



Addressing Tipping Points for a Precarious Future

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Print publication date: 2013

Print ISBN-13: 9780197265536

Published to British Academy Scholarship Online: January 2014

DOI: 10.5871/bacad/9780197265536.001.0001

Into a Precarious Future

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DOI:10.5871/bacad/9780197265536.003.0025

[-] Abstract and Keywords

The scientific world recognizes the Anthropocene, where the human hand appears to overcome natural cycles of energy, chemical processes, and land use. We may be approaching planetary boundaries of natural tolerance, though these may be more regional than local. Yet the floors of any safe operating space need to offer scope for redistributing dignity, income, opportunity, social rights, and capabilities in a world of limiting ceilings. This is a difficult message to deliver in a time of unprecedented austerity and unemployment, with reducing public expenditures, falling real wealth, and rising household costs. Three scenarios are offered: more of the same with an inbuilt political and technological lock-in; a mix of resilience adaptations in a wide range of institutions and technologies along with associated social value shifts as crises deepen and become more observable; and a full-throated transformation to a more socially just and ecologically robust planet based on well-being and betterment, and the profound role of investing in social capital, capability building, and individual and collective flourishing. But this vision may not be possible for the very reason that tipping points will overwhelm us when we have no learnt capacities to accommodate and to avoid.

Keywords: tipping points, Anthropocene, planetary boundaries, social floors, well-being, betterment, transformational tipping points, islands of hope

In the run-up to the UN Conference on Sustainable Development held in Rio de Janeiro in June 2012, the leaders of the global scientific convention *Planet under Pressure* concluded:

Research now demonstrates that the continued functioning of the Earth's system as it has supported the well-being of human civilization in recent centuries is at risk. Without urgent action, we could face threats to water, food, biodiversity and other critical resources: these threats risk intensifying economic, ecological and social crises, creating the potential for a humanitarian emergency on a global scale.

(Brito *et al.* 2012: 3)

GEO 5, the fifth Global Environmental Outlook of the UN Environment Programme, reached similar conclusions:

As human pressures on the Earth system accelerate, severe critical global, regional and local thresholds are close or have been exceeded. Once these have been passed, abrupt and possibly irreversible changes to the life support functions of the planet are likely to occur, with significant adverse implications for human well-being.

(GEO 5 2012: 5)

We are starting to stray outside the 'safe operating space for humanity' as introduced by Rockström *et al.* (2009) and extended in Rockström and Klum (2012). Rockström and his many colleagues believe that they have the scientific evidence that humanity is near or past safe boundaries in the areas of climate change, biodiversity loss, nutrient cycling, and ocean acidification. Although such boundaries are fiendishly difficult to define, the concerted scientific effort on the contingent outcomes of ubiquitous climate change shows that it is reasonable to agree on them (in this case, **(p.302)** staying below 2°C global warming). The real difficulty lies in staying within the boundaries. Now the World Bank (2012) has begun to address a world of 4°C temperature increase by 2100, once considered at the outside range of scenarios. The Bank suggests that human institutions of adaptation and adjustment have no precedent for coping and 'the risks of crossing critical social system thresholds will grow'. The Bank concludes: 'that simply must not be allowed to occur' (2012: xviii).

Regional navigation between social foundations and planetary boundaries

We suggest that sharing a common view of what is just and safe for all is also what will make our future sustainable. Fundamental considerations of what is just, especially what is equitable, must be considered alongside planetary boundaries on what is safe.

In the planetary boundaries framework, protecting human well-being is the rationale for limiting natural resource use in order to avoid tipping points in critical Earth system processes. At the same time, human well-being clearly depends upon each person having claim upon the natural resources required to meet their dignified human rights, such as decency in life, health, water and sanitation, food, shelter, and subsistence.

Meeting these basic human rights for everyone is what Kate Raworth (2012) at Oxfam calls the 'social foundation' for human betterment. Although we need to use resources to provide this social foundation, the amount of additional resource use necessary is modest compared to current global overconsumption. Instead we have a distribution problem - resource use and availability are profoundly not equitable, and a small minority are massively overusing global resources. The UN Human Development Report (2011: 2) shows that overall poverty is increasing, that environmental stresses and associated diseases are afflicting the poor and the powerless and women in a particularly adverse manner, and that there is a 'turning point' for general human ill-being in the least developed countries well before 2050, if present trends continue.

This inefficient overuse of resources is overstepping the planetary boundaries that represent an outer limit on our collective activities. Between the social foundations and the planetary boundaries lies a 'doughnut' (or torus) that prescribes the 'just and safe operating space for

humanity' – the 'Oxfam doughnut' as devised by Kate Raworth, building **(p.303)** on the work of the Stockholm Resilience Centre (www.oxfamblogs.org/doughnut).

The challenge then is to ensure that there is sufficient resource use and distribution to achieve human rights and well-being, while simultaneously ensuring that total resource use remains within planetary boundaries. We suggest the pathway to achieving this goal is a regional approach.

The reality or otherwise of planetary boundaries has been questioned (Nordhaus *et al.* 2012) with arguments that 'boundaries' are fuzzy, that regional variations make nonsense of global guardrails, and that huge differences in cultures and economies mean that any such boundaries are highly elastic in every particular human setting. These criticisms are partly helpful, and partly spurious. We take them as an impetus not to throw out planetary boundaries, but to try to define regional and local ones.

Of the nine original 'planetary' boundaries, only four clearly involve globally well-mixed variables: climate change, ocean acidification, stratospheric ozone depletion and phosphorus cycle boundaries. Carbon dioxide is well-mixed in the atmosphere and affects the climate and ocean acidification boundaries, well-mixed chlorofluorocarbons affect the stratospheric ozone boundary, and excess phosphorus leaking into the global ocean is also well-mixed, and might ultimately trigger excess removal of oxygen from deep ocean waters – an oceanic anoxic event.

However, for the other five proposed 'planetary' boundaries there are more immediate and evident thresholds and clearer management opportunities at regional or local scales. The corresponding boundary variables – namely atmospheric aerosols, chemical pollution, freshwater availability, land system change, and biodiversity – are regionally very variable. Conditions can sometimes exceed local or regional scale thresholds, but currently there is a lack of evidence for a global-scale threshold.

Furthermore, even where a 'planetary' boundary may exist, say, for phosphorus input to the global ocean, the original boundary was set at a level far beyond the point at which multiple regional systems – including lakes, coastal seas, and their fisheries – could pass tipping points into anoxic conditions (Carpenter and Bennett 2011). It clearly makes more sense in this case to set boundaries for regional systems, and then aggregate them through their catchments to a global scale. By iterating between such efforts to define regional and global thresholds, the boundaries concept can be placed on a firmer scientific foundation.

There are other compelling human reasons for a more regional and local approach. The regionalization of boundaries fits with existing scales of **(p.304)** communities and governance, and it reflects the scales at which democratic social foundations have relevance. Furthermore, the impacts of ecosystem degradation are experienced most strongly within national or regional economies – long before global boundaries of resource pressure may be reached. Already, natural resource management takes place predominantly at smaller scales, as part of national and regional development planning. Therefore, analytical tools that map resources and their boundaries at these scales of governance are more likely to have relevance and traction.

In the context of global population growth coupled with extreme income inequality – within and between countries – many nations and regions face significant and urgent challenges to ensure that available resources are used to meet the rights of all, whilst also seeking to guarantee that total use of regional resources stays within boundaries necessary to protect human well-being.

Nations therefore need the analytical tools to define both an environmentally safe operating space and a socially just one. This theme is most eloquently addressed by the report published by the Royal Society entitled *People and the Planet* (Sulston 2012). This emphasized the necessity to address the relationships between population growth, increasing inequalities of health, wealth, and opportunity, and overconsumption as an integrated totality for discerning targeting of policy. It pushed the case for more investment in the well-being of the one billion poor and the further two billion disadvantaged, and for much more sensitive planning and socially caring development of the emerging world's cities, which will dominate human occupation within a decade.

Happily, the thickness of the 'doughnut' is not fixed for certain critical social foundations and environmental boundaries at regional scales – for example, those processes involving the use of the nutrients nitrogen and phosphorus to produce food. By shifting to much more efficient and targeted use of fertilizers and food, along with more recapture and recycling of nutrients, we can simultaneously produce human betterment whilst reducing the pressures tending to tip lakes or coastal seas into anoxic states. There is room for manoeuvre, and we need a creative interplay between regional and global scales of analysis and governance, to define and then live within the 'doughnut'.

The message of this book is that although tipping points are hard to predict and corresponding boundaries even harder to define, they are taking form on an advancing horizon. Reviewing the ecological evidence, Barnosky *et al.* (2012: 57) conclude that only with a combination of organized scientific effort, together with serious transformations in the institutions **(p.305)** of global cooperation, plus widespread cultural recognition of the moral need to share and care, can we 'steer the biosphere towards conditions we desire, rather than those that are thrust on us unwittingly'. How might the world approach this task?

On trifurcations

Tipping points carry options. John Fowles, in his novel *The French Lieutenant's Woman*, offered two storylines for the outcome of the fateful meeting of his lovers. When contemplating tipping points we can only see stories. In astronomical time, nothing of our earthly human experience eventually will matter. As Filipe Duarte Santos (2011: 285–96) reminds us, the ultimate fate of the Earth is either spinning away into the outer realms of the solar system as a frozen lifeless rock, or being engulfed in an expanding, and subsequently contracting Sun. Before the planet is destroyed, life on Earth will be cooked to death by our steadily brightening Sun, in roughly a billion years' time. So we have time to consider our inevitable fate. The human race, even if it were to become truly sustainable, is unlikely to last for more than a few more millions of years. Given the essence of this text, such a prolonged prospect for a survivable humanity is extremely unlikely.

In this book we have so far offered two broad scenarios. One is the 'lockin' effect of succumbing to combinations of Earth system phase changes, even in the full knowledge of possible catastrophic outcomes – especially for the most vulnerable people, the human majority. The other is the creeping mass realization that positively creative transformations are increasingly unavoidable, and that if this is so, then some form of creative adaptation towards localized resilience is necessary.

In framing our conclusions, we feel it is realistic to suggest that three distinct scenarios for the coming generation of 30 years are plausible – our 'trifurcation' of tipping points.

The first scenario

The first scenario is that the 'lock-in' effect will prevail. This will be marked both by prolonged overall economic decline and turmoil, punctuated by and coupled to real successes of emergent eco-friendly and socially beneficial technology. We envisage advances, such as: in 3D computing; in **(p.306)** recyclable photo-voltaics which are so thin that they can coat objects; in robotics; in portable programmable computers with blossoming 'apps'; in human genetics to increase survival; and in permaculture married to targeted plant, fungal, and animal genetics to enhance food production. But these advances will not push the economic system towards sustainable paths. On the contrary, they seem more likely to reinforce efforts to keep the globalized industrial show on the road. The more there is technological hope for 'fixing' the wicked problems generated by economic growth and the explosions in production and demand, the more the lock-in effect will be relentlessly pursued. In fact it may influence the future pathways of the much touted 'resilience'. This is because such technology will be seen as the basis for successful adaptation to global and regional change. Hence 'tipping points' may lose some of their frightening qualities and 'nonadaptive' resilience will prevail.

In this scenario, tipping points of various combinations introduced in this book will become unavoidable before the century is out. Indeed, they will begin to reveal their physical dangers in the coming three decades and in some cases (summer Arctic ice removal, degradation of the Amazon) even sooner. As for social system disruption, we have repeatedly claimed that these thresholds are much more menacingly nearer.

The second scenario

The second scenario is that some form of accommodation to such approaching probable calamities will take place as an adjunct to the lock-in scenario, with a significant effort to establish 'adaptive' resilient communities across the planet. These will embrace sustainable energy, low-carbon, low-water, and low-waste technologies, behavioural change in consumption habits more generally, and the emergence of the local, more autonomous, community. Social enterprise, sensitive mentoring, and creative learning for flexible employment will flourish. Locally sourced resources will be generated by levies on non-sustainable consumption and behaviour, with the proceeds being incorporated into community-based not-for-profit cooperatives. These might be created by community charitable trusts and subject to community forums for advice, linked to media and web-based scrutiny. They could build resilience and leadership from within the vulnerable and establish the scope for sustainability enterprises. Most challenging will be the formation of such resilience in the poorer communities lying within wealthy, prosperous, and impoverished societies. **(p.307)** Local resilience will reflect capability and inequality of opportunity. But at least it could offer signposts.

Tipping points in this scenario will be mixed – positive and negative – but overall will contribute to human disruption and misery, despite many islands of resilience and hope.

The third scenario

The third scenario is the progressive combination of the first two, where the spectre of calamitous tipping points and the encouragement of 'islands of hope' begin the transformation of governing, of politics, of markets, and of learning into a world of sustainable living. This optimistic scenario will be seen as unrealistic by many. Positive narratives and expectations, however, can generate action, encouraging a drive for innovation and a willingness to embrace change, even when the initiating institutional conditions are very hostile. We feel it is possible for humanity to shift towards cooperative living for its own civilized survival in the light of

emerging risks of serious social violence, economic disintegration, widespread destitution, and irrecoverable global damage. But as we concluded in Chapter 1.1, we may have first to be 'shocked and awed' into such dramatic transformations.

We believe that aspects of all of these scenarios are likely to develop and shape our choices and constraints by 2050. It is partly the purpose of this book to offer the reader the scope for considering the ways in which we may avoid the first scenario, embrace the emergence of the second, and realize we need to capture the third over the coming two decades. This is the message of Matthew Taylor (3.2), namely to respect, to listen, and to cooperate through mutual vision, understanding, and action.

The politics of lock-in

It is dangerous to extrapolate from immediate trends into distant prospects. As we write in late 2012, the signs for both the European and the global economies are distinctly unhappy. Official growth predictions summarized in the April 2012 World Economic Outlook (International Monetary Fund 2012) verge on recession in the European theatre where even the more powerful economies of Germany and the Scandinavian countries are weakening. In May 2012, the manufacturing sectors in Europe and the **(p.308)** USA fell to their lowest levels in three years, with few signs of sustained recovery. In the USA there is such turmoil in domestic politics that sustained recovery seems to be thwarted by political anger. Paul Krugman and Robin Wells summarize the dismal scene:

Ultimately the deep problem isn't about personalities or individual leadership; it's about the nation as a whole. Something had gone very wrong with America, not just its economy, but its ability to function as a democratic nation. And it is hard to see when or how that wrongness will get fixed.

(Krugman and Wells 2012: 2)

The 2012 UK Democratic Audit (Wilks-Heeg *et al.* 2012) has recorded a widespread and disturbing lack of confidence in politicians and political institutions, with deepening dismay over the failure of legislatures to be responsive to public needs, and an overwhelming perception that politicians are in the grip of big self-serving corporations. The authors conclude that long-term representative democracy is in persistent decline, though local informal activism is strengthening. The loss of faith in overall political democracy adds to the huge difficulties facing legislatures in credibly tackling tipping points.

The normally dynamic propulsions of the emerging economies are also slowing down. Given their population growth and burgeoning cities, what looks like high rates of growth may not mop up the huge numbers of people seeking employment. Furthermore the rising rates of job-seeking amongst young people in many member states of the European Union do not bode well for their well-being and self-confidence. Overall the unemployment rate for young adults in the EU is 22.6 per cent. There is a real danger that many millions of young adults could become a 'forgotten generation'. In May 2012, there were 5.52 million unemployed young people in the EU, a figure that has been steadily rising since 2007.

EU policymakers and stakeholders are aware of this potential catastrophe of creating a 'lost generation', but so far appear powerless to halt the rising unemployment among young people:

This is a huge problem to tackle, but it is essential that young people are encouraged to develop skills that are in demand and that they are given the chance to obtain meaningful work experience that enables them to gain a foothold in the labour market.

(Andrea Broughton of the Institute for Employment Studies 2012 http://www.employment-studies.co.uk/press/10_12.php)

The Prince's Trust (2012) found that two in five of youngsters not in employment, education, or training were deeply pessimistic about their **(p.309)** ability to cope with their lives, exhibiting very little self-confidence about their abilities to enter into meaningful work. The Trust has launched a campaign over this *Undiscovered Generation* (Prince's Trust 2012).

While the Western nations are reassessing means to force-feed growth, they are also paying lip-service to 'green economies'. Even the most optimistic supporter of the green economic transition realizes that little can be achieved in a hurry, that by no means all of the currently unemployed can be mopped up by this transition, and that it will not sidestep the real risks of ecological breakdown. The Commons Environment Audit Committee (2012: 3–5) concluded that: the government in the UK do not give high priority to a green economy, favouring instead established, carbon-intensive investments in infrastructure; there were no measures of success or sense of direction in the transition to any coherent version of a green economy; there were conflicting and unhopeful prospects for many net new jobs without extensive training and work experiences; and there was no central mechanism to promote a full-scale environmentally and socially robust transition to such an economy.

From this we conclude that lock-in is rife, and that any transition towards our alternative tipping scenarios is still in its infancy and lacking in leadership. Beetham (2011) sees the weakening of democratic processes as fuelled by a combination of: market fundamentalism; corporate globalism; the hollowing out of the public service in favour of 'cherry picking' privatization; and the informal influence and ready access to politicians by those who donate to political parties. He also points to the 'revolving door' of senior civil servants moving to lucrative consultancies in the private sector they once managed; the perfidious entry of corporate advisers into the public service, often without any accountability; and the weakness of any individual politician to stand up to this onslaught. Even if he is half right, this is surely a recipe for lock-in.

The International Institute for Applied Systems Analysis (IIASA) is a highly respected modelling and policy advising interdisciplinary group of top-level researchers. In October 2012 it organized an impressive conference, *Worlds Within Reach: From Science to Policy* (IIASA 2012a). In the run-up to this event it published a number of reports seeking to show how indeed it is possible to turn around the big conundrums of the age: climate change, water and energy security, and sustainable urban living (IIASA 2012b). What is evident from these massive exercises in systems-led policy prescription is both the huge danger of lock-in (where IIASA modellers give to 2030 at most for successful transformation) and the challenging **(p.310)** requirements they seek for ensuring that their clever and comprehensive recommendations are acted upon.

What they seek seems remote from the present economic and political realities: strong international leadership; consistent and durable regulation to provide reliable investment conditions for business to commit resources and inventiveness; significant joint public-private investment of many new billions of US dollars guaranteed every year for over 25 years; and the scope for entrepreneurial technology and enterprise across the face of the planet. This is genuinely stirring stuff. And it comes from many person-years of painstaking modelling and

discussions amongst some of the brightest minds in the sustainability business. But it does appear fanciful in the harsh realities of limited available cash, deep divisions over climate change verities and solutions, touching faith in as-yet-untested technologies, and optimism over relatively rapid and enduring behaviour change coordinated across nations and time.

For us, the IIASA optimism lies at the cusp of our two scenarios: deeply dependent on the smashing of lock-in and heroically cheerful about untried ways of inventing, working, managing, and leading which should be the hallmark of a human species searching for joyous salvation.

Pavan Sukhdev (2012), the doyen of sustainable accounting, also places great faith in transformations to capitalism which, as yet, show little sign of being embraced by global financial markets and debt-plagued politicians. Perverse subsidies would be reduced (when billions are spent annually on lobbying to keep them (Heinrich Böll Foundation 2012)). Taxes would be reformed and new 'green' incentives created, with future infrastructure geared towards ecosystem sensitivity and alignment (while at present there seems only talk of more airports, roads, pipelines, and transmission lines). Public ownership of the commons and community ownership of common pool resources would be the new economic reality (while critical minerals and land are being purchased by international speculators and acquisitive governments and the global biodiverse hotspots, such as the mangrove and coral, fade). Socially responsible regulations would extend to the corporates generally, and advertising would be forced to follow strict ethical and accountable codes. Resource and pollution (including greenhouse gases) levies would steadily replace corporate taxes.

These are the recommendations we support for our second scenario. What all of these powerful and well-analysed reports reveal is the lack of alignment between the frantic regrowth-policy desperation of beleaguered politicians, their failure to connect these recommendations in an unprecedented (**p.311**) era of recurring Euro crises and deep social malaise as austerity strips family after family of their accustomed dignities, and the emerging realities of fundamental political and social failure. Yet it is precisely this combination of excellent science, policy analysis, and unavoidable crises which we feel stimulates the conditioning for our second and third scenarios.

Beginning the journey

Throughout this book, we have sought from authors some sense of what needs to be done to break the lock-in effect. There are signs of hope. Jeffrey Sachs, the special adviser to the Director General of the UN, Ban Ki-moon, has begun the process of determining what would constitute the Sustainable Development Goals (SDGs) for all nations which formed a centre piece of the Rio+20 UN Conference on Sustainable Development:

One of the key planks of the SDGs is that we need better measurement of well-being and one way is to ask people how well they feel they are doing, one crude measure of life satisfaction. A legion of scholars have been studying this and picking up great traditions as brought by Buddhism and Bhutan in particular. We can now identify pretty systematically places where people are deeply unhappy, highly anxious and also identify systematically the reasons why.

Second, people are, like Aristotle said, social animals. We depend on our sense of participation in communities, and if there is a lack of trust, our lives are miserable, and if we live in unhappy places where people do not co-operate with each other and altruism is

not a moral virtue that is defended, where cheating is rife and pervasive, then unhappiness soars.

(Jeffrey Sachs, quoted in the *Guardian*, 22 June 2012)

Sachs is highly critical of the lobbying powers of big business which result in distortion of commodities prices, profound undervaluing of natural and social capital (as outlined by Sara Parkin (6.3)), and the under-mining of political democracy as governments seem unable to withstand their financial and self-serving political purposes.

In order to understand how we might make the move towards alternative scenarios avoiding lock-in, we consider below some of the signals of change and instability of our time, within a conceptual framework of 'landscape, regime and niche' (Geels 2002) that can help us map the terrain and chart paths towards better futures.

(p.312) Turchin (2011: 7–9) suggests that there are long waves of stability and instability in many societies lasting for about a century at a time. His neo-Malthusian approach regards the disintegrative cycles as being marked by rising populations, increasing scarcity of food, insupportable urban migration, and bulges in the young to middle age ranges, releasing great social dissatisfaction. More of a trigger is the sequestering of wealth by elites and competition amongst rising numbers of aspiring elites to get hold of diminishing amounts of remaining wealth, leading to factionalism and social turmoil. The diminishing state coffers mean that the rising costs of military and police control, and associated surveillance, exceed the capacity of the state to finance their voracious demands on the tax purse. The outcome is deep social turbulence and loss of central authority.

There are signs in the troubled Eurozone of the latter stages of this sequence beginning to occur. So we need to consider how best to avoid the worst and begin to address the better. We began this journey in Chapter 6.1. We also asked Andrew Dobson (8.2) and Ian Christie (8.3) to take us further on this path.

Well-being and betterment

The New Economics Foundation (2012: 6) regards well-being as a combination of *feelings* (contentment, joy, satisfaction) and *functions* (competence, self-esteem, worthwhileness). Placing these in the context of external *opportunities* (work, social connectedness, trust in others, democratic involvement) and *personal propensities* (health, resilience, optimism, diversity of experiences) gives a sense of flourishing (self-realization) and capabilities.

What lies behind well-being is the beginning of a whole new approach to measuring and appreciating social betterment. The scope rests on the assets of what is possible for an individual to achieve, alone or with others, in creating inner satisfactions as well as empowerment over apathy or disillusionment. It also offers, crucially, the chance to avoid seeing real loss of income and ageing as negative aspects of economic failure. Rather, well-being offers the scope for regarding household flourishing as a far more appropriate measure than income, and ageing into health a basis for extending experience for community enhancement.

One outcome of well-being is the current interest in *social investment*. This is of two kinds. One is essentially charitable giving, where investors place funds in schemes which are designed to better people and society who are otherwise disadvantaged. The other is to offer schemes and

(p.313) support to those who are a cost to themselves and to society more generally, so that they take on responsibility and avoid future financial burdens on the public and private purse.

It is too early in the development of a social investment bank to assess its overall value. There is a grumbling amongst market fundamentalists that this is not 'real value' but some kind of 'charity' of a kind more commonly found in Victorian times. Consequently social investment will require a concerted effort from businesses which are either strapped for cash as the banks restrict and channel lending for measurable gains, or which are really only prepared to pay lip-service to what they regard as government responsibility. This is the message of the commentaries from Amanda Long (6.4), John Elkington (6.6), and Thomas Lingard (6.8). Mike Barry (6.9) and Ian Christie (8.3) make an even more forceful point. The failure of governments to provide for publicly funded support for the planet or even for social capital may create a void which the private sector will simply have to fill. Social investment may have to be privately financed. This is the line also strongly advocated by Sukhdev (2012).

The second form of social investment is more promising. This depends on the intervention in the lives and consumption habits of people who are proving a cost to themselves (alcoholism, obesity, type 2 diabetes, self-harm, early and unwished-for pregnancy, and substance abuse). All this tends to result in expenditures to various other parties, such as insurance-premium contributors, or health authorities. For example, the cost of obesity to the UK alone is estimated to be over £5 billion annually, and the cost of treating depression over £4 billion per year (see Foresight 2008).

Mulgan (2011) offers seven criteria for success in this kind of endeavour:

- The programme is clearly preventative and sufficient funding is available.
- The programme demonstrably improves social well-being and ameliorates undesirable outcomes.
- The specific impacts and advantages of the programme can be measured.
- Sufficient participants offer robust evidence of a wider success.
- Beneficiaries can be identified.
- Their benefits are shown to be larger than the overall costs of the interventions.
- There is scope for rolling this out into a social investment bank.

In many ways key aspects of sustainability should apply here. For example, helping poor families to cut wasteful energy and water use could **(p.314)** result in incentives from utilities and reduce carbon emissions and water shortages in drought-prone areas. Such eco-orientated approaches fit in with the vision of socially responsive capitalism offered by our contributors to Part 6. Reconstituting waste, especially used consumer goods such as bicycles or electrical appliances, should provide reusable products for poor families who otherwise could not afford them. Mentoring potential depressives or would-be drug abusers provides significant benefits on the hard-pressed public purse, as well as possibly benefiting the well-being of both the helper and the assisted.

Maybe it is precisely in the realm of well-being and community support that sustainability can find a new home. This would be where it has never entered before. It is to the disadvantaged, the new household poor, the frustrated unemployed, and the incipient depressive that

sustainability can now reach out. So, if the conditions of sustainable capitalism do begin to take hold nationally and internationally, this sets the scene for sustainable localism. It is here that we finally must turn.

Redesigning locality

Getting to an effective role for localism will not be easy. Central governments dislike giving too much power and discretionary money to local governments, for the obvious reason that many local governments are run by other political parties. But equally relevant is the real crisis of reduced overall cash in local government coffers due to austerity measures. Along with this financial suffocation come losses of staff and discontinuity of programmes. In many cases the projects where local government excel, namely where they create a trusting and bonded relationship with less advantaged peoples and associated charities, are those which are cut and where well-liked personnel are made redundant.

The Economist (2012) offers the emergence of a revolution in local government, especially in London where councillors are well educated and amenable to creative experimentation. They are trying out 'John Lewis' cooperative partnerships and 'easy' (low cost, no frills) partnerships with communities where all manner of people are getting involved with bettering social services and care. These well-intentioned schemes are still very embryonic, but they do show the scope for really effective adaptation and resilience if the management innovations are shared, and if 'failure' is regarded as a source for learning and recalibrating.

(p.315) In essence there is little prospect of successful transfer to localism for sustainability unless several conditions are met:

- Local government needs to have powers to raise their own income from activities which are proven to be non-sustainable and carbon-generating.
- Most, if not all, of this revenue should be in the form of local not-forprofit investments which are handled by community charitable trusts for the benefit of viable local sustainability initiatives run on a partnership basis with the public and private sectors.
- Young people should be enabled to work on a host of sustainability schemes in the arenas of energy auditing, mentoring appropriate energy, water, waste, and food use by forming social enterprises which engage with communities on a neighbourhood level, and which embed real empathy with their peer groups.
- There should be a targeted programme of 'resilient streets' through which this effort can be enacted by young people who are from disadvantaged neighbourhoods so that neighbourly households can work together on common sustainability projects.
- Schools should also be involved with schemes for enabling their pupils to gain in mental toughness and confidence-building, and through such programmes to twin with schools in less advantaged areas (including in emerging and developing economies) to instigate resilient schools and streets programmes.
- The local media should support this enthusiastically, with lots of positive news coverage, information-rich websites, and schemes for community-based visits for other neighbourhoods to look and learn.
- All of this should also be promoted by social networking sites and the kinds of web-based schemes for linking people with skills to those who need support and confidence-building.

- The cascade of success should be progressively rolled out across the totality of the settlement to begin the process of creating a true sustainable city and a resilient community.

This is essentially Local Agenda 21 at work. This is the programme of conveying sustainability to the local scene and creating forms of democracy which genuinely introduce cooperative governance. Ideally there should be supportive sustainable community-based citizens' charitable or not-for-profit trusts which work alongside local politicians in a non-partisan way, so that effective collaborative democracy triumphs.

(p.316) We are some way short of this. In particular the freedoms sought here for local government are very variably available throughout the world. For the most part central administrations prefer to tether their local brethren. But surely here is the path to our second conception of a more socially tolerant transformation, drawn from its collective self-belief rather than the fear of impending economic and social collapse. But much more needs to be done. It may be more through economic and social desperation, coupled with local business leadership, that the necessary changes will eventually occur.

Islands of hope and transformational tipping points

Following the casework of the Resilience Alliance, recognizing the heartening examples offered by Emily Boyd (7.2) and Camilla Toulmin (Commentary 7.4), and reading countless websites of sincere community action for sustainability - together these offer a sense of 'islands of hope'. These are the myriad of trials, of pilots, of courageous innovation, of community or personal leadership which add up to a transformational movement.

What seems to kill the enlarging of these islands is a combination of the themes outlined in Chapter 6.1 and in this chapter so far: inadequate international leadership; hopeless indecision and contradiction; possible deliberate hypocrisy; and failing institutions unready for change because of complexity, lobbying, and lock-in. There is also the very real difficulty of trying to alter human behaviour when cultural norms and peer pressure intervene, as we saw in the commentaries by Matthew Taylor (3.2), Charles Clarke (6.7) and Camilla Toulmin (7.4). Andrew Dobson takes this further in his companion chapter (8.2).

We add another dimension. This is a moral envelope of the kind introduced by Laurence Freeman (5.1) and by Andrew Dobson (8.2). Social nudge, regulatory shaping, economic incentives are not in themselves sufficient to produce the kinds of across-the-board transformational behavioural change in what are very habitual, peer-guided, and market-driven actions. There needs to be an inner drive: what Ernst Schumacher (1972) called 'the centre'. This is the coherent inner certainty which directs supportively and creatively the kinds of sustainability citizenship addressed by Dobson. How this can be achieved and in a timescale of **(p.317)** decades, remains deeply problematic. We rely on a combination of 'awe and shock' as the wider and longer effects of the human footprint become more evident through scientific research, evidence collection, unavoidable warnings, and exceptionally damaging hazard. We sense that many people, especially younger people, are becoming more aware of the scale of the challenges and seek to be better informed and more in tune. We see the 'islands of hope' enlarging and gaining in publicity and attractiveness. We believe well-being and betterment will take over as the mainstay of human endeavour within a decade. We support the Sulston working group conclusions (Sulston 2012) that inequality in all of its pernicious manifestations in all nations must be reversed. For only a society of progressive, but earned, fairness can embrace

sustainability. And we see business and government being goaded by customers and encouraged by reconstructed regulations and markets (in that order) to turn the corner.

So we salute these islands of hope, their visionary leaders, and their 'centred' supporters. We thoroughly support the abundance of websites which proclaim their existence and learning pathways for others to emulate. And we share the optimism of Joe Smith (7.1) that we can communicate hope much better than despair.

But we also realize we will have to travel further into the uncharted territory of advancing tipping thresholds, before we move in the directions offered in Part 6 and Part 7. It would be so very sad if the human family, with its magnificent science and information-processing skills, and new forms of communication, cannot work creatively and purposefully to prepare us all for the positive transformations we all must eventually embrace. Civilizations have failed in the past, but never comprehensively, and always with some aftermath. We believe the prospect of global dismay, and with it a sense of failing our offspring, will provide the current that potentially will turn the tide. But we are not sanguine. The lock-in effect and the sheer magnitude of social and institutional transformations which grow more irreversible by the month, particularly in times of austerity which are a function of our folly, may make tipping points the beginning of human nemesis. This is why we humbly believe this book, with its marvellous contributions, is so very timely.

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