EVIDENCE REPORT
No 152

Policy Anticipation, Response and Evaluation

Accelerating Sustainability: Why Political Economy Matters

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September 2015

The IDS programme on Strengthening Evidence-based Policy works across seven key themes. Each theme works with partner institutions to co-construct policy-relevant knowledge and engage in policy-influencing processes. This material has been developed under the Policy Anticipation, Response and Evaluation theme.

Ian Scoones' time was co-funded by the ESRC STEPS Centre (ES/I021620/1).

The material has been funded by UK aid from the UK Government, however the views expressed do not necessarily reflect the UK Government's official policies.

AG Level 2 Output ID: 552

ACCELERATING SUSTAINABILITY: WHY POLITICAL ECONOMY MATTERS

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September 2015

First published by the Institute of Development Studies in September 2015

Content

Summary

Accelerating sustainability is a challenge that defines our era and is a central theme of Institute of Development Studies (IDS) research. This paper brings together what we can learn from development studies and from sustainability studies to understand this challenge and move forward.

Our starting point is that sustainability is a problem of success resulting from the reduction of poverty and increasing prosperity of ever more people. Understanding where, how and why such rises in living standard occurred was a central concern of IDS in its first 50 years. We argue that this development era of IDS needs to give way to a sustainability era for the next 50 years in which accelerating sustainability is the central concern. This paper spells out what this means in six steps:

1. It brings together what development studies contributes to understanding the conditions for accelerating sustainability.
2. It identifies four narratives on sustainability transformations: technology-led, market-led, state-led and citizen-led.

Based on these overviews, which draw together a wide range of literature, the paper then focuses on three questions.

3. Is purposeful acceleration of sustainability transformations possible?
4. Who drives the transformations – and who holds them back?
5. Do environmental sustainability and social justice reinforce each other? If so, under what political conditions?

The final section concludes that there is no motorway into the green future and that multiple politically negotiated pathways exist. It proposes an agenda for research and action that is centred on:

6. A political economy approach that is historically informed and comparative; unpacks the public, private and civic sectors; addresses explicitly dynamics and timescales; and respects context specificity – a key lesson from development studies.

The authors

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Acknowledgements

This paper draws on the work of many colleagues. A large part of the argument and evidence for this paper was developed in the course of workshops during 2013–14 that led to the book *The Politics of Green Transformations* (Scoones, Leach and Newell 2015). These discussions, led by the Social, Technological and Environmental Pathways to Sustainability (STEPS) Centre (which joins researchers from IDS, Science Policy Research Unit and Global Studies – all at the University of Sussex), have continued, convened by Professor Peter Newell from the School of Global Studies. Ideas generated collectively have inevitably found their way into this piece, given that both authors have been centrally part of these conversations. It is an ongoing dialogue and part of the renewal of the STEPS Centre agenda.

This paper is also a contribution to IDS strategic thinking and celebrations of the 50th anniversary of the founding of the Institute of Development Studies at Sussex. With such a vast canvas, we have necessarily been highly selective in our coverage and referencing, focusing on an attempt to generate a new agenda for research and action.

For assistance with digging out historical data, we would like to thank Justin Flynn. We would also like to thank John Gaventa, Melissa Leach, Peter Newell and Andy Stirling for comments on an earlier version of this paper.

Abbreviations

FAOSTAT	Food and Agriculture Organization of the United Nations Statistics Division
IDS	Institute of Development Studies
IPCC	Intergovernmental Panel on Climate Change
LGBT	lesbian, gay, bisexual and transgender
NGO	non-governmental organisation
PV	photovoltaic
SPRU	Science Policy Research Unit
STEPS	Social, Technological and Environmental Pathways to Sustainability
UN	United Nations
UNEP	United Nations Environment Programme
UN DESA	United Nations Department of Economic and Social Affairs
UN REDD	United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation
US	United States
WGBU	German Advisory Council on Global Change

1 Introduction

The world faces many development challenges. Banishing poverty, curbing inequality and overcoming violent conflict are enduring challenges for humanity, and have been central to the development agenda over the past 50 years. There is, however, one challenge that is more recent and deserves priority attention; this is the challenge of environmental sustainability. In this paper, we argue that the development era of the past 50 years must give way to a sustainability era for the next 50 years, where sustainability and development are woven together. Given our growing understanding of patterns of environmental change and earth systems dynamics, particularly around climate change, there is an urgency in addressing sustainability, and ensuring that transformations facilitated by development efforts are transformations towards sustainability. The urgency of the challenge means too that such changes must be accelerated. A core part of the answer to the challenge, and one that development studies is well placed to take on, is the need to take political economy – in addition to technology, markets, and so on – seriously, and understand how such political economies are rooted in highly diverse and fast-changing contexts.

Fifty years ago the world's human population was 3.4 billion people (UN DESA 2012). In 1970, 60.1 per cent of people were deemed to live below the poverty line (living with less than US$2/day, 1985 constant US$) (Bourguignon and Morrisson 2002: 732), and the proportion of people living in urban areas was 36 per cent (World Bank 2015a). The total world gross domestic product (GDP) was US$2.13tn (current US$) (World Bank 2015b), mostly concentrated in 'Northern', industrialised countries. Climate change, biodiversity loss and ocean level rise were not major global issues. As expressed by Dudley Seers, the first Director of the Institute of Development Studies (IDS) at Sussex, the challenge for development in the late 1960s was seen to be above all: 'understanding the causes of poverty, and the mechanisms by which unemployment emerges and inequalities grow, as a basis for genuine development plans' (Seers 1969: 9).

Today the world's human population is 7.3 billion people, expected to rise to 9.5 billion people by 2050 (UN DESA 2012). Carbon dioxide (CO_2) emissions have risen from 11,827 $MtCO_2$ (megatonnes of CO_2) in 1966 to 36,131 $MtCO_2$ in 2013 (Global Carbon Atlas 2015; World Resources Institute 2015), with the largest emitters being China, the United States (US) and India today. At the same time, poverty has declined dramatically, but is also distributed in different ways (Sumner 2010), with stark inequalities emerging as some become richer, while many remain poor (Fuentes-Nieva and Galasso 2014). Some countries – the 'emerging economies' of Asia and Latin America, but also increasingly Africa – have seen dramatic growth in economic activity, resulting in big reductions of absolute poverty and increasing material prosperity for many. In this sense, sustainability can be seen as a problem of success. The gains in living standards resulted in massive demand for resources, and shifts in patterns of urbanisation, the location of pollution burdens, and land use change. Rising carbon emissions and pollution of water and air endanger human life in many regions. In particular the growth in demand from an increasingly rich, urban middle class has created a huge pressure on the planet in ways that would have been unimaginable 50 years ago.

A focus on environment-development issues emerged in the 1970s, especially around the United Nations Stockholm Conference,[1] but it is in recent years in particular that issues of environmental sustainability have attracted enormous research and policy attention. Earth system science, climate science, environmental studies, ecological modelling and other

[1] See: www.unep.org/Documents.Multilingual/Default.asp?documentid=97&articleid=1503 (accessed 24 September 2015).

technical disciplines have emerged to address the big questions of global environmental change. Most recently, environmental scientists have come together to define a set of 'planetary boundaries', and have provided evidence on what has been transgressed (Rockström *et al.* 2009; Steffen *et al.* 2015). The evocative plea has been to create a 'safe space for humanity' through the respecting of what in a previous generation was termed 'the limits to growth' (Meadows *et al.* 1972). As a result of the explosion in scientific understanding, we know a good deal about the array of problems and their causes. In important respects, *we know what the problems are and where we need to get to. But we know much less about how to get there.* Despite the growth in global environmental agreements, conventions and institutions for environmental governance – from the United Nations Environment Programme (UNEP) to the United Nations Conferences on Environment and Development, to the Conventions on Biodiversity, Desertification and Climate Change, alongside scientific processes such as the Intergovernmental Panel on Climate Change (IPCC) – we know remarkably little about how to get from dangerous to safe situations, and the political, institutional, social and economic requirements for such journeys. We call these journeys sustainability transformations, and we argue that, given the pressing challenges, they need to be accelerated.

1.1 Questions and structure

In this paper we ask what can we learn from existing experiences and diverse literatures on three key questions:

1. Is it possible to accelerate transformations to sustainability in a purposeful way?
2. Who drives sustainability transformations or holds them back?
3. Do sustainability transformations and social justice reinforce each other?

The paper is structured as follows. The remainder of this introduction sets out what sustainability is and asks how robust the case is for accelerating sustainability transformations. Section 2 sets out how sustainability can be integrated within development studies, and how development studies insights can contribute to sustainability thinking. There is a lot we can build on. The following sections then bring together what the sustainability debate offers for propelling us into the new era. This is done in several steps. Section 3 gives an overview of how sustainability issues have been framed and what narratives have been constructed around problems and solutions. In order to do this it distinguishes between four types of transformation: technology-led, market-led, state-led and citizen-led. Section 4 asks the question too often side-stepped in the literature: is purposeful acceleration possible? Screening various strands of the transformations and transitions literature reinforces our argument that a political economy approach is vital. Section 5 pulls together the insights on who drives sustainability transformations – or holds them back – paying particular attention to the role of alliances between public, private and civic actors. Section 6 re-engages with a central issue in development studies: social justice. The question we address here is whether promoting green transformations and social justice reinforce each other, or whether there is a trade-off between the two? What does this mean for creating new pathways to sustainability? The final section lays out an agenda for research and action, emphasising the centrality of political economy analysis focused on rethinking development studies, policy and practice with a sustainability lens.

For us a political economy analysis emphasises how political power is constructed in relation to economic power, with economic and political relations influenced by relationships between classes, but also other axes of difference such as ethnicity, gender and race. Contradictions within political and economic systems, across scales, result in conflicts over meanings and outcomes, including around sustainability. Concentrations of capital, investment regimes and technologies – including different types of 'green' technology – will affect these dynamics as they influence relationships and the negotiation of different pathways. A structural analysis of

'concrete', historically-derived features is in turn informed by the 'multiple determinations' and dynamic processes and practices of people (cf. Marx in the *Grundrisse*, his treatise on method in political economy (1974)). In this way, political economy is not solely related to 'structure' in the absence of 'agency', but must continuously engage with the intersection of both (cf. 'structuration', Giddens 1984). Equally, political economy is not somehow separated from a deep analysis of the multiple dynamics of power (Acosta and Pettit 2013). In this sense our approach draws (very broadly, and mostly implicitly) from earlier traditions in political economy and political sociology, and rejects the narrow institutionalist and economistic versions centred on the analysis of incentives and economic and political behaviour, or the instrumentalist 'governance' and 'drivers of change' approaches favoured by international aid donors (see Hudson and Leftwich 2014 for an overview and critique) in favour of a more dynamic, historical analysis of the intersections of power, politics, economy and social difference in generating pathways to sustainability. It thus relates (again broadly) to the 'pathways to sustainability approach' of the Social, Technological and Environmental Pathways to Sustainability (STEPS) Centre (cf. Leach, Scoones and Stirling 2010), while bringing political economy more centrally into the picture.

1.2 Sustainability and development: what do we mean?

The most widely used definition of sustainable development is that used by the World Commission on Environment and Development (WCED), the Brundtland Commission: 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED 1987: 57–9).

Since the Stockholm conference of 1972, concerns around environmental sustainability have been raised on the international stage, but it was only in the late 1980s and at the second UN Conference in Rio in 1992 that environment and development really came together as a major global agenda. In the previous decades, alarms had been raised, from Rachel Carson's (1962) passionate call for the control of pesticide use in *Silent Spring*, to the Malthusian style arguments of the Club of Rome report, *Limits to Growth* (Meadows *et al.* 1972), Paul Ehrlich's dramatic scenarios in *The Population Bomb* (1968) and Barbara Ward and Rene Dubos' plea for looking after *Only One Earth* (1972). There were manifestos for transformation too, including the famous 'Blueprint for Survival' from *The Ecologist* magazine (1972), alongside a variety of pleas to change lifestyles and create new, environmentally-friendly economies and technologies (Dickson 1974; Schumacher 1975).

In this period, the Centre for Science and the Environment, the International Institute for Environment and Development, the World Resources Institute and the Worldwatch Institute, among others, were founded and led the way with research, analysis and action around environment-development issues. But their voices were often on the margins of mainstream development. IDS, for example, established an Environment Group only in 1990, in the build-up to the Rio Conference, and had largely ignored the environmental agenda in its first 25 years. Mainstream development was all about economic growth in the 'Third World' and its distributional challenges, particularly the need to reduce poverty.

Of course the concept of 'sustainability' has a much longer history than the post-Brundtland institutionalisation, and the creation of global institutions, networks and research outfits with agendas that have 'sustainable development' in their titles (Scoones 2007). The earliest scientific application was in the context of forest management in Germany, and the need to assure sustained yields through cutting regimes. Sustained yield and catch quotas in fisheries have long been part of policy applications of population biology. Emerging from these applied biosciences came the idea of sustainability – and more specifically, resilience – in the context of complex systems approaches to resource management (Holling 1973). Here sustainability got defined more precisely in terms of the ability to cope with shocks and stresses, returning to 'stable states' following perturbation. This ecological definition of

sustainability got incorporated later into such development-oriented fields as agroecosystems analysis (Conway 1985) and resilience studies (Folke *et al.* 2002; Walker and Salt 2006).

It has been from these lines of cross-disciplinary scientific study, rooted in earth systems and environmental sciences, especially those concerned with global-level system change, that the concept of 'planetary boundaries' has emerged. Nine boundaries are defined and, making use of the best scientific data available, assessments have been made of which boundaries have been crossed. The 2009 paper suggested that three had been transgressed, and several more were at risk (Rockström *et al.* 2009). The paper galvanised much attention and successfully put environmental and sustainability issues – in a broader way than just climate change – back on the agenda. The notion of a 'safe space for humanity' emphasised the importance of stewardship and balancing economic and social goals with environmental ones. In the build up to the Rio+20 conference in 2012, this served an important political purpose.

However, the concept of 'planetary boundaries', and the associated scientific underpinnings, has come in for some harsh critique too. Clearly there are many intersecting uncertainties, and the data on environmental processes and change are still poorly understood (Nordhaus, Schellenberger and Blomqvist 2012). Complex systems are just that, and simple statements about boundaries or limits do not always stand up to detailed scrutiny. Equally, some suggest that the planetary boundaries argument ignores politics, shuns democracy and implies a top-down, centrist approach to planetary management (Pielke 2013; Leach 2013). In the same way that there are critiques of many of the models around global climate change, and complaints about the IPCC's approach to generating evidence (Beck 2011; Beck *et al.* 2014), as well as the top-down approaches to climate change policy (Demeritt 2006; Hulme 2009; Castree *et al.* 2014), none of this denies (as some still continue to do) that climate change is occurring and needs tackling urgently. The issue is how, through what mechanisms, and with what checks and balances. The same applies to all planetary boundaries: the scientific argument for urgent action remains clear, but how to effect such change less so.

We must ask: what should be prioritised, where; what are the mechanisms for addressing the necessary change at a global scale; and how politically do we deal with the trade-offs between action on the environment and other societal goals of poverty reduction, equality, and social justice? For many it is this combination of the environmental, social and economic goals that makes up 'sustainability' in its comprehensive, rounded form (Leach *et al.* 2010). The challenge then is to seek pathways of change that meet multiple goals together, negotiating between biophysical constraints and social needs and rights (Leach, Raworth and Rockström 2013). It is not just a question of returning to some ideal 'stable state', as in the complex systems models of resilience and sustainability science, but a social and political process of deciding what states are acceptable and desirable. The meaning of 'green', and so sustainability, is inevitably highly contested, framed by different people in different ways (Leach 2015). The ideal of a green economy and society may look very different if you are poor and marginalised, from an ethnic minority, or as a man, woman, or younger or older person. Seeking 'just sustainabilities' (Agyeman, Bullard and Evans 2003; Swilling and Annecke 2012; Newell and Mulvaney 2013), in dynamic and differentiated socio-ecological contexts, is not straightforward. The political negotiation of what a sustainable society is requires the key ingredients of inclusivity, deliberation and democracy (Dobson 1998, 2000), but will look different in different parts of the world. Thus, the social and political negotiation of sustainability transformations will always be complex and contested, compounded by uncertainties, ambiguities and forms of ignorance (Stirling 2008) around patterns and trends in environmental change.

So while the urgency is accepted, and the need to accelerate transformations to sustainability clear, how this is done is less apparent. Urgency and acceleration to some may suggest speed: the need to rush, to cut corners if the world is to be saved. This is often the

impulse of those who see quick-fix, silver bullet solutions. The climate change challenge has created a number of these, as we discuss in more detail in later sections. There have been grandiose schemes for geoengineering the climate through massive technological interventions. There have been plans for mega-schemes for reforestation or desert 'greening'. And there have been apparently simple and elegant market-based solutions such as creating a market for carbon. All have been driven by the assumption that a top-down technological, managerial or market-based fix is all that is needed, and that if the plans are followed, as their designers suggest, then a quick solution will be realised that will offset the rising threat. To greater or lesser extents, these types of solution have failed. The uncertainties of the real world make the models and assumptions on which they are based fall apart. While there may be elements that make sense, the overall top-down rush to a solution usually unravels. Time and again we have failed to learn the lessons of such approaches' failure, and somehow when 'urgency' is ringing in our collective ears, the lessons are listened to less. This was the lesson from the first decades of sustainable development (Berkhout, Leach and Scoones 2003), and it remains the case today.

Most solutions to complex problems – and there are none more complex than sustainability – require a combination of hardware and software, where technology is linked in sensitive ways to local contexts and management capabilities, along with adaptive responses. Deep uncertainties, system indeterminacies and plain ignorance must be brought into the picture, and not reduced to risk that can be engineered or managed away. Debates about direction must be opened up, and challenge, dissent and dialogue must be central (Leach *et al.* 2010, 2012). And because solutions must work in particular cultural, social and political settings, they must be attuned and adapted to these local contexts, and negotiated within particular political cultures; and this is perhaps especially so at a global level, because solutions must operate across borders. All these factors do not remove the urgency of the problem, but suggest that a 'slow race' may be preferable – where often the slowest, most deliberate approach to getting things right wins out (Leach and Scoones 2006). It is therefore in this context that we advocate an urgent response and the need to accelerate transformations towards sustainability.

2 Perspectives from development studies: what can we learn for the sustainability era?

Contemporary challenges of sustainability are in many ways problems of remarkable development success. As we have already noted, economic growth in regions that once were demarcated as 'underdeveloped' or the 'Third World' has been impressive. In some parts of the world, levels of poverty have plummeted and wellbeing has improved for many. But this has come at a cost, as the demands on resources have grown proportionately, and are increasing. Growth paths have become unsustainable, as more energy is needed to fuel industrial activity and more materials are required to manufacture more goods. For example, China imported US$43.25bn worth of agricultural products in 2011 to feed its growing population of humans and animals (FAOSTAT 2015). China is the world's largest importer of timber, among other commodities (including illegal timber) (Bai *et al.* 2015; Environmental Investigation Agency 2012); it also imports 6.6m barrels of oil per day (surpassing the US and becoming the world's most important oil importer in 2014) (US Energy Information Administration 2014), and, despite being the world's largest extractor and producer of coal, it has also become the world's number one importer of coal as it can no longer satisfy its own demand, surpassing Japan with 182m metric tonnes of imported coal in 2011 (Tu and Johnson-Reiser 2012: 1). This coal is required to feed the 363 newly proposed coal-fired plants as of 2012, whose build rate is approximately one large plant per week (Koch 2014; Yang and Cui 2012: 5). Multiply this growth across the so-called 'developing world', then the future demands are enormous, and completely unsustainable.

If the last 50 years of development were about increasing opportunities through economic growth and reducing poverty, the next 50 years must be about ensuring such transformations are more sustainable. As debates about creating a new agreement on climate change have painfully shown, this raises difficult questions of global politics. Who is responsible for historical damage to the environment and climate, and who should pay for future transitions to more sustainable futures? And how should this be realised for maximum benefit – to ensure that no one is left behind and the benefits of development are widely shared, but also to ensure that future generations' prosperity is not compromised? These are massive challenges for development.

Yet some facets of development studies, as practised over the past 50 years, have some important things to say; while others point to pitfalls and dangers. A new sustainability agenda does not have to start from a blank slate. Of course not all aspects of what has been labelled as development studies are useful; many do not address the complex dynamics of transformation that we focus on here, for example. Some, as we argue below, may actually run counter to the argument for a radical, collective, political response to sustainability challenges, framed as they are within a top-down, modernist paradigm that has dominated some strands of development studies over the years. Development studies, and the practice of development with which it is associated, is far from uniform, and certainly has not spoken with a single voice. Here we suggest five themes that are associated with development studies – and indeed with other lines of cross-disciplinary enquiry committed to progressive change – that we believe we can build on, and so provide the conceptual and methodological foundations for the sustainability era.

2.1 Environment and resources

First, is the focus on environment and resources. While sustainability concerns were not centre-stage for much of the past 50 years' study of development, they have not been

completely absent. An analysis of resource access has of course been central to economic change. From Marxist notions of the metabolic rift (Moore 2011) to theories of comparative advantage in macroeconomic analysis (Barnett and Morse 1963), understanding resources has been central. Indeed, the politics of resource access – and considerations of 'scarcity' (Mehta 2010) – are at the core of the discipline of economics, defined as the 'science which studies human behaviour as a relationship between ends and scarce means which have alternative uses' (Robbins 1932: 15); and of course have informed debates in wider political economy from Malthus to Ricardo to Marx (Harvey 1974; Perelman 1979). Amartya Sen's theory of entitlements (Sen 1981) linked resource access to poverty and wellbeing (and wider capabilities). In the original case, this was food access in the context of famine, but the ideas have been extended to relate to environmental attributes and resource access (Leach, Mearns and Scoones 1999). Since the 1980s, a strand of work often labelled 'political ecology' has linked our understandings of environmental change with questions of poverty, justice and livelihoods (cf. Blaikie and Brookfield 1987; Redclift 1984; Peet and Watts 2004; Peet, Robbins and Watts 2010; Robbins 2011; Forsyth 2003). 'Sustainable livelihoods' approaches have explicitly connected sustainability concerns with poverty and livelihood issues in development (Chambers and Conway 1992; Scoones 1998, 2015), providing an important route into operational development concerns. Linking a perspective on dynamic ecological change in complex systems with the social science analyses central to development studies has been an important emergent field with rich conceptual and practical implications (Zimmerer 1994; Scoones 1999).

Together these perspectives have injected a more political understanding of environment and development. They have also provided a critique of some of the simplistic neo-Malthusian framings of previous forms of environmentalism (Hartmann 1998), and in particular they highlight that notions such as 'scarcity' are inevitably manufactured in particular socio-ecological contexts (Mehta 2010). A strong strand of IDS' work (alongside many other contributors) has been on local-level environmental histories and livelihoods analyses that have challenged simplistic narratives of environmental change (Leach and Mearns 1996), suggesting alternative perspectives, whether on forest change (Fairhead and Leach 1996), pastoralism and grazing management (Scoones 1995), soils management (Scoones 2001) or water resources (Mehta 2005).

Inequalities of access are fast changing, and are conditioned by both local and geo-political considerations, driving 'grabs' of land, water and other resources by local and international elites, and so shaping political and commercial relations between and within countries and regions (Hall, Scoones and Tsikata 2015). In our interconnected, globalised world, 'crises' of food, feed, water, energy and fuel access emerge at what some term the 'resource nexus' (Allouche, Middleton and Gyawali 2015), generating a 'perfect storm' (Beddington 2009), and potential conflicts unless addressed (Godfray *et al.* 2010). Yet such analyses sometimes drift too easily towards a simplistic analysis, unless they take into account the core political economy drivers that underlie such changes. Here a global analysis of development patterns points to the combined forces of the rise of demand through rapid economic growth, the searching out of opportunity by globalised finance, and the politics of resource control, where some regions appear empty, underused and in need of investment (White *et al.* 2012; Scoones *et al.* 2014). Drawing on classic concerns in development studies, a global political economy of resource politics must be at the centre of any analysis of sustainability issues.

2.2 Technology and development

A second theme at the centre of development and science policy studies is the role of technology in development. Many solutions to sustainability challenges – and particularly those that see a quick-fix solution as imperative – regard technology as central. Technology of course is crucial to development, and is at the root of many of the development successes of the past 50 years, whether the 'Green Revolution' that transformed agriculture (in some

parts of the world) (Hazell and Ramasamy 1991) or the just-in-time manufacturing techniques that boosted industrial production that allowed rapid economic growth in East Asia and elsewhere (Gereffi, Humphrey and Kaplinsky 2001). But the lessons of these advances have often not been heeded. The Green Revolution worked well where the conditions were favourable, and this included social and institutional factors, as well as biophysical ones. Industrial growth took off when key reforms had taken place, not least land reform in the countryside (Lipton 2009). Technology was inevitably only part of the picture.

A long-run picture of technological transformations, where understandings of history, politics and society are central, has been a core theme of the work of IDS' sister institute at Sussex, the Science Policy Research Unit (SPRU), also with a 50-year history. This work shows how such changes are not simple and easy, or indeed predictable and easily managed (Perez 2002). Transitions are as much social as they are technological, and must occur across scales, often simultaneously, shifting incumbent regimes, transforming policy landscapes, and continuously being reinforced by experimentation and innovation at small (niche) scales (Geels 2002; Geels and Schot 2007). Technological innovation must be seen as part of a system – at the national level (Freeman 1995) – but also in the international context, through relationships between North and South, and the building of technological capability (Bell 2009). Technology trajectories once set in train by government programmes, commercial investments or development projects, can suffer extreme path dependency or lock-in (Unruh 2000; Berkhout 2002). When infrastructures, incentives and interests combine they can be difficult to shift.

Across much of the world, development paths have got stuck in this way, with disastrous consequences for sustainability. Take energy systems for example: the reliance on non-renewable, carbon-producing fossil fuels in energy systems the world over is extreme. The co-evolution of energy systems (or indeed agriculture, housing infrastructure or any other area) with political and commercial interests is plain to see. The power of incumbent systems is massive, and defines imaginations as well as policies. It is no surprise that the past decades have been dubbed 'the age of oil', where resource use, economy and politics have been co-constituted, and reinforced by global geo-political relations. A new era of sustainability will therefore require a radically new politics, with new configurations of actors and interests (Mitchell 2011; WGBU 2011).

Such lessons from science and technology studies, and crucially long-term histories, have often not filtered through to those who see technology as the silver bullet solution; a trope that has come to define development thinking in recent years in ways that has not been the case since the 'white heat' technology modernisation era of the post-war years. Whether through the zeal of technology-focused philanthropists or the enthusiasms of a science-policy elite with pet projects to promote, technology is promoted as the saviour. Yet, the limits of a technology-driven approach to sustainability transformations has been long-learned. Again, as we discuss further below, this is not to deny the role of science and technology, but to locate this within a wider understanding of the social and political dimensions of developmental transformation to sustainability, as one element among many.

2.3 States and markets

A third theme, central to development studies over 50 years, is the varying role of states and markets in moves towards development (Colclough and Manor 1991). The post-independence era within which development studies was founded, saw a process of state formation, whereby capacities for what came to be called 'development' were created around the world. Many of the features of such new states drew inspiration – and sometimes whole administrative systems, bureaucratic procedures and policy frameworks – from the former colonial powers, or emerged as the consequence of the Cold War tussle between US and Soviet hegemony. In many places, states were not reimagined and reconstructed, and many

of the pathologies of existing systems were replicated. The consequence has been that a limited array of pathways of development were offered. Administrative, institutional and policy lock-in was created alongside technological path dependency, and much of this has been reinforced by the practice of 'aid' and 'development' over the past 50 years. This historical legacy presents many challenges for current development thinking and practice, particularly around sustainability.

Globally experiences have not been uniform, of course. A key challenge for today is to reject the idea that development emerges from the 'transfer' of models from the North (the 'developed' world) to the South (the 'underdeveloped' world). This thinking has dominated the aid agenda for much of the past five decades, and has resulted in multiple problems of inappropriate transfers, and the lack of building of local capacities, particularly in those parts of the world – notably Africa and parts of south Asia – that have been 'aid dependent' (Harris, Moore and Schmitz 2009). While much of the public and academic debate clung (and continues to cling) to outdated distinctions between developed and developing countries; the world has reconfigured. New geographic demarcations have been created – such as the 'rising powers', the BRICS (Brazil, Russia, India, China, South Africa), the MINTs (Mexico, Indonesia, Nigeria, Turkey) and the rest – with arguments repeated that 'transfers' of policy, technology and administrative models need to occur to replicate 'success' in less fortunate parts of the world. But such arguments – increasingly made around sustainability issues – suffer the same problems. The configurations of states, markets and societies in the context of highly variegated capitalisms mean that solutions in one place almost certainly will not work elsewhere.

Today the world looks very different: there are Norths in the South and Souths in the North (Gaventa 1998), and the old geographical distinctions do not work, if they ever did. Complicating this with new demarcations does not help either. With the emergence of a set of 'Sustainable Development Goals' in 2015, the challenge for development and sustainability is global, but local solutions must always be forged. Where we can perhaps learn something is from the comparative historical experiences of different places, and how states and markets have been combined in different ways and at different times in different sequences for both developmental and sustainability gains.

Perhaps the most instructive cases are those areas where Western 'aid' has been less present, and solutions have been crafted independently. The fast transforming Asian countries – in particular Korea, China, Vietnam and Malaysia – held foreign aid agencies at bay and kept their distance from the prevailing Washington consensus. Cuba's isolation through US sanctions promoted many experiments and initiatives, including in sustainable agriculture, for example (Funes *et al.* 2002). More recently, Ethiopia and Rwanda have both adopted elements of the East Asian model of the 'developmental state', and adapted and extended it for their contexts, including incorporating commitments to a transition to a 'green economy', consciously 'leap-frogging' to a more sustainable economy. In Europe, Germany and Denmark are held up as exemplars of social-democratic, capitalist countries where commitments to sustainability transformations have been possible by directed investment by the state, combined with capitalist enterprise (Lockwood 2015).

During the past 50 years there have been shifts backwards and forwards between a focus on states and markets, largely driven by ideological commitments to state-based socialism or neo-liberal market capitalism. A more empirical approach has shown that it is always a combination of states and markets that have operated, even in the most liberalised capitalist systems in the world, where 'entrepreneurial states' shape and guide, and deploy expertise, finance and incentives towards societal ends, including around sustainability goals (Mazzucato 2013, 2015). Understanding the 'varieties of capitalism' (Hall and Soskice 2001) and the different roles of states and markets, and their relationships to society is standard fare in development studies, although sometimes hidden in a set of more normative

(Western, liberal) agendas around 'governance', associated with the prescriptions about the role of states, civil society, business and markets, and the 'rule of law'.

Moving away from such prescriptive, normative agendas around governance that have captured aspects of development thinking in the West since the 1980s, any analysis of sustainability challenges and options must return to basics, and start instead with looking at the historical emergence of states and markets, and the operation of capital, set within a historical political economy frame (Newell 2015). Only then can we identify the policy levers, economic incentives and power dynamics that are at the core of green transformations (Scoones, Leach and Newell 2015).

2.4 Participatory, bottom-up development

A fourth theme central to development studies from the late 1970s has been a critique of 'top-down' development, and the assumption that benevolent states, projects, programmes or other development institutions could deliver poverty reduction, environmental management or other benefits. A perspective drawing on longer traditions of participatory action research, liberation theology, subaltern studies and social activism (cf. Freire 1970; Fals-Borda and Rahman 1991; Spivak 2003) made the case that alternative visions of development were needed that challenge a top-down, high-modernist vision. 'Seeing like a state' (Scott 1998) created certain pathologies, and many problems in implementation, with only some people benefiting. Alternative perspectives emerge instead through 'indigenous knowledge' (Brokensha, Warren and Werner 1980), combined with 'bottom-up' forms of activism.

A paradigm shift in development was proposed, and Robert Chambers in particular was the most effective advocate. This required 'putting the last first' (Chambers 1983), including farmers (Chambers, Pacey and Thrupp 1989), asking 'whose knowledge counts?' in development, and developing methods and introducing processes that create 'reversals' in thinking and practice. The flourishing of participatory development through the 1980s and 1990s – and perhaps especially the growth of rapid and later participatory rural appraisal (Chambers 1994a) – presented a challenge to the standard models of development planning and implementation, and encouraged an alternative set of voices to be heard in development debates, even in institutions like the World Bank (Narayan *et al.* 2000). Linked to 'sustainable livelihoods' approaches (Chambers and Conway 1992; Scoones 1998), as well as wider approaches to community development, including around environmental issues, in various guises, including 'community-based natural resource management' (Agrawal and Gibson 2001; Mehta, Leach and Scoones 2001; Brosius, Tsing and Zerner 2005), participatory forms of development offered a very different paradigm to what went before.

Yet, such approaches often did not address questions of power and interests, and remained rather apolitical, failing to get to grips with the forms of 'environmentality' that emerged between communities, states and markets (Agrawal 2005). With the focus on decentralisation and local control, such schemes were easily co-opted into the mainstream development practice of the time framed by structural adjustment and economic liberalisation. As a route to reducing state involvement in development, participation became a useful, instrumental tool for some. An emerging 'tyranny' in much development practice was rightly critiqued (Cooke and Kothari 2001), but the basic arguments for inclusion and participation remain pertinent. Encouraging alternative frames, diverse knowledges and agonistic democratic politics in constructing different development pathways is an essential lesson, creating what Andy Stirling (2015) calls 'emancipating transformations'. This is of course a deeply political process, of contested negotiation and sometimes conflict. Rooted in new understandings of citizenship as located and practised, sometimes local, often cross-national (Ellison 1997; Leach and Scoones 2007), such approaches shift the focus of development to collective action and human agency in seeking development and freedom

(Sen 2001), rather than top-down imposition and directed control. This, as we discuss below, is an important lesson for the sustainability era.

2.5 Global interdependencies

The fifth theme we can draw from development thinking is that of global interdependence and global institutions. Many, perhaps most, sustainability challenges are global in nature and scope, cutting across borders and presenting many challenges given the weak international policy architecture, particularly around environmental issues. For many years, development studies focused on national, at most regional, development issues. The post-colonial challenge of state building, central to the development project, was focused largely on national governance frameworks. However, since the post-war establishment of the United Nations, the Bretton Woods organisations and the many conventions, agreements, funds and initiatives that have followed since, there has been an important debate about global governance. Yet, over time, there has been a limited ability to establish and enforce commitments within the context of international regimes. The United Nations Environment Programme (UNEP) was established in 1972, but even with its recent upgrading it has limited funding, and even less capacity to enforce environmental agreements. In the end, the legislative provisions are national, and must relate across borders usually in bilateral or regional agreements on such issues as fishing, water resources and river basin management and so on (Young 2002). Regional groupings, formed usually around trade blocs, sometimes have legal powers, such as the European Union, and can push through environmental legislation with the requirement that member states comply, but it is often an uphill struggle, with much resistance (Jordan and Adger 2009). As the failure to reach international consensus on a climate change treaty – and even the less controversial biodiversity convention – shows, creating a binding framework around any issue, no matter how significant, is tough, unless particular, powerful interests are well aligned, as in trade agreements, and the binding requirements of the World Trade Organization.

Even with a global climate deal in 2015, many assume that the real action will occur through national, city-level or regional/sub-national initiatives, where the incentives for action can become aligned. Indeed, global networks of cities and regions are showing the way on climate action, far exceeding what national governments and certainly international treaties have agreed.[2] It raises the question about what the notionally global project of 'development' really means, and who has responsibility and who can take action, over what are deemed to be 'global public goods'. Maybe such goods are less global and less public than the theorists imagine, suggesting different political arrangements that can involve private and more local, but networked action. The post-Second World War international architecture that was created by the period's geopolitical settlement (essentially in favour of US interests) is under threat, and its institutions and processes are looking increasingly anachronistic, with the emergence of new global powers and sources of development finance.

The international relations of the sustainability era must inevitably look in different directions, as must the field of 'development studies'. New configurations of power and authority, and with this responsibility and commitment, are being galvanised, and this is emerging from unexpected places, and is requiring very different forms of organisation (cf. Bulkeley *et al.* 2014; Newell, Pattberg and Schroeder 2012). International development's reference points for the past 50 years have been the United Nations and the Bretton Woods organisations, and the sometimes unhealthy ideological antagonism between them, along with the array of bilateral aid, and increasingly non-government and philanthropic assistance programmes that have emerged from the rich, Western countries. This set of reference points is already changing, and with it the international system. A key task for development studies in the

[2] See, for example: http://climateaction.unfccc.int/ or http://www.c40.org/.

sustainability era will be to reimagine this system in ways that deliver required sustainability transformations in different parts of the world.

By looking back in order to look forward, there are plenty of lessons – good and bad – from the development era of the past 50 years. The sustainability era of the next 50 years will look very different, partly as a result of changes already firmly underway. It must do, if the challenges are to be met. But we must not forget the lessons of the past, and be overcome with unreasonable hubris or excessive impulses to react in the face of urgent and pressing demands in ways that ignore what we have learned. It is clearer than ever that there is no 'one-size-fits-all'; there are diverse pathways to sustainability, as there have been to development. Context and history really do matter, and fundamentally condition possible futures.

3 Perspectives from sustainability studies: four transformation narratives

Having distilled some of what we can learn from the development era of the past 50 years, we now ask what we can learn from studies that have concentrated on the sustainability challenge. We concentrate on the framing of sustainability issues, and the narratives that are constructed around problems and solutions. In the book *The Politics of Green Transformations* (Scoones *et al.* 2015), four narratives of transformation are presented. These draw on other typologies of political and environmental change (e.g. Clapp and Dauvergne 2011; Jamison 2001). Of course no narrative of transformation is exclusive, and all may operate together, or in sequence; but they do allow us to point to some of the key drivers of change, and the conditions under which sustainability transformations may occur. Highlighting these different narratives of transformation directs attention also to the actors, and associated networks, that promote each, and the interests that lie behind them. In any policy process towards sustainability transformations, it is this combination of narratives (the way problems and solutions are defined and talked about), actors and networks (the people and institutions that gather around such a problem-solution frame) and interests (political, commercial, professional and more) that create policy spaces, and so influence outcomes (cf. Keeley and Scoones 2003; IDS 2006).

Investigating this configuration of narratives, actor-networks and interests also points to the limitations, as substantial critiques that have emerged around each 'ideal type' narrative of transformation. Without repeating what is presented elsewhere, here we offer a summary of each.

3.1 Technology-led

The narrative that big-push, silver-bullet technological solutions are the solution to the world's problems is a familiar one, and historically has been associated with a cornucopian view of environmental problems. As a push back against the doomsday 'limits to growth' arguments of the 1970s, technological optimists put forward the case that human ingenuity and innovation would get us out of the ecological bind, and that scarcity economics would provide the incentives to do this (Cole *et al.* 1973).

Today, there are similar visions, most visibly expressed in some of the grandiose geoengineering schemes being promoted (Stilgoe 2015). Geoengineering refers to a range of technologies aimed at offsetting the effects of climate change. They fall into groups: the first, solar radiation management, includes technologies that aim to reduce the amount of sunlight or solar radiation reaching the earth's surface and thereby cooling the planet. The second, carbon dioxide removal methods, seek to suck carbon dioxide out of the atmosphere, fix it in a safer form and bury it underground or under the ocean. Such technologies have not been tested on a meaningful scale but they have given rise to influential narratives about how to deal with the urgency question (Hamilton 2013). Their overall message is that humans can develop the technologies to exercise control over the climate system. While some proponents do not regard it as a substitute but rather as a complement to cutting greenhouse gas emissions, most of the research is funded and promoted by vested interests that seek to promote narrow private gains and show little concern for ethical questions such as who should have the power to control the weather.

The actor-networks that coalesce around such large-scale, technology-led solutions revolve around scientists-engineers and associated research funders whose commitment to technological solutions is paramount. Very often the space-military-industrial complex is not far away, given the scale and type of technologies, and an environment and sustainability tag is often useful in such instances. The political and commercial interests are clear, as such technological solutions will allow the persistence of the status quo.

Yet, despite being dominant and media-worthy, this is not the only technology narrative around sustainability transformations. An alternative narrative focuses on small-scale, appropriate technology and a more bottom-up approach to innovation, often from the grass roots (Fressoli *et al.* 2014). Again the historical parallels to the 1970s are clear: to the appropriate or intermediate technology movement (Kaplinsky 1990) and to movements around socially useful production, such as the Lucas Aerospace workers' initiative (Smith and Ely 2015). In the context of the developing world, the potentials for low cost 'leap frogging' with small-scale appropriate technologies that have become dramatically cheaper, such as solar photovoltaics (PV), is often emphasised. Here the challenge is to develop the capabilities – among technology suppliers, brokers, credit providers, servicers and repairers – for a move to an off-grid rural electricity supply (Ockwell and Byrne 2015).

Actor-networks supporting such technology-led transformation narratives are more socially embedded, located in communities or workplaces, and end up with a bricolage of technological solutions rather than a single, big-bang fix. Today, initiatives such as the Transition Towns movement in the UK are examples, where low-carbon technologies are integrated with architecture and design in restructuring urban environments for sustainability (Connors and McDonald 2011). Interests are associated with alternative lifestyles, but also small-scale entrepreneurs, designers, engineers and service providers who are able to make a living from such alternative technology trajectories. However, the power of such alternatives remains weak, and incumbent interests favour a large technology-focused approach, rather than linking technology to more radical transformations. That said, the power of grass-roots technology movements is growing, and there are many initiatives, linked often through virtual connections – such as maker/hackerspaces and fabrication labs (Smith *et al.* 2013b) – that offer connected and organised challenges to mainstream design and innovation. Such initiatives tend to be associated with urban middle classes in relatively rich cities, but there are wider grass-roots networks that act to mobilise alternative technologies for sustainable transformations, such as in India with the Honey Bee Network or the All India People's Science Movement or in Latin America around movements for social technologies (Fressoli *et al.* 2014). A key argument of such movements is that for technology to be transformative and sustainable the process of technology generation must be accountable and democratised.

3.2 Market-led

Market-led sustainability transformation narratives have been extremely popular in the last two decades. Get the prices right, and the incentives to conserve, protect and assure sustainability will follow, it is argued. The rise of environmental economics from the 1980s, popularised in such books as *Blueprint for a Green Economy* (Pearce, Markandya and Barbier 1989), provided an apparently simple template for governments to create policies that 'internalised' the 'externalities' or generate 'green accounts' that incorporated the costs of environmental damage into national or company accounting. Environmental accounting has become a core part of policy and the assessment of ecosystem services (Bateman *et al.* 2011). These arguments have been extended further to create markets in aspects of the environment that are under threat. Thus the promotion of carbon markets is seen as a route to climate change mitigation as it provides incentives to invest in carbon in order to increase sequestration.

A global market allows carbon purchases in one part of the world to be offset by sequestration or switching to low-carbon options elsewhere. Such offset markets of course assume commensurability (that carbon here is the same as there) and a smooth operation of markets globally, including concrete assurances that sequestration/offsetting is actually occurring (Lohmann 2012). In the case of carbon offsets, these assumptions have not held up, and with the carbon price low, and questions raised about many carbon offset schemes, the neat solution has not always proved effective (Newell, Boykoff and Boyd 2012; Leach and Scoones 2015). Other offset schemes – such as around biodiversity, species or habitats – have also been established, and caused similar controversy (Sullivan 2013). Payments for Ecosystem Services (PES) schemes offer a similar market-based solution, and one that has come under similar critique (Robertson 2006; McAfee 1999, 2012). Such commoditisation of nature has resulted in various forms of dispossession, resulting in wider questions about market environmentalism as a route to sustainability transformations (Fairhead, Leach and Scoones 2012; Büscher *et al.* 2012).

Despite the pitfalls, the market-led narrative remains remarkably resilient. This is because the actor-networks promoting it are well positioned and organised. Linked to a frame of development rooted in a marketised, neoliberal order, with some tinkering at the edges to cope with the environmental damage of capitalist development, this position is not threatening to the status quo. A professionalised grouping of environmental economists has made massive inroads into policymaking since the 1980s with remarkable effect, particularly in Europe and North America. This has been replicated in international development, with substantial aid funds associated with offset schemes (such as via the UN Reducing Emissions from Deforestation and Forest Degradation (REDD) programme) and climate-smart and PES efforts.

Emissions trading in particular has become the dominant experiment in climate politics. By generating and trading the right to emit greenhouse gas emissions, private companies, governments and individual citizens could participate in schemes aimed at mitigating climate change. Together such schemes represented a large-scale attempt to accelerate sustainability through market-based environmental governance. Political economy analysis by Jonas Meckling (2011) shows how and why this occurred. In the early phase of international climate politics, business – led by fossil fuel interests – were united in opposing caps on greenhouse gas emissions and able to fend off proposals for carbon taxes in both Europe and North America. The dynamic started to shift when a split in the business community occurred in the mid to late 1990s. Some companies in the US and UK began to promote emissions trading jointly with a few public actors and business-oriented non-governmental organisations (NGOs). This business-led coalition had the political goal of avoiding carbon taxation and promoting emissions trading as the policy response of choice to climate change. It was extraordinarily successful in this respect. However, their success in promoting the market-based narrative and in formulating policies contrasts with widespread failures in the implementation.

Markets are social and political institutions, where benefits are distributed unevenly, depending on market access and control. The interests supporting such new environmental market solutions are significant, and include large investors, a whole panoply of professional consultants and accounting experts involved in verification and validation of schemes, and increasingly a large aid industry contingent of climate mitigation experts wedded to such approaches. It is a powerful network with deep pockets and powerful backers, and will inevitably be part of the story of sustainability transformations globally in the coming years. If a climate deal is struck and the carbon price recovers, and markets expand, maybe the incentives will realign to push for major mitigation investments and financing of a far-reaching nature. The advocates of this narrative argue that this is the only way, given the current configuration of power and capital, for sustainability transformations to occur in the period required.

Yet, as critics of the neoliberal order point out, such dynamics will only reinforce extractive and exploitative capitalist relations (cf. O'Connor 1994; Magdoff and Bellamy Foster 2010). Given the relentless search for profit, will capitalism really be able to save itself from environmental disaster? Does a sustainability transformation really mean old-style polluting fossil fuel conglomerates refashioning themselves for new 'green' markets? Is the 'green economy' not just a façade for the replication of the existing neoliberal economy, a reinvention of an old argument for ecological modernisation without challenging the power relations that created the sustainability crisis in the first place? Will they be committed to sustainability for the long term, if the price of carbon or other incentives drop away? And if carbon emissions are reduced, is this the only element of sustainability that matters?

These are massive questions, but ones that will be central to the development and sustainability agenda for years to come. The 'green economy' has become a watchword for development agencies, and many developing countries with an eye on the funding opportunities it offers. UNEP has backed the concept, as has the World Bank and many others (although with some important if subtle differences) (e.g. UNEP 2012; World Bank 2012). As many countries around the world move to establish a 'green economy', and galvanise investment from private sources for at least notionally sustainable solutions, how will this match the realities on the ground; who will be the winners and the losers?

3.3 State-led

Many argue that the nature of the sustainability challenge as a public good means that the state must be involved (Altenburg and Pegels 2012). This narrative of state-led transformations to sustainability has familiar echoes with the long-running development debates about the relative role of states and markets (see above), and particularly the role of a 'developmental state' in steering development – and so also sustainability pathways. Mariana Mazzucato points out in her book *The Entrepreneurial State* (2013), that in many countries that appear at face-value the epitome of the neoliberal, free-market setting – for example the US – the state has had considerable involvement in key processes of innovation, including in 'green' technologies. State funding for space exploration, military equipment or industrial engineering has provided the core funds that have allowed private companies to exploit and profit from such innovations. Private venture capital, she argues, is too impatient to make the long-term investment necessary for breakthrough innovations, and hence state funding is needed to get things moving. This requires setting priorities, picking winners, providing funds for the long term and ensuring that technologies move to market use later in the cycle. This requires actually quite an active – and entrepreneurial – state that in her comparative review appears in some places more than others. This has important lessons for sustainability transformations, as state-backed shaping and guiding of technology or market trajectories can be crucial. Indeed, most of the 'market-led' examples highlighted in the previous section require some form of state intervention, even if in a fairly limited regulatory role.

The financial resources required to bring about sustainability transformations are enormous. There is agreement that most of the investment has to come from the private sector but the public sector plays a critical role in mobilising this investment. Mariana Mazzucato (*ibid*.) shows how government has done this by directly funding the early stage of the innovation cycle. Hubert Schmitz, Johnston and Altenburg (2015) concentrate on the later stage of the innovation cycle and on public rent management: government creating and withdrawing opportunities for highly profitable investment. This is not easy. Rent management always contains the risks of political capture, adopting the wrong instruments or targeting the wrong sectors. In the case of green rent management there is an even bigger risk: doing too little. The constellation of challenges invites this, most clearly so in the case of fostering renewables. Technological uncertainties are high, time horizons for investment are long, yet action is required now. Overcoming these hurdles requires above all a political approach.

Mobilising support from public, private and civic actors – and fostering alliances between them – is needed to overcome the common problem of too little, too late.

A comparative analysis in the low-carbon energy sector reveals some interesting patterns. Which countries have managed to establish a substantial renewable energy industry, and become world policy and commercial leaders in the field? The US was an early starter, and had important breakthroughs, but these failed due to the lack of long-term funding. The venture capital firms that provided backing were not in it for the long term. By contrast, China has provided substantial state support for renewable energy innovation, design and manufacture, and has done this through a target-based, state-led approach in a remarkably short period (Mathews 2015; Mazzucato 2015). From its early beginnings as an alternative, community-led initiative Danish wind power has also become a global market player, while Germany has moved to replacing its nuclear capacity with renewables through massive state-supported private investment (Pegels and Lütkenhorst 2014). Other countries, such as the UK, have lagged behind largely because of the absence of consistent, sustained state support (Lockwood 2015).

How can these contrasts be explained? Some of it is down to circumstance, chance and conjuncture, but there are wider patterns. One issue, inevitably, is the power of incumbent interests. Where new start-ups are trying to shift 'locked-in' political, commercial or technical interests, shifting these is very hard. But it is not impossible, and here the role of the state, and state institutions, and their forms of accountability become important (Lockwood 2015). Two patterns are evident. One is a strong, centralised state push, with substantial clout and enforcement capacity (such as in China). The other is a decentralised, democratic response where states (or more often federal regions) compete with each other, and have strong forms of downward accountability to electorates (such as in Germany). Both these dynamics, in very different settings, appear to offer the opportunities for state-led sustainability transformations, where the narrative for change is mobilised, galvanised, networked and financed by the state, linking state and business actors in a developmental push towards sustainability.

In Africa, there has been an intriguing if tentative return to an argument for 'developmental states', accepting that 'good governance' and liberal values will not necessarily deliver development without more active intervention (Chang 2002; Fine, Saraswati and Tavasic 2013). Despite their poor track records in human rights and political freedoms, leaders in Ethiopia and Rwanda have been hailed as modern exemplars of the earlier East Asian miracle states (Booth 2011; Kelsall 2013). It is perhaps no surprise that both countries have initiated active state-led programmes around the 'green economy' and sustainability.

State-led sustainability transformations are highly dependent on the history, capacity, experience and political legitimacy and strength of the state and its institutions, and the particular national political-economic conditions pertaining. Understanding these contexts and histories in an international, comparative way will be central to any new work on accelerating sustainability (Newell 2015).

3.4 Citizen-led

As discussed earlier, one of the long and painful lessons of the development experience over 50 years has been that development efforts that ignore citizens' knowledge, aspirations, expertise, rights and needs are almost bound to fail (Chambers 1983, 1997). Embedding development in a more democratic environment, where accountabilities are assured and citizenships respected is essential (Gaventa 2002). Participatory, inclusive, accountable development is certainly the ambition, even if difficult to achieve, and prone to diverse fads and multiple tyrannies (Cooke and Kothari 2001; Hickey and Mohan 2005), as already discussed.

Citizen-led approaches offer the opportunity for reframing development, generating new visions and pathways, around concerns defined through inclusive dialogue and participation. In this way sustainability becomes deeply linked with the immediate concerns of people's lives and livelihoods, and not just an environmental add-on. It also gains a politics through the processes of framing, deliberation and contestation central to a more participatory, citizen-led approach. The narrative of citizen-led sustainability transformations thus picks up on many strands of argument, long present in development studies, but surprisingly less clearly articulated in 'green' development efforts in Northern settings. But, just as in development more generally, the actor-networks supporting such a position remain relatively thin, and their power and interests relatively weak – certainly by comparison to the three narratives discussed above.

However, the view that citizens play an important role in accelerating sustainability transformations has begun to enter the mainstream. Researchers and organisations from outside environmental movements have stressed that state-led efforts remain timid without citizen pressure from below. Others go further and suggest that progress in global negotiations requires support from a world citizen movement (WGBU 2014). The view that citizen involvement plays a key role in accelerating sustainability is gaining ground in organisations which advise governments. A good example is the German Advisory Council on Global Change which reports directly to Angela Merkel. Its 2011 flagship report was entitled *A Social Contract for Sustainability* (WGBU 2011). A multitude of citizen initiatives around the world point towards a 'horizontal responsibility architecture in the form of a world citizen movement for climate protection… the transformative impulses provided here can penetrate into the vertical architecture of international negotiations, in that the governments point to a mandate from the more advanced demands being made by the constituencies they represent' (WGBU 2014: 113). Thus the narrative is one of transformations in which citizen movements play a key role.

We have already discussed the potential of 'grass-roots' innovation in relation to the technology-led narrative, and the potential for citizen mobilisation, network formation and institution building (Gupta 2013) around alternatives. Linking wider social movements – around human rights, labour, land and other issues – with 'green' movements presents the possibility of networking across movements around progressive alternatives that challenge the neoliberal mainstream (Jamison 2001). The environmental movement, born out of the growth in environmental awareness in the North, but also appearing under different guises in the global South, has been notoriously bad at linking environmental issues to wider rights, livelihoods and other concerns that allow a wider mobilisation in society, with real political clout. The few green parties that contest elections have made limited inroads into mainstream politics outside the coalition politics of continental Europe. Environmental concerns sometimes remain the preserve of the relatively rich, urban middle class. Yet there are important traditions, as already noted, in environmental and climate justice movements (Carmin and Agyeman 2011), as well as feminist environmental activism (Rocheleau, Thomas-Slayter and Wangari 1996), that link questions of identity, race, gender, rights, justice and livelihoods very firmly to sustainability questions. The same applies to what Joan Martínez-Alier (2002) refers to as 'the environmentalism of the poor', whereby local concerns are articulated around environmental issues but linked to environmental concerns. Emerging in particular locales, often around particular issues – such as toxic waste dumping (Blum 2008) or forest protection (Rangan 2000) – such movements articulate exactly the type of collective action that connects people and issues that is required for transformations to sustainability, as we discuss below.

The emergent, aspirant, young, educated global middle class, however, should not be ignored as a political force for backing sustainability transformations. Connected by the internet and social media, highly articulate, and geographically dispersed, this is a powerful force that may yet spur significant change. Recent mobilisations around climate change in

cities across the world have witnessed a growth of such energy, with pressure applied in sophisticated and coordinated ways as part of tech-savvy campaigning. Pushing governments to sign up to a climate treaty may be one objective, but forcing city administrations to adopt climate-friendly policies may be another, as well as building climate initiatives from the bottom up[3] or targeting the top ten historically polluting companies globally (responsible for most historic carbon emissions – cf. Heede 2014) may yet be the most effective campaign to push transformations to sustainability around climate change.

Outside the formal, labelled green movements, a range of citizen-led actions also take place; indeed in some places sustainability is centrally part of normal, day-to-day livelihoods. Conserving environmental practices amongst indigenous peoples and forest dwellers have been widely documented, as have the biodiversity conservation and sustainable agricultural practices of many small-scale farmers. Much of this has been reified as 'sustainable' when in fact it is simply a response to poverty, and lack of alternatives. Sometimes, however, such practices become more embedded in community-based, institutionalised responses, whereby a silent, under-the-radar sustainability can emerge, perhaps particularly so in contexts where organised movements are less likely or simply disallowed (Smith and Jehlička 2013). Here the power of repeated, localised, institutionalised practice becomes important. Many individuals and groups combining to change what they do can have enormous power, and has been at the root of at least the first stages of waste recycling, community growing, organic food, sustainable transport and other initiatives, that have later garnered state and private support. Shifting incumbent power through mobilisation may not always be the result of a high profile campaign or protest, but may emerge through more incremental, less threatening but nevertheless powerful actions over time.

This section has distinguished between four narratives of what and who drives sustainability transformations, drawing from a vast literature on sustainability and development. These four narratives overlap, intersect and compete with each other, and most transformations must involve combinations. In Section 5 we will examine the role of alliances between public, private and civic sector, where such narratives are often combined, with associated tensions over framings, tactics and strategies. Before this, however, we need to step back and ask whether consciously pursued acceleration is possible at all.

[3] E.g. http://350.org/.

4 Is purposeful acceleration towards sustainability possible?

The previous sections made two central arguments. First, unsustainability is often a problem of economic success. Precisely because material prosperity increased substantially for more people, the limits of further growth of a certain sort have become apparent. Second, no easy solution has emerged for dealing with these sustainability challenges. The pursuit of technology-led, state-led, market-led and citizen-led approaches has resulted in valuable insights but they constitute insufficient responses to the challenge of accelerating sustainability. This section asks whether approaches that have an explicit focus on combining social, market and technical transformations provide a clearer answer. The title of this paper assumes that accelerating sustainability is possible; but is it?

If it took us three centuries to evolve the interconnected technological, institutional and political web that now sustains our massively carbonised and multi-dimensionally 'un-green' global society, can we sensibly expect that, in a few decades, we can untangle that web and create a new one to sustain a radically different world? This question – put to us by the historian Martin Bell (pers. comm.) – lies at the core of the acceleration debate. Does the recent literature on transformations and transitions move us forward?

There is no established transformation theory, but there are various lines of work that can provide useful insights on how transformations occur. The most fundamental point is that there is no single line of causation: transformation results from a concurrence of multiple changes. This is the conclusion of Jürgen Osterhammel's (2014) history of the nineteenth century, Klaus Leggewie and Dirk Messner's (2012) review of theory and history of transformations, and Frank Geels and Johan Schot's (2007) analysis of major technological transitions (cf. also Fouquet and Pearson 2012 and Allen 2012 for other examples). This emphasis on the concurrence and interaction of multiple changes highlights the immensity of the challenge. Can purposeful acceleration be achieved if so many different things need to come together for a transformation to occur?

When seeking historical parallels for sustainability transformations, reference is often made to the industrial revolution (Leggewie and Messner 2012; Mathews 2015). On the one hand this is very helpful for bringing out the immensity of what needs to be achieved; on the other hand, it raises questions about the feasibility of deliberate acceleration. The industrial revolution resulted from the incidental concurrence of changes in several fields: energy (from wood to coal), beliefs (from religion to enlightenment), technology (from crafts to science), finance (from inherited immobile property to mobile capital generated by international trade), transport (new canals), institutions (more reliance on the 'rule of law') and social standing (from ascribed to earned positions in society), among others. These changes interacted to bring about a set of transformations that was historically unprecedented in depth and speed. Understanding the interconnections and specifying time scales is daunting.

Historically-informed approaches to understanding transformations can therefore be very informative. One such approach that has become influential is the multi-level perspective on socio-technical change (Geels 2002, 2011). It distinguishes three analytical levels: niches, the locus of radical innovations; socio-technical regimes, encompassing diverse actors and institutions; and wider landscapes. Transformations are shifts brought about through interactions between these levels. Radical innovations taking place in niches can destabilise existing regimes and break through more widely if changes in the external landscape (for example the global financial crisis or the Fukushima disaster) create pressures on the regime

that lead to cracks and windows of opportunity. As a result, the existing regime might be replaced – or it might be strengthened if it can adapt. As a framework for retrospective analysis, the framework offers useful insight, but it does not inform us of whether and how sustainability can be accelerated in a purposeful way.

It is therefore worth asking what we can learn from the work on deliberate 'transition management' (Rotmans, Kemp and Asselt 2001). Central to transitions management is involving stakeholders in developing shared visions, conducting experiments to explore concrete ways forward, as well as putting the existing regime under pressure. As stressed by Florian Kern (2013: 21), 'its long term sustainability orientation, its focus on learning and innovation, its elaborate process architecture, its theoretical underpinnings in a sophisticated understanding of processes of socio-technical change all contributed to the appeal of the Transition Management model'. However, the implementation experience in the Netherlands and Belgium revealed that it was too technocratic, focused too much on the early stage of the policy cycle (design and formulation), shied away from conflict and therefore failed to change power relations and structures (Kern and Smith 2008; Paredis 2013). In sum, as with some applications of the multi-level perspective, it lacked an understanding of the political economy of transformations.

Some innovation scholars have focused more on 'niche management' – finding ways of piercing through the prevailing socio-technical regime by promoting specific niches (Schot and Geels 2008; Smith and Raven 2012). Investing in shielding, nurturing and empowering niches that might challenge wider regimes is a political choice. Innovation scholars have a lot to say on shielding and nurturing niches, but little on empowering and the wider conditions of democratic politics for successful transformations (Stirling 2015). According to Rob Raven and colleagues, 'To successfully secure resources for niche development, advocates need to link socio-technical narratives to socio-political agendas, and enrol powerful actors into their networks' (Raven *et al.* 2014: 8). They emphasise 'the importance of narratives as key devices in undertaking this socio-political work' (2014: 26) and the need for 'analysis of the wider political economy' (2014: 27). This is also the conclusion of Frank Geels (2014) who suggests that the destabilisation of existing regimes requires equal attention to the creation of new ones. Referring to Schumpeter's notion of 'creative destruction' (1942), Geels stresses the need to understand better the dynamics of destruction. These contributions, coming from the intersection of innovation and transition research, advance our understanding of structural change, but provide few insights into our key concern – accelerating transformations.

What can be learned from experiences where rapid transformations have occurred? Both China and Vietnam have undergone transformations that were managed and very rapid – involving major economic reforms, big sectoral shifts, a build-up of new production capabilities and massive job creation. The speed and depth of changes were unprecedented in economic history. Assessments of this experience are contested, not least because the environmental consequences have often been devastating. However, for our concern with acceleration there are useful insights. Both China and Vietnam used temporary institutions and transitional arrangements (Qian 2003; Heilmann 2008). Experimentation was also a key feature in Vietnam, sometimes organised purposefully from above; sometimes pushed on the agenda from below – called 'fence breaking' (Malesky 2008). The key feature of China's development strategy, and that of other East Asian countries, is that they did not follow models from elsewhere. Mike Hobday (2003), in a review of rapid Asian industrial development, concludes that it is diversity rather than uniformity in the institutional arrangements and development policy that characterises the innovation experience of the Asian Tigers. In *Institutions and Growth in East Asia*, Stephan Haggard (2004) emphasises how East Asia succeeded through a process that was highly experimental in nature.

The importance of step-by-step experimentation comes out most strongly in the Chinese experience (Qian 2003). ‘Transitional institutions’ rather than ‘best practice institutions’ were the key. Institutions need to take account of the conditions at each stage of a reform process. For example, a market was created through a dual-track approach to liberalisation, enterprises were created through the non-conventional ownership of township-village enterprises, and government was reformed through a particular type of fiscal federalism. These institutional innovations worked for a while and then had to be replaced. Not all of them succeeded, but there was a common thread to those that did: ‘pragmatic innovation’, ‘adaptive management’ and aligning of the interests of the newly enabled decentralised actors with those of the reformers in central government. At that time, the Communist Party failed to give this transformation a green direction, but it was a transformation that was deep and fast. Attributing this depth and speed to a big push from the centre along a predetermined path would be misleading. Distributed entrepreneurship, trial and error, diversity and transitional arrangements are key features of the Chinese, and indeed East Asian, fast track. Each stage brings new obstacles, as well as new opportunities. Drawing on the ‘varieties of capitalism’ literature (Hall and Soskice 2001), we can characterise both China and Vietnam as forms of ‘coordinated capitalism’, which was decentralised and encouraged experimentation.

In these cases, multiple, interconnected changes had to be brought about and some of these had unintended consequences. The capacity to ‘structure uncertainty’ (Breznitz and Murphree 2011) or deal with ‘mess’ and create ‘reliability’ (Roe 2013; Roe and Shulman 2008), tracking between assessment of macro pattern and engagement in micro operations, becomes important. This requires both new institutional arrangements, and also new types of sustainability professional who can spot opportunities, navigate uncertainties and complexities, and bridge and broker between groups. At the heart of any sustainability transformation, such individuals will be key. In the next section we continue this discussion by asking who moves any transformation process forward – or holds it back.

5 Who drives sustainability transformations – or holds them back?

Who can drive sustainability transformations forward? Recent literature (Newell 2015; Schmitz 2015a) suggests that answering this question requires taking four critical steps: first, recognise that no single actor has the resources to bring about sustainability transformations; second, recognise that within government, civil society and business there are actors seeking to block or slow down the process; third, attention needs to focus on supportive alliances across these categories; and fourth, including actors with different motives helps to understand and accelerate transformations to sustainability. The transformative alliance becomes the central concept.

Who then can be considered a member of such an alliance? Is the criterion motivation or action? The environmental movement has tended to opt for an alliance of the like-minded, but this seems a limiting step to take. There is a range of actors that can support sustainability transformations through their action (such as investing, providing expertise, lobbying), but their motive need not be to improve environmental sustainability or mitigate climate change; the main motive might be to secure energy, to build competitive green industries or to foster green jobs – with climate change mitigation at best a 'co-benefit'. In other words, there is a potential for alliances that include actors whose priority is not environmental sustainability. This can be a game-changer in the political process (WGBU 2011: 85).

Such alliances have been important in both China and Europe. In Denmark, for example, the experimentation with wind energy received substantial support from politicians and business leaders concerned with energy security in the wake of various oil crises. Actors with environmental motivations played a role at the start and increased in importance over time, but they were never sufficient (Smith 2004). Actors motivated by the chance to build a globally competitive hub (for providing wind energy solutions and creating highly paid jobs) have played a big role. In China, such alliances were equally if not more relevant. China's massive investment in renewable energy was not driven primarily by concerns with global climate change, but by concerns to secure energy and ambitions to build new competitive sectors. These were major concerns in both Chinese government and industry (Schmitz 2015b), added to by the more recent concern in urban society to reduce pollution.
Recent research in China (Dai 2015) shows that such alignments of interest matter in both policy formulation and implementation. In China, policy formulation tends to take place at central level and implementation at local level. Local take-up of centrally designed policies varies enormously within China. 'Dynamic' localities that implement central policies for solar and wind energy are led by local government and often supported by business. These government and business actors have ambitions that are rarely about mitigating climate change; they are more concerned with promoting local economic development, creating jobs, increasing local government tax revenue and generating business profits.

The relevance of alliances is confirmed by research on the local politics of climate change in China and India:

> In both countries the ability to build and sustain coalitions is central to the effectiveness and sustainability of climate change policy. For various reasons, state strategies in China and India have focused on the need to bring different parties with otherwise divergent interests on board to build a coalition in favour of climate mitigation measures.
> (Harrison and Kostka 2012: 5)

Recent research in India (Chaudhary *et al.* 2014) shows that such coalitions have played a critical role also at the national level but that the combinations of interests varied between sectors. The solar industry was supported for reasons of both securing energy and building competitive low-carbon industries. The 'National Solar Mission' is the most visible symbol of an industrial policy for this sector. The most vigorous implementation of this policy occurred in the state of Gujarat where Chief Minister Narendra Modi (now Prime Minister of India) spearheaded an alliance of government and business interests determined to accelerate economic development (Chaudhary *et al.* 2014). Energy security was the main driver – on the part of government – while climate change mitigation was only a 'co-benefit' (Dubash *et al.* 2013).

Two further lessons can be derived from this literature. First, the composition of transformational alliances varies, depending on the specific policy, project or sector in question. This has important implications for research strategy (the need to focus on specific events, moments and conjunctures) and political strategy (opportunism around policy spaces plays a big role). Second, agents of resistance need to be analysed in the same way as agents of change: the opponents also seek alliances (Newell and Paterson 1998, 2010). The opposing forces are not necessarily against de-carbonisation as such, but they are fighting for their jobs and/or protecting their assets that are tied to fossil fuel and related sectors.

To summarise, focusing on alliances is essential for understanding advances and setbacks in sustainability transformations. Such alliances are best seen as vehicles for bundling diverse interests for a particular purpose, such as influencing legislation, policies or projects. In order to be effective, analytical and political work needs to deal with both agents of change (prospective winners) and agents of resistance (prospective losers). The South African case is an interesting example, because it provides insights on both the forces that hold back the transition to renewable energy and on the forces that (seek to) move it forward. Cheap and plentiful coal-generated energy was essential for South Africa's 'minerals-energy complex'. Actors from business, government and trade unions sustained this complex. They helped keep energy prices low and minimised support to renewable energy. A key actor in this alliance was the energy supplier Eskom, a vertically integrated state-owned monopoly, well connected to key government departments and energy-intensive companies. But 'moments of crisis create opportunities for change' (Baker, Newell and Phillips 2014: 813). A crisis in the supply of electricity provided the political space for advancing the renewable energy agenda (Morris and Martin 2015). The crisis loosened the grip of the 'minerals-energy complex'. A struggle between two coalitions emerged: one against and one in favour of renewables, splitting the public and the private sectors. Today, an alliance in favour of renewables is gaining influence and creating a platform for a renewable energy path. But the process has been messy because control over different elements of the energy supply chain has been – and remains – contested. In other words, this shift (tentative as it is), has emerged from a very particular political economy, driven by alliances and interests brought together by crisis (Morris and Martin 2015).

Putting such alliances centre stage is a critical step, but three further moves are needed. First, analytically we need to distinguish between alliances of different types. At one end there is the strategic alliance based on joint action. At the other end there is the mere alignment of interest without co-ordination between the parties. Both can be transitional (short term) or enduring (long term). All types can be instrumental in bringing about collective action or blocking it. Second, empirically we need to ask where these alliances come from. They are not given, but are in themselves a product of history. Matthew Lockwood (2015) shows that the policies adopted in one stage have knock-on effects for subsequent stages and influence the momentum of the policy debate. Depending on how these policies are designed and implemented they give rise to new stakeholders; for example business and workers who invested their money or careers in the deployment of green technologies. But these policies can also create a backlash from those who pay for the subsidised investments

through increased taxes or energy bills. Third, politically we need to recognise that the proposed alliance approach – which includes business actors – is contested. Naomi Klein (2014), for example, shares our concern with urgency, purposeful action, political experimentation and talks about the need for a transformative movement. But the current structure of capitalism – and particularly the interests of the corporate sector – are seen as blocking transformations. Alliances thus must be struck in the context of wider structural, political forces, requiring an in-depth analysis of the political economy of capital. At the same time it is essential to unpack the corporate sector and uncover how both strategic and pragmatic alliances involving business actors can be struck towards progressive ends.

Political science analysis shows that alliances (or coalitions) can be effective in overcoming complex collective action problems (Leftwich 2009; Peiffer 2012). Sylvia Maxfield (1991: 421) stressed the critical role of policy coalitions that cut across state and society and include business. More recently, Abla Abdel-Latif and Hubert Schmitz (2010) have shown why and how state-business alliances matter for overcoming bottlenecks in economic development. When it comes to sustainability transformations, the inclusion of business seems particularly important. As stressed by Peter Newell and Matthew Paterson (2011: 23, 41) ‘many capitalists and state elites, for a range of different reasons, now have a political and financial stake in the project of decarbonisation’ … ‘short or medium term transitions to a low carbon economy will have to be supported (financially and politically) by powerful fractions of capital with a stake in the success of such a project’.

This is a key point. There are parts of the business community (‘fractions of capital’) that are keen to support green policies but have other motivations. Effective cooperation and collective action does not require that the players support renewables for the same reasons. On the contrary, the chance of accelerating sustainability increases if players with different motivations are brought into the picture.

6 Can environmental sustainability and social justice reinforce each other?

This section reconnects with the broader development agenda. The central concerns of the past 50 years of the development era were reducing poverty and improving social justice. A core concern of the next 50 years will be to accelerate environmental sustainability, while at the same time addressing poverty, inequality and social justice. In this section, therefore, we ask whether these objectives are in conflict with each or can be mutually reinforcing.

At first sight, the joining of environmental sustainability with inequality and social justice concerns should be an easy undertaking. There are numerous high profile reports and conferences that have sustainability and social inclusion in their titles – suggesting that bringing the two together is an obvious and uncontested task. A good example is the World Bank's (2012) report entitled *Inclusive Green Growth – the Pathway to Sustainable Development.* While it acknowledges that 'we cannot presume that green growth is inherently inclusive' (2012: xi), it does little to specify the conditions under which it becomes so. There is a rich stream of debate about how socialist ('red') perspectives should combine with environmental ('green') thinking in constructing alternative futures (O'Connor 1998; Benton 1996). Building on this, Stephen Spratt (2015) suggests that one needs to unpack both dimensions since they can be achieved to different degrees. Accordingly he distinguishes between light and dark green and between different degrees of social inclusion. This then provides the basis for a matrix of different configurations of environmental and social progress. Such a matrix can help with indicating where different authors or organisations are positioned. It remains difficult, however, to populate the boxes with empirical studies that have assessed both dimensions.

The most promising way forward probably lies in concentrating on the political conditions that make it possible to combine environmental sustainability with social justice. Here we find stark differences. Some argue that effective sustainability transformations will only be realised at the scale and depth required if there is strong, directive, top-down leadership. Some go to the extent of suggesting that democracy is a brake on sustainability (Hickman 2010). The imperatives, and urgency, of sustainability require drastic impositions for the wider good, it is argued. In this argument, environmental sustainability is prioritised above inclusion, as the key is to 'get the job done', and fast. Social inclusion, the argument goes, can be dealt with later. The counter to this is that effective, long-term sustainability transformations will only emerge when democratic inclusion and citizen participation is assured (Stirling 2015). This builds on a line of work which stresses the connections between direction, diversity and distribution (3Ds) achieved through dialogue, debate, dissent and deliberation (STEPS 2010). This may take place in a variety of political settings, through a range of institutional forms. Matthew Lockwood (2015) points to the inclusive policy stance in Germany, rooted in a federal, decentralised democracy, and how this contributed to the greater momentum of its transition to renewable energy, and away from a nuclear energy (see also Stirling 2014).

The remainder of this section reflects further on the political conditions for achieving both progressive environmental and social change. How and under what circumstances, can sustainability and social justice objectives be aligned, so that sustainability and development are viewed in concert? How can the sustainability transformations discussed earlier, alongside the alliances that support them, be channelled in ways that 'just sustainabilities' emerge? Our discussion of narratives of transformation identified technology, market, state and citizen-led processes, while our analysis of alliances for sustainability suggested that

diverse coalitions, including those without a direct, explicit commitment to sustainability, were likely to be the most robust. But which pathways and which coalitions will also deliver social justice, equity and poverty reduction? Stefan Dercon (2012, 2014) rightly points to the trade-offs that exist. There are many reasons why a move to a 'green economy' will not be good for the poor, unless directed in particular ways. Market or technology-oriented approaches may reduce employment, increase the costs of resources and environmental services, and encourage elite capture, displacing poor people's livelihoods. State-led approaches equally, focused on investment and regulation, may divert resources and create barriers to particular poverty-reducing livelihood change. Green growth under the green economy banner is no panacea (Levidow 2014), and as Stefan Dercon (2012: 17) argues the poor 'should not be asked to pay the price for greening the planet'. Citizen-led transformations may have the best chances of alignments with social justice, but it rather depends on how and to what extent citizens are represented in movements (Ellison 1997; Leach and Scoones 2006).

How then can the different narratives of transformation we have defined be combined in a wider political process? Karl Polanyi made the case that the 'great transformation' of the nineteenth and early twentieth centuries involved a 'double movement' between marketisation and social protection; a tension between the depredations of the untrammelled market and responses of advocates of 'protection' from cooperative movements, labour unions and the state (Polanyi 1980). The 're-embedding' of markets under state and societal control was, he argued, essential, lest wider conflict, ultimately war, resulted. This is of course a point raised forcefully again today by critics of the current financial and economic system, where footloose, financialised and globalised capital is beyond control (Harvey 2005). Yet, as Nancy Fraser (2011, 2012, 2013) argues, the 'double movement' – including the argument for protection and an enhanced role for the state – insufficiently addresses other pressing issues. She highlights women's empowerment, LGBT rights, racial equality, disability and environmental issues as examples. Indeed, she points out, both state and market-led approaches may result in marginalisations and exclusions, and can fail to address forms of domination. The 'double movement' is, in other words, insufficient.

Thus in order to address the contemporary challenges of sustainability and social justice together, she instead argues for a 'triple movement' that galvanises an 'emancipatory' movement that can challenge dominations by both protectionist and market moves. Just as the movement for 'social protection' was driven by the collective organisation of multiple movements reacting to the consequences of unregulated markets, so too must such forms of emancipation, linked across issues. This would strike a new compact for social justice and sustainability between state and society, in the context of the current moment of market-led neo-liberalisation. Such collective responses to the twin challenges of sustainability and social justice may emerge from different sites, and in different political contexts, but always rooted in the struggles of what Chantal Mouffe (2005) describes as 'agonistic politics'.

In some important senses, these represent the 'post-democratic' dynamics of a globalised society, dominated by transnational corporations, with states hollowed out and the market dominant (cf. Crouch 2004; Swyngedouw 2010; Wilson and Swyngedouw 2015). Politics is enacted in diverse sites, and through a range of alliances, often outside the conventional political or governance 'system'. Vibrant, conflictual, rooted in identity and social formations, 'the political' (Mouffe 2009), takes on a new form confronting liberal forms of democracy and authoritarian regimes alike (Ranciere 1999; Zizek 1999). The shaping of pathways to sustainability must emerge in such settings – differing radically across the world – and these must involve the building of alliances across groups, as part of emancipatory struggles to make a 'triple movement' a reality. Following Andy Stirling (2015: 54), this means transformations to sustainability are not processes that are 'managed under orderly control, through incumbent structures according to tightly-disciplined knowledges, often emphasising technological innovation, towards some particular known (presumptively shared) end', but instead they involve 'more diverse, emergent and unruly political alignments; more about

social innovations, challenging incumbent structures, subject to incommensurable knowledges and pursuing contending (even unknown) ends'.

In thinking about sustainability and social justice we must look at different sites of both contention and organisation, asking how a 'triple movement' might emerge. In the following sub-sections, we look at three: local struggles over environmental justice; wider debates about the direction of policy and how inequality and environmental issues are dealt with in national contexts; and, finally, global negotiations about both historical responsibilities and future guardianship of the planet. In each case, the focus is on how forms of collective action emerge that generate an emancipatory narrative about both the future and the present, in terms of sustainability and social justice, and a commitment to action that is inclusive and collective. This requires a particular type of politics that often needs to address tough issues, entrenched interests and overcome long-term patterns of behaviour. Whether at local, national or global levels we have not been very good at this. But if sustainable development is to have meaning, this must be central to the new politics of the coming era.

6.1 Struggles for environmental justice: winners and losers

It really matters who are the winners and losers in forging pathways to sustainability. Take urban waste management in India. Everyone regards this as a pressing problem, as cities grow and waste mounts up. It is high on the political and media agenda. But there are different ways of dealing with the problem. One is a technical-business solution based on large-scale dumping and incineration, perhaps combined with power generation. This is favoured by an alliance of some arms of government, large-scale corporate recycling/power generation businesses, and technology/infrastructure manufacturers. The other is a more locally led solution, involving organised waste-pickers, local communities, NGOs and activist groups and municipal authorities. They advocate recycling at home and neighbourhood level, and the involvement of a highly marginalised but skilled group in sorting and managing waste, often with the support of low-cost solutions. These two pathways to waste management – both aiming at reducing waste, and alleviating the problems of massive dump sites – are at loggerheads in many cities, sometimes resulting in protests and violence over alternative directions (Chaturvedi, Vijayalakshmi and Nijhawan 2015).[4] The diversity of socio-technologies claimed to lead to sustainability are clearly very different, while the distributional consequences of their use are also dramatically divergent. Clearly in this case, as most others, sustainability can be achieved through different means and the trade-offs between direction, diversity and distribution, are starkly political.

The lack of sustainability often arises from various forms of structural inequality. Poverty, for example, may result in people being driven to unsustainable practices, and various forms of discrimination are causes of negative environmental changes, as access to resources is squeezed. Equally, as discussed earlier, differences across class, gender, race, wealth and location are often highly correlated with exposure to environmental pollution, land degradation, climate impacts and more (Newell 2005; Bond 2012; Martin 2013; Martínez-Alier *et al.* 2014). Thus poverty, inequality and discrimination are deeply intertwined with patterns of unsustainability, as the environmental justice literature makes clear (e.g. Bullard 2000; Brulle and Pellow 2006; Blum 2008).

If large portions of society are excluded from sustainable development solutions in favour of an elite, narrow solution, even if the argument is for urgent action, then how will sustainability ever be sustained? Innovations with a lasting impact occur if those affected become involved. Strong coalitions for change will be forged, where pressure is exerted on governments, companies and international programmes through continuous demand from those where sustainability and day-to-day experiences and livelihood options are intimately

[4] Some waste-picker groups have sought support from the Clean Development Mechanism, suggesting that here again the contrast between local actors and global solutions is not so clear-cut (Peter Newell, pers. comm.).

connected. In this way environmental justice becomes central to sustainable development approaches, politicising them from the grass roots, where social difference really matters. In this way, contemporary struggles – including for environmental sustainability – need to be connected in a 'triple movement' that brings in an emancipatory politics that seeks justice and equality in respect of gender, race, as well as for future generations around the environment. This will mean the forging of new alliances – such as those central to the environmental and climate justice movements – that can hold states and markets to account.

6.2 Inequality and sustainability: forging a wider compact

In *The Spirit Level*, Richard Wilkinson and Kate Pickett (2010) argue that divided, unequal societies are unhealthy and unhappy, and such inequalities are not good for development. By extension, unequal societies are unlikely to be able to address sustainability challenges in the long term, as they will be unable to form a common commitment – a wider compact – for change (Wilkinson, Pickett and De Vogli 2010). This means that bringing the agendas of equality and sustainability together makes much sense, as we carve out an agenda for research and action for the sustainability era.

Issues of inequality have risen up the agenda in recent times. The Occupy movement has identified the symbolic, privileged 'one per cent', while academic economists have documented the shocking concentrations of wealth and privilege (Piketty 2014; Atkinson 2015). Rising inequalities within and between nations, it is argued, are not good for economic development or wider wellbeing (Deaton 2013). As in previous eras, a small elite that hoards wealth is not contributing productively to society, except perhaps through taxation and even this is often minimised. Redistributive policies are suggested to address this, ranging from wealth taxes to statutory living wages. But much of this debate is focused on economic assets, and the mechanisms for economic redistribution in order to fuel productivity through inclusion, with little attention to the implications for sustainability. Too often the focus is on such inequalities being addressed by 'policy' – and so an assumed benevolent, uncaptured state – rather than on the requirements for collective, emancipatory political action (a 'triple movement'), and building a new vision for a sustainable society.

Concentrations of wealth and power have long emerged in capitalism (and indeed under various forms of state socialism), and have been challenged both by revolutionary and social democratic politics. Yet the traditions of radical socialism and social democracy emerged in different periods. The struggles for labour rights, the emancipatory politics of racial or gender equality or the commitments to a welfare-providing state were generated around a particular historical confluence of circumstances, interests and alliances. What then for a new compact for sustainable development, forged as part of a new politics? With a few exceptions, 'green politics' has not had a major impact on national polities, either through existing parties or through new green parties. Many constraints exist, including electoral systems, financing, and the fact that day-to-day struggles that drive political commitments and form constituencies are often not linked to the bigger questions of the future of the planet. But does action always have to arise from near-disaster and major outcries? Can a more sustained collective response be built? This will depend on the setting and the political context. A national compact must emerge from the particular configuration of capitalism and state politics. Confronting inequality and unsustainability means taking on powerful forces – incumbent political and commercial power will always resist. A new politics for sustainable development that creates a societal compact that combines sustainability and social justice must transcend such problems, and this, inevitably, requires collective political action.

6.3 Global sustainability: galvanising transformations across borders

A particular political challenge for sustainable development is galvanising action between nation states. This has proved incredibly difficult, partly because of the domestic politics of international action and partly because international agreement is inherently difficult. At both global and national level progress is slow because the debate pitches public against private (or civic) sectors, developed against developing countries, or rising powers against old powers. But actors supporting (and opposing) progress on sustainability can be found in each of these categories. The analytical and practical challenge lies in identifying and forging alliances across these divides. We have argued throughout that a focus on alliances offers the best hope to accelerate sustainability. The categories we use and the way we frame the political discussion is essential for making more substantial progress. Current framings of the political debate make it easy for elite interests to block change at a national level that has repercussions for global negotiations. National interests frequently offset internationalist rhetoric about planetary protection or climate change mitigation. And generating collective action at a global level through transnational connections is notoriously challenging.

Climate change has been the dominant signifier of a global environmental challenge (IPCC 2014). This too has equity and social dimensions at its core. Some nations and some social groups are far more likely to suffer the consequences of adverse climate change than others. And there is an intergenerational and historical dimension too. As Anil Agarwal and Sunita Narain (1991) argued nearly 25 years ago, certain parts of the world are responsible for historical emissions, and have benefited from a fossil fuel economy to generate economic growth, while others have remained in poverty. Since then some of the formerly poor countries have joined the top leagues of carbon emitters so old country groupings need to be re-thought. Addressing inequalities in the past, present and future, and across the globe, makes the politics of climate change especially contentious. The result is that global agreements, if they have been struck at all, have been weak and inadequate.

Some argue that as a result the slow, painful and highly ritualised and formal process of international negotiations around sustainable development – whether climate treaties, biodiversity agreements or long lists of Sustainable Development Goals – should be abandoned in favour of a more top-down form of ‘global governance’ (or government). Various options have been mooted including a ‘World Environment Organisation’; something with international legislative teeth, akin to the World Trade Organization (Newell 2002). Some of the debate around ‘planetary boundaries’ pushes the idea of the need for overarching governance to ensure that a ‘safe operating space’ for humanity is created, balancing planetary and social boundaries (Biermann *et al.* 2012; Galaz *et al.* 2012). Yet, top-down environmental governance has a poor track record, and is inevitably subject to capture, and becomes distorted by existing configurations of power. The lack of accountability and failure to connect to a wider politics also too often undermines credibility and legitimacy. A serious move towards greater equality and sustainability instead requires a central role for a politics of collective action. This is indeed the lesson from past struggles for environmental and social justice. How this becomes embedded in the envisaged visions for multi-level global governance for planetary boundaries has yet to be elaborated, and remains a key area for future debate.

But can globally connected social movements, committed to environment and social justice, provide an alternative? Just as large, state or business-led initiatives, such efforts are inevitably prone to biases inherent in their organisation and origins. Particular narratives about change are pushed above others, and a movement elite may suppress a genuine contentious politics that generated constituent movements in the first place. Critiques, for example, of the food sovereignty movement raise such issues (Bernstein 2014). By asserting a unified globalism – a singular pathway – the diversity, energy and innovation of diverse

alternatives can be silenced (Leach and Scoones 2015). Across social movements, North and South, there are of course 'varieties of environmentalism', with multiple, often quite local characters that may be challenging to connect (Guha and Alier 1997), and this may be the case even in one national setting (Gadgil and Guha 1994). Transnational mobilisations around sustainability therefore must galvanise such contextual understandings and motivations, while connecting diverse locations and imperatives with wider concerns.

As Chantal Mouffe (1999, 2005) argues, appeals to cosmopolitanism and deliberative consensus can offset the forms of agonistic politics essential for progressive change. Instead there is a need to pay attention to how located citizenships – reflected through identities, cultures and practices – feed into debates about sustainability. 'Culturing' sustainabilities (cf. Stirling 2015) requires rooting concerns in diverse political framings, and emphasising democratic struggle and agonistic contention instead of managerial control. Translating such emancipatory ambitions into global citizen-led movements for sustainability is a major challenge, however, requiring the simultaneous accommodation of diverse views, while projecting a common vision (Edelman 2001; Edelman and Kay 2008). Global sustainability transformations may have to be built through connecting smaller, incremental changes driven by diverse forms of citizen action in diverse localities over time (Leach and Scoones 2007), rather than imagining a singular, organised response.

6.4 Linking green and red: towards a progressive sustainability agenda

While there is much appeal in linking social justice with sustainability, as the previous sections have shown, this is far from straightforward. Progressive movements that have linked struggles have emerged in the past, but perhaps the sustainability challenge is even larger, given the global scale, the diversity of visions, and the immensity of the task. The galvanisation of a 'triple movement', following Nancy Fraser (2013), linking the re-embedding of markets in state and societal control, with emancipatory movements for sustainability and social justice, is a central ambition for the sustainability era.

Ensuring social justice is part of sustainability transformations means such transformations are more inclusive, and more likely to be sustained over time, with greater legitimacy. There are many ways of achieving this, from more top-down to more bottom-up approaches, but we argue that building alliances across groups that garner wide support is essential. This means taking the often highly contested politics of such processes seriously. This is a lesson long learned in development. Linking processes with outcomes, means with ends, is essential. They are not separate, and are inevitably co-constituted. In development studies, critiques of standard, top-down development emerged through an argument for participatory development processes (Chambers 1983, 1994b). Participatory development delivered, it was argued, more appropriate and effective outcomes. It is the same for the sustainability challenge. There are many things to learn from participatory development, both good and bad (Hickey and Mohan 2005). A transformation from constructing recipients of 'development' as beneficiaries or consumers to 'active citizens' is an important step, for example (Cornwall 2000).

All this requires an approach to building coalitions for sustainability, based on how citizens envision pathways to sustainability, with alliances struck with states, businesses, civil society groups and others in line with such visions, so action can follow. Such processes are not free of conflict. This means that an approach that takes seriously the 'agonistic' politics of contention is essential, and allows for the building of alliances and movements that are not devoid of dissent, subject to forced consensus, but vibrant sites of debate and challenge, in diverse contexts globally.

A new politics of sustainability is therefore not one of managerial uniformity, or top-down dirigisme, but one that must always be opened up to debates about alternatives and challenges to authority. In many cases it will be a ‘slow race’ to sustainability as the visions, institutions and politics are aligned for change through a painful, contested politics. This will have to occur at the very local level, as around waste management solutions in a city; at national levels as new compacts for sustainability forged in particular polities; and at a global level around the big cross-border challenges, such as climate change. Difference and diversity must always be central, and so distributional questions around addressing inequalities and assuring social justice. Just as the fable of the tortoise and the hare, it may be that a more deliberate, slow, diverse and multi-sited approach is the best way of meeting our most urgent of collective challenges.

7 The political economy of sustainability and development: an agenda for research and action

At the outset of this paper we asked three questions. First, is it possible to accelerate sustainability transformations in a purposeful way? Second, how do sustainability transformations occur, and who drives them or holds them back? Third, do sustainability transformations and social inclusion reinforce each other? The main overall lesson is that answering these questions requires an approach that gets to grips with a perspective on political economy that integrates a structural and relational understanding of economy and politics in historical context, with an understanding of the influences of the diverse axes of social difference and power relations. A focus on 'people in places' (often places that are connected) highlights agency, knowledge and practices, but always in relation to structural drivers, determinants and constraints.

Accelerating sustainability transformations is above all a political challenge. Precisely because such transformations result from the concurrence of multiple changes the uncertainties are enormous. It is hard to imagine how deliberate (rather than accidental) acceleration could happen unless there is a supportive alliance of public, private and civic actors. We stressed that this need not be an alliance of the like-minded; it can be an alignment of actors that support transformations for reasons other than sustainability concerns. This is a plank of our analysis which is both fundamental and risky. It is fundamental because the range of relevant actors increases dramatically. It is risky because the convergence of interests might be only temporary. This need not matter if the joint action helps to take transformations to a new level at which inevitably new problems and constellations emerge.

Taking political economy analysis seriously requires willingness and ability to unpack the public, private and civic sectors. There are actors promoting and obstructing transformations in each of these groupings, and this requires an unpacking of each. We argue that increasing inequality ultimately undermines the prospects for sustainability transformations. Social exclusion tends to weaken political support. In this political sense, sustainability transformations and social justice reinforce each other. In the words of Dirk Messner (2015: 12), 'the transformation to sustainability implies a fundamental realignment of societies which requires legitimation by their citizens'.

Political economy analysis is fundamental to answer our three questions but it is not sufficient. Understanding dynamics and timescales is equally important. A focus on time means reflecting on the timescales over which processes unfold: centuries, decades, electoral cycles, stages of the policy process and so on. It includes acknowledging time lags and recognising explicitly that different dimensions of transformations proceed at different speeds; for example, legislation can be introduced quickly but concomitant cultural changes might take a long time. In this paper we have stressed that recognising urgency does not translate into big-push, hurried solutions. There is no motorway into the green future. Multiple pathways make acceleration easier and faster. A number of points emerge.

First, experimentation matters. Experimentation is critical because principles for moving forward might be clear but the policy design needs testing. Post-communist China and Vietnam were able to transform their economies fast not because their governments were bulldozing forward but because they were willing to test ideas and use transitional institutions

and arrangements. By implication, accelerating transformations might be easier in countries in which governance is decentralised. Also, an analysis of dynamics needs to allow for unintended consequences. The success of Germany's energy transition induced a political backlash because the short-term financial cost of the feed-in tariff was visible in peoples' energy bills and many of the jobs for producing solar panels were created in China rather than Germany.

Second, is the importance of understanding and responding to complex, dynamic systems. As stressed above, sustainability transformations are not one big project but a complex process, with multiple pathways. Concerned with finding a way through such complexity, we suggest focusing on turning points and then asking who was driving the process at those turning points – or holding it back. In the case of China, for example, one can argue that the Renewable Energy Law of 2006 was such a turning point. A different idea is to look for political tipping points. Sustainability transformations are intensely political processes. The stakes are high precisely because the changes are structural. While one can argue that in the long run everybody benefits, in the short run there are winners and losers. As stressed earlier, the opposing forces are not necessarily against de-carbonisation or environmental sustainability, they are fighting for their jobs or protecting their assets. The battle lines sometimes run right through organisations (for example the World Bank) or companies (for example Siemens). In order to understand the dynamics of transformation we need to pay attention to both the creation of the new low carbon economy and the destruction of the old high carbon economy. The key indicators to look out for are clear: the ratio between high and low carbon investments and the power balance between high and low carbon alliances. Only when substantial business interests join the low carbon alliance is a political tipping point in the making.

Third, is the importance of context-specificity. The most successful (former) developing countries are those that found their own way forward (Schmitz 2007). All transformations are located in contexts, reflecting different historical experiences, and are attuned to particular political economies. As the cases that we have touched on in this paper have shown, transformations to sustainability are inevitably shaped and conditioned by place and time-specific contexts, and we can learn much from these through comparing and contrasting lessons and experiences, and linking these to action.

Fourth, is the importance of understanding the role of crises and (near) disasters. Crises have played a major role in some transformations. While it is important to recognise this, it can have a disabling effect for politically engaged research. There is, however, a constructive way of dealing with crises that is consistent with the research and action approach suggested here: include crises in the analysis by seeing them as opportunity spaces that (constellations of) actors can use to advance particular initiatives, open up debate about alternative pathways and challenge incumbent power and interests.

If the next 50 years is to be defined by sustainability concerns, then these lessons must be central to a new era for development studies. It is therefore a historically-informed comparative political economy approach that we believe is the most fruitful avenue for future research and action in the field of sustainability and development. This must be rooted in particular places, but be truly international: North and South, rich and poor, urban and rural. It must be comparative across geographies, and so political-economic contexts, so learning can emerge, and hypotheses about what works where and when tested through deep, long-term empirical research. It must be informed by history, and the experiences that shape what is possible, and what currently is not, as well as learning lessons from past transformations. It must also be comparative across sectors, looking at food and farming, waste and recycling, water resources, energy and carbon reduction and so on. It must uncover, perhaps facilitate, alliances or coalitions for transformational change, analysing political incentives, democratic opportunities and deficits and the roles, existing or potential, of citizens and states,

businesses and more. And taking a political economy stance of the sort highlighted earlier, it must necessarily be interdisciplinary and cross-scale. It must take seriously the structural conditions that make current pathways unsustainable, and analyse locally, but also internationally, the processes, actors and institutional arrangements that lock economies and livelihoods into unsustainable patterns. It must shine a light on incumbent power and interests, and expose the failings of the past, including efforts promoted under the label of 'development'. It must also focus on local understandings, practices and perspectives to get a handle on what sustainability means to different people, and what existing socio-technical innovations and experiments are, and what their potentials and constraints might be. It must track between such local understandings and the international processes that may enable and constrain pathways to sustainability and actively link the two. And it must be alert to issues of equality and social justice, identifying the winners and losers from different transformation pathways, and examining how class, race, gender, ethnicity, and the array of structural inequalities, affect and are affected by sustainability transformations.

This is of course a massive prospectus, and can only be undertaken collaboratively and in partnership with others. Because so much of the required research is place-specific and context-sensitive, as well as long-term, working with partners in places across the world will be essential. This should not be confined to old geographic demarcations of North and South, as the sustainability agenda is truly global. It must be rooted in partnerships where there are commitments for the long term, as this agenda is not easy or quick-fix. And because so many of the pathways to sustainability remain uncovered, hidden or supressed it must involve linking research with action. Our argument has been that transformations to sustainability – combining environmental and social justice challenges – involve alliances across actors – states, business, citizens and others – generating a 'triple movement'; research, too, must forge such alliances. A commitment to co-constructed, co-produced research means engagement in practice and excellence in research must go together. The next 50 years of development studies in the sustainability era will certainly be challenging, but also exciting, as we seek out diverse pathways to sustainability.

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