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Equality, Security and Sustainability

Equality, Security and Sustainability: In Search of Virtuous Circles

Stephen Spratt

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Contents

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Abbreviations

ADB	Asian Development Bank
BAU	business as usual
CO_2	carbon dioxide
CRISE	Centre for Research on Inequality, Human Security and Ethnicity
EKC	Environmental Kuznets Curve
ETS	European Trading System
FX	foreign exchange
HI	Horizontal Inequality
IDS	Institute of Development Studies
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
ISSC	International Social Science Council
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
SDGs	Sustainable Development Goals
SO_2	sulfur dioxide
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNU-WIDER	United Nations University World Institute for Development Economics Research
VI	Vertical Inequality
WCED	World Commission on Environment and Development
WSSR	World Social Science Report

Introduction

Many people and institutions are conducting research on inequality, security, or environmental sustainability. Some are looking at two of these issues together. None, to our knowledge, are examining all three simultaneously, or looking in detail at the interactions between them. This matters. Of the 17 Sustainable Development Goals (SDGs), nine relate directly to these subjects,[1] and eight have strong indirect linkages. Crucially, while each SDG can be considered on its own terms, they should really be viewed as interdependent objectives: the level and nature of growth and industrialisation, for example, is inextricably linked with environment goals.

The same is true of the three objectives that form the title of this report. From a development perspective, the aim is not to foster societies that are equal *or* secure *or* sustainable, but to understand the pathways that could potentially lead to societies with *all* of these characteristics. As a prerequisite, we need to identify the ways that these goals can interact during the development process, both negatively and positively, and understand better how negative interactions might be reduced and positive synergies enhanced.

This is an extremely challenging task for four reasons. First, the literature on each of these three subjects is vast and growing all the time. Second, rather than a single 'literature', we are really talking about numerous discrete, and often non-overlapping, literatures within the different social science disciplines.

Third, and perhaps most importantly, no interaction holds in all circumstances. What was true in the past may not be in the future. Relationships that seem very robust in one location may not hold in others. To a greater or lesser extent, all interactions are thus contingent on particular contexts. In some cases, these contextual factors are relatively well understood. In others we know very little.

The final challenge concerns timescales, or duration. An interaction that looks positive in the short run may turn out to be less so over the longer term, and vice versa. The classic example is the relationship between economic growth and sustainability, which its proponents argue is captured in the inverted U of the Environmental Kuznets Curve (EKC). From this perspective, the early stages of growth are associated with deteriorating environmental outcomes, but this negative interaction becomes positive beyond a certain level of national income.

The validity of the EKC is fiercely contested in the literature, with supporters and opponents both pointing to examples that give weight to their positions. This rather underscores the point about contingency: in some circumstances EKC-type relationships may hold, in others not. This suggests that there is nothing inevitable about these relationships, in either a negative or a positive sense. That is, growth may lead to worsening environmental outcomes, but this is contingent upon the nature of growth. Similarly, environmental outcomes may improve beyond a certain level of income, but this is also not guaranteed. In the first instance, we need to understand how growth can avoid creating negative environmental impacts. In the latter case, we need to understand how the potentially positive environmental effects of more affluent countries can be realised.

[1] Gender equality; affordable and clean energy; reduced inequalities; sustainable cities and communities; sustainable consumption and production; climate action; life below water; life on land; and peace, justice and strong institutions.

Given these challenges, it is important to establish some boundaries at the outset, and to be clear about the aims of this report. Given the scale of the literatures, it is simply not possible to be comprehensive. Inevitably, many relevant research findings will have been missed. Rather than a comprehensiveness review, therefore, the first aim of the report is to develop some analytically useful categories, which may help cut through the complexities of the interactions between these development goals. The simple typology of interactions introduced in Section 1 is the main contribution in this regard.

Sections 3, 4 and 5 explore these interactions through a series of paired development goals: sustainability and equality; equality and security; and sustainability and security. In a limited number of areas, important interactions emerge between all three goals, which are considered in Section 6. As described above, no claims to comprehensiveness are made. Rather, some of the most important interactions – negative and positive – that are found in the literature are identified. In each case, a distinction is made between the dynamics of these potential interactions, and the contingent factors which determine whether they are 'catalysed' or not. The second aim of the report is to develop these analytic categories and begin to populate them.

Each section concludes with a series of research questions, which are summarised and discussed in Section 6. Developing these research questions is thus the third aim of this review.

1 Forms of interaction

There are three possible types of interaction between the objectives described. First, they may be mutually supportive of each other, so that progress with one is associated with progress in the other(s). We might call these types of interactions, 'win-win'. Second, there may be a trade-off between the goals, such that progress in one is associated with negative impacts in another. We might call these, 'win-lose'. A third category of 'lose-lose' interaction would see negative impacts reinforce each other.

As the title of the report suggests, the ultimate aim of the exercise is to contribute towards our understanding of how development pathways where sustainability, equality and security reinforce each other positively can be encouraged. Specifically, how can synergies be enhanced and the debate be moved onto a more positive footing? There are two stages to this.

First, we need to identify the most important interactions in what might be called business-as-usual (BAU) scenarios. In what ways are outcomes in each of the three areas related? How, and under what conditions, can inequalities undermine security, or sustainable environmental behaviour, for example? Conversely, how and under what conditions, does greater equality undermine conflict or unsustainable environmental outcomes? As well as the dynamics of these relationships, the role that context plays in shaping these dynamics is a principle concern.

The reason why it is important to understand these dynamics and contingencies is so that they can be positively influenced. As well as BAU, therefore, the second stage is to examine interactions during interventions designed to achieve positive outcomes in one or more area. In what ways, and under what conditions, for example, can interventions to enhance sustainability affect inequality? How can negative impacts be avoided and positive synergies be enhanced? Similarly, how might interventions to avoid or resolve conflict affect inequalities of different forms, and how can these interventions be designed to have positive impacts?

This simple typology is used to organise the material in each of the following sections. There are many different ways this could be done, and the approach taken here is just one of these. What is important, however, is to use *some* framework to organise and analyse the relevant material. An advantage of the approach taken here is its simplicity. In reality, there are many more than three possible interactions, not least in terms of differing intensity – 'lose-lose' interaction may be relatively mild or potentially catastrophic. Rather than build this into the framework, adding to the complexity, this issue is addressed through the prioritisation of research questions on the basis of their importance.

A second decision that has been taken in the service of simplicity, is to keep questions of definition separate from this framework. In each of the three areas, 'sustainability', 'equality' and 'security' can mean very different things. This is partly different aspects of the issue concerned – climate change versus natural resource use, or inequality of income or status, for example. 'Sustainability' is particularly multifaceted in this regard. A second point of difference, however, is more fundamental. What level of resource use or carbon emissions *is* sustainable, for example, or what do we mean by 'security' in a particular context? For the framework to be analytically manageable, these questions are examined separately in Section 2 and then integrated throughout the report.

Finally, while some schools of thought are discipline-specific, there are important cross-disciplinary perspectives at play. These broad 'narratives' shape the analysis of both problems and solutions. Drawing on the literature on sustainability transitions, Schmitz and Scoones (2015) identify four forms of narrative:

1. Market-led;
2. Technology-led;
3. State-led; and
4. Citizen-led.

Proponents of market-led transformations, for example, tend to diagnose the problem as the lack of such instruments – environmental assets are not priced, or not priced accurately, for example. The solutions that naturally follow are thus very likely to be market-led.

While it is likely that workable 'solutions' could be found in each of these narrative areas, the consequences – in terms of the interactions we are concerned with here – may be quite different. Depending on the detail of their design, for example, some market mechanisms to address sustainability issues could have negative implications for inequality, for example. When considering the merits of different narrative-led solutions, it is therefore important to think through these implications. This question of narratives is addressed at relevant points in the following sections, most significantly in Section 6 where research questions are summarised and discussed.

2 Some definitions

Equality, security and sustainability have a number of different aspects, and also mean different things to different people. Before examining interactions between these objectives, therefore, we first need to unpack this a little. One way of thinking about this is to distinguish between questions of 'what' and 'for whom'.

2.1 (In)equality

Inequality is concerned with the distribution of something. This often refers to income or wealth, but can also be applied to political matters (such as rights) or social phenomena (such as status). The 2016 World Social Science Report (WSSR) identifies seven types of inequality:

1. Economic inequality – e.g. wealth and income;
2. Social inequality – e.g. education, health or justice;
3. Cultural inequality – e.g. discrimination based on gender, ethnicity, race or religion;
4. Political inequality – e.g. ability to influence decisions or participate in political activities;
5. Spatial inequality – e.g. disparities between urban and rural areas;
6. Environmental inequality – e.g. access to natural resources or exposure to pollution; and
7. Knowledge-based inequality – e.g. ability to access and/or contribute to knowledge (ISSC, IDS and UNESCO 2016).

These differences highlight an important distinction; for example, some measures of inequality, such as income or wealth, concern outcomes, while others, such as access to education, relate to opportunities. In terms of the 'what', therefore, we can first distinguish between inequality of outcome and inequality of opportunity. In practice, these two concepts are often, though not always, related: unequal access to education is likely to result in unequal outcomes with respect to income, for example, while unequal income may also influence access to high-quality education. Whether or not unequal outcomes lead to unequal opportunities is relevant for the questions motivating this report. Reducing inequalities from current levels is not possible unless this link can be broken, as existing inequalities would simply be reproduced, and possibly exacerbated. Understanding the dynamics of these relationships, and how they can be influenced, is therefore important.

If the 'what' question refers to outcomes and opportunities – material and non-material – the 'for whom' question focuses on the nature of the distribution. In this regard, two main types of inequality are differentiated by their unit of analysis. While *vertical* inequality is concerned with the individual or household,[2] research into *horizontal* inequality looks at how the different types of inequality (outcomes and opportunities; material and non-material) are distributed between groups. These may be organised along ethnic lines, or by gender or religion. Stewart and Langer define and distinguish the approach as follows:

> Horizontal Inequality (HI) is defined as inequality among culturally defined (or constructed) groups, in contrast to Vertical Inequality (VI) which is inequality among households or individuals. HIs are multidimensional, including a political and social

[2] Generally applied to income or wealth, measures of vertical inequality such as the Gini coefficient capture how equally distributed these assets are amongst the population. A country where all the income (or wealth) was held by a single individual would have a Gini coefficient of one. A situation of full equality would be zero. While most commonly used to measure the degree of economic inequality within different countries, these approaches can also be applied internationally to measure total global inequality.

> dimension, as well as economic, and a range of elements in each of these dimensions.
> (Stewart and Langer 2008: 1)

Horizontal inequalities may thus cut across the seven dimensions identified in the WSSR, though are most directly relevant for cultural inequalities.

While acknowledging the importance of non-material forms of inequality, the majority of the material presented below focuses on income or wealth, reflecting the weight of this kind of research in the literature. Although the other dimensions of inequality will be considered to some extent, more attention is paid to economic forms. As discussed in detail in the WSSR (*op. cit*.), however, many of these forms of inequality are mutually reinforcing, such that many of the most important issues for income and wealth are also very relevant for the other dimensions of inequality.

2.2 (In)security

> To ravage, to slaughter, to usurp under false titles, they call empire; and where they make a desert, they call it peace.
> (*The Agricola* by Tacitus, AD98)

Security means different things to different people. The quote above is from the Roman historian, Tacitus, but Tacitus is actually quoting the Celtic chieftain, Calcagus. From the perspective of Rome and its supporters, the Empire brought stability and peace: the *Pax Romana*. For their opponents and defeated enemies, however, things would no doubt have looked rather different.

What do the questions of *what*, and *for whom* look like with respect to security? 'Security' may mean the absence of war, conflict or violence, but may also refer to the suppression of social movements. Depending on one's perspective, therefore, it may be either a negative or a positive phenomenon. Similarly, we may be talking about the cessation of conflict between professional armies, or the absence of guerrilla warfare, terrorism or popular protests. In each case, there will be different protagonists involved, or affected as 'collateral damage', and people will disagree on the appropriate nomenclature – one person's terrorist is another's freedom fighter.

Luckham and Kirk propose another way of addressing the 'for whom' question, distinguishing between 'suppliers' of security, including but not restricted to states, and those who are the intended beneficiaries of a conflict-free environment. The authors term the latter form 'security in the vernacular', to capture the fact that this is security as viewed through its 'end users':

> According to the first (or supply side) view: security is the creation and maintenance of authoritative social orders including, but not confined to, those we term states. According to the second (or demand side) view: security is a basic entitlement of those who are supposed to be protected by these social orders.
> (Luckham and Kirk 2013: 339)

Returning to the 'what', Brown and Stewart (2015) identify four forms of conflict which have characterised recent decades and contrast these with large-scale conflicts between nation states, which culminated in the world wars of the twentieth century. First, *wars by proxy* are where 'great powers' fight indirectly, supporting opposing sides in a conflict, providing 'advisors', arms and other resources to the different sides. Second, *external interventions in domestic conflicts* have been particularly associated with the West in recent decades.

Examples include Kosovo, Afghanistan, or the wars in Iraq. Third, *revolutionary or ideological wars* include those fought against colonial rule, as well as those to overthrow existing political orders, such as the Khmer Rouge in Cambodia, the early stages of the Colombian conflict, the Shining Path in Peru, and Maoist factions in Nepal. Rebellions aimed at installing democracy or imposing a particular ideology such as Sharia law are also examples. The final category identified is *wars fought for political control by ethnic or religious groups*, or coalitions of groups, and include conflicts in Rwanda, Burundi, Northern Ireland, Uganda and most recently, the Middle East.

Historically, these types of conflict have generally been contained within nation states, though often involving actors from other jurisdictions. An exception, which has become increasingly important in recent times is international terrorism, which may be motivated by religious or ideological factors.

As well as conflicts of these kinds, 'insecurity' can also be defined broadly to include jobs and livelihoods. Whilst acknowledging the importance of these issues for the process of development, this report focuses primarily on issues of physical rather than economic security. Insecurity, therefore, is defined as the lack of physical security, or the risk of physical harm. As to the 'for whom' question, we are interested in security from the perspective of citizens rather than states – i.e. 'security in the vernacular' in the language of Luckham and Kirk (2013) and Luckham (2015).

2.3 (Un)sustainability

Of the three objectives considered, environmental sustainability – or its absence – is the most multifaceted and complex. For reasons of space, therefore, questions of 'what' and 'for whom' are unpacked and summarised in Table 2.1. The 'what' in this case is some form of environmental pressure or shock. These are divided into two columns to differentiate ultimate causes (e.g. climate change) from proximate impacts (e.g. temperature increases, volatile weather and rising sea levels).

The next column addresses the 'for whom' question, distinguishing between households, social groups, businesses and nation states.[3] The environmental pressures and shocks described will have different impacts on these actors, mostly negative but in some cases positive.[4] As well as the direct examples given, we would also expect to see indirect effects. Reduced crop yields resulting from rising temperatures, for example, would reduce the incomes of farming households directly, and could also increase malnutrition rates. This could have wider (indirect) impacts on food prices, and also on productivity and growth because of the impact of lower incomes and productivity. Another 'indirect' impact is that on future generations. While not included directly, this issue is inherent to all aspects of the sustainability debate.

Given the breadth and complexity of questions of environmental sustainability, it is neither feasible nor desirable to give a focused definition. This is compounded by the fact that there is no consensus on what 'sustainable' actually means. In 1987 the Brundtland Commission defined 'sustainable' development as that which 'meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED 1987). While this well-known definition has been adopted by most international agencies (Schneider 2008), it has never really satisfied either extremes of the debate, which we might crudely term the economist versus ecologist positions – the views of most actual economists or ecologists would be somewhere between these extremes, which are presented in stylised form to illustrate the main points of difference.

[3] An 'actor' not included here is the planet itself, or 'Gaia' to use James Lovelock's terminology. Whilst acknowledging this important ethical position, the approach taken in this report is anthropocentric.
[4] Negative environmental impacts create opportunities for some businesses, for example.

For our stylised ecologists, the principal problem with the definition is that 'needs' could be defined to include luxury items, leading to consumption that is unnecessary as well as unsustainable. A second, more 'deep green' objection, is that the definition is too anthropocentric, ignoring the 'needs' of other species (Goffman 2005; Lélé 1991; Montani 2007). Some economists would argue, again depending on how key terms are defined, that the definition risks trapping the poor in a cycle of impoverishment, as it may preclude levels and forms of growth today necessary to escape these (Beckerman 1992, 1994; Bernstam 1990; Pezzey 1997).

Table 2.1 Environmental pressures and shocks: *what* and *for whom*?

Of what?		**For whom?**	**Direct impacts**
Climate change/ ocean acidification	Rising temperatures	Household	Crop yield; food security; income; malnutrition; migration
		Social groups	Livelihoods; migration
		Businesses	Revenues; costs; jobs
		Nations	Tax; FX
	Volatile weather patterns	Household	Crop yield; food security; income; malnutrition; floods; storm damage; migration
		Social groups	Livelihoods; migration
		Businesses	Revenues; costs; jobs
		Nations	FX; tax; infrastructure
	Rising sea levels	Household	Housing; livelihoods; migration
		Social groups	Communities' livelihoods; migration
		Businesses	Revenues; costs; jobs
		Nations	Infrastructure; housing; security
	Declining fish stocks	Household	Food security; malnutrition
		Social groups	Food security; income
		Businesses	Revenues; costs; jobs
		Nations	Tax; FX
Biodiversity	Declining biodiversity	Household	Income; health; leisure; wellbeing
		Social groups	Livelihoods; culture
		Businesses	Offsets
		Nations	ODA; tourism
Resource use	Unsustainable renewable resource use (e.g. deforestation, overfishing)	Household	Income; livelihoods; migration
		Social groups	Land rights; culture; income
		Businesses	Revenues; jobs
		Nations	CO_2 emissions; biodiversity; tourism; tax revenue; FX; security
	Unsustainable non-renewable resource use (e.g. fossil-fuels, minerals, metals)	Household	Income; livelihoods; migration
		Social groups	Land rights; culture; income
		Businesses	Revenues; jobs
		Nations	CO_2 emissions; biodiversity; tourism; tax revenue; FX; security
Localised pollution/supply	Air	Household	Health
		Social groups	Local health
		Businesses	Revenues; costs; jobs
		Nations	Health costs; tourism
	Water (quality + supply)	Household	Health; costs
		Social groups	Health; costs
		Businesses	Revenues; costs; jobs
		Nations	Health expenditure; security
	Soil	Household	Crop yield; food security; income; health
		Social groups	Livelihoods
		Businesses	Revenues; costs; jobs
		Nations	Tax revenues; FX

An alternative paradigm is weak sustainability, sometimes called the ‘economics definition’. Weak sustainability draws on the work of welfare economists (most notably Solow (1974) and Hartwick (1977)) and assumes that human-made capital can often be substituted for natural capital, and under certain conditions should be. Specifically, if the value generated by transforming natural capital into human-made capital is greater than that from leaving natural capital intact, the transformation should take place (Beckerman 1994; Solow 1993). To not do so is inefficient and even morally objectionable.

Proponents of ‘strong sustainability’ take a different view, disputing the substitutability of natural and human-made capital for a number of reasons. First, different elements of natural capital exist as part of complex ecosystems and we do not understand the system-level consequences of depleting individual elements. Second, unlike human-made capital, the loss of species is irreversible. Third, as human-made capital relies on natural capital to exist, it can only be a complement not a substitute. Finally, certain forms of natural capital are viewed as essential for human survival – so called ‘critical capital’ – and cannot be replaced by human-made capital (Pelenc and Ballet 2015).

When we think about how ‘sustainability’ could interact with the other areas, therefore, we need to consider how this is affected by the definition of sustainability being used. Disagreement over definitions and ramifications will shape perspectives on the existence and nature of the interactions described above, both in terms of ‘business as usual’ and the design and implementation of policy interventions. For these reasons, no attempt is made at a single definition in this case. Rather, the roles that these different definitions can play are explored throughout the report.

Having introduced a simple typology of interactions, and discussed how our three development goals can be defined, Sections 3, 4 and 5 examine some key findings from the literature on the interactions between these goals. As discussed above, the goal is to further understanding on how negative interactions can be avoided and positive synergies encouraged. Accordingly, each pair of development goals examines three forms of interaction: ‘lose-lose’; ‘win-lose’; and ‘win-win’.

3 Sustainability–equality interactions

Research on the interactions between inequality and environmental sustainability is a rapidly evolving field. This is partly because interest in how inequalities can be reduced has only recently moved to the top of the research agenda. Another factor is that the timeframes with some environmental issues are very long, complicating questions of causal relationships. While we can already see clear evidence in some parts of the world, the most severe projected impacts of climate change will be felt in the future, potentially the distant future depending on one's view. Inevitably, therefore, research on how these long-term effects could interact with inequality (or security) is somewhat speculative. This is not to question its importance, however. As we shall see, some of these interactions have profound implications. Waiting to act until they have fully transpired could be catastrophic.

3.1 Lose-lose interactions

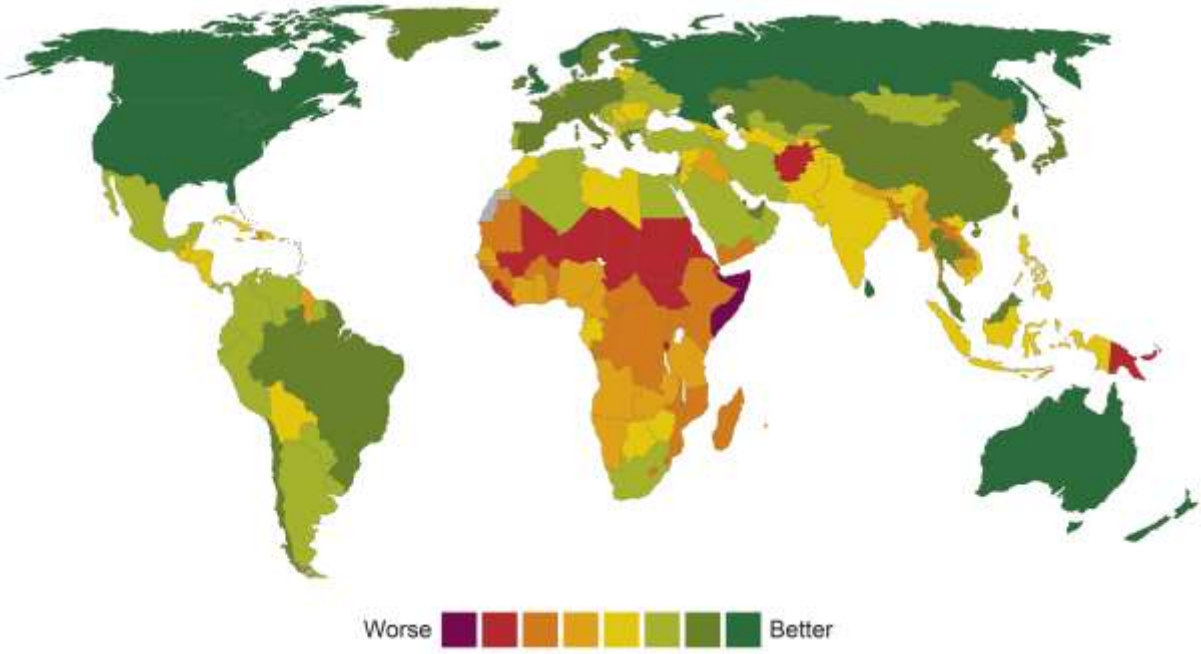
In some cases, 'lose-lose' interactions can be observed as part of business as usual. Here the task is to understand the dynamics of these relationships, and the contingencies that shape them – when does a 'lose' in one area create or exacerbate one in another, what contingent factors determine this, and how might they be avoided? At face value, we would not expect to find such interactions resulting from interventions to improve outcomes with respect to either sustainability or inequality. By definition, these are trying to produce at least one 'win'. Having said that, it is not difficult to imagine – or to find examples – of well-intentioned interventions that have spectacularly failed to achieve this, and have made matters worse. Sometimes this may be the result of incompetence. In other cases it may be the result of the application of flawed and fiercely contested approaches.

This is a particular issue with questions of 'sustainability'. 'Green grabbing', for example, is where land in developing countries is acquired by groups of companies and investors for ostensibly 'green' reasons, but which result in negative environmental and inequality outcomes. The latter may result from dispossessing local people of traditional lands and their associated livelihoods, many of which are environmentally positive. The former may result from environmentally damaging land-use change as more intensive farming methods are used, or where 'green' crops such as biofuels are grown, or where the aim is to obtain international climate finance (Fairhead, Leach and Scoones 2012).

As well as understanding how 'lose-lose' interactions can be avoided in terms of business as usual, therefore, it is also essential to do the same for interventions. Ideally perhaps, these types of intervention would be avoided entirely. If this is not feasible, however, we need to understand the contingent factors that lead to the negative outcomes so that they can be successfully mitigated.

Returning to BAU scenarios, the impacts of climate change are, and will continue to be, unevenly distributed around the world. Rising temperatures are felt more acutely in equatorial regions, affecting agricultural yields and rates of desertification. Increasingly volatile weather patterns are more likely to affect tropical regions (IPCC 2014). At the same time, vulnerability to these impacts will tend be higher in poorer countries, where infrastructure may be lacking or not resilient to climate change, and households have fewer assets to help cushion them from shocks (*ibid*.).

Figure 3.1 National vulnerability to climate change impacts



Source: Adapted from ND-GAIN (http://index.gain.org/).

This is illustrated in the map (Figure 3.1) from the ND-GAIN research programme at the University of Notre Dame, which combines physical impacts of climate change with capacity to adapt to these effects, creating a global index of national vulnerability. As we can see, the highest levels of vulnerability are concentrated in sub-Saharan Africa, South, Southeast and Central Asia. As well as these national-level differences, we would expect to see similarly uneven intra-country distributions. Again, this is partly the result of physical proximity to arid regions, or threatened coastal areas, and partly due to different socioeconomic capacities to adapt to these effects (IPCC 2014). At both the national *and* sub-national level, therefore, climate change impacts are likely to exacerbate existing vertical and horizontal inequalities (Dennig *et al.* 2015).

We also find negative interactions in the other direction, with existing economic inequalities being reproduced in environmental outcomes. From a world-systems perspective, for example, unequal patterns of global production and accumulation are important drivers of environmental change (Bergensen and Parisi 1997). Within this framework, adverse environmental impacts may be greatest in nations that are in the periphery of the world economy, as a result of economic activities to serve countries at the core (Frey 1998; Bunker 1984, 1985).

Within countries there is also evidence that environmentally damaging activity is more likely to be located in relatively poor areas, creating negative health effects, which perpetuate inequalities. Localised environmental quality is an important channel through which income inequalities affect population health. These results hold for air-pollution indicators (CO_2 and SO_2) and water pollution, and for rich and developing countries (Drabo 2011).

Again, we find interactions in both directions, with a growing body of literature linking intra-country inequality with negative environmental outcomes, particularly in higher-income countries. Rich countries with higher inequality, for example, have been found to consume more resources and generate more waste per person (Dorling 2010, 2011; Dorling, Barford and Wheeler 2007).

A number of channels have been identified to explain these effects. From a behavioural perspective, inequality has been linked with (over)consumption triggered by 'status anxiety'. People have a natural tendency to strive for status (Lindenberg 2001; Schwartz 1992), and their concerns about relative position in social hierarchies have been linked to stress and health problems, particularly mental illness (Wilkinson and Pickett 2010). Of particular relevance is that status anxiety has also been linked to higher levels of consumption (Frank 1999; Levine, Frank and Dijk 2010).

A second channel, which is relevant for countries of all incomes, is political. Unequal political and civic rights have been associated with negative environmental outcomes, with some evidence that democratic governments are more environmentally concerned (Congleton 1992; Li and Reuveny 2006; Farzin and Bond 2009). The presence of stable democracies has also been linked to more sustainable land-use. Rates of deforestation, for example, may be higher under unpredictable authoritarian governments encouraging short-term, extractive attitudes (Deacon 1994; Didia 1997). Political instability may also increase unsustainable deforestation for similar reasons (Barbier and Burgess 2001). 'Stability' can also be a feature of authoritarian regimes, however. Smith *et al.* (2003) find that the rate of deforestation increased after the collapse of the Suharto regime in Indonesia, and argue that this was because rent-seeking was no longer centralised and strictly controlled.

Horizontal inequalities between genders may influence policy towards the environment. Women have been found to have more environmentally positive attitudes (Bord and O'Connor 1997), be less materialistic (Beutel and Marini 1995) and be less willing to engage in unethical behaviour (Betz, O'Connell and Shepard 1989). Stern, Peters *et al*. (2006) suggest that increasing the voice of women in policymaking is likely to be environmentally positive, and Agrawal (2005) confirms this empirically, finding more involvement of women in forest management improves outcomes.

A number of important negative interactions can therefore be identified with respect to equality and environmental sustainability:

- Some interventions (e.g. 'green grabs') can negatively impact local communities (worsening horizontal inequalities) and also have negative environmental effects.
- Climate change impacts of all kinds may exacerbate existing inequalities, both between and within countries.
- Activities with negative environmental impacts are often located in areas already affected by other inequalities, both between and within countries.
- Countries with high vertical inequality (both economically and politically) are less likely to have environmentally positive policies.
- Gender inequality is associated with less environmentally positive policies and outcomes.

As described above, there is nothing certain about these relationships. Rather, what is described here are underlying dynamics that *can* create 'lose-lose' interactions, but where these outcomes are contingent on the presence – or absence – of certain contextual factors. What factors cause particular climate change impacts to worsen economic inequalities in a specific location, for example? Most importantly for the purposes of this research, how can these factors be mitigated or removed altogether? Section 6 on research questions returns to these issues.

3.2 Win-lose interactions

In this section we consider 'win-lose' interactions, where there is a potential trade-off between positive and negative outcomes with respect to equality and sustainability. As above, a distinction is made between the underlying dynamics of these contingent relationships, and the contextual factors needed to trigger them. The ultimate aim, again, is to begin to understand which of these factors may be most important, with the ultimate goal of mitigating or eliminating their effects.

Globally, eliminating income inequality such that everyone enjoys the level of affluence of today's rich countries may be incompatible with addressing climate change, and with the sustainable use of renewable and non-renewable resources. For example, Jackson (2011) finds that achieving this for nine billion people by the end of the century would require the global economy to be 40 times bigger than today. To be compatible with a sustainable level of emissions, the carbon intensity of growth[5] would need to be 55 times less than today by 2050. If addressing global inequality was combined with income growth of 2 per cent per year, the carbon intensity of growth would need to fall 130-fold from its current level. While still immensely challenging, achieving the necessary reduction in emissions *without* addressing inequality is a less daunting task. Assuming existing levels of inequality and trend income growth, this would require a 21-fold reduction in emissions (*ibid*.).

Empirically, Ravallion, Heil and Jalan (2000) find that high inequality (between and within countries) is associated with lower carbon emissions, suggesting a trade-off between efforts to reduce inequality and address climate change. How inequalities are reduced is important here. Doing so by reducing the incomes/wealth of those at the top of the distribution, for example, will have little effect on consumption levels and thus would not be expected to increase emissions. On the other hand, reducing inequality by increasing the incomes of these at the bottom of the income distribution (with little or no disposable income) would be likely to influence consumption patterns. As a result of these dynamics, the carbon intensity of consumption could rise, increasing total emissions (*ibid*.).

Addressing the same question more recently, Grunewald *et al.* (2011) find the existence of a U-shaped relationship between per capita emissions and inequality, with the relationship mediated by the level of income. The authors agree with Ravallion *et al.* (*op. cit*.) that reducing inequality in poor countries is likely to increase emissions, as the very poor live largely outside the carbon economy. Increasing their incomes would therefore be very likely to increase the carbon content of their consumption. They go on to argue, however, that Ravallion *et al*. take insufficient account of differences between countries.

Using a more comprehensive and recent dataset, as well as more sophisticated econometric techniques, Grunewald *et al.* (*op. cit*.) find a positive association between inequality and carbon emissions in high- and upper-middle-income countries, suggesting that reducing inequality would be likely to lower emissions in these countries. The result reflects the fact that national emissions are strongly influenced by environmental policy, and that highly unequal countries are less likely to have the social consensus needed to support these.

These types of 'win-lose' interactions are not restricted to carbon emissions, but are also relevant for the use of other natural resources. There is no reason that the Ravallion *et al.* (*op. cit*.) findings could not be extended to other renewable and non-renewable resources. Raising the incomes of those at the bottom of income distributions in low-income countries could increase the carbon intensity of consumption. The same logic suggests that it would also increase the *resource*-intensity of consumption, as people can afford to buy more

[5] The carbon intensity of growth is the amount of additional carbon dioxide (CO_2) generated by each additional unit of output. In 2007, for example, this was 768g/CO_2 per $. To be compatible with nine billion people reaching the level of affluence of EU countries this would need to fall to 14g/CO_2 per $ by 2100 (Jackson *op. cit*.).

material goods. There is little current research on this topic, which has strong links to the growing interest in the 'circular economy' and the development trajectories of low- and middle-income countries (Gower and Schroeder 2016).[6]

Most of the literature on the relationship between natural resources and inequality focuses on non-renewable resources, particularly oil, but also metals and minerals. Ross, Lujala and Rustad describe how the discovery of resource wealth can affect horizontal inequality, positively or negatively:

> If the producing region is poor, resource wealth can help to close any gaps between that region and the rest of the country; if it is relatively rich, resource wealth can widen gaps. If extraction facilities operate as enclaves and the regional government has no taxing authority, then a booming resource sector may have little or no impact on regional living standards. But if the extractive sector is strongly connected to the local economy or if the local government can tax resource revenues (either directly or indirectly), resource wealth can sharply boost regional employment and wages and increase local revenues.
> (Ross *et al.* 2012: 2)

While these effects are well known and studied for high-value resources like oil, this has been less the case for relatively low-value renewable resources like forests. In principle, the introduction of programmes such as the UN Reducing Emissions from Deforestation and forest Degradation (UN-REDD, known collectively as REDD+), which creates and transfers a financial value for the carbon held in standing forests, has the potential to change this. As with high-value resources, the impact on inequality will depend on whether relatively poor groups benefit more than the relatively wealthy, or vice versa.

The distribution of REDD+ finance depends on how rights to forest land – or the carbon stocks they contain – are allocated. In many countries, indigenous and forest communities hold 'traditional' rather than formal rights over forest areas, which are often unquestioned because of the low economic value of forests. As REDD+ programmes create a new income stream for forest 'owners', however, incentives may be created to override traditional rights, either taking forests under state control, or granting exclusive use rights to private operators (Stevens *et al.* 2014). As well as preventing forest communities from accessing new forms of finance, this negatively affects their livelihoods, exacerbating horizontal inequalities (Spratt, forthcoming).

Recent evidence suggests that, even when local communities do benefit, REDD+ programmes may exacerbate existing inequalities. Rather than reaching the most disadvantaged, benefits were more likely to be captured by 'households with more socio-political power locally, those with greater food security, and those that are more accessible… while many people likely to be negatively impacted by the REDD+ project did not receive compensation' (Poudyal *et al.* 2016: 35).

Thus far the assumption has been that REDD+ programmes will have a positive environmental effect, even if they exacerbate inequalities. This is not necessarily the case, however. Excluding forest communities from REDD-type programmes may also have negative environmental consequences. There is a growing body of evidence that these communities are often the best stewards of forests. Deforestation rates in the Amazon, for example, are positively correlated with forest management by indigenous peoples (Stevens *et al.* 2014). Interventions that fail to take account of this risk turning 'win-lose' interventions into 'lose-lose'.

[6] The circular economy is one where waste is minimised, recycling maximised, and the outputs of some economic processes become the inputs of others. As a result, the resources needed to support a given level of material living standard will be less than would otherwise be the case. This is a very new field, particularly with respect to international development, therefore how much less remains an open question.

REDD+ is not the only sustainability intervention that has implications for inequality. Interventions that are designed to influence incentives do so through offering payment incentives ('carrots'), or imposing costs ('sticks'). The way these are distributed has clear implications for inequality.

Carbon trading schemes, for example, affect inequality in two ways. The first is through their direct impacts on relative prices. Here effects tend to be regressive, as they raise the relative price of goods such as energy and fuel, which comprise a larger share of the incomes of the relatively poor than the relatively wealthy. Secondly, such schemes entail the transfer of financial resources between different parties. The level of these transfers – and who receives them – depends on the way that emission permits are allocated. The net inequality is thus determined by both the level of the 'cap', and the way that emission permits are allocated within this. The lower the cap, the greater the direct impact on relative prices. The more that the allocation of permits diverges from the existing pattern of emissions, the greater the transfers between different actors (Spratt 2012).

At one extreme, 'grandfathering' sees permits allocated on the basis of current emissions. If allocated nationally, this could lock in existing levels of inequality between countries. At the other end of the spectrum, equal per capita emission rights would mean richer countries having to buy permits from poorer countries, generating large financial transfers, and reducing – and in principle ultimately eliminating – inter-country inequality.[7] Intra-country trading schemes operate according to the same dynamics. The net impact of such schemes on inequality thus depends on the relative strength of these effects and the extent to which either is mitigated (*ibid*.).

The most high-profile example we have is the European Trading System (ETS). There is consensus that the ETS has been very unsuccessful, and this can partly be explained by mistakes made with respect to the two issues described. First, the overall cap was set too high and second, the permits allocated to industry were too generous. Industry lobbying was an important driver of these outcomes, which served to put downward pressure on carbon prices due to excess supply of permits. Economic downturns in Europe exacerbated these problems, leading to persistent low carbon prices that were unable to achieve a meaningful impact on incentives (Grubb 2014).

To the extent that trading schemes are negative for inequality – which depends on the details of their design – and fail to achieve their environmental objectives, they are not so much 'win-lose' as '*draw*-lose', with no positive impact on one side, but a negative impact is felt on the other. While preferable to a 'lose-lose' interaction, this is also worse than would have been the case with no intervention at all.

The general assumption has long been that pollution taxes are regressive, as they increase the relative prices of goods that form a larger part of the income basket of the relatively poor than the relatively wealthy.[8] These disposable income effects are not the only relevant factors, however, as taxes also affect production and employment patterns, encouraging growth in some industries (in some locations) and discouraging others. Also, the proceeds may be used to reduce other taxes, or partly redistributed to poorer groups. The net effect on inequality will thus be a combination of all these factors (Oueslati *et al.* 2016).

Examining these issues in OECD countries, Oueslati *et al.* (*op. cit*.) find no general relationship that holds in all circumstances. If some of the proceeds are not redistributed, the

[7] Some would go further, arguing that equal per capita emission rights does not take account of historical emissions, and that a fairer allocation would be to allocate total, cumulative emission rights equally. This would result in people in many high-income countries having negative emission rights today.

[8] For a UK-based discussion of these issues, see the work of the now disbanded Green Fiscal Commission (www.greenfiscalcommission.org.uk/). For a review focused on developing countries, see Spratt (2012).

expected regressive impact of energy taxes is found, though the effect is not large. Where these taxes are used to reduce those on income or labour, the impact is progressive, while the general impact of waste and air pollution taxes is also found to be progressive. No relationship is found between transport taxes and inequality. While it is certainly the case that environmental taxes can increase inequalities, therefore, it also seems to be true that this is not inevitable and can be strongly influenced by policy.

A related example is fossil-fuel subsidies, which are designed – in theory – to reduce inequalities by lowering the costs of fuel, but create environmentally negative impacts – a 'lose-win' intervention. In 2015, the International Monetary Fund (IMF) estimated these subsidies at US$5.4tn per year, or more than total global expenditure on health (Coady *et al.* 2015). As with taxation, however, the net effect on inequality of these subsidies – and thus their removal – is not uniform, and is determined by the extent to which the relatively wealthy are able to capture the fuel subsidies. While proposed reforms are projected to increase inequality in Nigeria (Rentschler 2015) and Malaysia (Solaymani 2016), the outcome in Indonesia – where subsidies have absorbed up to 20 per cent of the total government budget – are far less certain (ADB 2015).

The IMF estimated in 2010 that, on average, the net effects of subsidy reform programmes on inequality would be neutral:

> On average, the burden of subsidy reform is neutrally distributed across income groups; a US$0.25 decrease in the per liter subsidy results in a 6 per cent decrease in income for all groups. More than half of this impact arises from the indirect impact on prices of other goods and services consumed by households. Fuel subsidies are a costly approach to protecting the poor due to substantial benefit leakage to higher income groups. In absolute terms, the top income quintile captures six times more in subsidies than the bottom.
> (del Granado, Coady and Gillingham 2012: 1)

As described here, while such subsidies may increase disposable incomes (by lowering the price of fuel) there is little impact on inequality as the poor do not benefit more than the relatively wealthy. This suggests that, on average at least, such programmes are not so much 'lose-win' as 'lose-draw' from an environment–equality perspective. Removing fossil-fuel subsidies such that inequality is reduced – by targeting the proceeds on poorer groups – is thus a clear example of a potential 'win-win' intervention.

A number of important 'win-lose' interactions have been identified:

- Eliminating global income inequality by increasing the minimum income level to that of today's high-income countries may be incompatible with a sustainable level of global carbon emissions.
- Reducing inequality in low- and lower-middle-income countries by increasing the incomes of the poor is likely to increase national carbon emissions (though this may not apply for upper-middle- and high-income countries).
- The same effects may be found with natural resource consumption (though it is not clear how this relationship would be affected by countries' income level).
- The discovery of natural resource wealth (or creation of new income streams associated with natural resources) may exacerbate existing inequalities.
- The use of market-based instruments, such as trading schemes, to achieve environmental goals may exacerbate inequalities.
- The use of environmental taxes may exacerbate inequalities.

As in Section 3.1, we have also seen that these dynamic relationships are not inevitable, but depend on the presence or absence of certain contextual factors. The negative interaction between carbon emissions and increasing the income of people in lower-income countries, for example, is 'catalysed' through growth in the carbon intensity of their consumption. The key research questions, therefore, concern whether this link can be broken, or at least mitigated significantly.

Whether natural resource wealth (or new revenue streams associated with national resource wealth) increase or reduce inequality depends on whether the benefits go to the relatively wealthy or relatively poor, which is largely a matter of policy. Similarly, emission trading schemes or a rise in environmental taxes may increase inequalities, but could also have the opposite effect. The catalytic factors in this case are to be found in the design of these schemes, particularly the way that benefits and costs are distributed between groups. Again, this is largely a matter of policy.

3.3 Win-win interactions

As we have seen, the distinction between 'win-lose' and 'win-win' interactions – and all potential outcomes in between – is rarely clear-cut. Interventions to promote sustainability can have neutral, negative or positive impacts upon inequality, for example, depending on how they are designed and implemented. As well as specific policy interventions, we also see potential sustainability–equality interactions resulting from broad economic processes. The most important of these processes is growth, and the key question is whether growth can be both 'green' and 'inclusive'.[9]

Depending on one's perspective, growth is either the main cause of environmental problems, or the only solution. The former position views the 'decoupling' of carbon emissions and economic activity described in Section 3.2 as impossible, with the inevitable conclusion that ending the fixation with economic growth – or implementing 'degrowth' – is the only viable option. Although there are important inequality implications of this viewpoint, actual implementation of degrowth policies seems unlikely in the foreseeable future. Constraints on space require us to focus largely on the inequality implications of policies that are more likely to be implemented, but for more on these issues see Tim Jackson's *Prosperity Without Growth* (2011) for an excellent examination of them.

One distinction that should be made is between national and global growth. The argument that globally, growth must ultimately run into resource constraints is compelling, though there is no agreement on when this might occur. Even those who tend to the more pessimistic end of the spectrum on this question, however, do not suggest that poor countries should remain poor. Rather, the argument is usually some combination of redistribution from rich to poor countries, and zero or negative growth in richer countries to create the 'ecological space' for poorer countries to grow.[10] In principle, these are empirical questions – how much 'headroom' would a transition to a circular economy provide in terms of multiplying the potential for finite natural resources to be re-used, and what would this imply for the potential trajectory of global growth paths, for example? These questions are rarely posed, however, let alone answered, so we really don't know how much global growth will be possible in the future, and therefore what might be required of richer countries to create sufficient ecological space for poorer countries to grow and reduce global inequalities to acceptable levels.

[9] We define 'inclusive' growth as both broad-based and inequality-reducing. This might be thought of as a 'hard', absolute definition, where poorer groups should benefit more than others from the process of growth. The alternative, relative definition only requires this group to benefit to some degree and is therefore not necessarily inequality-reducing. Indeed, it is unlikely to be so. See Spratt, Griffith-Jones and Ocampo (2013) for a discussion.

[10] See Spratt (2015) for an examination of different perspectives on these questions in the context of competing definitions of 'green transformations'.

While these key parameters remain unknown – and perhaps unknowable – it is clear that we need to move as rapidly as we can in this direction: to make growth as green as possible in countries at all levels of income, even if we must ultimately address questions of the equitable distribution of finite ecological space. As growth is being 'greened', however, we need to think hard about how policy can influence its form such that inequalities fall rather than rise – i.e. how can it be made 'win-win'. In Section 3.2 we considered how the design of market-based initiatives can influence inequality. It seems likely, however, that the nature of growth – in terms of industrial and financial structures, and the way that assets of different kinds are distributed across economies, for example – will have a much greater effect.

Whether growth has an inherent tendency to increase inequality is a moot point. As discussed previously, the influential Environmental Kuznets Curve proposed exactly this relationship for low- and middle-income countries. While the validity of this relationship is now seriously disputed – if not discredited – historical experience shows that growth certainly *can* lead to a rapid growth in inequality. This same record also demonstrates, however, that there is nothing inevitable about this. It appears that the dynamic relationship between economic growth and inequality is not fixed, suggesting that it can be influenced by policy. While 'green' growth would have its own peculiarities, there is no reason to assume it would be different in this regard, though some specific policy levers may differ.

As well as the design of environmentally specific interventions, therefore, policies to influence the broad nature of growth are crucial. In this regard, we can identify four main areas of policy (UNDP 2013). The first category focuses on the 'inclusiveness' of growth in terms of the quantity and quality of jobs, financial inclusion and macroeconomic stability. To be 'win-win', green growth should create large numbers of good quality, relatively well-paid jobs, provide broad access to affordable financial products, and avoid inequality-increasing macroeconomic stability.

The potential for 'green jobs' is often used to support the case for green growth. As well as creating more jobs than in a business-as-usual scenario, a number of high-profile institutions have also claimed that green growth will generate better paid, higher quality jobs (OECD 2011; UNEP 2011). Others have countered that the idea of green jobs is a 'myth' (Hughes 2011) or that even if jobs are created, this will be at a very high (net) economic cost (Alvarez *et al.* 2010).

Although we don't know how accurate these predictions are, as the type of 'green economy' envisaged by its proponents does not yet exist, it is important to assess both direct and indirect employment effects. The degree of change required to move economies onto a sustainable footing amounts to a 'green transformation' (Schmitz 2015), which will inevitably have deep structural effects. As well as the creation of 'green' jobs in new areas, 'brown' jobs will be destroyed. Changes to technology, input prices and labour markets will also have large macroeconomic effects, influencing employment levels, both generally and by sector (Bowen and Kuralbayeva 2015).

The net impact on job creation is inherently uncertain. The same is true for the distribution of these jobs, and thus their impact on existing levels of inequality. The creation of more and better 'green' jobs would certainly be a good thing. Whether this would reduce inequality, however, depends on how these jobs are distributed. In both cases, outcomes will be strongly influenced by policy.

The second set of policies aims to reduce inequalities of *opportunity*, particularly access to education, health and nutrition. Unequal access to education, and poor health and nutrition are both causes and consequences of inequality. Inequality reduces human capital formation (Saint-Paul and Verdier 1992; Galor 2011), where people from low-income families are often unable to obtain high levels of education, regardless of talent. As a result, they cannot

access higher paid jobs, reducing the potential for lifetime earnings (Bottero 2005). Poor health also reduces children's access to education, whilst malnutrition in the early years of life can permanently impair cognitive ability: adults affected by malnutrition as children earn a fifth less than those who were not (Grantham-McGregor 2007).

The third set of policies address the social exclusion of, and discrimination against, marginalised and vulnerable groups. While the implementation and enforcement of anti-discrimination legislation is an important part of this, so are cultural factors, where the education system has an important role (UNDP 2014).

The final group of policies that would shape the inequality effects of green growth relate to fiscal policy and redistribution. As discussed previously, there are important interactions between environmental taxation and inequality, with net impacts being determined by a combination of direct and indirect effects, and the extent of compensating mechanisms. Not only does it appear possible to design interventions that are 'win-win' from a sustainability–equality perspective, it may actually be less difficult than is commonly supposed, as the regressive impact of environmental taxes may be less pronounced in certain important areas than has been assumed.

A broader issue concerns the general tax system, which is likely to have a greater overall effect on inequality. Most developing countries have regressive tax systems, largely as they disproportionately rely on (regressive) sales taxes rather than (*potentially* progressive) income taxes (Killick 2002). Recent research from Latin America provides empirical support for the potential of tax systems to reduce inequality by increasing the weight of income tax in the tax system (Martorano 2016).

While growth can increase inequality, the evidence suggests that this is not inevitable. The same is very likely to be true of green growth. Inclusive green growth that is inequality-reducing requires active and strategic policy interventions, however, and this is unlikely to emerge naturally. This raises the question of what would make these types of policies more likely and more legitimate.

On the first point, agreeing and implementing environmentally positive policies is likely to require a degree of social solidarity and commitment to a shared future. The evidence suggests that reducing inequalities is important if the conditions for these forms of collective action are to be achieved (Olson 1965; Bergstrom, Blume and Varian 1986; Ostrom 2000).

Legitimacy requires all groups to be able to contribute meaningfully to the policy process, and translating this into workable policy requires mechanisms to balance competing interests. While beyond the scope of this report to explore in detail, the Mouffian concept of re-politicisation (Mouffe 2005) may offer a useful frame through which competing worldviews can debate difference and influence policy at a range of levels, including globally (Schmitz and Scoones 2015).

This section has identified the following potential relationships with the potential to create 'win-win' interactions between sustainability and inequality:

- Depending on the potential to decouple economic activity from carbon emissions and resource constraints, we may ultimately run up against limits to global growth. Remaining within these planetary boundaries while addressing human development imperatives would require redistribution from richer to poorer countries – as well as within these countries – reducing inter- and intra-country inequalities.
- Nationally, green growth can reduce inequalities through:
    a. the creation of significant numbers of high-quality green jobs, which disproportionately benefit the relatively poor;

b. avoiding the loss of ‘brown’ jobs disproportionately affecting the relatively poor, or compensating/offsetting these impacts;
c. ensuring access to affordable financial service and avoiding macro instability;
d. eliminating inequalities of access to education, health and nutrition;
e. creating a progressive fiscal regime; and
f. avoiding the social exclusion of vulnerable and marginalised groups.

- Creating legitimate local, national and global political processes – where all groups participate effectively in decision-making, and that their interests are balanced – can ensure that ‘green transformations’ remain both equitable and green.

As in Sections 3.1 and 3.2, these interactions are far from certain. Whether outcomes do indeed turn out to be ‘win-win’ depends on contextual factors such as those described here. It is entirely possible that green growth ends up as a ‘lose-lose’ outcome, with negative outcomes for both sustainability and inequality. Alternatively, it would be ‘win-lose’, where environmental goals are achieved, but inequalities get worse.

In some cases, we don’t know which contextual factors are most important or how far they can take us – where the physical and technical limits to ‘green growth’ might lie, for example. The implications of this for inter- and intra-country inequality are thus also uncertain, though it is certainly possible to think these through under a range of plausible scenarios. Within the context of national green growth processes, however, there is a reasonable understanding of the most important contextual factors in terms of inequality. The hardest part of achieving ‘win-wins’ in this regard may be in getting the politics right, such that necessary policies are actually implemented, and these are based on legitimate processes.

Thus far we have considered interactions between sustainability and equality. Next, the goal of security is introduced, in terms of its interactions with inequality (Section 4) and with respect to sustainability (Section 5).

4 Equality–security interactions

As we shall see, there are important interactions between inequality and security/conflict. When considering these, it is particularly important to bear in mind the distinctions between vertical and horizontal inequality discussed above. As in Section 3, these will be explored according to the three types of interaction: 'lose-lose'; 'win-lose'; and 'win-win'.

4.1 Lose-lose interactions

Some of the earliest approaches in the literature to the relationship between inequality and conflict can be found in relative deprivation theory, theories of ethnic conflict and structural inequality, and the Marxist theory of class struggle and revolution. In each case, the assumption is that conflict is fuelled by the grievances among relatively disadvantaged individuals or groups.

Empirical evidence to support these hypotheses is weak, however. Collier and Hoeffler (2004), for example, find no cross-national relationship between vertical inequality and conflict. What is found in the literature, however, is evidence linking high vertical inequality with low levels of trust between citizens (Elgar and Aitken 2011), and altruism and reciprocity (Attanasio *et al.* 2012; Bowles and Gintis 2011). In the light of this, it is perhaps unsurprising that high vertical inequality is also associated with low levels of social cooperation (Justino 2012).

As well as affecting relationships between citizens, high vertical inequality may also reduce trust in political institutions because of a lack of opportunities to participate in these institutions, and concerns over elite capture. This lack of trust may in turn foster frustration and social discontent (Lipsky 1968; Flechtner 2014).

This combination of low trust between citizens and a lack of faith in political institutions may also create the conditions for the observed relationship between high vertical inequality and an increased propensity of individuals and/or groups to engage in criminal activities and violence (Fajnzylber, Lederman and Loayza 1998; Gupta 1990).

While there is little evidence linking vertical inequality with formal conflict, the literature exploring the relationship between conflict and horizontal inequality is large and growing (Cederman, Weidmann and Gleditsch 2011; Esteban and Ray 1994; Montalvo and Reynal-Querol 2005; Murshed and Gates 2005).

The strongest evidence links horizontal inequality along ethnic lines with conflict. For example, Østby (2004) finds evidence of a relationship between ethnic and regional inequalities and conflict in sub-Saharan Africa. Brown (2010) finds a similar relationship between inequality, ethnic identity and violent secessionism, which is supported by the results of Cederman *et al.* (2011).

The evidence suggests that economic and social horizontal inequalities provide the conditions that lead to dissatisfaction among the general population and create the potential for group mobilisation, but that it is political inequalities that trigger conflict (Brown and Stewart 2015).

While the sense of grievance amongst relatively deprived groups is an important part of the explanation for this relationship, it may not be the only cause:

> … [I]t is not only resentment on the part of relatively deprived groups that causes political instability. Privileged groups may also attack the less privileged, fearing that they may demand more resources, or that they may even try to break away. (Østby 2013: 2)

We therefore have a set of clear potential 'lose-lose' interactions: high levels of horizontal inequality create the conditions for conflicts to occur, while high vertical inequalities negatively affect social and political cohesion, increasing the likelihood of crime and violence.

These potential interactions also run in the other direction: from conflict to inequality. In the broadest economic sense, conflict has severe impacts, devastating core economic functions. To the extent that whole communities are affected, the effects are amplified, as individuals and households are less able to go to their friends and families for help (Justino 2012).

The long-term economic impacts of conflict remain unclear. The 'phoenix' view is that economies tend to bounce back to their long-run economic trend rate (Organski and Kugler 1980). Others find a persistent, negative effect on growth (Collier 1999). Whichever is correct, these results pertain to the macroeconomic level. The effects of conflict in terms of human capital do appear to persist (Justino, *op. cit*.). To the extent that these affects are felt to differing degrees by households and communities – which seems very likely – the inequality effects would also persist.

For vertical inequality, the relatively poor may be disproportionately affected by conflict. Poorer people may be less likely to be able to educate their children under conflict conditions, for example, widening existing inequalities (Collier and Hoeffler 2004). There is also evidence that this is more likely to be the case with girls than boys (Shemyakina 2011), and particular ethnic groups (Østby and Urdal 2014), again worsening with negative inequality impacts.

As well as exacerbating existing inequalities, conflicts may also create new ones. Children affected by conflict are more likely to be malnourished, for example (Bundervoet and Verwimp 2005, cited in Justino 2012). As we have seen, childhood malnutrition is an important driver of poverty traps.

In general terms, the impact of conflict on inequalities depends on which households and groups are most affected. Where this is the relatively poor, inequalities will be made worse. Where elites and the non-poor are disproportionately affected – as seems to have occurred in the Rwandan genocide (Akresh and de Walque 2008) – inequality may even fall. Most studies, however, find that conflict makes existing horizontal inequalities worse (Justino 2012).

Inequality tends to be self-perpetuating at both the household and group level. As well as the mechanisms discussed above, Justino describes how findings on institutions and group dynamics from the economics literature are also relevant for horizontal inequalities in conflicts:

> The economics literature has shown that institutional effects are responsible for poverty traps when political forces and social interactions result in dysfunctional institutions that make property rights insecure and perpetuate inequalities in power and wealth (Bowles, Durlauf and Hoff 2006; Mehlum, Moene and Torvik 2006). These effects are likely to matter substantially in contexts of civil war due to two features that distinguish the impact of armed conflict from other shocks. One is the fact that during civil wars property rights are insecure and often cannot be enforced because the state has lost the monopoly of violence and the rule of law does not

> operate. The second is the profound institutional transformation caused by violent conflict.
> (Justino 2012: 20)

The following negative interactions have been identified in this section:

- Vertical inequality may reduce trust – both between people in political institutions – negatively affecting social cohesion and encouraging crime and antisocial behaviour.
- Horizontal inequality, particularly between ethnic groups, can increase the likelihood of conflict.
- Conflict may exacerbate existing horizontal and vertical inequalities, and create new patterns of inequality.
- Inequalities tend to be self-perpetuating.

There is quite strong evidence to support these findings. Again, however, the relationships are not fully deterministic but contingent. From a research perspective, the interesting questions are why, and under what circumstances, do these negative relationships hold.

4.2 Win-lose interactions

These types of interaction entail situations where one part of a negative interaction is avoided: a 'lose-lose' becomes a 'win-lose'. While this is clearly a second-best outcome (compared to a 'win-win'), it is better than the alternative ('lose-lose'). An example, as introduced above, can be found in the fact that high levels of horizontal *economic* inequality may create the conditions for conflict, but do not inevitably lead to it. Many very unequal countries do not suffer from conflict.

In some cases (e.g. Ghana), inclusive political representation seems an important counterweight to the tensions created by economic inequality. What seems particularly dangerous is a combination of economic and political inequalities – for example, relatively poor groups with little or no political voice or representation.

> Conflict is likely to erupt in such a situation because the political inequalities motivate leaders to mobilize in order to gain power, while the socioeconomic inequalities provide potential followers with a powerful grievance.
> (Brown and Stewart 2015: 10)

This suggests that even where significant economic inequality exists between groups, tensions that could lead to conflict can be mitigated by increasing political representation. Genuinely inclusive political participation may also, over time, lead to a reduction in economic inequalities, as policies to facilitate this are more likely to emerge under these political conditions.

As well as the combination of political, economic and social dimensions of inequality, Stewart (2005) finds that horizontal inequalities are most likely to lead to conflict where:

a. They persist and widen over time;
b. Group boundaries are relatively impermeable;
c. There are quite large numbers of people in the different groups;
d. Aggregate incomes are stagnant, with no absolute improvement in living standards;
e. Groups are sufficiently cohesive;
f. Political leaders emerge and are not co-opted into the ruling elite; and
g. The ruling elite is hostile and/or unresponsive to demands for change.

A number of these criteria are not amenable to policy change – group size, for example. Others could potentially be influenced, though this would not be positive – group cohesiveness could be undermined, for example. In some cases, however, the potential exists for policy to reduce the tensions that could lead to conflict. Positive engagement and efforts to reduce inequalities, and policies to raise general living standards, are all things that could potentially avoid conflict.

If conflict cannot be avoided, the priority is for it to end as quickly as possible. From an inequality perspective, an important task is then to prevent the effects described above. Stewart (2005) identifies three policy areas that need to be addressed in post-conflict reconstruction to prevent the creation or exacerbation of horizontal inequalities. The first is to address *economic and social inequalities:*

> Three types of policies can be adopted to achieve greater group equality in economic entitlements (although the distinctions are not watertight). First, policies towards changing processes which are either directly or indirectly discriminatory. Secondly, assistance can be directed to particular groups, such as training people for interviews and subsidising housing. Thirdly, targets and quotas can be introduced for education, land distribution, financial and physical assets.
> (Stewart 2005: 11)

The author cautions that the third form of policy has the greatest potential to generate resentment and hostility, and may also further entrench existing ethnic divisions. Where these are already deep and horizontal inequalities ingrained, however, they may be necessary. Stewart (*op. cit*.) stresses the importance of process reforms, such as those to carefully identify and address discrimination, highlighting how important this was in Northern Ireland, for example. These types of reforms take time, however, and post-conflict situations tend to require immediate change. The second form of intervention is important in this respect, as government can directly control public expenditure and make rapid progress in this area (*ibid*.).

The second set of policies addresses political inequalities in areas such as human rights, and participation in the political process, including as employees within government. The details, in areas such as the best voting arrangements, will depend on the circumstances. For example, where the relatively deprived group(s) are a numerical minority (as in Rwanda, Northern Ireland and Sri Lanka) is to avoid establishing a UK-style 'winner takes all' majoritarian political system (*ibid*.).

The final set of policies are cultural:

> Cultural policies can be an important aspect of group grievances and consequently of post-conflict policies – such policies aim to correct cultural exclusion and discrimination. For example, policies towards language, religious ceremonies, religious or ethnic dress, national holidays and so on can trigger or mitigate conflicts. Language has been a critical issue in many countries, including Sri Lanka, and among the Kurds in Iraq.
> (Stewart 2005: 21)

As discussed above, conflict is more likely to result from horizontal inequalities when they exist across a range of dimensions. As well as preventing the growth of inequalities in post-conflict environments (valuable in its own right), addressing all of these areas is thus likely to be crucial in preventing conflicts being reignited. While the importance of each dimension may vary, Dimitrijevics (2004) argues that cultural factors have been most important in major peace negotiations.

Despite the strong evidence linking horizontal inequalities to conflict, the incorporation of policies to address these in post-conflict settings has been quite limited (Stewart 2005). Given conflicts are likely to exacerbate inequalities for the reasons described above, this is a crucial area to address.

To summarise, the following potential 'win-lose' interactions have been identified:

- Where economic inequalities are high, the probability of conflict can be reduced by:
  a. elite engagement with affected groups;
  b. ensuring political participation;
  c. making efforts to reduce economic inequalities; and
  d. maximising the general growth rate.
- The inequality-increasing effects of conflict described in Section 4.1. can be mitigated in post-conflict settings by implementing policies to reduce:
  a. economic and social inequalities;
  b. political inequalities; and
  c. cultural inequalities.

While not ideal, 'win-lose' is better than 'lose-lose', particularly where the latter involves violent conflicts. It is clear that the 'wins' described above are far from inevitable. Indeed, the fact that conflicts tend to increase inequalities suggests strongly that, in the absence of effective policies to prevent this, the outcome is far more likely to be 'lose-lose'. Recent years have seen significant advances in our understanding of the policies needed to achieve this, with the work of Frances Stewart and the Centre for Research on Inequality, Human Security and Ethnicity (CRISE) being particularly important. Continuing to expand this understanding, while working on the political aspects of implementation is essential.

4.3 Win-win interactions

Given that there are strong 'lose-lose' interactions in this area, it is not surprising that the potential for 'win-wins' is also significant. Most fundamentally, avoiding conflicts is likely to be positive for inequalities, while reducing inequalities should positively affect the tensions that can lead to conflict, erode trust and social cohesion, and encourage crime and antisocial behaviour.

As we have seen, horizontal inequalities are important catalysts for conflict. A key part of conflict prevention, therefore, is preventing the emergence of such inequalities, particularly in a multidimensional sense as described above.[11] As we shall see in Section 5 on security and sustainability, not all conflicts are the result of inequalities, however, and even where they are an important factor, they are rarely the only one (Stewart 2005).

While it is beyond the scope of this report to review the literature on conflict prevention in detail, some important elements should be mentioned. Although efforts to prevent conflicts have existed since time immemorial, the discipline of conflict prevention is relatively new, emerging in the early 1990s but growing rapidly thereafter (Ackermann 2003). Given its relative youth, the discipline is still developing a consensus on core concepts, but four main questions can be identified (*ibid*.).

- First, what should be the scope of conflict prevention? Should it address the underlying causes of conflict – such as the presence of large inequalities – or focus on stopping particular violent events being triggered (Lund 2002)? That is, should prevention be 'light or deep' (Miall 2000)?

[11] It is not possible to do more than touch upon the vast, and rapidly developing literature on reducing inequalities in the context of this report. Interested readers are referred to ISSC, IDS and UNESCO (2016).

- Second, how should theoretical work on the causes of conflict be linked to the creation of early warning systems to predict (and potentially prevent) the onset of crisis (Ackermann 2003)?
- Third, once detected, how can looming conflicts be prevented? What, for example, is the right balance between turning to a 'toolbox' of tried and tested mechanisms (Lund 1996), or developing a bespoke response to each situation?
- Finally, how can conflict prevention be 'mainstreamed', and built into the procedures of global institutions rather than being turned to *in extremis* (Ackermann 2003)?

These questions are important for inequality. A 'light' touch approach, for example, might avert a conflagration, but store up greater problems for the future. Over the long term, preventing conflicts by addressing 'deep' causes is likely to be essential if 'win-wins' are to be created and maintained.

If conflict cannot be prevented, a final important determinant of whether this outcome is a 'win-win' is the terms of the peace.[12] To secure peace it may be necessary to allow protagonists to participate in government, for example, providing or maintaining access to economic rents, with implications for the distribution of resources and inequality. The deal to end the civil war in Sierra Leone, for example, has been criticised on precisely these grounds (Francis 2000).

The following potential interactions have been identified in this section:

- Reducing horizontal inequalities should reduce tensions that may lead to conflict.
- Preventing conflict by suppressing these tensions may store up problems for the future, while addressing these underlying issues should create a more stable 'win-win'.
- An equitable peace is more likely to support peace over the longer term.

As we shall see in Section 5, access to natural resources has important interactions with the onset, continuation, as well as the end of violent conflicts.

[12] Historically, the most infamous example of this is the Treaty of Versailles, with the draconian terms imposed on the defeated German government being seen as a major cause of the Second World War.

5 Security–sustainability interactions

Thus far the concept of sustainability has been largely applied to climate change and the use of renewable natural resources, such as forests. While these issues remain central to this discussion, the focus is extended here to include non-renewable resources. As well as being important in its own right from both an environmental and equality perspective,[13] there are lessons to be learned from the historical interactions between non-renewable resource use and conflict. Of particular relevance in this regard is the creation of revenue streams relating to renewable resources in the future, and how these might represent a new source of 'resource wealth' or rent.

5.1 Lose-lose interactions

> Since 1990 at least eighteen violent conflicts have been fuelled by the exploitation of natural resources. In fact, recent research suggests that over the last 60 years at least forty percent of all intrastate conflicts have a link to natural resources. Civil wars such as those in Liberia, Angola and the Democratic Republic of Congo have centred on 'high-value' resources like timber, diamonds, gold, minerals and oil. Other conflicts, including those in Darfur and the Middle East, have involved control of scarce resources such as fertile land and water.
> (Matthew, Brown and Jensen 2009: 2)

It is not inevitable that interactions of this kind must be 'lose-lose'. In theory, it would be possible for different groups to fight over control over a natural resource, with the victor then managing the extraction or use of this resource sustainably.[14] The historical record does not support this view, however. During and after conflicts influenced by control over natural resources, these resources have generally been exploited in an unsustainable way, with those gaining control extracting as much rent as possible while they retain the ability to do so.[15]

This issue is not restricted to low-income countries. Even before the invasion of Iraq, scholars and political commentators were noting that 'the determination to ensure US access to overseas supplies of vital resources... [and] the protection of global resource flows is becoming an increasingly prominent feature of the American security policy' (Brown and Stewart 2015: 32).

As well playing an important role in their initiation, conflicts may be perpetuated by incentives to control scarce resources, which may be easier in a conflict situation. The role of 'conflict diamonds' in the civil war in Sierra Leone is often used as an example. In recent years, this type of negative interaction has been extended to a wider range of natural resources, and connected to the issues of population growth and climate change (Homer-Dixon and Blitt 1998; Homer-Dixon 2001).

[13] Renewable resource extraction creates significant environmental impacts, and is strongly associated with issues such as resettlement and the distribution of resource revenues, both of which are important for inequality.
[14] For renewable natural resources, this would mean the resource was used at a rate compatible with its replacement rate (i.e. the maximum sustainable yield). For non-renewable resources, the optimal rate of extraction from an economic perspective is that determined by the Hotelling Rule. To be sustainable in the sense that the total stock of capital (natural + human-made) is not depleted, revenues should be invested in other forms of capital following Hartwick's Rule (Spratt 2012).
[15] These phenomena are intimately related to the issue of the 'resource curse', where countries with abundant natural resources are found to perform worse in terms of growth than those without such resources. For a general review of the literature, see Torres, Afonso and Soares (2013). For a review of the political economy issues, see Rosser (2006).

> As the global population continues to rise, and the demand for resources continues to grow, there is significant potential for conflicts over natural resources to intensify in the coming decades. In addition, the potential consequences of climate change for water availability, food security, prevalence of disease, coastal boundaries, and population distribution may aggravate existing tensions and generate new conflicts. (Matthew *et al.* 2009: 2)

While there is little current evidence to support the 'resource wars' hypothesis with respect to climate change,[16] this does not mean that this could not become a serious issue in the future. As discussed previously, many of the most severe environmental consequences have not yet happened. Similarly, the global population continues to expand, and the most recent predictions are that this may continue beyond the level previously imagined. Given this, it is not surprising that the potential consequences in terms of conflicts over resources have not yet materialised.

It can be easy to dismiss warnings in this regard as unduly apocalyptic in tone:

> Climate change will degrade or destroy many natural systems, often already under stress, on which humans rely for their survival. Some areas that now support agriculture or animal husbandry may become uninhabitable or capable only of providing for greatly diminished populations. Under the pressure of rising temperatures and increasingly fierce droughts, the southern fringe of the Sahara desert, for example, is now being transformed from grasslands capable of sustaining nomadic herders into an empty wasteland, forcing local nomads off their ancestral lands. Many existing farmlands in Africa, Asia, and the Middle East will suffer a similar fate. Rivers that once supplied water year-round will run only sporadically or dry up altogether, again leaving populations with unpalatable choices. (Klare 2015)

While the tone of the quote above is a good example of this kind of doom-laden hyperbole, it would be foolish to dismiss warnings of impending 'resource wars', not least because of the uncertainty over the nature and distribution of impacts.

One type of resource that is considered particularly important in this regard is water. As documented in the Pacific Institute's Water Conflict Chronology, there have been conflicts over control of water for thousands of years.[17] Today, tensions between countries over access to major river systems in Asia and Africa continue, and are likely to intensify as population pressures intensify.

In the other direction, there is already evidence of conflict increasing pressure on natural resources. In Mozambique's 1984–92 civil war, for example, the population of Maputo increased as displaced peoples moved to the capital. This increased demand for fuelwood from the surrounding area, leading to significant deforestation (McGregor 1998). Similar effects were seen in Sierra Leone, with a large influx of people into Freetown during the civil war. Increased deforestation in surrounding areas has been associated with the increase in flash flooding in the city.

Conflicts may also lead to higher levels of poaching, as needs for revenue rises and authorities' ability to prevent poaching falls (De Boer *et al.* 2000). More directly, people displaced by the Rwandan genocide, as well as fighters involved in the conflict, are believed

[16] A systematic review of the evidence linking climate change to conflict found no compelling evidence (Theisen, Gleditsch and Buhaug 2012).
[17] http://worldwater.org/water-conflict/

to have killed elephants and gorillas in the Maiko and Kahuzi-Biega National Parks in the Democratic Republic of the Congo for food (Van Krunkelsven, Bila-Isia and Draulans 2000).

To summarise, the environment is often a victim of war, adversely affecting those who rely on it for their livelihoods:

> The environment continues to be the silent victim of armed conflicts worldwide. The United Nations Environment Programme (UNEP) has conducted over 20 post-conflict assessments since 1999, using state-of-the-art science to determine the environmental impacts of war. From Kosovo to Afghanistan, Sudan and the Gaza Strip, UNEP has found that armed conflict causes significant harm to the environment and the communities that depend on natural resources. Direct and indirect environmental damage, coupled with the collapse of institutions, lead to environmental risks that can threaten people's health, livelihoods and security, and ultimately undermine post-conflict peace-building.
> (Mrema, Bruch and Diamond 2009)

Here we have a strong link to the previous section on sustainability, and an example of a potential 'lose-lose-lose' interaction between all three objectives: conflict leads to environmental damage, negatively impacting the livelihoods of particular communities, and exacerbating existing horizontal inequalities. To the extent that these inequalities exist across dimensions and have the characteristics that are likely to foster conflict, a vicious circle may be created.

To summarise, the main interaction dynamics identified in this section are:

- Disputes over natural resources can initiate or prolong conflicts in countries.
- The desire to secure natural resources can initiate conflicts between countries.
- The victors in conflicts may exploit natural resources in an unsustainable way.
- Climate change and population growth may lead to conflict through migrations and disputes over resources.
- Conflict can lead to pressure on natural resources through migration effects.
- The need to fund/support conflict can lead to the unsustainable exploitation of resources.

5.2 Win-lose interactions

If conflict cannot be avoided, how can environmental damage be minimised? This is partly a matter of international law, where a number of legal conventions have been created and ratified to prohibit the use of particular weapons. During the Vietnam War, for example, the use of Agent Orange led to widespread deforestation and environmental contamination. As a result, international legal instruments were created which prohibited 'widespread, long-term and severe damage to the natural environment' (Mrema *et al.* 2009).

A second form of 'win-lose' interaction with respect to sustainability and conflict are only 'wins' in the narrowest sense. Ongoing conflicts, and their legacies, may prevent or discourage people from exploiting the natural environment in particular areas, for example. Cluster bombs or landmines are a particularly insidious form of weapon in this regard, being very expensive and time-consuming to remove, but cheap and easy to distribute (Mannion 2003). Such weapons have a strong indirect environmental impact in that they prevent land being used for human activity. What looks like pristine forests in parts of Southeast Asia,

such as Lao PDR, may in fact be areas rendered unusable because of the effects of cluster bombs dropped during the Vietnam War.[18]

In a less extreme but general sense, conflict prevents development, which may reduce the economic pressures associated with resource use. The relatively limited deforestation in Sierra Leone is one example. Again, however, there is no 'win' here, even in a narrow environmental sense. 'Sustainable' resource use means that which is compatible with thriving human development. As discussed previously, deforestation rates tend to be higher in preservation areas which prohibit development activity, than in those that are preserved as a natural part of the livelihoods of traditional communities (Stevens *et al.* 2014).

A final form of interaction concerns how the 'lose-lose' example given at the start of Section 5.1 could become a 'win-lose'.

> During peace mediation processes, wealth-sharing is one of the fundamental issues that can 'make or break' a peace agreement. In most cases, this includes the sharing of natural resources, including minerals, timber, land and water… Natural resources can only help strengthen the post-war economy and contribute to economic recovery if they are managed well. The international community should be prepared to help national authorities manage the extraction process and revenues in ways that do not increase risk of further conflict, or are unsustainable in the longer term. (Matthew *et al.* 2009: 5)

Rather than conflict resulting in victors unsustainably exploiting natural resources, the question is: can these resources be shared sustainably and equitably as a means to achieving peace?

In this penultimate section, the following 'win-lose' interactions have been identified:

- Legal prohibitions on the use of weapons designed to be environmentally destructive need to be strengthened and enforced.
- Incorporating rights to exploit natural resources into peace negotiations may avoid or mitigate the inequality-increasing implication of conflicts.

As in the preceding sections, there is no automaticity in these relationships. We already have international legal prohibition on acts of war that are deliberately destructive in an environmental sense, yet the first Gulf War saw 600 oil wells ignited by the retreating Iraqi army, creating an estimated US$85bn in environmental damage (Mrema *et al.* 2009).

Natural resources can be an important aspect of peace processes, but this certainly does not ensure that use rights are equitably distributed. Where there is a need to 'incentivise' protagonists to cooperate, and power relations are highly unequal, it is perhaps more likely that the opposite will occur. Finally, even where natural resource rights are equitably distributed, this does not ensure that these resources will be used sustainably. That said, given the evidence on the positive environmental impacts of community management of natural resources, and the lessons from the resource curse literature on the often extractive way that elites can 'manage' natural resources, this seems more likely to be the case.

[18] Between 1964 and 1973, the United States dropped over 2 million tonnes of ordnance over Laos. At least 270 million cluster bomblets were dropped, a third of which failed to detonate. These have killed or maimed around 50,000 civilians, with casualties continuing at rate of 100 a year. Over the past 40 years, less than 1 per cent of the bomblets that failed to detonate have been cleared, creating vast no-go areas and severely restraining most forms of economic development in the country (Khamvongsa and Russell 2009).

5.3 Win-win (+ win?) interactions

> Every state needs to use and protect vital natural resources such as forests, water, fertile land, energy and biodiversity. Environmental issues can thus serve as an effective platform or catalyst for enhancing dialogue, building confidence, exploiting shared interests and broadening cooperation between divided groups, as well as between states.
> (Matthew *et al.* 2009: 5)

As in previous sections, the distinction between 'win-lose' and 'win-win' is a fine one. If done well, the use of natural resources has the potential to establish a virtuous circle of peace, sustainable resource use, rising prosperity and falling inequalities – a 'win-win-win' interaction.

Linking equitable and sustainable access to natural resources to peace negotiations in conflict-affected countries is a good first step. Addressing environmental issues requires a long-term perspective, which is impossible in a conflict environment. Peace is thus a prerequisite for sustainability. As discussed previously, reducing inequalities may also be necessary to create the conditions for the collective action to resolve environmental issues, including the management of common resources. Reducing inequalities may thus be necessary for sustainability, and are clearly central for addressing the tensions that may give rise to conflicts.

These dynamics appear to be mutually reinforcing, but this is the case in both directions. A virtuous circle would be self-reinforcing, but so too would a vicious circle. Understanding the most important contextual factors that would encourage the former dynamic and discourage the latter is one of the most important development challenges there is.

Whilst these points emerge in the literature from the analysis of national and sub-national issues, they may also be relevant at the international level. Creating a fairer long-term distribution of natural resources – including the distribution of 'carbon emission rights' – would build trust between countries and potentially encourage longer term perspectives. At the same time, reducing the extreme inequalities between countries may be essential if we are to foster the solidarity and collective action needed to address global problems.

6 Interaction dynamics, research questions and concluding remarks

This report has examined some of the dynamics that underpin interactive relationships between sustainability, equality and security, both positively and negatively. These are summarised in Tables 6.1, 6.2 and 6.3.

None of these outcomes are certain, however: all are contingent on other contextual factors. While this is true for all of the potential interactions that have been identified, it is also the case that the nature of the contextual factors varies considerably from a research perspective. In some cases, it is reasonably clear what would need to happen to avoid negative interactions or encourage positive ones. In these cases, the outstanding research questions relate to issues such as the detail of policy design, how these are affected by different locations or sectors, and the political economy of successful policy implementation.

Table 6.1 Sustainability–equality dynamics

Lose-lose interactions
'Green' interventions can negatively affect local communities and the environment
Climate change impacts may exacerbate inequalities, between and within countries
Damaging environmental activities are often located in areas already affected by other inequalities
Countries with high vertical inequality (economically and politically) are less likely to have environmentally positive policies
Gender inequality associated with less environmentally positive policies and outcomes
Win-lose interactions
Eliminating global income inequality may be incompatible with a sustainable level of emissions
Reducing inequality in lower-income countries is likely to increase national carbon emissions
Reducing inequality in lower-income countries is likely to increase natural resource use
The discovery of natural resource wealth (or creation of new revenue streams from natural resources) may exacerbate existing inequalities
The use of market-based environmental instruments may exacerbate inequalities
The use of environmental taxes may exacerbate inequalities
Win-win interactions
Reducing inequality in middle- and high-income countries is likely to reduce carbon emissions
Remaining within global planetary boundaries while addressing human development imperatives requires redistribution within and between countries, reducing inequalities
National green growth processes can reduce inequalities through creating 'green' jobs, mitigating impact of 'brown' job loss, ensuring equal access to education and health, preventing discrimination and creating a progressive fiscal system
Legitimate local, national and global political processes can ensure 'green transformations' are both equitable and green

A good example is the relationship between environmental taxation and inequality described in Table 6.1. There is some evidence that these tax instruments tend to have regressive effects, but there is also a growing literature examining how these effects can be avoided by adjusting other taxes or redistributing some of the proceeds of the tax to poorer groups.

Broadly speaking, these types of research question might be described as *hypothesis testing* in nature.

Table 6.2 Equality–security dynamics

Lose-lose interactions
Vertical inequality may reduce trust – both between people in political institutions – negatively affecting social cohesion and encouraging crime and antisocial behaviour
Horizontal inequality, particularly between ethnic groups, can increase the likelihood of conflict
Conflict may exacerbate horizontal and vertical inequalities, and create new patterns of inequality
Inequalities tend to be self-perpetuating
Win-lose interactions
Where economic inequalities are high, conflict tensions can be reduced by elite engagement, ensuring political participation, reducing economic inequalities, and maximising the growth rate
The inequality-increasing effects of conflict can be mitigated in post-conflict settings by policies to reduce economic, social, political and cultural inequalities
Win-win interactions
Reducing horizontal inequalities should reduce tensions that may lead to conflict
Preventing conflict by suppressing these tensions may store up problems for the future, while addressing these underlying issues should create a more stable 'win-win'
An equitable peace settlement is more likely to support peace over the longer term

In other cases, the factors which shape whether potentially negative or positive interactions actually happen are far less understood. For example, identifying the factors that might break – or at least mitigate – the link between carbon emissions and the incomes of people in poor countries is a very different type of research question. The type of research required here is more about hypothesis *formation* than testing.

Table 6.3 Security–sustainability dynamics

Lose-lose interactions
Disputes over natural resources can initiate or prolong conflicts in countries
The desire to secure natural resources can initiate conflicts between countries
The victors in conflicts may exploit natural resources in an unsustainable way
Climate change/population growth may lead to conflict through migration and resource disputes
Conflict can lead to pressure on natural resources through migration effects
The need to fund/support conflict can lead to the unsustainable exploitation of resources
Win-lose interactions
Legal prohibitions on the use of weapons designed to be environmentally destructive need to be strengthened and enforced
Incorporating rights to exploit natural resources into peace negotiations may avoid or mitigate the inequality-increasing implication of conflicts
Win-win interactions
Peace is prerequisite for sustainability
The integration of equitable natural resource use into post-conflict development processes can create positive long-term impacts for sustainability and security, but also for inequality

As well as the dynamics between pairs of goals, we have also identified important three-way interactions, where virtuous or vicious circles are possible. As described in Section 5.3 (and the bottom of Table 6.3), there are significant links between conflict, inequality and the extent to which natural resources are used sustainably. Given the complexity of these dynamics is increased, it may be better to develop focused research questions on particular parts of this loop.

The next stage of this research is to derive research questions from the dynamics summarised in Tables 6.1, 6.2 and 6.3. As we have seen throughout this report, all of these relationships are contingent on the presence or absence of contextual factors. 'Lose-lose' dynamics are rarely if ever inevitable, but this is equally true of 'win-win' interactions. For every example of a negative interaction, a positive alternative from a different time or place, where a different set of interventions was used, could be found. The same is true of positive interactions.

Sometimes the crucial contextual factors are relatively well understood. In others we know very little. In many cases, however, there is partial understanding, but this is contested. That is, there are different sets of explanations, or 'narratives' which purport to have solutions that will allow negative interactions to be avoided and positive synergies created.

As described previously, Schmitz and Scoones (2015) identify four of these narratives from the sustainability transitions literature: market-led; technology-led; state-led; and citizen-led. This framework can also be applied to the interaction dynamics examined in this report, and may be useful in charting a future research agenda.

The first step of this would be to prioritise between the dynamics identified. This may be related to their perceived importance to sustainable and secure development, but would also reflect the competencies and interests of institutions and individuals. The second step is to decide what type of dynamics these are – hypothesis forming or testing – on the basis of the existing research evidence. A third step would be to organise this evidence according to the different narratives described above, looking for commonalities and points of difference, but also taking a normative position in line with the institution concerned.

Finally, the principle research gaps could be identified and a programme of research developed to address this. Importantly, the nature of this research should follow directly from the nature of the question – i.e. is the task to form plausible hypotheses in the face of deep uncertainty, or to test solid hypotheses themselves based on robust and context-aware evidence?

References

Ackermann, A. (2003) 'The Idea and Practice of Conflict Prevention', *Journal of Peace Research* 40.3: 339–47

ADB (2015) *Fossil Fuel Subsidies in Indonesia: Trends, Impacts, and Reforms*, Mandaluyong City, Philippines: Asian Development Bank

Agrawal, A. (2005) *Environmentality: Technologies of Government and the Making of Subjects*, Durham NC: Duke University Press

Akresh, R. and de Walque, D. (2008) *Armed Conflict and Schooling: Evidence from the 1994 Rwandan Genocide*, IZA Discussion Paper 3516, Bonn: The Institute for the Study of Labor

Alvarez, G.C.; Jara, R.M.; Juliá, J.R.R. and Bielsa, J.I.G. (2010) 'Study of the Effects on Employment of Public Aid to Renewable Energy Sources', *Procesos de Mercado: Revista Europea de Economía Política* 7.1: 13–70

Attanasio, O.; Fitzsimons, E.; McGregor, S. and Rubio-Codina, M. (2012) *Early Childhood Development: Identifying Successful Interventions and the Mechanisms Behind Them*, Working Paper S-2001-COL-1, London: International Growth Centre

Barbier, E.B. and Burgess, J.C. (2001) 'The Economics of Tropical Deforestation', *Journal of Economic Surveys* 15.3: 413–33

Beckerman, Wilfred (1994) '"Sustainable Development": Is it a Useful Concept?', *Environmental Values* 3.3: 191–209

Beckerman, Wilfred (1992) 'Economic Growth and the Environment: Whose Growth? Whose Environment?', *World Development* 20.4: 481–96

Bergesen, A. and Parisi, L. (1997) 'Discovering the Environment', *Journal of World-Systems Research* 3.3: 364

Bergstrom, T.; Blume, L. and Varian, H. (1986) 'On the Private Provision of Public Goods', *Journal of Public Economics* 29.1: 25–49

Bernstam, Mikhail S. (1990) 'The Wealth of Nations and the Environment', *Population and Development Review* 16: 333–73

Betz, M.; O'Connell, L. and Shepard, J.M. (1989) 'Gender Differences in Proclivity for Unethical Behaviour', *Journal of Business Ethics* 8.5: 321–4

Beutel, A.M. and Marini, M.M. (1995) 'Gender and Values', *American Sociological Review* 60: 436–48

Bord, R.J. and O'Connor, R. (1997) 'The Gender Gap in Environmental Attitudes: The Case of Perceived Vulnerability to Risk', *Social Science Quarterly* 78.4: 830–40

Bottero, W. (2005) *Stratification: Social Division and Inequality*, Abingdon: Routledge

Bowen, A. and Kuralbayeva, K. (2015) *Looking for Green Jobs: The Impact of Green Growth on Employment*, London: Grantham Research Institute on Climate Change and the Environment and Global Green Growth Institute

Bowles, S. and Gintis, H. (2011) *A Cooperative Species: Human Reciprocity and its Evolution*, Princeton NJ: Princeton University Press

Brown, G.K. (2010) *The Political Economy of Secessionism: Identity, Inequality and the State*, BPD Working Paper 9, Bath Papers in International Development, Bath: Centre for Development Studies, University of Bath

Brown, G.K. and Stewart, F. (2015) *Economic and Political Causes of Conflict: An Overview and Some Policy Implications,* CRISE Working Paper 81, Oxford: Centre for Research on Inequality, Human Security and Ethnicity (CRISE)

Bunker, S.G. (1985) *Underdeveloping the Amazon: Extraction, Unequal Exchange and the Failure of the Modern State*, Urbana ILL: University of Illinois Press

Bunker, S. (1984) 'Modes of Extraction, Unequal Exchange and the Progressive Underdevelopment of an Extreme Periphery: The Brazilian Amazon', *American Journal of Sociology* 89: 1017–64

Cederman, L.E.; Weidmann, N.B. and Gleditsch, K.S. (2011) 'Horizontal Inequalities and Ethnonationalist Civil War: A Global Comparison', *American Political Science Review* 105.3: 478–95

Coady, D.; Parry, I.; Sears, L. and Shang, B. (2015) *How Large are Global Energy Subsidies?*, IMF Working Paper WP/15/105, Washington DC: International Monetary Fund

Collier, P. (1999) 'On the Economic Consequences of Civil War', *Oxford Economic Papers* 51.1: 168–83

Collier, P. and Hoeffler, A. (2004) 'Greed and Grievance in Civil War', *Oxford Economic Papers* 56.4: 563–95

Congleton, R.D. (1992) 'Political Institutions and Pollution Control', *Review of Economics and Statistics* 74.3: 412–21

Deacon, R.T. (1994) 'Deforestation and the Rule of Law in a Cross-Section of Countries', *Land Economics* 70.4: 414–30

De Boer, W.F.; Ntumi, C.P.; Correia, A.U. and Mafuca, J.M. (2000) 'Diet and Distribution in the Maputo Elephant Reserve, Mozambique', *African Journal of Ecology* 38: 188–201

del Granado, F.J.A.; Coady, D. and Gillingham, R. (2012) 'The Unequal Benefits of Fuel Subsidies: A Review of Evidence for Developing Countries', *World Development* 40.11: 2234–48

Dennig, F.; Budolfson, M.B.; Fleurbaey, M.; Siebert, A. and Socolow, R.H. (2015) 'Inequality, Climate Impacts on the Future Poor, and Carbon Prices', *PNAS* (Proceedings of the National Academy of Sciences) 112.52: 15827–32

Didia, D.O. (1997) 'Democracy, Political Instability and Tropical Deforestation', *Global Environmental Change* 7.1: 63–76

Dimitrijevics, A. (2004) 'Integrating Patterns of Conflict Resolution. A Group Oriented Approach to the Study of the Genesis and Dynamics of Conflict', DPhil thesis, Oxford University

Dorling, D. (2011) ‘Inequality: A Real Risk to Our Planet’, *Resurgence & Ecologist* 297, July/August: 20–2

Dorling, D. (2010) *Injustice: Why Social Inequality Persists*, Bristol: Policy Press

Dorling, Danny; Barford, Anna and Wheeler, Ben (2007) ‘Health Impacts of an Environmental Disaster: A Polemic’, *Environmental Research Letters* 2.4: 045007

Drabo, A. (2011) ‘Do Political Institutions Protect the Poor? Intra Countries Health Inequalities and Air Pollution in Developing Countries’, http://cerdi.org/production/show/id/1252 (accessed 12 December 2016)

Elgar, F.J. and Aitken, N. (2011) ‘Income Inequality, Trust and Homicide in 33 Countries’, *European Journal of Public Health* 21.2: 241–6

Esteban, J. and Ray, D. (1994) ‘On the Measurement of Polarization’, *Econometrica* 62.4: 819–51

Fairhead, J.; Leach, M. and Scoones, I. (2012) ‘Green Grabbing: A New Appropriation of Nature?’, *Journal of Peasant Studies* 39.2: 237–61

Fajnzylber, P.; Lederman, D. and Loayza, N. (1998) *Determinants of Crime Rates in Latin America and the World*, Washington DC: World Bank

Farzin, Y. Hossein and Bond, Craig A. (2006) ‘Democracy and Environmental Quality’, *Journal of Development Economics* 81.1: 213–35

Flechtner, S. (2014) ‘Aspiration Traps: When Poverty Stifles Hope’, *World Bank Inequality in Focus* 3.1: 1–4

Francis, D. (2000) ‘Torturous Path to Peace: The Lomé Accord and Postwar Peacebuilding in Sierra Leone’, *Security Dialogue* 31.3: 357–73

Frank, R. (1999) *Luxury Fever: Why Money Fails to Satisfy in an Era of Success*, New York NY: Free Press

Frey, R. (1998) ‘The Export of Hazardous Industries to the Peripheral Zones of the World-System’, *Journal of Developing Societies* 14: 66–81

Galor, O. (2011) *Inequality, Human Capital Formation and the Process of Development*, NBER Working Paper 17058, Cambridge MA: National Bureau of Economic Research

Glover, D. and Hernandez, K. (2016) *Integrating Sustainable Development: A Foresight Analysis of Interactions Among Competing Development Challenges*, IDS Evidence Report 204, Brighton: IDS

Goffman, E. (2005) ‘Defining Sustainability: Defining the Future’, in C.R. Weisser, 'What Are the Foundations of Sustainability?’, *Sustainability*, A Bedford Spotlight Reader, Macmillan Learning

Gower, R. and Schroeder, P. (2016) *Virtuous Circle: How the Circular Economy Can Create Jobs and Save Lives in Low and Middle-income Countries*, Teddington: Tearfund and Institute of Development Studies

Grantham-McGregor, S. (2007) ‘Development Potential in the First 5 Years for Children in Developing Countries’, *The Lancet* 369: 60–70

Grubb, M. with Hourcade, J.-C. and Neuhoff, K. (2014) *Planetary Economics: Energy, Climate Change and the Three Domains of Sustainable Development*, Abingdon: Routledge

Grunewald, N.; Klasen, S.; Martınez-Zarzoso, I. and Muris, C. (2011) *Income Inequality and Carbon Emissions*, Courant Research Centre: Poverty, Equity and Growth Discussion Paper 92, Göttingen: University of Göttingen

Gupta, K.D. (1990) *The Economics of Political Violence: The Effect of Political Instability on Economic Growth*, New York NY: Praeger

Hartwick, John M. (1977) ‘Intergenerational Equity and the Investing of Rents from Exhaustible Resources’, *American Economic Review* 67.5: 972–74

Homer-Dixon, Thomas F. (2001) *Environment, Scarcity, and Violence*, Princeton NJ and Chichester: Princeton University Press

Homer-Dixon, T. and Blitt, J. (eds) (1998) *Ecoviolence: Links among Environment, Population, and Security*, Lanham MD: Rowman & Littlefield Publishers

Hughes, G. (2011) *The Myth of Green Jobs*, GWPF Report 3, London: Global Warming Policy Foundation

IPCC (2014) *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds)], Geneva: IPCC

ISSC (International Social Science Council), IDS and UNESCO (United Nations Educational, Scientific and Cultural Organisation) (2016) *World Social Science Report 2016, Challenging Inequalities: Pathways to a Just World*, Paris: UNESCO Publishing, http://unesdoc.unesco.org/images/0024/002458/245825e.pdf (accessed 2 December 2016)

Jackson, T. (2011) *Prosperity Without Growth: Economics for a Finite Planet*, Abingdon: Earthscan

Justino, P. (2012) *War and Poverty*, IDS Working Paper 391, Brighton: Institute of Development Studies: 1–29

Justino, P. and Moore, M. (2015) *Inequality: Trends, Harms and New Agend*as, IDS Evidence Report 144, Brighton: Institute of Development Studies

Khamvongsa, C. and Russell, E. (2009) ‘Legacies of War: Cluster Bombs in Laos’, *Critical Asian Studies* 41.2: 281–306

Killick, T. (2002) ‘Responding to Inequality’, *Briefing Paper* 3, London: Overseas Development Institute

Klare, Michael (2015) 'Tomgram: Michael Klare, Are Resource Wars Our Future?’, *TomDispatch.com*, 3 November, www.tomdispatch.com/blog/176063/tomgram%3A_michael_klare,_are_resource_wars_our_future/ (accessed 13 December 2016)

Lélé, Sharachchandra M. (1991) ‘Sustainable Development: A Critical Review’, *World Development* 19.6: 607–21

Levine, A.S.; Frank, R.H. and Dijk, O. (2010) ‘Expenditure Cascades’, *Social Science Research Network*, https://ssrn.com/abstract=1690612 (accessed 24 November 2016)

Li, Q. and Reuveny, R. (2006) ‘Democracy and Environmental Degradation’, *International Studies Quarterly* 50.4: 935–56

Lindenberg, S. (2001) ‘Intrinsic Motivation in a New Light’, *Kyklos* 54.2–3: 317–42

Lipsky, Michael (1968) ‘Protest as a Political Resource’, *American Political Science Review* 62.4: 1144–58

Luckham, R. (2015) *Whose Security? Building Inclusive and Secure Societies in an Unequal and Insecure World*, IDS Evidence Report 151, Brighton: Institute of Development Studies

Luckham, R. and Kirk, T. (2013) ‘Understanding Security in the Vernacular in Hybrid Political Contexts: A Critical Survey’, *Conflict, Security & Development* 13.3: 339–59

Lund, M. (2002) ‘From Lessons to Action’, in Fen Osler Hampson and David M. Malone (eds) *From Reaction to Conflict Prevention: Opportunities for the UN System*, Boulder CO: Lynne Rienner: 159–84

Lund, M. (1996) ‘Early Warning and Preventive Diplomacy’, in Chester A. Crocker and Fen Osler Hampson with Pamela Aall (eds), *Managing Global Chaos*, Washington DC: United States Institute of Peace Press: 379–402

Mannion, A.M. (2003) *The Environmental Impact of War and Terrorism*, Geographical Paper 169, Reading: Department of Geography, University of Reading

Martorano, B. (2017, forthcoming) ‘Inequality: Consequences, Causes and Cures’, Brighton: IDS

Martorano, B. (2016) *Taxation and Inequality in Developing Countries: Lessons from the Recent Experience of Latin America*, WIDER Working Paper 2016/98, Helsinki: United Nations University World Institute for Development Economics Research (UNU-WIDER), www.wider.unu.edu/sites/default/files/wp2016-98.pdf (accessed 25 November 2016)

Matthew, R.A.; Brown, O. and Jensen, D. (2009) *From Conflict to Peacebuilding: The Role of Natural Resources and the Environment,* Nairobi: United Nations Environment Programme (UNEP)

McGregor, J. (1998) ‘Violence and Social Change in Border Economy: War in the Maputo Hinterland, 1984–1992’, *Journal of Southern African Studies* 24.1: 37–60

Miall, H. (2000) ‘Preventing Potential Conflicts: Assessing the Impact of “Light” and “Deep” Conflict Prevention in Central and Eastern Europe and the Balkans’, in Michael Lund and Rasamoelina Guenola (eds), *The Impact of Conflict Prevention Policy: Cases, Measures, Assessments. SWP-CPN Conflict Prevention Network Yearbook 1999–2000*, Baden-Baden: Nomos

Montalvo, J.G. and Reynal-Querol, M. (2005) ‘Ethnic Polarization, Potential Conflict and Civil Wars’, *American Economic Review* 95: 796–816

Montani, G. (2007) 'The Ecocentric Approach to Sustainable Development', *Ecology, Economics and Politics* 49: 25–60

Mouffe, C. (2005) *On the Political*, London and New York NY: Routledge

Mrema, E.; Bruch, C.E. and Diamond, J. (2009) *Protecting the Environment during Armed Conflict: An Inventory and Analysis of International Law*, Nairobi: United Nations Environment Programme (UNEP)

Murshed, S.M. and Gates, S. (2005) 'Spatial–Horizontal Inequality and the Maoist Insurgency in Nepal', *Review of Development Economics* 9.1: 121–34

OECD (2011) *Towards Green Growth*, Paris: Organisation for Economic Co-operation and Development

Olson, Mancur (1965) *The Logic of Collective Action: Public Goods and the Theory of Groups*, Cambridge MA: Harvard University Press

Organski, A. F.K. and Kugler, J. (1980) *The War Ledger*, Chicago IL: University of Chicago Press

Østby, G. (2013) 'Inequality and Political Violence: A Review of the Literature', *International Area Studies Review* 16.2: 206–31

Østby, G. (2004) *Do Horizontal Inequalities Matter for Civil Conflict?*, Oslo: Centre for Study of Civil War and International Peace Research Institute

Østby, G. and Urdal, H. (2014) *Conflict and Educational Inequality: Evidence from 30 Countries in Sub-Saharan Africa*, Commissioned report for USAID, Washington DC: USAID

Ostrom, E. (2000) 'Collective Action and the Evolution of Social Norms' *Journal of Economic Perspectives* 14.3: 137r58

Oueslati, W.; Zipperer, V.; Rousselière, D. and Dimitropoulos, A. (2016) *Exploring the Relationship between Environmentally Related Taxes and Inequality in Income Sources: An Empirical Cross-Country Analysis*, OECD Environment Working Paper 100, Paris: OECD

Pelenc, J. and Ballet, J. (2015) 'Strong Sustainability, Critical Natural Capital and the Capability Approach', *Ecological Economics* 112: 36–44

Pezzey, J.C.V. (1997) 'Sustainability Constraints Versus "Optimality" Versus Intertemporal Concern, and Axioms Versus Data', *Land Economics* 73.4: 448–66

Poudyal, M.; Ramamonjisoa, B.S.; Hockley, N.; Rakotonarivo, O.S.; Gibbons, J.M.; Mandimbiniaina, R. and Jones, J.P. (2016) 'Can REDD+ Social Safeguards Reach the "Right" People? Lessons from Madagascar', *Global Environmental Change* 37: 31–42

Ravallion, M.; Heil, M. and Jalan, J. (2000) 'Carbon Emissions and Income Inequality', *Oxford Economic Papers* 52.4: 651–69

Rentschler, J.E. (2015) *Incidence and Impact: A Disaggregated Poverty Analysis of Fossil Fuel Subsidy Reform*, OIES Working Paper 36, Oxford: Oxford Institute for Energy Studies

Ross, M.L.; Lujala, P. and Rustad, S.A. (2012) 'Horizontal Inequality, Decentralizing the Distribution of Natural Resource Revenues, and Peace', in P. Lujala and S.A. Rustad (eds) *High-Value Natural Resources and Post-Conflict Peacebuilding*, London: Earthscan

Rosser, A. (2006) *The Political Economy of the Resource Curse: A Literature Survey*, IDS Working Paper 268, Brighton: Institute of Development Studies

Saint-Paul, G. and Verdier, T. (1992) 'Historical Accidents and the Persistence of Distributional Conflicts', *Journal of the Japanese and International Economies* 6.4: 406–22

Schmitz, H. (2015) 'Green Transformation: Is There a Fast Track?', in I. Scoones, M. Leach and P. Newell (eds), *The Politics of Green Transformations*, Abingdon: Routledge

Schmitz, H. and Scoones, I. (2015) *Accelerating Sustainability: Why Political Economy Matters*, IDS Evidence Report 152, Brighton: Institute of Development Studies

Schneider, R. (2008) 'Measuring Social Dimensions of Sustainable Production', OECD Sustainable Development Studies, Paris: OECD Publishing: 39-47

Schwartz, S.H. (1992) 'Universals in the Content and Structure of Values: Theory and Empirical Tests in 20 Countries', in M. Zanna (ed.), *Advances in Experimental Social Psychology*, New York NY: Academic Press

Shemyakina, Olga (2011) 'The Effect of Armed Conflict on Accumulation of Schooling: Results from Tajikistan', *Journal of Development Economics* 95.2: 186–200

Smith, R.J.; Muir, R.D.J.; Walpole, M.J.; Balmford, A. and Leader-Williams, N. (2003) 'Governance and the Loss of Biodiversity', *Nature* 426: 67–70

Solaymani, S. (2016) 'Impacts of Energy Subsidy Reform on Poverty and Income Inequality in Malaysia', *Quality & Quantity* 50.6: 2707–23

Solow, Robert M. (1993) 'An Almost Practical Step Toward Sustainability', *Resources Policy*, September: 162–72

Solow, R.M. (1974) 'Intergenerational Equity and Exhaustible Resources', *Review of Economic Studies* 41: 29–45

Spratt, S. (2017, forthcoming) 'Insecurity and Conflict: Consequences, Causes and Cures', Brighton: IDS

Spratt, S. (2017, forthcoming) 'Forest Taxation and REDD+: An Analysis of Potential Impacts in Cameroon, Ghana and Sierra Leone', ICTD Working Paper, Brighton: IDS

Spratt, S. (2015) 'Financing Green Transformations', in I. Scoones, M. Leach and P. Newell (eds), *The Politics of Green Transformations*, Abingdon: Routledge

Spratt, S. (2012) *Environmental Taxation and Development: A Scoping Study*, ICTD Working Paper 2, Brighton: IDS

Spratt, S.; Lawlor, E. and Joyce, K. (2017, forthcoming) 'Environmental Pressures and Shocks: Consequences, Causes and Cures', Brighton: IDS

Spratt, S.; Griffith-Jones, S. and Ocampo, J.A. (2013) *Mobilising Investment for Inclusive Green Growth in Low-Income Countries*, Bonn: BMZ, German Federal Ministry for Economic Cooperation and Development

Stern, N.H.; Peters, S. *et al*. (2006) *Stern Review: The Economics of Climate Change*, Vol. 30, Cambridge: Cambridge University Press

Stevens, C.; Winterbottom, R.; Springer, J. and Reytar, K. (2014) *Securing Rights, Combating Climate Change*, Washington DC: World Resources Institute

Stewart, F. (2005) *Policies towards Horizontal Inequalities in Post-Conflict Reconstruction*, CRISE Working Paper 7*,* Oxford: Centre for Research on Inequality, Human Security and Ethnicity, University of Oxford

Stewart, F. and Langer, A. (2008) 'Horizontal Inequalities: Explaining Persistence and Change', in F. Stewart (ed.) *Horizontal Inequalities and Conflict: Understanding Group Violence in Multiethnic Societies*, Basingstoke: Palgrave Macmillan: 54–82

Theisen, O.M.; Gleditsch, N.P. and Buhaug, H. (2012) 'Climate Change and Armed Conflict', in G.K. Brown and A. Langer (eds), *The Elgar Handbook of Civil War and Fragile States*, Cheltenham: Edward Elgar

Torres, N.; Afonso, Ó. and Soares, I. (2013) *A Survey of Literature on the Resource Curse: Critical Analysis of the Main Explanations, Empirical Tests and Resource Proxies*, CEF.UP Working Paper 2013–02, Porto, Portugal: Faculty of Economics, University of Porto

UNDP (2013) *Humanity Divided: Confronting Inequality in Developing Countries*, New York NY: United Nations Development Programme

UNEP (2011) *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication – A Synthesis for Policy Makers*, Nairobi: United Nations Environment Programme

Van Krunkelsven, E.; Bila-Isia, I. and Draulans, D. (2000) 'A Survey of Bonobos and Other Large Mammals in the Salonga National Park, Democratic Republic of Congo', *Oryx* 34.3: 180–7

WCED (World Commission on Environment and Development) (1987) *Our Common Future* [The Brundtland Report], Oxford: Oxford University Press

Wilkinson, R.G. and Pickett, K. (2010) *The Spirit Level: Why Equality is Better for Everyone*, 2nd ed., London: Penguin

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