the means required to implement this Agenda through a revitalized Global Partnership for Sustainable Development, based on a spirit of strengthened global solidarity, focused in particular on the needs of the poorest and most vulnerable and with the participation of all countries, all stakeholders and all people. (UN 2015b: 2).

Box 1: Key milestones in the development of the SDGs

1. The *United Nations Conference on the Human Environment*, held in Stockholm on 5-16 June 1972 first gave visibility to the idea of a need for a 'synthesis between development and environment' (UN 1972: 45).
2. The report of the *Club of Rome*, an international think tank comprised of leading industrialists, academics and policy-makers entitled the *Limits of Growth* and produced in the same year (Meadows et al 1972) highlighted the ecological consequences of the Western model of development and demonstrated for the first time that there are natural limits to economic growth.
3. The *Cocoyoc Declaration* (UN 1975) arising from a UN sponsored meeting of experts in Cocoyoc, Mexico went even further in proposing 'eco-development' as a model for development.
4. The report of the World Commission on Environment and Development, entitled *Our Common Future* (WCED 1987) and otherwise known as the *Bruntland report* after the Norwegian Prime Minister who chaired it has arguably been most responsible for propelling ideas about SD centre-stage in global debates. The report famously defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987: 47).
5. General Assembly resolution 44/228 of 22 December 1989 called for a United Nations Conference on Environment and Development, and on the acceptance of the need to take a balanced and integrated approach to environment and development questions.
6. The resulting UN conference on the environment and development in Rio in 1992 (otherwise known as the *Rio Earth Summit*) resulted in the adoption of *Agenda 21* which argued that 'integration of environment and development concerns and greater attention to them will lead to the fulfilment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future' (UNCED 1992: 1). An important outcome of the summit was an agreement on the *Climate Change Protocol* which in turn led to the *Kyoto protocol* (UN 1998) and the *Paris Agreement* (UN 2015a).
7. The adoption of the Millennium Development Goals (MDGs) marked a turning point in the international development arena, where, more than ever before, agencies, institutions, corporations, and nations collaborated in a bid 'to address the deep and interconnected economic, social, and environmental challenges the world faces' (Sachs 2012: 1001).
8. A decade after the Rio Earth Summit, the *Johannesburg Summit* (otherwise known as Rio + 10) adopted the *Johannesburg Declaration* which focused particularly on 'the worldwide conditions that pose severe threats to the sustainable development of our people, which include: chronic hunger; malnutrition; foreign occupation; armed conflict; illicit drug problems; organized crime; corruption; natural disasters; illicit arms trafficking; trafficking in persons; terrorism; intolerance and incitement to racial, ethnic, religious and other hatreds; xenophobia; and endemic, communicable and chronic diseases, in particular HIV/AIDS, malaria and tuberculosis.' (UN 2002: 1).
9. The Conference on Sustainable Development in 2012 marked the twentieth anniversary of the Rio conference. The resulting document, *The Future We Want* renewed participants commitment to *Agenda 21* 'and to ensuring the promotion of an economically, socially and environmentally sustainable future for our planet and for present and future generations' (UN 2012: 1). The text includes language supporting the development of Sustainable Development Goals (SDGs).
10. The adoption of the 17 Sustainable Development Goals (SDGs) by the United Nations in November 2015 and enshrined in *Transforming our World: the 2030 Agenda for Sustainable Development* (UN 2015b).

Source: Tikly 2020

The UN asserts that the 17 SDGs correspond to these principles. They are set out in box 2.

Box 2: The Sustainable Development Goals

Goal 1. End poverty in all its forms everywhere
Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3. Ensure healthy lives and promote well-being for all at all ages
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5. Achieve gender equality and empower all women and girls
Goal 6. Ensure availability and sustainable management of water and sanitation for all
Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10. Reduce inequality within and among countries
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12. Ensure sustainable consumption and production patterns
Goal 13. Take urgent action to combat climate change and its impacts
Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

Source: United Nations (UN 2015b)

Contemporary approaches towards conceptualizing sustainable development

The SDGs weave together a range of sometimes contradictory ideas about the meaning of SD. In this respect, the term 'sustainable development' can be understood as a floating signifier in which the meaning of the terms depends on who is using it and the context. It is also something of a 'meta-fix' (Lélé 1991) in that it weaves together different understandings of SD, often linked to different economic and political interests and world views under one umbrella. In the section below, we review four contemporary approaches to conceptualising SD. Some of these, including growth-led and human rights approaches find prominence in the SDGs, others of which, including the capability approach as well as environmental and decolonial approaches are also explicitly or implicitly critical of aspects of the SDG agenda and in particular, the predominance of modernist, growth-led models within the SDGs as a means of conceiving development.

Growth-led approaches

The idea that sustainable development needs to be led by the imperative of achieving economic growth has a long history in development thinking and goes back to the dawn of the so-called 'development era' itself in the period immediately following the second world war[1]. A major influence on early thinking about 'development' was modernisation theory originally developed by Rostow (1960). It is based on the idea of development as comprising discrete stages from the traditional to the high mass consumption society. The stages are summarised in figure 1.

In the context of US aid policy in the 1960s the role of development agencies was to focus assistance on supporting the 'pre-conditions for take-off' stage. Education is deeply implicated in this stage and in the project of modernisation more broadly through its role in inculcating the skills, attitudes and dispositions required to produce 'modern' citizens. Much educational thinking continues to be informed by the idea of education providing the skills necessary to drive technological development and growth (below). Traces of modernisation theory are evident in the SDGs in the view of prosperity based on technological, social and economic 'progress'.

Modernisation theory was heavily critiqued by dependency theorists such as Gunder Frank (1970) for not taking into account the unequal nature of the relationship between countries at the core and periphery of the global capitalist system; for positing only one view of modernity that is presented as synonymous with Western consumer societies; and, for assuming a linear view of progress that does not take account of the inherent contradictions and crisis tendencies of the capitalist system and the complex, non-linear nature of the development process.

[1] The dawn of the 'development era' is often linked to President Truman's inaugural speech to the UN in 1949.

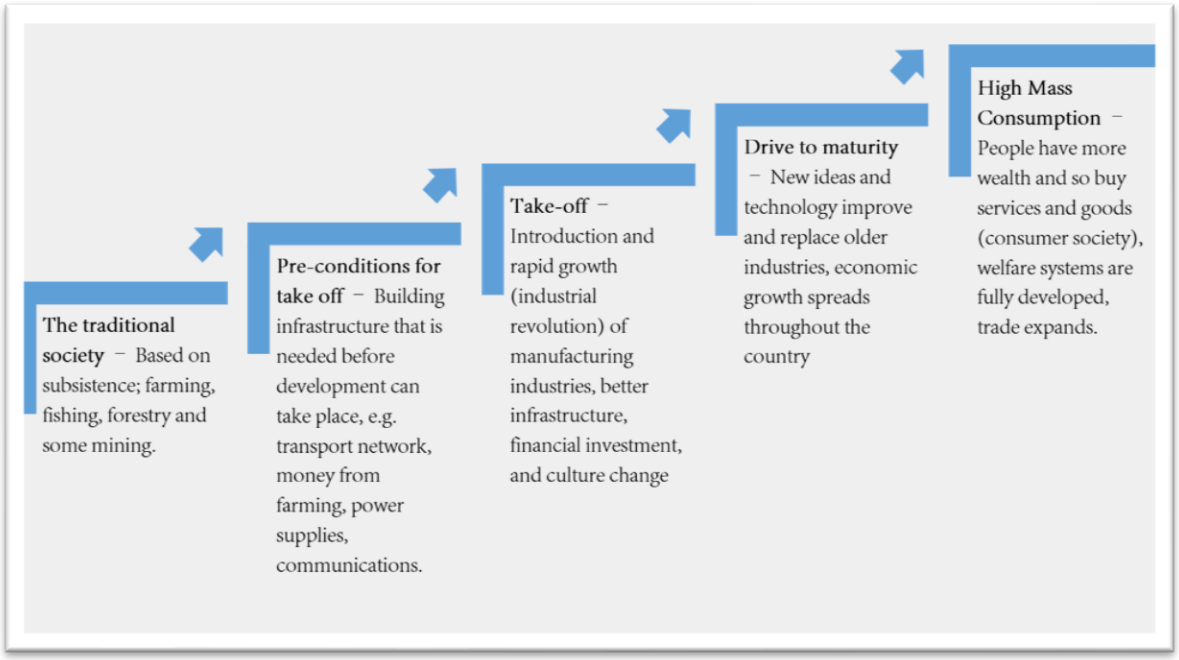

Figure 1: The Rostow model of development

The Western basis of modernisation and indeed much Western-led development theorising has also been critiqued by scholars writing within postdevelopment, postcolonial and decolonial frameworks. These critiques are significant in the context of TESF. As each of the four country papers makes clear, 'development' in each country has often been determined by the dominance of Northern economies in the development process. Rather than demonstrating a linear process of development, each country has been beset by periods of sustained crisis and unequal growth characterised by growing inequalities. Furthermore, in each country, 'development' since colonial times has often meant adopting Western models of progress and this has led to the undermining of indigenously determined growth paths. This has been particularly the case since the 1980s as market-led and neoliberal models of growth have increasingly predominated.

Neo-liberal, market-led models of growth were associated with austerity and the imposition of Structural Adjustment Policies on low- and middle-income countries as a condition for aid. As part of the so-called 'Washington consensus', these policies emphasised the need to liberalise economies through reducing trade barriers, cutting government expenditure on welfare and subsidies for basic goods and privatising services such as health and education. These policies had a devastating effect on the poor and led to growing inequality. They were eventually replaced by the 'Post-Washington consensus' (Robertson et al 2007). Whilst still based on the assumption of the benefits of the market and the trickle-down effects of economic growth for alleviating poverty, the post-Washington consensus sought 'adjustment with a human face' through advocating the introduction of safety nets for the poorest to alleviate the worst excesses of the market.

A key point of reference in contemporary discourses about SD is the notion of 'inclusive growth' which has been popularised through sometimes contradictory discourses emanating from key multilateral organisations including the World Bank (2012) the OECD (2014), the United Nations Development Programme (2017) and the African Development Bank (2014). Although there are differences in emphasis in the way that inclusive growth is defined, at the most basic level it is premised on a view of broad-based growth across sectors that can be made more 'inclusive' largely through the creation of job opportunities arising from the removal of regulatory constraints and through creating a climate conducive to investment. Inclusive growth is also conceived as 'green growth' in the sense that growth should be compatible with environmental protection through processes of adaptation and the use of green technologies. It can be seen that the definition of inclusive growth provides continuity on the so-called post-Washington consensus through seeking to link key elements of global discourses including a concern with economic growth as a driver of prosperity, with concerns about the environment and human development. These elements are, however, contradictory in nature, a point that is explored in the sections below. It will be suggested in the next section for example, that whilst concerns with economic development are central to SD, a focus on the idea of economic growth (however 'growth' is qualified) can have deleterious implications for human development and for environmental protection.

Environmentally oriented perspectives

Indeed, within the environmentally oriented literature, there has been a sustained critique of the idea of growth as the driver for sustainable development. For example, for advocates of the ideas of 'degrowth' (Latouche 2007; 2010), 'prosperity without growth' (Jackson 2016) or 'post-growth' (Blewitt and Cunningham 2014; Blewitt 2018), the very idea of 'growth' is antithetical to the idea of a sustainable environment given that natural resources are limited and the damage that growth under capitalism has historically wrought on natural systems. The emphasis on the use of 'adaptive measures' (an idea

that is implicit in the concept of inclusive growth) has been criticised in the environmental literature as being based on the assumption that climate change and environmental degradation can be dealt with primarily through processes of technological innovation. Rather, for environmentalists such as Blewitt (2018), these solutions alone are insufficient for tackling the root causes of climate change which lie in patterns of production and consumption as they have developed under petroleum driven capitalism and particularly in the global North. These issues are explored in more depth in the accompanying background paper on education and climate action (Facer et al 2020). Further, there is a contradiction between the idea of inclusive growth, current patterns of growth in our four countries which are highly unequal and the prevalence in national agendas of neoliberal, market-led solutions to achieving growth.

Writing within an environmentalist perspective, the economist Kate Raworth has sought to reconceptualise the idea of SD in relation to economic development. At the heart of the understanding is a view of the purpose of economic development as meeting social needs on the one hand and operating within ecological boundaries on the other hand. These ideas are encapsulated in figure 2. For Raworth, the aim of economic policy is to achieve a dynamic equilibrium in the 'sweet spot' between the social foundation and the environmental ceiling of economic activity (hence the term 'doughnut economics' which Raworth applies to her model).

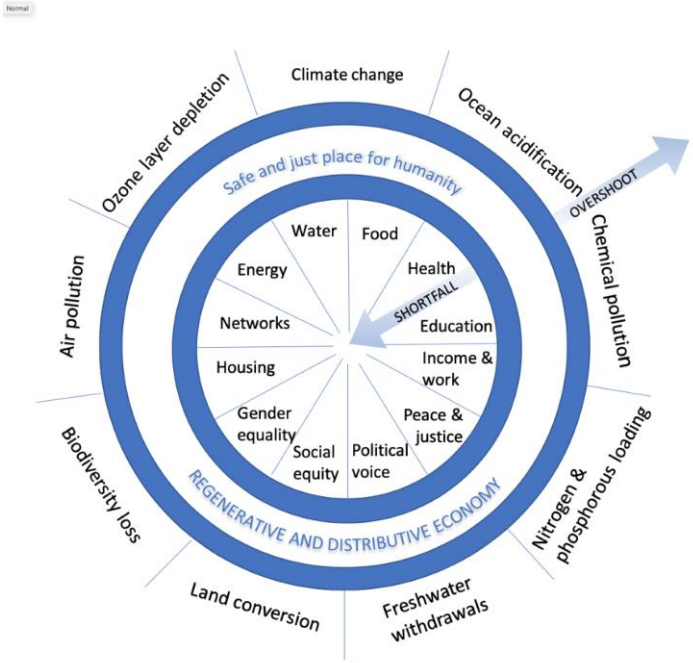

Figure 2: The model of 'Doughnut Economics' adapted from Raworth (2017)

This understanding of SD has potential for TESF as a way of re-conceptualising the relationship between the economic domain and education. Firstly, the model suggests that rather than focusing on the relationship between education and economic growth and the contradictory implications that flow from this, the focus might rather be on the relationship between education and sustainable livelihoods within regenerative and distributive economies. This point is explored further in an accompanying background paper that focuses on skills for sustainable livelihoods (McGrath 2020). Secondly, the model also suggests a complex and multidirectional relationship between education and the economic domain, mediated by the effects of other areas of social development. A potential weakness of Raworth's approach, however, from the point of view of our vision as a Network Plus and in particular our view of sustainable futures, is that it does not set out an ethical and moral basis for considering SD. Here rights based and capability approaches provide a more promising starting point.

Rights-based approaches

The idea of universal, inalienable human rights has also had an important influence on the evolution of the idea of sustainable development in the period following the second world war and in the context of the formation of the United Nations (UN). The *Proclamation of the Universal Declaration of Human Rights* and subsequent legally binding covenants and conventions have sought to create a framework intended to guarantee a dignified life for all human beings regardless of race, culture or gender. The mandates for both UNESCO and UNICEF arise from their roles in advancing human rights in education and other spheres. Rights-based approaches recast the inhabitants of impoverished parts of the globe as rights-holders entitled to justice rather than beneficiaries of the charity of the privileged (McCowan 2015).

A rights-based approach is potentially highly relevant for the work of TESF. It posits a universal framework of values against which sustainable development may be interpreted and evaluated. As noted above, the Bruntland Report *Our Common Future* was a key milestone in the emergence of sustainable development. It drew on a conception of the role of development in meeting basic needs which are themselves rooted in the idea of human rights (the right to food, shelter, health, education etc). As will be discussed below, the idea of the rights to education has been a key point of reference in the development of the principles of Education for All (EFA) as have the various UN conventions on human rights and especially on the rights of the child. More recently, the five principles underpinning the SDGs of people, planet, prosperity, peace and partnership are also derived from the idea of inalienable human rights.

Whilst providing an alternative, liberal egalitarian view of development to that posited by modernisation theory and neoliberalism, the idea of universal human rights has, however, also been subject to criticism and some of these criticisms are potentially pertinent for the work of TESF. For example, human rights frameworks have been described as an example of a universalising Western discourse and have, as such operated as a source of hypocrisy and contradiction. For some critics, for example, many Western democracies supposedly founded on human rights principles have been implicated in colonialism, racism and slavery and have sometimes turned a blind eye to the most gross violations of human rights including genocide. It is also argued that the emphasis on individual rights including individual property rights, provides a source of tension with the idea of collective rights (de Sousa Santos 2002). Policies drawing inspiration or making reference to human rights have also sometimes been criticised for being too homogenising and top down in their application, often removed

from indigenous and local discourses about ethics with which they are seldom brought into conversation. In this respect, a criticism of the basic needs approach that underpinned the Bruntland Report is that the document does not make explicit how basic needs are defined in different contexts and who decides on what constitutes basic needs. Similarly, in relation to the five principles underpinning the SDGs, it is not clear how these can be taken up and applied in different country contexts and by whom raising questions about their broader meaning and utility as a set of guiding principles.

In summary, whilst the idea of human rights continues to provide an important rallying call for mobilising action around SD, it is also necessary to be aware of the criticisms and limitations of rights based approaches both with respect to their content and the processes through which they have been defined and implemented including in the four country contexts we are working across. In the section below we will turn our attention to the capability approach which potentially provides a useful development on the idea of human rights through its insistence on the importance of ethically informed public dialogue at different scales from the local to the global as a basis for determining rights and capabilities and giving more contextualised substance and meaning to discourses about rights.

The capability approach

An alternative but related starting point for considering the ethical basis for sustainable development comes from the capability approach of Sen and Nussbaum. Sen's work in particular has been influential in the development of thinking within the UN about how human development can be conceptualised and measured. Sen provides a critique of the idea of growth as measured in GDP seeing it rather as a means for achieving the true purpose of development which lies in the fulfilment of human wellbeing and freedom. For Sen rather than development being measured in the extent to which economies are able to fulfil basic needs (as in the Bruntland formulation) development needs to be assessed in relation to the capabilities (opportunity freedoms) that individuals have to convert resources into valued functionings (beings and doings) that they have reason to value and that will contribute to wellbeing, freedom and human flourishing. In Nussbaum's (2011) terms, the idea of capability equates to on the one hand having the basic capacity (access to resource and skill/ aptitude) plus the opportunity to turn these into valued functionings. In the context of the shift to SD as the dominant development paradigm, Sen (2013) has argued for an expansion of this idea of capabilities to take account of the capabilities of future generations and the extent to which this necessitates a concern with environmental protection as inseparable and integral to the realisation of human capabilities both now and in the future.

There are several advantages of the capability approach in the context of TESF. Firstly, it draws attention to the importance not only of providing basic resources necessary to facilitate access to a good quality education such as classrooms, textbooks and qualified teachers but also the opportunities that are available to different groups of learners to convert these into valued outcomes. As we argue below, this is significant because in highly unequal education systems not all individuals and groups including the socio-economically disadvantaged, girls, speakers of minority languages, indigenous groups, children with disabilities, who may be subject to further forms of discrimination that limit their educational opportunities. It is also significant because a concern with increasing opportunities so that all learners achieve outcomes from education that they have reason to value entails moving beyond the idea of basic entitlements to education (as sometimes implied in a rights-based approach) and a recognition that some individuals and groups may require different levels and kinds of resource to achieve similar outcomes. The idea, inherent in the capability approach, that what counts as valued functionings are in some important respects relative and dependent on context also draws attention to the importance of informed public dialogue as a basis for decision making in education as in other spheres of development. In the context of our work in TESF, this aspect the capability approach provides impetus for a focus on processes and the nature of the learning experience as well as learning outcomes if we are to better understand the extent to which inequalities that limit opportunity freedoms available to different groups are embedded in the curriculum and in pedagogical practices. It also adds legitimacy to the use of methodologies based on knowledge co-production and transdisciplinarity that bring together in the research process different interests and conceptions of the means and ends of sustainable development.

There are, however, potential shortcomings of the capability approach that are important to acknowledge. Firstly, like rights-based approaches, the approach is sometimes characterised as being ontologically individualistic, i.e. as being concerned with the realisation of individual capabilities (as such it has sometimes, erroneously, been linked with neoliberalism) (Herring 2012). This is significant for TESF as we are concerned not only with the role of education in supporting individual but group capability, and in particular the capabilities of groups of disadvantaged learners. As Sen (2011) has argued, however, whilst it is still useful methodologically to measure capabilities at an individual level, it is both possible and necessary to conceive of capabilities as applying as much to groups as to individuals. In relation to our work in TESF this is important because it allows for understanding the extent to which different groups may or may not have their capabilities realised whilst also allowing for differences brought about by the interplay/ intersection between different kinds of inequalities as they manifest at an individual and a group level. This in turn draws attention to a further issue which is how capabilities can be measured. This is critical if the idea of capabilities is used as a way of evaluating the nature and extent of inequalities in accessing good quality education for sustainable development and we return to this issue below.

It is also important to recognise that Sen's is an anthropocentric view of capability, i.e. a view of capability as applying only to human beings. Nussbaum has begun to articulate a view of other species having capabilities linked to their inherent dignity (Nussbaum 2006)[2].

[2] Whilst it is important to take account of the rights of other species to flourish, Nussbaum's ideas have been critiqued from within the environmental tradition because by invoking animal dignity she appears to be favouring only sentient beings (Schlosberg 2007). She has also been criticised for focusing on the

Extending this view, Schlosberg (2007:142) argues the importance of understanding species as parts of wider ecosystems and systems themselves have capabilities and functionings and might be considered 'agents for the work they do in providing the various capacities for their parts to function - i.e., purifying water, contributing oxygen, providing nutrition, sustaining temperature[3]. This implies that the idea of capabilities can be applied to natural systems and to other species, although as we suggest below, this has implications for how these capabilities and the interest of natural systems and of other species may be interpreted and represented in public debate.

Finally, as we have seen, at the heart of Sen's approach towards SD is that determining the capabilities and needs of existing and future generations requires processes of advocacy and informed public dialogue in which the interests of different groups are made transparent and open to public scrutiny. As has previously been argued (Tikly and Barrett 2013), Sen's ideas provide an important evaluative 'space' in this case for considering SD as a process of balancing the capabilities of existing and future generations and indeed of environmental systems. However, on their own, Sen's ideas about justice do not provide a means for considering the wider structural and discursive barriers that prevent some individuals and groups and indeed environmental systems from having their interests recognised and their voices heard in public policy.

Taking account of these differences requires a recognition of the wider structural and discursive barriers that limit the agency freedom of some individuals and groups to either access and convert educational and other resources into valued functionings or to have their voices heard and/or interests represented in public debates about what constitute valued capabilities and functionings. TESF has the potential to expand these ideas of justice and capabilities as they would bear on educational processes and arrangements in diverse contexts. Here Robeyns (2017) argues that the core concepts of the capability approach need to be considered alongside other theoretical approaches that allow for a consideration of these wider structural inequalities. Several scholars have developed such hybrid approaches. For example, DeJaeghere (2020) sets out a relational view of capability that sees the development of agency freedoms in relation to postcolonial and feminist forms of analysis that draw attention to the continuing effects of colonialism and of patriarchy on the capabilities of formerly colonised populations/ people of colour and of girls and women respectively. Other scholars have sought to theorise capabilities in relation to other complementary theories of justice. Unterhalter and DeJaeghere for example, consider the capabilities of girls and women in relation to an analysis of patriarchy in education and of gender justice (Unterhalter 2007; DeJaeghere 2018). In a recent study, Walker (Walker 2020) draws on Fricker's ideas of epistemic justice to consider how the voices of different marginalised and racialised groups are recognised and validated in educational settings and in public discourse more widely. Several theorists have sought to link the capability approach and theories of global justice drawing on Nancy Fraser's work (e.g. Schlosberg 2004, 2007; Tikly and Barrett 2011). For these authors, Fraser's understanding of global justice discussed below provides a multi-dimensional way of conceiving the barriers to social and environmental justice.

Nancy Fraser's work has been influential in seeking to establish a theory of global justice that provides the basis for both an analysis and critique of existing global inequalities in the development era and a basis, rooted in political philosophy for outlining a theory of global justice. Fraser defines justice as 'parity of participation'. She explains that:

> *According to this radical-democratic interpretation of the principle of equal moral worth, justice requires social arrangements that permit all to participate as peers in social life. Overcoming injustice means dismantling institutionalized obstacles that prevent some people from participating on a par with others as full partners in social interaction (Fraser 2008: 16).*

By institutionalised obstacles, Fraser is here referring to economic structures that deny access to resources that people need in order to interact with others as peers; institutionalised hierarchies of cultural value that may deny them the requisite standing; and, exclusion from the community that is entitled to make justice claims on one another and the procedures that structure public processes of contestation. Extending this view and writing from an environmentalist perspective, Schlosberg (2001; 2004; 2007) argues that environmental justice also requires extending the view of parity of participation to include a consideration of the rights and capabilities of other species and of environmental systems.

Fraser draws attention to three dimensions of social justice, each related to one of the institutional barriers identified above. The first, redistribution, relates to access to different kinds of material resources or to services such as education and health. From the point of view of SD, distributive justice would also need to take account of the way that environmental benefits (in the form of access to natural resources) as well as risks (in the form of the effects of global warming, droughts, famines, pollution etc) are distributed. In this sense, environmental inequalities can be seen to cut across and

rights of individual animals rather than on the integrity and flourishing of species as a whole and of ecosystems. For Schlosberg (2007), it is this aspect of recognitional justice that sets his view of environmental justice apart for that of Nussbaum's in that the focus is on the flourishing of whole ecosystems rather than on the rights of individual animals. This also leads to a non-romanticised view of environmental flourishing in that, for example, being food for other living beings might form part of essence of functioning for some living things.

[3] In this case, the central issue of ecological justice would be the interruption of the capabilities and functioning of a larger living system - what keeps it from transforming primary goods into capabilities, functioning, and the flourishing of the whole system' (p. 13). This view of environmental systems themselves having capabilities raises important considerations for educators and these are discussed further below.

reinforce other inequalities including those based on class, race/ethnicity, gender and disability[4].

The second of Fraser's dimensions, recognition, means first identifying and then acknowledging the claims of historically marginalised groups. In our four countries of focus these include but are not limited to women, socio-economically disadvantaged communities living in rural and urban areas, members of low castes, victims of Covid-19, malaria, HIV/AIDS and other communicable diseases, orphans and vulnerable children, refugees, cultural, linguistic, religious, racial and sexual minorities and indigenous groups. In the context of a transformative SD and ESD, this also means recognising the integrity and the right to flourish of other species and ecosystems, a view that is in keeping with many indigenous knowledge systems in Africa that have posited a more organic, symbiotic and custodial relationship between human beings and the natural world (Maware and Mubaye 2016). Closely related to recognitional justice then is the need to take account of the hegemonic relationship between Western knowledge systems and indigenous and local knowledge systems. It also draws attention to debates about what counts as 'legitimate' knowledge as well as which groups have access to different kinds of knowledge.

Participatory justice includes the rights of individuals and groups to have their voices heard in debates about social justice and injustice and to actively participate in decision-making. Importantly, for Fraser, this is a prerequisite for realising issues of redistribution and recognition. It also ties in with Sen's insistence on public participation and informed public dialogue as the basis for adjudication between justice claims. In relation to participatory justice, Fraser identifies two forms of misrepresentation. The first is related to issues of 'ordinary-political representation'. It is concerned with the nature of political rules and processes within nation states that deny some citizens the chance to participate fully in decision-making including members of socially marginalised groups. The second form of misrepresentation is related to globalisation and has increasing significance for education in low income countries because of the influence over national policy of global and regional agendas and frameworks. Fraser describes this as 're-framing'. Here the injustice arises when the community's boundaries are drawn in such a way as to wrongly exclude some people from the chance to participate at all in its authorised contests over justice. The idea of misrepresentation is significant for TESF because it draws attention to the difficulties and challenges in accessing the perspectives and realising the agency of marginalised groups in the research process and ensuring that their voices are represented in national and global policy.

Extending the discussion, Schlosberg (2007) has considered how Fraser's (and indeed Sen's) views about the importance of participation might be extended to incorporate environmental and ecological concerns. Noting the obvious point that other species or natural systems do not have the same reasoning or communicative capacities to participate in processes of democratic deliberation, he nonetheless argues that the capabilities and flourishing of other species and natural systems can and ought to be the subject of public deliberation. He argues that in 'applying a capabilities approach to nature, we do not need to have a particular animal or ecosystem express a desire for a particular functioning; rather, we need to recognise a different type of agency - a potential, a process, or form of life illustrated by its history, ecology, integrity, and non-reason-based forms of communication' (Schlosberg 2007: 152). Such a view has important implications for education systems in creating a space for this understanding of the capabilities and needs of other species and of environmental systems (see below).

Decolonising approaches

Decolonising approaches bring together a range of perspectives that have in common a critique of the Western-centric nature of development and of development discourse since colonial times. Recent debates about decolonising universities and other institutions have been given impetus through a range of contemporary social movements including the *#RhodesMustFall* Movement. Given their resonance with contemporary debates about ESD, these are discussed in more detail below. It is important to acknowledge though that these campaigns critically build on a long history of anti-colonial thought and struggle. In the Indian context, they also build on anti-caste struggle that predates the anti-colonial struggle (Batra 2020).

In the post-independence period Nkrumah's critique of neo-colonialism drew attention to the continued relations of economic and political dependency between former colonised and former colonising countries. These ideas were given impetus by Andre Gunder Frank (1970) and the dependency school. Dependency theory also informed the ideas of anti-colonial activists such as Walter Rodney whose influential (1973) book *How Europe Underdeveloped Africa* became a classic text for those fighting against the vestiges of colonialism and neo-colonialism. Overall, dependency theory provided a compelling argument about the negative consequences of economic dependency of low-income countries at the periphery of the global economy to countries of the former

[4] It should be pointed out that although it has been highly influential and widely considered to be useful, Fraser's approach has been subject to criticism. For example, it has been argued that Fraser ignores the differences between different theories of distributive justice and presents an oversimplified judgement of Rawl's theory (Xu Dequiyang & Xianonan, Hong 2015).

colonial metropole. More recent scholarship within the Marxist tradition has provided a critique of the role of the US and its Western allies in supporting market-led models of development, including the Washington and post-Washington consensus to underpin and provide legitimacy for their own economic interests and hegemonic aspirations in the context of the rise of the new powers (including the so-called BRICS[5] economies).

For commentators such as Harvey (2003) this can be understood as a form of new imperialism. In this context many countries in Africa became harnessed to the global economy either as exporters of primary commodities to the global North (or as increasingly the case, to the rising powers and especially China) or as a vast and as yet relatively untapped marketplace. The reliance on the part of many low- and middle-income countries on the extraction and export of primary commodities has often come at enormous cost to the environment. It has also often happened in enclaves and has been accompanied by land grabs resulting in limited benefits to local populations (Mohan 2013). In the case of China and the other rising powers, access to primary commodities and to local markets has often been in exchange for China's assistance in developing infrastructure including roads, hospitals, schools and universities. The development of infrastructure, however, has often relied on importing cheap labour form China rather than in providing local jobs. In brief, the imposition of neoliberal, growth-led economic development it is argued, has led to growing inequalities between a local urban elite who have often benefitted from the neoliberal status quo and the urban and rural poor who have not. In political terms the effect has been the creation of the 'shadow state' (Ferguson 2006) or the neo-patrimonial state (Bøås 2003) characterised by limited democratic participation at a national level and increased political dependency on the global North either in the form of conditional lending or through the power of the West to set global agendas.

Much critique since colonial times has focused on the cultural domain. Anti-colonial activists from Gandhi to Nyerere to Rodrigues and Biko have provided a trenchant critique of the valorisation since colonial times of Western forms of knowledge and the systematic undermining of indigenous knowledge systems, languages and cultural values. The pan-African movement for example, with its roots in anti-colonial struggle has emphasised the need to reassert alongside demands for economic and political independence, African cultures (whether in Africa or in the wider diaspora) onto the global stage, a theme that has been taken up more recently by exponents of the idea of an African Renaissance (Tikly 2003). The negritude movement in the 1930s under the influence of thinkers such as Aime Cesaire and Leopold Senghor drew attention to the racialising effects of western colonial discourse and sought to challenge this through the projection of positive conceptions of black identities. Drawing on insights from psychoanalysis, phenomenology and Marxism, the Martinique psychoanalyst and revolutionary Frantz Fanon drew attention to the damaging effects on the Black psyche arising from the internalisation of racialised identities transmitted through Western language and culture (Fanon 1961; 1986). Fanon's work was in turn influential on the thinking of Steve Biko and other leaders of the Black Consciousness movement in South Africa (Biko 1978). Anti-colonial activists including, for example, the Kenyan writer and dramatist Ngũgĩ wa Thiong'o and the South African former political prisoner, Neville Alexander have also highlighted the need to reinstate indigenous languages as key in supporting indigenously led development.

More recently, postcolonial thought has provided a lens through which scholars have challenged the cultural hegemony of the West. Drawing on poststructuralist as well as Marxist ideas and providing continuity on the work of earlier anti-colonial intellectuals, postcolonial scholarship has drawn attention to the role of western knowledge in perpetuating the dominance of the West through knowledge of the non-Western 'other' as an aspect of the postcolonial condition (Said 1978; Spivak 1988; Bhabha 1984). It also draws attention to the contingent and contested nature of postcolonial identities with clear echoes of Fanon's thought (Hall 1996). Closely aligned with postcolonial scholarship are the ideas of postdevelopment thinkers such as Escobar (1995; 2004), Rist (1997) and Wilson (2013). Escobar and Rist have provided critiques of the powerful role of Western development discourse in re-creating the 'Third World' in the image of the West and in the interests of the West. Knut (1996) has argued, the field of development has primarily been the purview of technocrats and a technocratised discourse which marginalised other perspectives on human lives and living practices. Wilson's work draws attention to the racialised nature of much contemporary development discourse which, she argues, provides continuity on Western constructions of the non-European other going back to colonial times. For example, she draws attention to the role of racialised constructions of non-Western sexualities in discussions about over-population and the spread of HIV/AIDS. In recent years anti-colonial, postcolonial and postdevelopment scholarship has found new expression in debates about decolonising the curriculum, a point we will return to below. Importantly for the TESF vision, some of these accounts draw on Southern philosophies such as *buen vivir* and *ukama*, which point to a relatedness,"that is not restricted to human relations but extends to the natural environment, the past, the present and the future" (Murove 2009: 28).

Decolonising perspectives are highly significant for considering TESF research and indeed the ways in which we work together as a network. It has been suggested above, for example, that the very idea

[5] BRICS stands for Brazil, Russia, India, China and South Africa

of sustainable development has since the advent of the so-called development era been most closely articulate with a Western, modernist view of development. A focus for our work across the four countries we will be working in is to problematise the relevance of the idea of sustainable development through bringing global understandings and agendas into conversation with more localised perspectives and realities.

Decolonising perspectives also challenge us as a UK government funded and Northern-led Network Plus to critically reflect on our ways of working so that we challenge rather than reproduce traditional ways of working in global development projects in which typically, research agendas are conceived and often written up in the global North with little effort to problematise basic, Western ontological and epistemological assumptions and the role of Southern partners has historically been largely one of data gathering within frameworks determined elsewhere. These issues are explored in more depth in the accompanying background paper on partnership working and capacity mobilisation (Mitchell et al Forthcoming 2020).

Box 3: Key milestones in the development of the education SDG Source: (Tikly 2020)

1. The report of the *UN Stockholm conference* in 1972 states that 'for the purpose of attaining freedom in the world of nature, man must use knowledge to build, in collaboration with nature, a better environment' (UN 1972, : 3) and as such environmental education was promoted, though there was disagreement as to how this should be implemented.
2. Education features strongly in the *Cocoyoc declaration* of 1974 as a means for promoting eco-development. Education is identified as not only a basic need but also as necessary for providing a critical understanding and practical knowledge of the ecosystem and its relationship with social and economic structures (UN 1975).
3. The UN organises its first inter-governmental conference on environmental education in Tbilisi, Georgia, USSR in 1977. The *Tbilisi Declaration* recommended the adoption of criteria that would help to guide efforts to develop environmental education at national, regional and global levels (UNESCO 1977).
4. Education is cited in the 1987 *Bruntland report* as integral to sustainable development. Gender parity and making literacy universal are set as goals and expanding education beyond primary school is deemed necessary for 'improv[ing] skills necessary for pursuing sustainable development' (WCED 1987: 96). Quality education is characterised as practical, flexible, community-based and comprehensive with environmental education integrated into all aspects of the curriculum.
5. The 1990 *Jomtien Declaration* (1990) arising from the UN World Conference on Education for All in Jomtien, Thailand sets out principles aimed at providing access to all to a good quality education from pre-primary, primary, secondary, tertiary, vocational and adult basic education.
6. The *Rio Earth Summit Declaration on Environment and Development* cites education as 'critical for promoting sustainable development and improving the capacity of the people to address environment and development issues… It is critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for affective public participation in decision-making' (UNCED 1992: 3).
7. The Jomtien principles were reaffirmed and developed into a *Framework for Action* (Unesco 2000) at the Dakar World Conference on Education for all in Senegal a decade later.
8. The education *Millennium Development Goals*, also in 2000 emphasise a more reductionist education agenda focusing on access to primary education and gender parity at levels of education and training.
9. The *Johannesburg Summit* in 2002 adopted a resolution to start the *UN Decade for Education and Sustainable Development* (DESD) from January 2005. The purpose of the decade was to create a world 'where everybody has the opportunity to benefit from education and learn the values, behaviour and lifestyles required for a sustainable future and for positive societal transformation' (UN 2002: 3) was envisioned.
10. The decade resulted in the adoption in 2013 of the *Global Action Programme on ESD* which was launched at the *UNESCO World Congress on ESD* in 2014 (UNESCO 2017b).
11. The outcomes of these conferences fed into the inclusion of ESD as a target in the *Muscat Agreement on Education for All* (and subsequently adopted but the *World Education Forum* for EFA)(UNESCO 2014).
12. In identifying priorities, the *Incheon Declaration and Framework for Action* (UNESCO 2015) prefigures the goals of the education SDG. It blends the emphasis in the EFA movement on access to a good quality education with an explicit reference to ESD.

An initial definition of Sustainable Development

Based on the above discussion, we offer an initial working definition of SD as

> ***development that supports the rights, freedoms and capabilities of existing and future generations to live the lives they have reason to value whilst protecting and co-evolving in a more harmonious relationship with the natural environment of which human beings are an integral part so that natural and social systems may flourish.***

What do we mean by education for sustainable development?

Whereas the previous section has focused on a critical discussion of different interpretations of SD in relation to the goals of TESF, this section focuses in on how understandings of education for sustainable development have emerged over time and how they relate to the work of TESF.

The Education SDG

The education SDG (SDG 4) has a related but distinctive history to that of the other SDGs. Key milestones in the development of the education SDG are given in box 3.

The education SDG along with its key targets are set out in box 4.

As the accompanying country background papers make clear, the education SDG like the other SDGs needs to be treated critically. For example, on the positive side, the targets can be seen to provide a call to action, can be seen to provide and a holistic response to the learning crisis and a basis for holding governments and donors to account. On the other hand, although the intention is that regions and countries identify their own priorities within goal 4, the list of targets is highly ambitious especially in that they are supposed to be achieved by 2030.

Linked to this is the lack of specificity about how the targets might be funded and implemented. As such, the danger is that they operate more as a rhetorical device and are setting up some of the poorest countries to fail. It is important in the context of TESF to critically engage with the education SDG including issues of how the various targets might be implemented.

Box 4: SDG4 targets and indicators

SDG 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

4.1	By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes
4.2	By 2030, ensure that all girls and boys have access to quality early childhood development, care and preprimary education so that they are ready for primary education
4.3	By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university
4.4	By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship
4.5	By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations
4.6	By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy
4.7	By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development
4.8	Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all
4.9	By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries
4.10	By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing states

Source: Adapted from UNESCO (2017a)

Target 4.7

All of the above targets are potentially relevant for the work of TESF in that they are concerned with access to an inclusive, good quality education for across the lifespan. TESF will focus in particular, however, on the role of target 4.7 in relation to these other areas of sustainable development, i.e.

> *By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development*

This is because 4.7 is the target that most explicitly addresses the need to develop the knowledge and skills associated with SD. The indicators that UNESCO hopes to collect in order to measure progress towards 4.7 are set out below:

Global Indicators for 4.7

4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment

Thematic Indicators for 4.7

4.7.2 Percentage of schools that provide life skills-based HIV and sexuality education

4.7.3 Extent to which the framework on the World Programme on Human Rights Education is implemented nationally (as per the UNGA Resolution 59/113)

4.7.4 Percentage of students by age group (or education level) showing adequate understanding of issues relating to global citizenship and sustainability

4.7.5 Percentage of 15-year-old students showing proficiency in knowledge of environmental science and geoscience

While significant work had been undertaken to improve indicators for 4.7, at present, they remain limited in scope. There are also very limited data available to measure the indicators in their current configuration. There is a separate background paper concerned with the complexities of developing indicators for 4.7 (Sprague and Brockwell Forthcoming 2020) in a way that captures progress towards this target across multiple contexts in which we will be working. Herein we argue that indicators possess the potential to do more than simply measure progress or achievement if a values-based approach is taken, allowing a co-constructed and engaged methodology and a vocabulary for communicating our values of education that can be situated and context specific (PERL 2014; Burford 2016).

Education and the other SDGs – a complex relationship

Education is accorded a central position in the SDGs. The Global "Education First" Initiative (GEFI) was run under the slogan "Sustainable Development Begins with Education" (United Nations, n.d.). UNESCO's Director General, Irina Bokova, has recently reiterated the centrality of Education in the concept of sustainable development (Bokova 2015). Further, a recent analysis of UN flagship reports, for example, shows that education is implicated in realising all of the other SDGs as well as being affected by them (Vladimirova and Le Blanc 2015: 23). As the country background papers make clear, education is also accorded a high priority in relation to national policy responses to the SDSs. The nature of the relationships between education and other areas of sustainable development are highly complex. For example, as noted in the previous section, the relationship between education and the economic domain suggests that whilst education can contribute to regenerative and redistributive economies through providing the skills required to support sustainable livelihoods, education systems can also be subject to the effects of austerity (for example in the context of structural adjustment policies in the 1980s) as well as by the effects of economic crisis. Similarly, education can contribute to the skills, knowledge and attitudes required to support sustainable cities. As the background paper dealing with the complex relationship between education and cities (Parnell and Bazaz Forthcoming 2020) makes clear, however, the quality of education is also negatively impacted where schools are located in over-crowded and poorly planned urban spaces with a crumbling infrastructure. Furthermore, as the background paper on education and climate action (Facer et al. 2020) makes clear, whilst education can play a role in supporting efforts to adapt to and to mitigate the effects of climate change, education systems are themselves susceptible to the effects of climate change whether this is directly though the effects of flooding and drought or more indirectly through having to deal with increased migration and displacement of populations linked to climate change.

Education and unsustainable development

What historical analysis makes clear is that education has also historically played a role in processes of unsustainable development (e.g. Tikly 2020). This is significant in the context of TESF where the four education systems we are focusing on have, since colonial times and like other education systems around the world, often been complicit in unsustainable development. That is, they have often failed to provide the opportunities, especially for disadvantaged groups of learners to develop the skills, knowledge and attitudes required to support sustainable livelihoods within peaceful and democratic societies. More often they have contributed to reproducing existing inequalities between groups in their abilities to live sustainable lives through limiting access to a good quality education and training and because the curriculum has often been skewed towards dominant interests including those of former colonisers, indigenous elites and has been largely irrelevant to the backgrounds and future aspirations of learners. Furthermore, and in relation to our foci in TESF, they have often also failed to develop the skills, knowledge and attitudes required to support sustainable cities, communities and climate action. Understanding the complex

relationship between education and other areas of sustainable development requires acknowledging the role of education systems historically in supporting unsustainable development as well as identifying areas where education has positively contributed to SD.

Contemporary approaches to Conceptualising Education for Sustainable Development

As we have seen, the education SDG (SDG 4) aims to ensure inclusive and equitable quality education and to promote life-long learning opportunities for all. As with SD, current global discourses of ESD bring together several approaches in sometimes contradictory ways and these are discussed below. The aim of this section is to outline contemporary discourses on ESD. As with the discourses on SD, some, like human capital and rights based approaches are more dominant in global agendas whilst others like the capability, environmental and decolonising perspectives are also explicitly or implicitly critical of these dominant narratives and offer alternative ways of conceiving ESD.

Human capital approaches

A major discourse to have shaped education policy in low- and middle-income countries in the post-war years and that has proved remarkably enduring is that of human capital theory originally developed by Theodore Schultz (1961). Human capital theory (HCT) has however changed in form and emphasis over the years (Robertson et al 2007). During the 1960s and 70s it was associated with modernisation theory through positing the link between education, human capital formation and capitalist growth. During the 1980s, HCT provided the basis for rates of return analyses that compared the individual and social rates of return to different levels and sub-sectors of education. It was these analyses that were used as a basis and in the context of the Millennium Development Goals for prioritising primary education as it was perceived to have the greatest social rate of return to investment in terms of contributions to economic growth. It also provided a rationale for cutting expenditure on higher levels of education and introducing student fees. During the 1990s and in the context of the so-called post-Washington consensus, HCT became more associated with policies aimed at poverty reduction. This included a recognition of the role of education and training in improving health and other welfare outcomes, particularly for girls and women.

The idea of seeing the provision of education and training principally in terms of human capital remains very popular amongst mainstream economists and policy makers but has been subject to sustained criticism. Firstly, the idea of positing 'growth' as the ultimate goal of development has been critiqued from a number of directions as we have seen. The emphasis on economic growth also often leads to a narrow set of priorities regarding the kinds of skills and competencies that education needs to develop, a point that is also taken up below. A further critique of HCT is that it is based on an idealised and narrow view of the role of education as a means for achieving economic development (Tikly 2004; Vally and Motala 2014). In particular, HCT assumes a linear relationship between the development of skills and economic growth. This fails to take account of the effects of economic crises in shaping the ability of education systems to provide the skills actually required by economies or to tackle issues of poverty and inequality. It will be recalled, for example, that the effects of economic crisis in the 1980s was an overall reduction in government investment in social institutions such as education with the effect of rendering them less effective in providing access to even the most basic skills (Ilon 1994; Samoff 1994).

Closely linked to HCT in dominant global discourses including the SDGs is the idea that education can contribute to the development of 'knowledge economies'. The idea of the knowledge economy has been advocated by the World Bank since the 1990s (Robertson et al 2007). Resting on the four pillars of education and training, the development of an information infrastructure, providing an economic and institutional regime to support knowledge flows and supporting innovation systems. Policies linked to the idea of the knowledge economy have for a while now found prominent expression in the education and training policies of several African countries including, for instance Rwanda and Tanzania (Tikly et al 2003). It has provided an impetus for the recent shift towards competency-based curricula in many countries including our four countries of focus. Emerging out of discourses of the knowledge economy has been an emphasis on so-called 21st Century skills. This emphasis is also evident in CESA. A recent, influential World Economic Forum publication (World Economic Forum 2015) grouped these skills into three categories: foundational literacies, competencies and character qualities (see Table 1). These have proved influential in shaping approaches towards competency-based curricula in Africa as elsewhere.

Foundational Literacies	**Competencies**	**Character Qualities**
How students apply core skills to everyday tasks	How students approach complex challenges	How students approach their changing environment
Literacy	Critical thinking/ problem-solving	Curiosity
Numeracy	Creativity	Initiative
Scientific literacy	Communication	Persistence/ grit
ICT literacy	Collaboration	Adaptability
Financial literacy		Leadership
Cultural and civic literacy		Social and cultural awareness

Table 1: Twenty-first Century Skills.
Source: World Economic Forum (2015).

Like the master narratives of HCT and modernisation theory, the idea of the knowledge economy has also been subject to sustained critique (e.g. Robertson et al 2007). The concept emerged in relation to Western industrialised nations and other countries at the centre of the global economy including the countries of the pacific rim. Whilst 21st century skills as a means of supporting economic and social innovation may have purchase in national and regional agendas including those impacting on our four countries of focus, the idea stands in stark contrast to the nature of existing labour markets which continue to be characterised by poorly paid, insecure employment in the formal and informal sectors.

Thus, whilst the idea of a knowledge economy and of 21st Century skills might be intuitively appealing to policy makers, it can often operate more as a rhetorical device removed from the realities of low and middle-income economies. Like HCT it can be perceived as idealistic in positing the development of 21st century skills as a 'solution' in and of itself for the problems of unsustainable development whilst the need for more profound changes in the economy and labour market in order to create a demand for these skills in the first place is not taken into account. There is also a tension between the use of HCT to support processes of structural adjustment, a reduction in the role of the state in education provision and increasing privatisation on the one hand, and the imperative of developing knowledge economies in low quality, under-resourced and fragmented education systems. In this context, critical voices from the South have questioned the relevance and appropriateness of neoliberal ideas that have shaped educational reforms. Narratives from the region tell us that importation of educational concepts and policy orientations have led to the dismantling of existing structures and processes of education, creating new forms of inequities and disadvantage (Batra 2019).

In recent years there has been an emergence of green economy discourse in international movements for sustainability, many of these narrowly conceived within a growth discourse and associated green skills research being associated with technicist HCT theories and assumptions. There is, however, a critique of this green skills discourse with more nuanced analysis emerging (Death 2014, 2016). These debates are discussed in more depth in the accompanying background paper on skills for sustainable livelihoods (McGrath 2020).

Rights-based approaches

In contrast to the emphasis on economic growth within the human capital approach, advocates of a rights-based approach see development as multifaceted involving a spectrum of economic, political and cultural dimensions and linked to the realisation of peace, human security and environmental sustainability. Human rights are seen as fundamental, indivisible and integral to the development process (Piron and with O'Neill 2005; UNDP 1998). The human rights approach to education is interested in the role of education in securing rights to education, rights in education and rights through education (Subrahmanian 2002; Unterhalter 2007). In this sense, human rights discourses have often been advocated by United Nations (UN) agencies, international non-governmental organisations (NGOs) and civil society organisations at the international, national and local level (Mundy and Murphy 2001). These include the enactment of negative rights such as protection from abuse, abolishing corporal punishment as well as positive rights, for example celebration and nurturing of learner creativity, use of local languages in schools, pupil participation in democratic structures and debate. Hence, teaching approaches that are broadly identified as learner-centred have often been linked to the rights-based approach (Schweisfurth 2013). The human rights discourse has also contributed towards sustained initiatives to transform education and training. These include initiatives such as the girl friendly school, rights-based schools promoted by UNESCO.

It is against this historical backdrop that UNESCO has been promoting global citizenship education (GCE) as a means to develop democratic agency, respect for the rule of law and peacebuilding. GCE aims to empower learners of all ages to assume active roles, both locally and globally, in building more peaceful, tolerant, inclusive and secure societies. It is based on the three domains of learning - cognitive, socio-emotional and behavioural.

- Cognitive: knowledge and thinking skills necessary to better understand the world and its complexities.
- Socio-emotional: values, attitudes and social skills that enable learners to develop affectively, psychosocially, and physically and to enable them to live together with others respectfully and peacefully.
- Behavioural: conduct, performance, practical application and engagement.

The key learning outcomes, key learner attributes, topics and learning objectives suggested in GCED are based on the three domains of learning mentioned above. They are interlinked and integrated into the learning process.

As with other aspects of the rights-based approach, the idea of GCE potentially has traction for our work in TESF. It is also a key component of SDG goal 4.7. However, there are important caveats when considering the relevance of GCE that are similar in tone and emphasis to the broader critiques of rights-based approaches identified above. For example, recent scholarship has attempted to identify the challenges of implementing citizenship education in autocratic (Waghid and Davids 2018) and unequal (Vally and Spreen 2012) contexts and the tensions between Western conceptions of democratic citizenship and non-Western philosophical traditions (Enslin and Horsthemke 2004). For some commentators there is a danger that GCE can play a legitimatory role in reproducing wider inequalities through presenting GCE as a panacea for creating more just societies thereby letting governments off the hook for addressing the roots of inequality and injustice which lie outside of the school in wider structural inequalities (Vally and Spreen 2012). For these reasons, GCE needs to be seen in relation to efforts to decolonise the curriculum (below) as well as in efforts to democratise processes of educational governance and to wider struggles for participatory justice.

As noted above, rights-based approaches have also underpinned the development of the Education for All (EFA) movement. The principles governing EFA have remained fairly consistent over the past quarter of a century as encapsulated in the various targets set out in key declarations and frameworks including the Jomtien Declaration, the Dakar Framework for Action and more recently the Muscat Agreement and the 2015 Incheon Declaration and Framework for Action (IDFA) (Tikly 2017). The concept of 'life skills' developed through the EFA movement has developed as a counter narrative to that of 21st Century skills and has been used in different but

overlapping ways by various international organisations working within a rights-based framework.

Within the EFA Movement, life skills was a catch-all term for 'skills for sustainable livelihoods' which has historically formed part of UNESCO's wider ESD discourse (Maclean and Wilson 2011). Closely linked to the idea of life skills is that of lifelong learning which is seen as essential for developing relevant life skills in rapidly changing societies and economies across the life span. The idea of lifelong learning has a long pedigree in India and on the African continent (albeit largely in the context of struggles to introduce adult literacy programmes). It was used by Nyerere for example, to encapsulate his view of education in relation to self-reliance (Nyerere 1967). Within a rights-based framework, the idea of lifelong learning has been central to evolving discourses of EFA. The Dakar Framework for Action adopted at the World Education Forum (WEF) states:

> *All young people and adults must be given the opportunity to gain the knowledge and develop the values, attitudes and skills that will enable them to develop their capacities to work, to participate fully in their society, to take control of their own lives and to continue learning (WEF 2000: 16)*

The ideas of life skills and lifelong learning appear to resonate more closely with the realities of the development challenges facing the four countries that we are focusing on as well as in other parts of the low-income, postcolonial world than does the list of 21st Century Skills. The idea of Life Skills has also been subject to similar critiques as the idea of 21st C skills in that it presents a top down 'one size fits all' approach to skills development. Here, as suggested above, advocates of the capability approach (CA) argue that the CA provides a way of reconceptualising skills and competencies in relation to the capabilities and functionings that communities, governments and other stakeholders have reason to value. This point is taken up below.

The capability approach to ESD

Scholarship within the field of education and training using the capability approach has blossomed over the past 20 years. It has been used to provide an alternative rationale beyond the instrumentalism of HCT and the limitations of rights-based approaches to think about the goals and purpose of education and training. As such it has contributed to contemporary debates about the quality of education (Tikly and Barrett 2013). The capability approach has also been used to discuss the opportunities and freedoms enjoyed by groups of learners in a range of formal settings from schools (e.g. Lotz-Sisitka et al. 2017), TVET settings (e.g. Powell and McGrath 2019; De Jaeghere 2017) to higher education (e.g. Walker 2006) as well as informal settings (e.g. McGrath et al. 2020). It has also been used to address different kinds of disadvantage and as a means for advocating gender justice (e.g. Unterhalter, Challender, and Rajagopalan 2005; Unterhalter 2007); the rights of speakers of minority and indigenous languages (e.g. Tikly 2016); and understanding the aspirations of working-class learners (Hart 2015). Batra (2017) argues that by extending Sen's idea of capability deprivation to classroom-based research indicates that children of the poor are excluded from learning not because of the absence of conditions necessary for enabling participation and learning but because of the presence of conditions of capability deprivation that are found to characterise the everyday classroom. It is argued that a collusion between the manner in which quality of education and its relationship with poverty is conceptualised and positioned in the era of market-based reforms, sets the conditions for the production of capability deprivation.

More recently, the CA has been used in relation to ESD (McGrath and Powell 2016; Lotz-Sisitka et al. 2017; Tikly 2020). Lotz-Sisitka et al link the CA to their view of active learning for ESD (see below). For these authors, the CA provides a useful basis for considering the role of learners and of communities to reflect on the sustainability challenges facing communities and engage in decisions about what areas of SD are important to learn in the curriculum. Tikly argues that the idea of capabilities is a useful addition to the debate about the skills and competencies required for SD as it draws attention not only to the nature of the skills and competencies required for SD but to the facilitators and barriers that prevent some groups from having the opportunity to develop relevant skills. Powell and McGrath argue that the capability approach provides a useful lens through which to conceptualise the idea of green skills (see McGrath 2020).

As suggested above, the capability approach holds some promise for the work of TESF insofar as it allows us to posit an alternative end and means for education in the context of sustainable development linked to the idea of human wellbeing and the flourishing of natural systems. It also allows for a more contextualized understanding of how rights and capabilities are interpreted within and between different country contexts. As argued, however, this requires extending the understanding of the capability approach to encompass the capabilities of other species and natural systems. Nussbaum (2006), for example, talks about the importance of imagination and story-telling in accessing the capabilities of other animals. All of the disciplines spanning the natural and social sciences, arts and humanities have a positive role to play in this respect. It also requires taking account of the wider structural and discursive factors that limit distributive, recognitional and participatory justice in education. This in turn requires taking account of the nature of inequalities in education at different scales from the immediate pedagogical environment, to the institution, the wider education system and wider society.

Environmentally-oriented approaches

Environmentally oriented approaches are most often associated with forms of environmental education that have a long history in global discourses going back to the Stockholm conference and Tbilisi declaration of the 1970s (see box 3 above). Environmental education is fundamentally concerned with developing understanding of the natural environment and of the integrity of ecosystems and the role of human beings in managing natural systems, although there are long standing traditions in the global South that have considered environmental education as interacting biophysical, social, political and economic relations (e.g. Forum 1992; O'Donoghue and McNaught 1991; Lotz-Sisitka 2004; REEP 2012; Leff 1999). Environmental Education in the global South has explicitly also been engaged with environmental justice concerns and has also critiqued sustainable development discourse for its economic (neo-liberal)

foundations (Lotz-Sisitka 2004). Thus whereas environmental education approaches often strongly overlap with sustainable development approaches in the curriculum and in policy, the latter have tended to place a greater emphasis on the human development (economic and social) aspects of sustainability (Wals and Kieft 2010), in some contexts, where environmental discourses are closely related to conservation rather than environmental justice discourses. As is discussed in greater detail in the section below on transformative pedagogies, environmental education is also strongly connected to learner-centred and active education pedagogies, and with transformative, transgressive learning (Lotz-Sisitka et al. 2015). As each of the country background papers makes clear, environmental education has a long history in each of the countries of research focus. The spiritual relationship and custodial role of human beings in relation to the natural environment has been an aspect of indigenous knowledge systems in India and in Africa long pre-dating the colonial encounter, and environments are integral to the materiality of livelihoods in these contexts. By contrast, the modern (Western) practices of bifurcating and producing dualist abstractions of nature and culture are less embedded in the lives and being of communities. Environmental education has been integrated (albeit to various degrees) in the formal school curricula in each country but has also been embedded in non-formal education including conservation education, outdoor education, citizen science, environmental activism and forms of social learning within communities focusing on a range of topics including, for example, water management, sustainable agricultural practices and initiatives to mitigate the effects of climate change (see accompanying paper on education and climate action).

Environmentally-oriented approaches have also been implicated in contemporary debates about 'green skills'. As noted above, the notion of green skills has been criticised for being a part of the "greenwashing" of growth-led approaches to SD and ESD (e.g. McGrath and Powell, 2016). An alternative notion of green skills is outlined in the accompanying background paper on skills for sustainable livelihoods. Here we draw upon an emergent literature on skills development for just transitions (e.g. Rosenberg, Ramsarup, and Lotz-Sisitka 2020; Swilling 2020). At present, this literature is best developed in South Africa. Rather than talk about just transitions simply in abstract terms, this approach seeks to explore what types of skills, work and industries need to develop if the climate crisis is to be overcome, and how such transformations can be achieved. It draws on critical realism and political ecology literature, but also works with political economy and capabilities literatures (McGrath et al. 2019; Rosenberg, Ramsarup, and Lotz-Sisitka 2020). Importantly, this South African literature is not just focused on the formal sector but has rural and informal sector dimensions, and also engages with systemic dynamics of transformations to sustainability (Lotz-Sisitka and Ramsarup 2019).

Environmentally oriented approaches are also reflected in some contemporary initiatives that are of potential relevance for TESF in that they posit alternative, radical ways of thinking about how education might engage historically disadvantaged communities and contribute to SD that resonate with principles of social and environmental justice, and with more integral and less dualistic conceptions of the nature-culture relation. One example is that of ecovillages that define themselves by principally environmental rather than social or economic ideals. They are a relatively recent but widespread phenomenon that is present in India and in many parts of Africa. They initially arose during the 1960s and 1970s in tandem with the peace, feminist and 'back-to-the-land' movements. Understood as "an intentional, traditional or urban community that is consciously designed through locally owned, participatory processes in all four areas of regeneration (social, culture, ecology and economy) to regenerate their social and natural environments" (GEN 2020) most ecovillages typically adopt organic gardening principles, aim for self-sufficiency in food or supplement it through local networks, produce their own renewable energy, recycle and repurpose as many resources as possible, implement cooperative self-governance and non-hierarchical forms of decision-making, and live communally with the sharing of resources and tasks (Liftin 2009; Hong and Vicdan 2016). Today, ecovillages constitute a diverse archipelago of set-ups; from farming communes with sustainable practices, eco-architectural and experimental towns, spiritual communities with pro-environmental infrastructures and villages in the global South organized around ecological traditions (Esteves 2017). No two ecovillages are the same, as they are designed and evolved by the people who live in them according to the local context, culture and vision. Although historically, geographically and politically diverse, the ecovillage network is unified around a common ontology grounded in a holistic understanding of the natural world as a living organism, of which humans are an inter-related part (Liftin, 2009). Since the 2000s, many ecovillages have begun to offer educational programs through which to foster engagement with the wider public and develop and explore radical ecological perspectives and pro-environmental living techniques. This pedagogical aim has become a driving force of the Global Ecovillage Network (GEN) – an organisation founded in 1995 and committed to uniting ecovillages across the globe for the purpose of learning and sharing toward building a more resilient and sustainable future[6].

[6] GEN now operates through five continental networks and has partnered with Gaia Education and UNESCO to offer a range of accredited educational services within ecovillage sites – such as Permaculture Design Courses (PDCs), Ecovillage Design Education courses (EDEs), workshops and seminars on appropriate technology, conflict-resolution, food sovereignty, consultancy, group facilitation, and a Gaia School curriculum

Back in the school context, one global movement whose approach to education is rooted in an environmental perspective, which can provide cues to TESF's work, is that of Eco-Schools. Started in 1992 as a response to the United Nations Conference on Education and Development, Eco-Schools now operates in 76 countries around the globe, working with over 19 million students with programmes that focus on engagement with and protection of the environment. The approach to ESD is rights-based and makes explicit links to no fewer than 10 of the SDGs. Too often, programmes that take environmental education as their starting point are viewed as luxury affordances in the face of complex policy challenges. While it would be nice to incorporate learning about environment in the classroom, education policy systems often deem such educational opportunities as unattainable when matters of access and quality are pressing challenges (Copsey 2019). However, there are promising findings coming from research with Eco-Schools (e.g. Boeve-de Pauw snd Van Petegem 2013; Mogren, Gericke and Scherp 2019) where the very focus on environment within classrooms is reversing some of the issues around enrolment and quality provision, particularly in Uganda and Tanzania where the programmes have been well-established. Some reasons for this include its basis of democratic student participation, emphasis on community linkages, and collaborative action-based learning. Schools are surrounded by national and local community links, from the National Operators - usually NGO partners that administer the programme at the national level - to the increased involvement of parents, and local community activities that schools implement. Improved enrolment and decreased drop-out are among the benefits, which extend further: 'Immediate improvements are seen in learning environments which make them healthier, safer and more child-friendly, and incomes from microprojects are contributing to this change by funding new investment in schools.' (Copsey 2019).

While the process begins in classrooms through democratic student participation via eco committees, the programme extends to local communities in a two-way process of knowledge exchange: "Eco-Schools places great emphasis on involving the local community from the very beginning. By doing so, the lessons the students pick up are transferred back into the community where they take hold and lead to more sustainable, environmentally responsible behaviour patterns all round," (FEE 2020). This is the kind of out-of-the-classroom thinking that has the potential to transform education systems for sustainable futures, where learners can make holistic linkages between their environments, schools and neighbourhoods.

The relevance of Eco-Schools programme for TESF is in its emphasis on building school-community linkages vis-à-vis environmentally attentive, democratic learning, curriculum, and projects which lead to two-way knowledge exchange. TESF can build on this learning in ways that address issues of environmental change and quality education through co-produced investigation that develops an entire ecosystem or learning spanning generations, while bridging school-community divides with the added benefit of improving school participation and learner motivation.

Decolonising approaches

Debates about 'decolonising the curriculum' critically build on and re-articulate in new terms anti-colonial, postcolonial and postdevelopment thinking of previous eras (see above). These ideas have been given fresh impetus in recent years by student protests at the University of Cape Town in 2015. Although initially targeted at the continued presence of a statue in memory of the imperialist Cecil Rhodes the protests soon escalated into a wider critique of the Eurocentric nature of the curriculum. The *#RhodesMustFall* protests spawned similar campaigns at universities in South Africa, the UK, the US and elsewhere under the theme of *#WhyismyCurriculumWhite*? The protests ran parallel to a sister campaign entitled *#Fees Must Fall*[7]. Debates about decolonising the university have been given further impetus through the Black Lives Matter protests that started in 2016 in the US and that have spread to other countries in the global North, most recently in the context of the police killing of George Floyd. In India they have resonated with demands to introduce Dalit studies as a response to the silencing of issues to do with caste in the existing curriculum (Rege 2007). The construction of national imaginaries in the diverse societies of South Asia has the potential to provide new discourses to educational reform; going beyond the abstract goals set by disconnected international experts and the institutional processes they represent (Batra 2019).

More recently, demands to decolonise the curriculum have been informed by the work of scholars such as de Sousa Santos (2007, 2012, 2017), Mbembe (2005; 2016), Dei (2006; 2017) Maldonado-Torres (2007), Ndlovu-Gatsheni (2013, 2015), Comoroff and Comoroff (2011), Connell (2007, 2012, 2014) and others. In the case of Santos and Mbembe the emphasis has focused on a critique of the assumption at the heart of Western knowledge and Western science, in particular, that it represents a universalising truth. For these authors, despite its claims to objectivity, Western science since the

based around a whole systems approach to sustainability that encompasses social, worldview, ecological and economic factors.

[7] Whilst the *Rhodes Must Fall* and *Why is My Curriculum White?* protests focused on issues of representation in the curriculum, the Fees Must Fall protests rather took aim at another issue perceived by students as preventing the access of disadvantaged learners to HE, namely the imposition of tuition fees. Critical accounts of these student protests have been provided elsewhere (e.g. Jansen 2018).

European enlightenment has been linked to European colonialism and the development of global markets. They also link the dominance of Western knowledge to the marketisation of education and the commodification of knowledge which they argue detracts from the role of the university in promoting critical, independent thought (Santos 2017; Mbembe 2016). This has led in Santos' terms to the 'epistemicide' of non-Western cultures. For Santos, decolonising the curriculum entails bringing the disciplines as enshrined in the university curriculum into conversation through forms of knowledge production with grass roots movements and with indigenous knowledge.

For Santos, the aim is to develop a 'pluriversity' based on a recognition of multiple ways of 'knowing' the world that can benefit social and environmental justice. For Mbembe, a key goal must be to challenge the very basis of Western humanism itself which he claims lies in the separation of subject from object, nature from culture and human beings from other species. Rather, 'a new understanding of ontology, epistemology, ethics and politics has to be achieved. It can only be achieved by overcoming anthropocentrism and humanism, the split between nature and culture' (42). For both Santos and Mbembe, this involves a more fundamental shift in the way that the role of the university is perceived. For Santos it involves protecting the idea of the university as a public good. For Mbembe and Dei, it means developing diasporic intellectual networks that can transform the curriculum to reflect the experiences of Africans in Africa and in the diaspora. It also means engaging with and challenging new configurations of racism and in particular 'to explore the emerging nexus between biology, genes, technologies and their articulations with new forms of human destitution' (44).

For Maldonado-Torres and Ndlovu-Gatsheni, decolonising the curriculum is part of a wider project of 'decoloniality' which implies 'the dismantling of relations of power and conceptions of knowledge that foment the reproduction of racial, gender, and geo-political hierarchies that came into being or found new and more powerful forms of expression in the modern/colonial world' (117). For Connell, decolonisation is linked to the recovery of Southern theory, i.e. a renewed focus on the scholarly works of non-western scholars. In her book *Southern Theory* (Connell 2007), she draws attention to the depth and breadth of non-Western scholarship that she claims has been subsumed by the hegemony of Western knowledge. In a more recent publication, Connell (Connell 2012) has linked ideas about decolonising the curriculum to a wider concept of a 'just curriculum'. She argues that curricula justice entails:

> *a curriculum organized around the experience, culture and needs of the least advantaged members of the society – rather than the most advantaged, as things stand now. Socially just curriculum will draw extensively on indigenous knowledge, working- class experience, women's experience, immigrant cultures, multiple languages, and so on; aiming for richness rather than testability (682).*

Decolonising perspectives have a potentially significant role to play in TESF. They provide on the one hand a context for considering how global agendas including the SDGs themselves, continue to be shaped through the predominance since colonial times of Western ways of thinking about and interpreting the world. Through providing a trenchant critique of Eurocentricism in education, they also offer possibilities for thinking about the potential for non-Western, indigenous knowledge systems for contributing to understanding of the role of education in relation to ESD. Incorporating indigenous knowledge into the curriculum and indeed seeking to include indigenous voices and perspectives in the research process raises particular challenges for TESF given the extent to which these have been historically undermined. Some of these challenges are discussed in accompanying background papers on inequalities (Batra Forthcoming 2020) and on research methodology (Sprague Forthcoming 2020).

Futures-oriented approaches

Recent inter-disciplinary work on educational futures also provides a promising lens through which to conceive ESD that is in line with our vision of sustainable futures outlined in the introduction. The emerging field of educational futures studies, for example, combines and interrogates the fields of Anticipation Studies (Poli 2017; Poli 2019), temporality studies (e.g. Bastian, 2019 sociology of the future [in particular Adam and Groves 2007]) as well as the nascent concept of Futures Literacy (Miller 2018). It proposes a critical examination of the ideas and orientations to the future within which education is positioned (e.g. Facer 2013) and argues that core underpinning assumptions about temporality are central to locking-in particular assumptions about the role of education. It draws on decolonial critiques that challenge the anchoring of education within the teleological temporality of coloniality-modernity (Facer and Sriprakash under review). And it problematises the instrumental orientation of education towards (assumed) known futures. Amsler and Facer (2017) call for education to become a site of critical anticipatory practice:

> *liberating the future from the enclosures of capitalism and from the epistemological grip of the anticipatory regime is not a matter of identifying existing possibilities that can be successfully predicted given what is already known, but an experimental process of generating and enlarging the space of possibility itself through practices of critical, disobedient anticipation. (Amsler and Facer, 2017: 12-13)*

Scholarship on education futures has also informed recent global initiatives. For example, the UNESCO Futures of Education Initiative that seeks to build on the long history of UNESCO's leadership of debates about global education aims and goals. It explicitly references the original Faure Report (1972) *Learning to Be,* and the later Delors Report which produced the Four Pillars of Learning. This initiative aims to take a much more collaborative and participatory approach to the processes of generating normative visions for educational futures at a global level and is arguably the first to take a decolonising perspective, recognising the limits of knowledge produced through global institutions. The work will not report until 2021, but we can expect an agenda that more explicitly interrogates the tensions between economic growth, privatisation of education, the role of digital and online learning and a wider commitment to the common good and to environmental sustainability. Given the overlaps with many of the ideas discussed in previous sections, the existence of this (and similar) initiatives is potentially significant for

TESF both as a source of learning and as a potential platform that TESF research can feed into.

A subsection of educational futures work focuses specifically on education in relation to futures associated with climate change. This work draws on traditions of environmental education (see above) combined with decolonial education (in particular Jimmy, Andreotti, and Stein 2020) and educational futures. It also draws in work in Science and Technology Studies (Latour 2015), Environmental Humanities (e.g. Ghosh 2017) and cultural geography (Hulme 2011; O'Brien and Leichenko 2019) amongst others. It argues that educational institutions are key actors in the shaping of sustainable or unsustainable futures at multiple levels. This perspective argues for changes at four levels:

- at the level of the *conception of the individual,* moving away from educating a future 'homo economicus' (the rational autonomous future worker/consumer) to instead educating for humans who are interdependent with each other and with the other beings of the planet;
- at the level of the *worldviews* that underpin education – shifting towards epistemic diversity and interdisciplinarity and away from epistemic monocultures and atomisation;
- at the level of the *political and economic practices* that the institution sustains – recognising the potential for education institutions to take a lead in creating sustainable local economies (following the emergence of new economic thinking from scholars such as Kate Raworth and the examples of initiatives such as the CommonWealth programme[8]);
- and at the *material level* – recognising the impact of the material activities of the institution (e.g. physical infrastructure, transport, consumption processes) in the process of creating sustainable futures (Facer 2019). This work on education for sustainable futures argues that education is not to be seen as in service of one knowable future (either of climate change or continued economic growth) but as a practice that actively creates encounters between humanity's diverse knowledge traditions to care for the ongoing capacity to create emergent and open futures.

Towards an Initial definition of Education for Sustainable Development

Based on the above discussion, we offer an initial definition of ESD as

> ***access to a good quality education for all that can facilitate existing and future generations of learners across the lifespan, in formal and informal settings, to realise the rights, freedoms and capabilities they require to live the lives they have reason to value and to protect and co-evolve in a more harmonious relationship with the natural environment of which human beings are an integral part so that natural and social systems may flourish.***

[8] https://www.thealternative.org.uk/dailyalternative/cleveland-model-democracy-collaborative

The meaning of transformative change

A key goal of TESF is to develop impactful research that can assist in transforming education systems so that they can contribute to SD. The aim of this section is to critically consider what is meant by the idea of an education system and by the notion of transformative change. The section commences with discussion of the idea of 'just transitions' that provides an overarching framework for considering the possibilities for transforming economic, social and environmental systems. Attention will then turn to a consideration of what we mean by education systems in the context of TESF research. Here the discussion is informed by a view of complex systems which provides a way of conceiving education systems in terms of complex systems and the nature of change. System change is then considered at three inter-related scales – that of the entire system, that of the institution and that of the pedagogical space.

What do we mean by education systems?

Education systems are often equated with the formal education system of schools, colleges and universities. They are often presented in terms of a chart or a diagram that shows how the different institutions relate to each other and are governed. This often results in a limited view of education and training systems. It is more helpful, however, to think of education systems as embracing not only formal institutions but informal education that takes place across a number of contexts including homes, communities, in civil society organisations and in social movements. This is especially important when we think of lifelong learning which occurs across a number of formal and informal contexts during the lifespan. It is also important in the context of ESD to consider how formal and informal settings such as the home, community and natural environment are mutually implicated in sustainable learning. Understood as a complex system, education can be seen to be made up of many inter-related parts. It operates at a number of scales. Thus, one can conceive of the entire education system in one country as well as sub-systems such as those associated with formal schooling, technical and vocational and higher education as well as systems of community-focused social learning outside of formal institutions.

Complexity thinking

Complexity theory has its origins in the natural sciences where it has been applied to a wide variety of disciplinary fields including neuroscience, ecology, epidemiology, computer science and the study of physical phenomena such as turbulent fluids, gravitational systems in space as well as to the intricacies of living cells (Capra 2005; Waldrop 1992; Cairney 2012; Geyer and Cairney 2015). Complexity theory has, however, become increasingly influential within the social sciences (Byrne and Callaghan 2014; Elliot 2013). The attraction lies partly in the extent to which it draws attention to phenomena or behaviours that pertain at a system level and arise

from the interaction between elements within a system. For some social scientists, the attraction also lies in the understanding of systems as being in a state of constant flux and change which has been used to challenge determinism and positivism in the social sciences (Byrne and Callaghan 2014). Given its ability to span disciplines it seems ideally suited to the study of SD and ESD which is inherently concerned with the co-evolution of complex environmental, economic, social and cultural systems (Sachs 2015). In this respect, complexity theory is best considered as an overall approach rather than as a general theory of education with predictive qualities. As such it is intended to complement rather than to replace other theoretical perspectives (Snyder 2013). It provides a vocabulary and a way of conceiving at a general level, the nature of complex reality and system change.

Complex systems

Education can be understood as an example of a complex system. Drawing in particular on Cairney's (2012) and Walby's (2009) work, Tikly (2020) has summarised the characteristics of complex systems as being self-organising and involving the interaction of inter-related parts. An education system, for example, comprises different sub-sectors including schooling, technical and vocational education and training, adult basic and informal learning, higher education, teacher education etc. as well as different functions such as curriculum and assessment. Complex systems undergo processes of complex change. However, rather than change being linear (I.e. where one action leads to another in a predictable way) change is usually non-linear and characterised by positive and negative feedback loops. This means that small actions such as a successful curriculum innovation or a student protest can sometimes lead to large scale system change and conversely, large actions such as whole scale curriculum reform can end up have modest effects on their intended outcomes, for example, if they are not implemented in a way that recognises the complex dynamics of education systems and the need for systemic approaches to change (see below). Education systems, like other complex systems often exhibit path dependency, i.e. a relatively long period of dynamic equilibrium in which the fundamental characteristics of the system stay the same. For example, many of the inequalities including those based on class, race, ethnicity, gender, disability etc that we witness in the education systems of India, Rwanda, South Africa and Somalia have remained entrenched in education systems as they have evolved since colonial times as have other aspects of the four systems. Systems may also experience 'tipping points' for example as a consequence of a major economic or political change or as a consequence of the build-up of smaller scale incremental change. Complex systems also exhibit 'emergence', or behaviour that evolves from the interaction between elements. In this respect, education systems emerge and develop through interaction with wider economic, political, cultural and environmental systems. Human agency is also an emergent quality that is both shaped by the constraints provided by these wider systems but also has the capacity to shape these in turn, for example through forms of collective action.

In keeping with ideas of complexity, ESD is seen to be emergent from the wider systems in which it co-evolves. In the diagrams below, for example and with reference to the discussion in previous sections, education systems can be seen to have developed in relation to wider processes of unsustainable development.

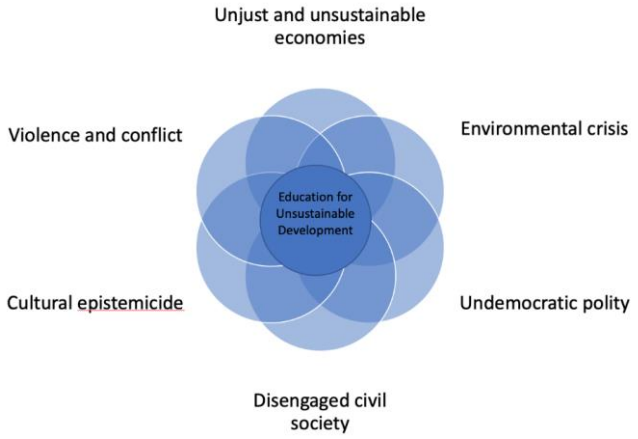

Figure 3: Education for unsustainable development Source: (Tikly 2019)

Conversely, through human agency and processes of transformative change (below), education can also play a role in supporting sustainable development as is indicated in Figure 4.

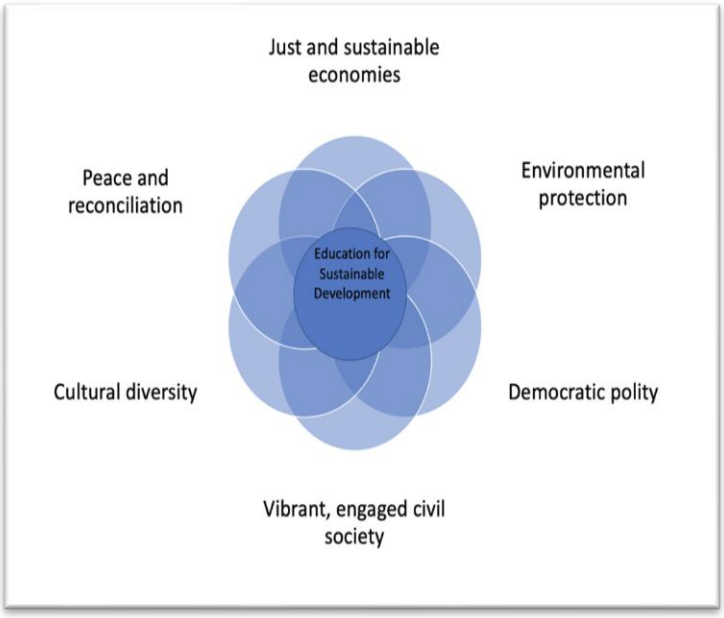

Figure 4: Education for sustainable development Source: (Tikly 2019)

In conceptualising SD and ESD it is also important to take account of different kinds of inequality that cut across each of the systems represented above including those based on class, caste, race, ethnicity, gender, urban/ rural location and disability. These have their basis in unequal power relations since colonial times. At a global scale there are inequalities in the power and influence of different governments to influence global institutions and agendas with countries in the global South often being steered towards specific policies through processes of internationalisation and policy borrowing. At a national level resources and opportunities are skewed towards more powerful groups, the rights and identities of

some groups are not fully recognized and/ or may be subject to violence and forms of persecution and the voices of powerful groups predominate in debates about policy.

Just transitions

A useful way of conceiving the process of transformation that accords both with complexity thinking and with the earlier definition of ESD is in terms of 'just transitions'. A fuller account of this term is provided in the background paper on skills for sustainable livelihoods (McGrath 2020) and in the work by Rosenberg, Ramsarup and Lotz-Sisitka (2020). Importantly, just transitions develops the concept of socio-technical transitions further in the sustainability sciences. The term is, however, not without its own complexities, and within the just transitions literature there is a differentiating and critique of the appropriation of just transitions discourse i.e. theory with little practice. Swilling (2020)'s work is seeking out the scope and framing of 'deep transitions' within a social justice trajectory. He defines a just transition as

> *a process of increasingly radical incremental changes that accumulate over time in the actually emergent transformed world envisaged by the SDGs and sustainability. The outcome is a state of well-being founded on greater environmental sustainability and social justice (including the eradication of poverty). These changes arise from a vast multiplicity of struggles, each with their own context-specific temporal and spatial dimensions. (Swilling 2020: 7)*

The above definition resonates with the view of social and environmental justice outlined in previous sections as the goal of just transitions as well as to Amsler and Facer's (2017) idea of radical anticipation mentioned above. It also draws attention, however, to the structural and discursive barriers to transition alluded to in the discussion of global justice above. In this respect such changes are not in the short-term interests of the powerful and there are considerable dangers that either or both justice and transition will be resisted or subverted. In considering how vested interests may be overcome Scoones (2016) argues that realising change can be technology, market, state or citizen-led. Following Fraser (2005, 2013) argues that what is needed is an emancipatory "triple movement" (Fraser 2013: 119) to connect a politics of redistribution (highlighting inequalities of resources across groups) with a politics of recognition (focused on issues of identity and identification), and a politics of representation (with its questions of community, belonging, and citizenship).

Transformative change at a system level

In complexity thinking, distinctions are made between simple, complicated, complex and chaotic systems (Patton 2011: chapt 4). In a simple system there is a direct link between cause and effect with relatively few elements involved, which makes control relatively easy. In a complicated system, there is still a direct link between cause and effect but with a large number of elements present. Complicated systems can be controlled predictably with enough information and coordination. Complex systems 'comprise many moving parts that interact with one another and change together, triggering outcomes that cannot be precisely controlled or predicted.' (Ang 2016, : 10). As a result, the aim must be to influence the general direction of outcomes. Although this influence can be regarded as a more modest goal than control, the change induced can be pervasive and large in scale. Finally, there are chaotic systems, where no meaningful cause and effect relationship can be discerned; where even influence, never mind control, is unachievable. With such systems the best course of action is avoidance or attempting to cope where avoidance is not possible. Transforming education systems to contribute to sustainable development will involve engaging with simple, complicated and complex systems, while seeking to avoid or cope with any contact with chaotic systems.

In this paper we have explored numerous perspectives on aspects of transforming education and sustainable development. The fact that there are so many perspectives, with unresolved debates back and forth over decades, is a sign that we are engaged with a 'wicked problem'. The notion of wicked problems (Rittel and Webber 1973) is usually defined as one with no consensus on the nature or causes of the problem; no consensus on the range of interventions or best interventions; a high degree of uncertainty of the impact of interventions; and no prospect of the problem ever being fully resolved. In the original formulation by systems analysts Rittel and Webber (1973), all problems of social policy are wicked problems (Conklin 2006; Ramalingam 2013). What have been called wicked problems are best addressed by the kinds of approach used to address other complex problems. For a complicated problem, a linear approach can be adopted, which involves identifying a problem, working out how to solve it and then implementing the solution. A complex problem requires a non-linear, iterative approach of problem-definition, initial effort at problem-solving, identifying progress and opportunities for progress and redefining the problem. In our list of the characteristics of wicked problems, we draw on Rittel and Webber but also rephrase the points. For example, we refer to 'interventions' rather than 'solutions', as extremely complex problems are not solvable.

Tikly (2010) has outlined an overall approach to realising complex change in low-income, postcolonial settings that build on the idea of the triple movement outlined above and takes account of complexity. On the one hand, he argues the need to develop a broad coalition for change across the state and civil society. This must include clearly articulating the causes of unsustainable development and of the learning crisis. Drawing on Gramsci's (1992) idea of hegemony (intellectual and moral leadership), he argues the important role that organic intellectuals (i.e. leaders of social movements with an interest in transformative change) as well as more traditional intellectuals (including, for example, educators and researchers at different levels of the education and training system and policy makers etc.) have in articulating an alternative vision of SD and ESD. On the other hand, he argues the need for transforming education systems themselves in order to realise ESD. This, he suggests involves several inter-related elements including the importance of a system-wide response; developing system leadership at all levels of the education and training system (broadly conceived); investing in the transformative agency of educators; democratising the governance of education and training; and, developing learning systems, i.e. systems that are able

to use different kinds of evidence including from practitioner-led action research to realise the kinds of radical incremental changes hinted at by Swilling (above). Importantly, for countries such as the four countries we are working across, this involves moving out of the dependency trap created by conditional lending on the part of powerful, Western states and linking educational transformation to wider struggles for social and environmental justice.

Transformative change at the institutional level

It is also possible to conceive of institutions as complex systems with inter-related parts. Wals and Benavot (2017) argue for creating institutions where policies, operations, contents and practices work together in an integrated fashion although they accept this is challenging. Among the most promising approaches they argue is the 'whole school' or 'whole institution' approach in which institutions make concurrent changes to curriculum, extracurricular activities, teacher training, human resources and infrastructure operations and processes (see also Mcmillin and Dyball 2009). In Figure 5, a whole institution approach to sustainability is illustrated.

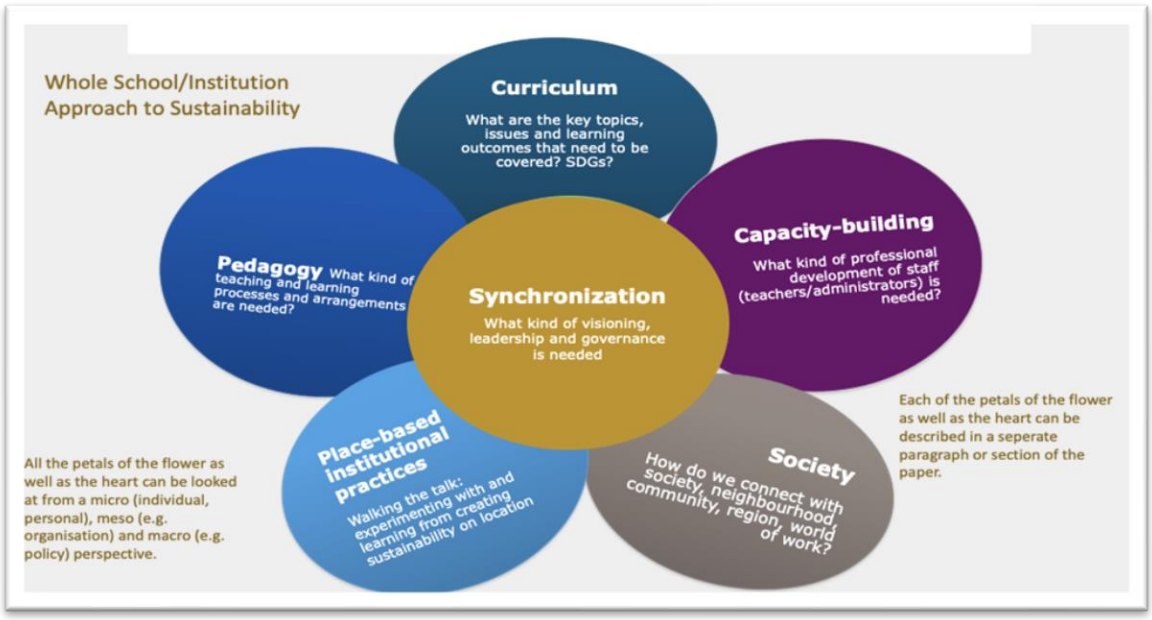

Figure 5: A whole school/institutional approach as applied to sustainability Source: (Wals 2019)

In addition to rethinking curricula (are emerging subjects and concepts covered and new competencies being taught?), the 'whole institution' approach implies reconsidering and redesigning the institutions' operations and environmental management (does the institution conserve water and energy, provide healthy food, minimise waste and provide green and healthy school grounds?), pedagogy and learning (are teaching, learning and participation in decision-making adequate and appropriate?) and community relationships (does the institution connect with community issues and resources?). The model is developed from work undertaken by Wals and others over many years and can be seen to bring together many elements of successful practice in institutional change for sustainability. As such it provides a useful starting point for further research undertaken within TESF that is interested in the dynamics of institutional change.

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Transformative change at the pedagogical level

The third scale at which transformation can be perceived to take place is that of the pedagogical space (whether this be a formal classroom or lecture theatre or a more informal setting in the community or even under a tree). A useful starting point for discussion is provided by Wals (2019) in his concept of sustainability-oriented ecologies of learning – a concept that resonates with the idea of complex systems outlined above. It is a useful concept for TESF because it is also provides a basis for thinking in transdisciplinary terms about how different stakeholders can be brought together within an ecology of learning to undertake processes of mutual learning, capacity mobilisation and change. In this respect, learning ecologies can be described as temporary, configurations or arrangements between different groups in society that are in each other's vicinity, but usually do not see a need or a possibility to work together, as they are locked up in their own worlds and locked-in in a particular way of seeing the world. Linking them through a common sustainability challenge and building mutual trust and social cohesion, they can become more connected and unlock new possibilities (Wals 2019).

Educationally speaking, 'ecologies of learning' call for an underlying pedagogy that is: relational (allowing for, caring for and connecting with people, places, other species, etc.), critical (allowing for critique and questioning), 'actional' (allowing for agency and creating change), ethical (opening up spaces for ethical considerations and moral dilemmas) and political (confrontational, transgressive and disruptive of routines, systems and structures when deemed appropriate). Figure 6 tries to capture this dynamic learning space by distinguishing and connecting the different elements constituting an ecology of learning. The rich picture still does not do justice to its complexity and should be regarded as a conversation starter, rather than as a definitive model.

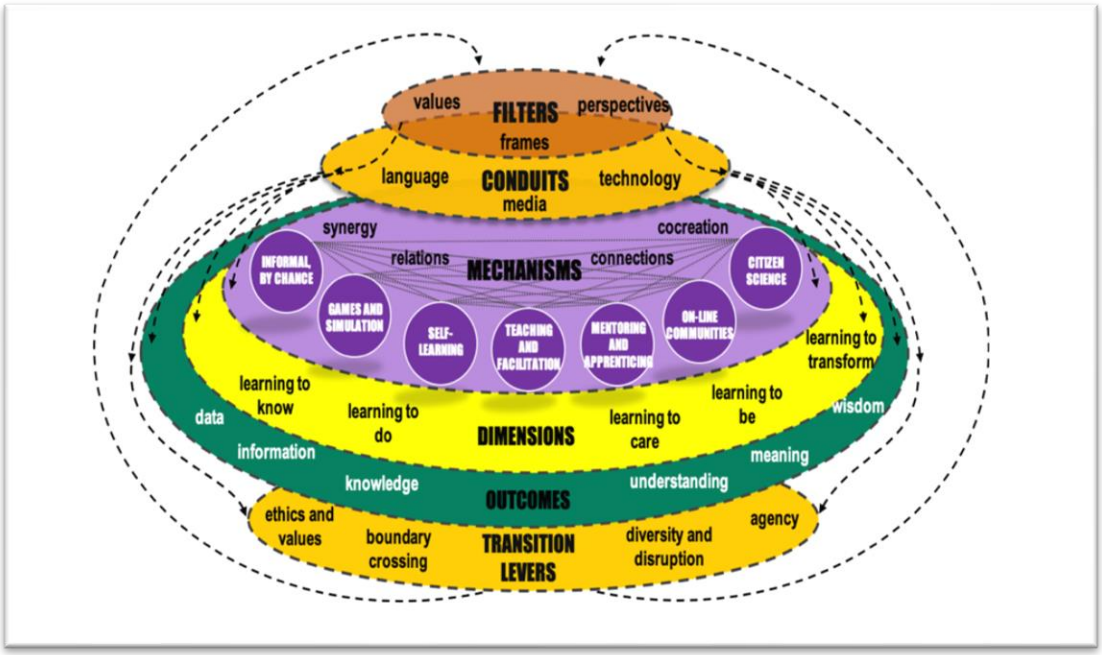

Figure 6: Ecologies of learning (Source: Wals 2019)

The need for more radical forms of learning-centred transformation is increasingly recognised in transformations to sustainability discourse. Yet these approaches to learning still remain under-developed and undertheorized and limited research has been done on this type of learning, or on how such learning emerges or can be expanded to strengthen agency for sustainability transformations at multi-levels. In the international T-learning (Transformative, Transgressive Learning) research programme established to explore this type of learning, researchers found the need for a wider range of pedagogical processes and tools, and recognition of learning as a

process of learning *what is not yet there* (Lotz-Sisitka et al. 2015; Engestrom 2016; Lotz-Sisitka 2019). One important insight on T-learning processes was that no one pedagogical method represents a process of T-learning. Instead, T-learning processes are *deeply embedded and embodied social-sustainability learning processes that emerged via reflexive and ongoing transgressive co-engagements with matters of concern in the company of others over time*.

A feature of the T-learning processes and methodologies developed in this research programme was their capability for *network building and relationality*, as well as *critique, de-coloniality* and challenging the status quo, while also enabling *emergence of desired alternatives as 'transgressive moves'*, ultimately critiquing the very notion of 'methodology' (Lotz-Sisitka 2019) (Kulundu-Bolus 2020). In all cases, researchers recognized that this work *requires deep levels of engagement and critique, recognition of diversity, ethics and empathy, AND willingness to co-engage in ongoing processes of reflexivity and transgressive change* (spiraling reflexivity) with deconstruction of the status quo being a foundation for building alternative praxis and change, with emphasis on the processes that enable the latter to emerge (McGarry, 2014; Macintryre, 2020). The *decolonial dialectic of absence and emergence* (Bhaskar 2008; de Sousa Santos 2007; Lotz-Sisitka et al. 2016) was a key feature of the methodologies, as was *collective agency formation*, in *pluralist, multi-actor* epistemic environments, where *the possibility for transgression* of 'norms' or 'normalised praxis' at epistemic and ontological levels, was always possible (Lotz-Sisitka et al. 2017; Lotz-Sisitka 2019) (Macintyre, 2020). These models of pedagogical transformation are potentially highly relevant for TESF in that they engage with the issues of diversity and decoloniality. They point not only to how transformative (and transgressive) pedagogy may be framed in research terms but also to processes of reflexivity and learning that have a wider resonance for how we aspire to learn as a Network Plus. Some of these aspects are explored in greater depth in the accompanying background paper on network learning and capacity mobilisation (Mitchell et al Forthcoming).

Conclusion

The aim of this extended background paper has been to set out in broad terms some of our initial ideas as a Network Plus. To reiterate what was said in the introduction, these ideas and definitions are emergent and therefore provisional. As such, it is hoped that the paper will serve as a useful resource not only for those applying for plus funded projects but also for those involved in developing and synthesizing the research going forward. In this sense the paper should be seen as a springboard and one point of departure for the journey on which we are about to embark.

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The TESF Background Paper Series sets out some of our foundational concepts for the work of the Network Plus and informs our forthcoming call for proposals. In many cases, these Background Papers have grown out of our shorter Briefing Note series. This work collectively informs future outputs to help us trace learning throughout the TESF lifecycle. You can follow this trajectory by visiting our Resources page for additional Background Papers and other writing from Network Plus.

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Contact Leon.Tikly@Bristol.ac.uk

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TE|SF

TESF is a GCRF funded Network Plus, co-ordinated out of the University of Bristol, working with partners in India, Rwanda, Somalia/Somaliland, South Africa the United Kingdom and the Netherlands.
We undertake collaborative research to Transform Education for Sustainable Futures.

TESF partner institutions are:
Indian Institute for Human Settlements
Rhodes University
Transparency Solutions
University of Bristol
University of Nottingham
University of Rwanda
Wageningen University

www.tesf.network
info@tesf.network
@TransformingESF

The Author Team
Leon Tikly, Vitalie Duporge, Eric Herring, Rafael Mitchell, Terra Sprague University of Bristol
Poonam Batra University of Delhi
Keri Facer Uppsala University
Heila Lotz-Sisitka Rhodes University
Simon McGrath University of Nottingham
Arjen Wals Wageningen University