

# 13

## *Reflections on the pathways to sustainability*

TIM O'RIORDAN

We are now at an exciting stage in the awkward, but vital, transition to sustainability. In international government, in national strategies, in business, in community action, and in individual behaviour and outlook we are beginning to witness a dawning realisation that global humanity has to shift if future generations are to survive with any meaningful sense of prosperity and wellbeing. We have no excuse about not knowing what may happen; modern science, the power of modelling and scenario building, together with the democratising effect of the internet, make any further denial impossible. We also know we have the global wealth and the technological wherewithal to change course if we have the will.

In this chapter, I start by summarising the major themes of this book. Then I look again at the morphology of the shift from the environmentalism of the 1970s to the rhetoric and politics of sustainability in the 2000s and beyond. My intent here is to show that we have not yet seriously completed this adjustment in paradigms, and that the environmental labelling of sustainability continues to plague its political acceptability and public empathy. In this section I also analyse why sustainability is such a slippery concept for governance. In part, this is because of its intensely ambiguous qualities. But I also claim that we have not yet devised governance arrangements that can resonate, promote and champion sustainability. The irony is that sustainability is supposed to be transformational. Yet efforts at transforming governance frequently build in reforms that resist, not promote, any meaningful transition to effective sustainability. Or to put it slightly differently, modern governance is proving to be too dependent on non-sustainable models of human values and developmental goals to be suitable for sustainability.

Then, in the fourth section I turn my attention briefly to the notion of tipping points. These are of two kinds. Abrupt changes may occur to the planetary functions so that step-shifts take place in the working

of the life-support processes of the globe. This is the earth scientists' approach. But tipping points also refer to culture shifts in citizen outlook and behaviour, in consumer habits and choices, and in shifting political perceptions of what has to be done, even if not all are politically acceptable. The so-called cultural tipping point towards sustainability may prove to be the force for change that proceeds and reshapes governance which is genuinely for sustainability. In the following section, I link these tipping points to the notion of human wellbeing as a measure of prosperity and being better off.

In the sixth section, I draw together all this material into three big questions about the governance of sustainable development, which I then make an attempt to answer. Finally, in the concluding section, I reconsider the existing governing structures and processes in the world today, in the hope that this book may inform how we manage and share the journey to sustainability.

### **Major themes in this book: a personal summary**

The chapters in this book represent the first truly serious attempt to assess governance arrangements, as they currently operate, for the promotion and pursuit of sustainability. In their different ways, all of the authors are justifiably sceptical that society is producing political structures and managers who really can guide it towards a more sustainable future. But, then, no-one really knows just what such a future would look like. No-one is ready to shoulder the responsibility of taking decisions and changing behaviour to create more sustainable outcomes a century hence. Moreover, as we are only just beginning to grapple with the immensity and complexity of sustainability as a concept, the task of defining the processes of governing to support it is terribly complex.

In Chapter 1 Neil Adger and Andy Jordan conclude that sustainability is both a set of outcomes (long term viability of ecosystems, social relations and prosperity) and processes (governing, guiding, participating and collective decision making). The outcome is a greater awareness and collective correction of current outlooks and practices (reflexivity), rather than a transformation. Yet they also point out that if a successful shift to sustainability is ever to meet the needs of poverty alleviation and societal justice, such a move may prove all too tricky in a limits-driven world.

They regard governance as more a set of networks than hierarchies or markets. But they also believe that all three ways of managing must be involved. I also share their view that we need more well-monitored experiments, more design of genuinely new institutional arrangements and ways of re-defining problems as opportunities.

In her chapter, Katrina Brown is healthily sceptical of any successful move towards ecological resilience and the maintenance of social justice in a world of ecological safeguards. She sees the synergies between livelihoods, wellbeing and sustainability, but does not observe any evidence that governance is addressing this in a reliable or convincing manner. She makes a plea for more adaptive living and more adaptive governance, along the lines suggested by Adger and Jordan at the end of their analysis. She rightly points out that the trade-offs between losers and gainers are not taking place in a coherent or fair manner, and that the language of interdependency may be better than the language of losers and gainers.

Albert Weale enjoys his frown over my idealism. He is quite right in proclaiming that governments matter, and that sectoral politics will first have to be upgraded in order to achieve fair outcomes amongst competing demands. He urges us not to forget that the competition for power is still a virtue of democracy. The key issue is to ensure that the competition is fair and that the values to be traded are fully representative of ecological and social resilience and robustness.

Philip Lowe and Katy Wilkinson remind us that powerful business and third sector lobbies are at their best when they are adaptable. To some extent, the farming lobby in the UK has begun to transform in the context of environmental pressures. It now realises that environmental improvement is an income earner. But look carefully. Farming in the UK and Europe, as elsewhere, is still by no means sustainable – environmental payments offer shallow and often self promoting investing practices, rather than the creation of new outlooks or management. Moreover, meeting the current global food shortages may well add to overall unsustainability, not promote sustainability. In short, the farming lobby of the 1970s is alive, well and kicking, and unsustainable. Adaptive change by the environmental and producer lobbies to new realities does not, by any means, lead to sustainability.

Mat Paterson also develops this theme by suggesting, rightly in my view, that international agreements cannot promote sustainability in a

world of non-sustainable social values and international capitalism. There is no synergy between the legal agreement, the underlying incongruous values, and the delivery of a multinational sustainability scheme. Even in the frame of competing scientific evidence about climate change and rising public concern, the levers of capital and politics grind slow and often in perverse directions. The larger the governance scale, the less sustainable the process and outcome.

Andy Stirling and Ortwin Renn both emphasise the role of better risk framing and participatory procedures in the governance of sustainable development. Stirling sees more in the manner of reflection as a means to rectify imperfect governance, than as a route to genuine awareness and corrective action. Yet the sustainability imperative is opening up in science, as Jill Jäger outlines. This is the exciting part. The modern scientist is more explicitly interdisciplinary, more attuned to social science perspectives and more ready to engage with civil and political structures and outlooks than ever before. Yet there is still a fundamental unwillingness to let go of the notion that science is still searching for better, peer reviewed and more rationalistic knowledge than is appropriate for sustainability. Social scientists do not always help themselves to gain credence by their constant squabbling over key terms and theories. Yet, even today, science is still rarely regarded as explicitly incorporating social science. The call by both Renn and Stirling for a more interactive and learning style of participation is widely shared in the chapters by Jäger and Burgess and Clark.

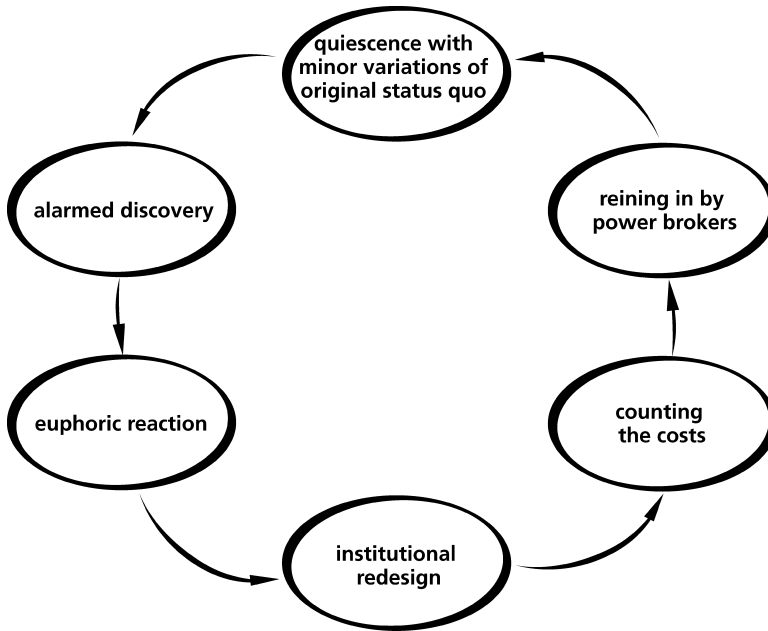
I have grouped together the economics Chapter 11 (Eric Neumeyer and Simon Deitz), the John O'Neill piece on philosophy and values (Chapter 12), and Andy Dobson's Chapter 6 on ecological citizenship into a single final comment. These offer more hope than some of the equally thoughtful earlier commentaries on governance as a struggle. The economists recognise that economic paradigms are shifting in favour of much greater interest in how natural resources are seen as social as well as ecological phenomena, not just mimicking monetary values. They also touch on the manner in which wider sustainability accounts are being pursued to favour work on better ecological economics and social resilience. There is movement here. Dietz and Neumayer argue that the Stern Review on climate change, for example, shows the power of economic arguments in public policy in pointing to the material risks of unsustainability. Admittedly progress is slow, but at least it is discernible.

John O'Neill touches on the more fundamental role nature still plays in many people's lives. The spiritual quality of the natural world mimics the emerging spiritual qualities of a citizenry that is beginning to care for its future and that of its neighbours. Here is where Andy Dobson does us a service. Good citizenship does not just come from behaviour. It must be spurred by profound values of compassion and justice, and by a form of government that resonates, promotes and emphasises such virtue. Virtuous citizenship is integral with virtuous politics. One cannot possibly expect to fashion a form of governance for sustainability that does not create a form of governing that is deeply virtuous. This is the ultimate test. We are not yet virtuous as citizens, and we have not crafted styles of governance that promote and champion virtue. Until we do, there can be no transition from environmentalism to sustainability.

### **The transition from environmentalism to sustainability**

The political transition of the late 1960s environmental movement was explained by Anthony Downs in 1972 and his model still has some resonance today (see Figure 13.1). I realise that this model is dated. I also recognise that the environmental movement has swept through science, government, economics and social behaviour since Downs produced his political analysis. But his perspective offers a sense of the ultimate failures of environmentalism to get to so-called one-planet living even when the evidence for earth system transformation is overwhelming.

Downs postulated that any environmental revolution begins with new scientific and observational evidence which is alarming, compelling and will, if proven actually to happen, carry unknown numbers of innocent bystanders into unjust pain and grief. In the late 1960s and 1970s, the concern was for environmental pollution, destruction of biodiversity, toxicity, and possible natural resource scarcity. All of this placed environmental wellbeing on the international agenda. It instigated the first UN Conference on the Human Environment in Stockholm in 1972. And it introduced an era of international environmental agreements along with a plethora of new regulatory and legal institutions, such as environmental protection agencies and international protocols. Many of those organisations are still with us, and some, such as the Law of the Sea and the Convention



**Figure 13.1** The Downs issue attention model reset for the sustainability transition

*Note:* Downs recognised that this was only a general model, and that the detail would vary by issues and over time. Nevertheless, if one looks at sustainability in transition, much of his original analysis holds.

*Source:* based on Downs (1972).

on the International Trade of Endangered Species (CITES), though flawed, are vitally important for managing the global environmental heritage. These are by no means perfect, but the world would be a much poorer and endangered place if such international agreements did not exist at all.

An enduring legacy of Stockholm is the resentment amongst poor countries that the environmental agenda was a purposeful strategy by the rich to ensure that there was sufficient ecological space for them to continue to create wealth, whilst seeking to reduce pollution and waste. The sustainability agenda is still not clear of this stigma.

Downs placed his finger on the political pulse when he noted that reactionary forces would look critically at the mounting political and economic consequences of all of these measures, and would lobby to

rein in the emerging but hesitant political enthusiasm. This, of course, did happen in the early 1970s and still occurs every day, even in the modern era. The analysis in chapters by Albert Weale, Mat Paterson and Andy Dobson all attest to this. Lobby groups abound in all the nations' capitals, but especially in Washington and Brussels, and exist primarily to ensure that environmental excitement of the kind described by Downs (1972) does not get too out of hand.

Downs, therefore, argued that environmental movements would inevitably wax and wane, pushed along by catastrophic events such as Bhopal, Chernobyl and Hurricane Katrina, yet jolted to a halt by those supporting the political and economic status quo. In general, then, environmentalism has been characterised as a powerful, but ultimately marginal, political movement that stirred the social conscience, created a fresh tranche of aware and concerned citizens in all walks of life, galvanised a mass of extremely determined pressure groups, scrutiny organisations and consumer bodies, and generally redefined the science of environmental assessment and of integrated environmental regulation. I remain struck by the arguments of influential journalists such as George Monbiot (2007) and Naomi Klein (2007) who claim that neoliberalism remains in the ascendant, and that even environmental calamity carries in its wake more corporate investment for corporate profit in reconstruction. Environmental transformation, it seems, can reinforce the neoliberal economic order. I do not believe these arguments can easily be dismissed.

Even so, nowadays we are witnessing exciting changes to the Downs model. Here is my take on the present arrangements, as outlined in Figure 13.2. I admit it is slightly flaky but it helps to portray the points I would like to make at the end that a more profound sustainability tipping point is in the offing. I begin with the global tipping points as environmental science writing on the wall. Then I move to the shift to experiments and innovations at all scales of governing that do give some hope for sustainability. It is the very ambiguity of sustainability that encourages experimentation to flourish, even when not labelled as such. The new economics of sustainability follows, and I complete the transition with the emergence of civic virtue and a more earth-focused fundamentalism in a future citizenry and sustainable consumerism.

Environmentalism is morphing into sustainability. Neil Adger and Andrew Jordan correctly emphasise in Chapter 1 that sustainability is

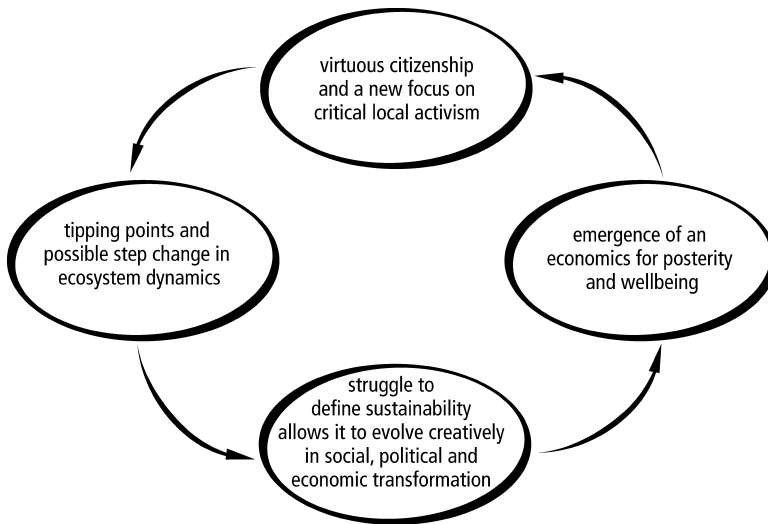


Figure 13.2 The sustainability transition tipping point

still vague, messy, easily manipulated and redefined, and therefore ultimately fruitless for a political sound bite or a ministerial mission. It is essentially revolutionary and radicalising, demanding a huge step change in culture, behaviour and outlook for which almost all citizens are still unprepared and mostly unwilling. It demands a form of multi-agency governmental and public involvement at a host of levels of political scale that simply cannot be delivered by present-day bureaucracies, nationalistic political endeavours and inadequate participatory approaches.

Yet Figure 13.2 does suggest some very important shifts in the manner of economics, social transformation and politics that are beginning to show up as truly revolutionary. No longer is environmentalism seen as a threat to the economy; the economy itself is increasingly seen as the main threat to our environment and particularly our climate. And no longer is environmentalism marginal to politics. At every level of government, and not least the G8 group of leading industrial nations, as well as the World Economic Forum, climate change, biodiversity, ill-health and inadequate safeguards for local secure livelihoods are seen as deeply troubling political, commercial and moral issues. The possibility of a growing link between

terrorism, violence generally and the mass movement of desperate peoples into unprepared lands and cultures, raises the scope for prolonged conflict, with all that this entails for the politics and economics of destabilisation, resentment, and social breakdown.

Environmental issues have become fully integrated into an economic, social, moral and political transformation. In his review of the economics of climate change, Sir Nicholas Stern (2007) showed that the possible costs of change offer a genuinely serious economic challenge to development trajectories with business-as-usual carbon intensity and emissions – the very activities that Downs claimed would defeat the earlier environmental movements.

What Figure 13.2 suggests is that global tipping points are becoming more and more visible. It also emphasises that to solve sustainability issues, the character of the sustainability problem has to be redefined. Verweij and Thompson (2007) refer to wicked problems, uncomfortable knowledge and clumsy solutions. *Wicked problems* are interpretations of challenges that so narrowly base their analysis for defining a solution that new variations of problems spring up to create endless suites of continuing unsolved outcomes. The biofuels debate is one such case. Producing biofuels in an attempt to reduce carbon emissions from automobiles creates a series of discomfiting repercussions on land use, loss of biodiversity, price rises for basic foodstuffs for the poor, and mischievous accounting of carbon savings, much of which is quite deliberately manipulated (Naylor *et al.*, 2007). Wicked problems are unsolvable if conventional patterns of institutional design and decision tactics are followed. Only step changes in problem analysis and institutional attention will overcome the inevitable tendency to generate more difficulties as well-meaning solutions are offered.

*Uncomfortable knowledge* is the confounding evidence that wicked solutions throw up. It is also the contradictory data and interpretation of long established cultural norms of behaviour that lie out of step with any effective transformation to sustainability. Above all, uncomfortable knowledge is the basis of a genuine recognition that present-day patterns of institutional thought and scope for action are inadequate for what the evidence suggests really has to be done.

In my own work on coastal change (Milligan and O’Riordan, 2007), uncomfortable knowledge appears in many guises. Planning bodies seek to address what to do about future roads, pipelines, telecommunications as well as the economic and social networks for

viable settlements for a future soft coastline facing inundation and hazard from a rising sea and a diminishing coastal nourishment of sediment and saltmarsh. Coastal agencies vie with each other over whether to continue to protect an eroding coastline, and gain public support, or let coasts evolve more naturally and face the hostility of aggrieved residents and businesses. No democracy exists in coastal areas that can plan 100 years ahead for a coastline that could vary in so many ways, depending on climate change and many other policy interventions (Urwin and Jordan, 2008). One way forward is to visualise the possible benefits of a wholly new coastline designed and implemented over a period of fifty years. This is not easy. There are no convenient institutional arrangements for delivering such a vision, nor are existing residents necessarily the best guardians of the long-term interests of communities.

Another example of uncomfortable knowledge lies in the UK debate on genetically modified (GM) organisms which took place between 2003 and 2005. An analysis in which I was involved (Horlick-Jones *et al.*, 2007) came to the conclusion that the many social interpretations of GM food could not be contained by the science of GM or biotechnology. Indeed, many of the social interpretations of GM crops in general and GM food in particular were inflamed by the manner in which scientists were closing off public disquiet so it became impossible to run a rational and scientifically informed public debate. Also, because of the open-ended nature of the various procedures, the anti-GM lobbies tended to dominate public meetings. In addition, the more formal evidence offered by science reviews and cost-benefit analysis turned out to be ambiguous and confusing. The upshot of this major exercise in participation was that the process was suffused with politics, notably by the government in deliberately not being clear as to what decisional status was to be given to the debate in its final politically motivated decisions. Nevertheless, the overall purpose of the introductory focus group work, and the final reflective evidence for committed bystanders, did suggest that meaningful interpretations of GM issues could be richly garnered for well judged and managed participatory events.

The final decision was a classic political fudge: one GM crop could be licensed, but there would be penalties of continuous surveillance and an ambiguous liability clause. In the final outcome, it is unlikely that GM crops will be grown in the UK in the foreseeable future, as

the companies do not want to get involved and the supermarkets do not wish to sell the products. Yet on a global basis, GM is being advocated for the much-needed food revolution. So we may have learnt a new process, but not yet delivered the sustainable outcome.

*Clumsy solutions* remind me of the ox-cart in Ravel's orchestration of Mussorgsky's *Pictures at an Exhibition*. The cart is characterised by trombones and tubas lurching from one muddy rut to another, while there is no stable or orderly track for sure progress. The combination of wicked problems and uncomfortable knowledge usually produce clumsy and ill-fitting solutions that still do a job, however inadequately. Many examples spring to mind. We will see it in carbon capture and storage and in voluntary carbon offsets; and we will witness it in the renewables saga, especially where large construction projects are concerned, such as major offshore wind farms, geothermal stations and tidal energy projects such as the proposed Severn barrage in the UK renewable energy arena.

Clumsy solutions set a challenge for us to visualise the minimal governance conditions (e.g. market and regulatory arrangements, public participatory arrangements) required to facilitate sustainable solutions. This may involve visualising a sustainable policy world of fifty years hence that would be far less clumsy and far more adaptable. This is an enormous governance challenge. We do not yet have the thinking or the visionary capability to imagine unimaginable future states where so many variables hinge on each other. Lying at the heart of all of this is the notion of the virtuous and responsible citizen. Admittedly such individuals do not yet exist in any meaningful numbers. But the notion of such a citizen is one who seeks joyfully to live for a sustainable future, and who adapts their behaviour into a mould of shared responsibility for the transition to come. This is the essence of the difference between the two models depicted in Figures 13.1 and 13.2. Downs could not see genuine transformation of politics, though to be fair to him, he did hint that this might be necessary in the aftermath of major environmental crises.

### Global tipping points

At this point I turn to the earth science interpretation of tipping points. I see this important work as a vital trigger for the transformation to virtue citizenship. I am struck by the revealing work of John

Schellnhuber and his colleagues (2004). Earth systems are notorious because they do not follow predictable paths, so cannot be synthetically modelled. The very act of modelling to dissect highly integrated and unexpectedly random relationships deprives us of the essence of complexity and unpredictability. In any case, we have no external models of the planet to compare one treatment or cure with another. In addition, it is evident that any outcome of a given set of human activities may only reveal itself in both planetary systems and human outlooks once the act is underway. Any outcome is emergent, and rooted mysteriously in its initiating conditions. For example, if we try to issue carbon tradable quotas to every citizen on the planet, we can have absolutely no idea ahead of time as to how such a policy would affect national economies, social relations, consumer behaviour and popular interpretations of climate change science. Even well-meaning pilot schemes in the UK cannot seriously give us an idea of what would ultimately happen on a global scale.

Of course the tipping points agenda has yet to emerge centre stage. When it does, I suspect three outcomes are likely. First, public alarm will be heightened. This process needs to be handled very carefully by scientists, who are still regarded as trustworthy. Fear and denial can make any adaptive cultural shift very difficult and contentious. These two unhappy bedfellows are magnified when governments are not regarded as accountable and reliable. Leadership cannot come from flawed institutions. The process in science would be especially acute, if the scientific prognosis seems unsupported or too dramatic, and if the case for human behaviour change is too strident, there could be a backlash against the integrity of science. Downing and Ballantyne (2007: 4) find evidence that some 56 per cent of the UK public is not convinced about the scale of climate change threat; uncertainty in the science, they remark, is matched by widespread confusion about what actions to take and what products to buy. This remains a particularly awkward issue, and hence may have repercussions for any deep and profound transition to civic virtue discussed earlier.

Second, the role of the business community, coupled to consumer pressure, could be critical. Indeed, this is yet another arena for a tipping point. In his wide-ranging assessment of the future of so-called sustainable capitalism Jonathon Porritt (2007: 264–90) admits to his ambivalence about how far the current models of capitalism and business culture can handle sustainable development. A number of

**Table 13.1** *How businesses perceive the benefits of sustainable development*

Issue	Perception of opportunity and threat
Efficiency of minimising materials flows and wastages	reduced costs; new inventions; commercial potential of selling technology and management systems
All-encompassing management	better risk sensing and avoidance; improved communications and strategic guidance in the company; corporate upgrade of the company culture and employee-community-customer relations
Licence to operate forever	better relations with regulators; adaptive potential of local communities to provide a public interest service, not just a private interest profit
Market advantage	better brand recognition and customer loyalty; improved employee recruitment and retention; stronger influence on favourable regulation and competition; new business opportunities
Reliable profits	creative partnerships with public, private and civil sectors; in-built commercial adaptive capacity in a changing world

*Source:* based on Porritt (2007: 241)

prominent and profitable businesses have opened up their thinking in favour of the commercial and reputational advantages of moving towards sustainability (see Porritt, 2007 and also Table 13.1). We are nowhere near a business model for sustainability. But if the notion of tipping points is to be believed, then capitalism will have to recognise and adjust to them.

Third, one likely outcome of the transition to more sustainable businesses could be the blurring of the distinction between the public, private and non-profit sectors. The concept of governance draws attention to and in so doing problematises this. For example, in a more sustainable age, businesses might be participating with governments and civic society to help incorporate local sustainable societies

and economies so that business is conducted fairly and co-operatively with local people. Such arrangements are just beginning to appear in the supply chain of cocoa and coffee, and in the scope for a living wage supported by a few retailers. There is a long way to go, but the signs are there for the optimistic to see.

The science of earth and human systems connections and adaptation has a huge and vital task ahead of it. Jill Jäger shows that this cannot be achieved by scientists alone. We are entering a new era of participatory science and public understanding, the likes of which are still untried, even though at more modest scales, much has been done in this arena. I like what Katrina Brown says in her contribution. Unless science is more sensitive to the many resilience facets of ecosystems, and we can work on the trade-offs with the support of people and their governors, then we cannot possibly move forward. The final section of the Dahlem Conference (Schellnhuber *et al.*, 2004: 404–31) addresses this experience. Better conceptions of story telling, artistic interpretation, visualisation and simulation of possible future states and conditions need to take place with care and calm to allow grounded civic dialogue.

In sum, the emergence of the science and popular understanding of tipping points is an alarming but necessary trigger for government, business and civil society to march onto the path to sustainability. We seem to need the drivers of calamity for the human race (*not* for the planet) to focus our attention. But every calamity should be seen as an opportunity, not a crisis. This is the next challenge in the sustainability transition.

### On wellbeing

The idea of wellbeing for many years has captured the attention of economists, politicians and social theorists. While governments seek to do much to meet happiness criteria, wellbeing is altogether a more profound notion, linked to civic virtue and good governance, not just security, satisfaction and esteem. Wellbeing is not the same as happiness, the source of economic reassessment, and political interest by a number of leading UK politicians. Wellbeing is much more fundamental, as Figure 13.3 indicates. I concocted this with Jonathon Porritt and it appears in his book *Capitalism: As If the World Matters* (Porritt, 2007).

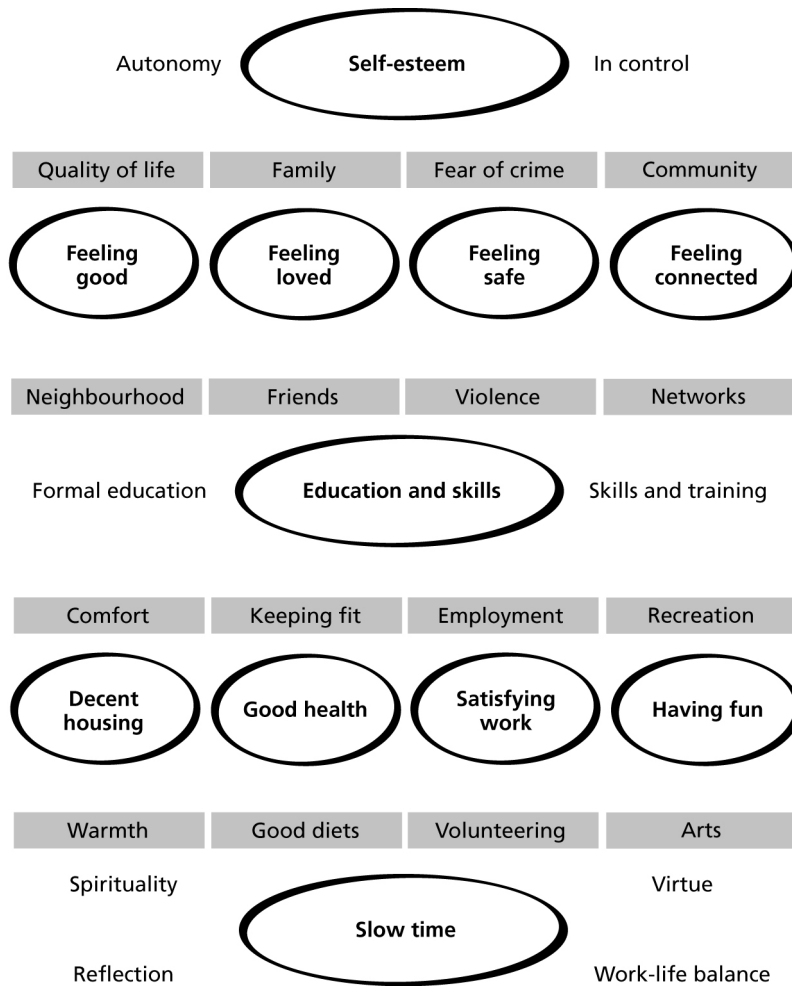


Figure 13.3 Components of wellbeing

Source: Porritt (2007, 254).

The international notions of sustainable consumption, social capital, civic virtue, schools of sustainability and a fresh look at measuring prosperity all connect with Figure 13.3. Porritt (2007: 255) admits that this is a heady brew to place in one metric. I do not believe this is necessary. The two framing themes at the top and foot of the diagram are deliberately selected. *Self esteem* and *slow time* are the

designated frames of the notion of wellbeing. We need to believe in ourselves and our self worth, via our civic virtue. We can visualise the closure of wellbeing as a central framework for a sustainable society and economy. Equally, government as well as governance more broadly has to win the trust and support of citizens. Here we find the essence of good governance as outlined by Adger and Jordan in Chapter 1, namely governing that creates the conditions and the incentives for virtue and wellbeing amongst all citizens. Maybe this is the ultimate goal for governance and sustainability.

### Some fundamental questions

Having summarised the previous chapters and drawn out a number of additional themes from the wider literature, I would now like to identify three fundamental questions that I attempt to answer, as part of my overall conclusions for this book.

*Is sustainability just too big to handle by any form of government or governance?* I fear the answer is yes. All of the contributions here look at various aspects of sustainability, laid out in bite-sized chunks. Even the widening of perspective in recent years leaves government far short, as Albert Weale and Mat Paterson indicate in their complementary but contrasting contributions. Weale notes the difficulties for the process and scope of government arising from the pervasiveness and amorphousness of sustainability, while Paterson sees the failure of genuine transformation of non-sustainable governing structures as an Achilles heel of sustainability governance. Getting close to sustainability is challenging the credibility and effectiveness of both national and transnational government. Jill Jäger concludes the same for science. I therefore conclude that unless we somehow manage to establish new creative institutional arrangements, fully integrating the public, private and civil sectors, along with new forms of regulation and assessment, participation and scenario-building, I cannot see even the most imaginative of contemporary governance meeting the challenge of sustainability.

Innovative approaches to participatory science in the form of precaution and sensitive civic and political engagement cannot yet meet the credibility and legitimacy challenges for a sustainability science offered by Jill Jäger. Ortwin Renn believes that genuine participation

is not fully feasible, while Stirling sees a need for a more reflexive governance that is not yet in the bloodstream and nervous system of current patterns of societal steering. My ultimate conclusion here is that all forms of government and governance will have to develop new formulations to deliver sustainability. I see these conclusions in the material of Weale (keep it tight and focused); Stirling (open up but be aware); Burgess and Clark (evaluate more fully then make accountable); and O'Neill (develop more ecological and social empathy).

*Can we ever get to a universally accepted notion of sustainability and its strategic significance for the future of humanity without having to define it?* My answer here is no. We cannot properly get to a universal meaning through the circumstances of many initiatives aimed at governing economic change and experimenting with shifts in social values. I do not see any realistic scope for a sustainability enlightenment of the kind that transformed science, technology, the arts, and political institutions in the eighteenth century. Maybe this is just as well. Previous cultural shifts were essentially promoted by elites. We somehow need to get this transformation to sustainability into the masses, many of whom are as yet unborn. A sustainability culture is, however, elusive, unless it occurs primarily at the local level, fitting in well with more multi-levelled patterns of governance.

*Even with current shifts in business practice, governmental activities, local government and civil society, can we still not move forward constructively to sustainability?* Here I am more optimistic. I turn to Andy Dobson for guidance. Behaviour shift may come from a new sense of civic virtue, and this could be born with the changes occurring in consumer and civic behaviour. The consumer analysts see in Western society the emergence of a new consumer culture. This is mainly in young people, and especially women. It covers personal health, good quality of product, ethical sourcing in the retail sector, where good corporate behaviour needs to be demonstrated, and a genuine concern that consumption is designed to make a future planet more habitable. Such feelings seem to be attractive for around a quarter of this group. But this cultural cohort is growing and its demands are becoming more vociferous. What cannot be answered is whether all of these shifts will reduce consumption, or simply make increasing levels of consumption more sustainable. This remains a deeply contested arena. I admire the hard core of low impact lifestyles

that are becoming popular, particularly amongst the young. This is heartening, but it is by no means widely shared.

## Conclusions

I have already touched on my key observations arising from this volume of essays in the first part of this chapter. We are indeed at a turning point, and the next decade will chart how well we can adjust to the huge transformations that lie before us. Whatever, the rest of this century will be the testing ground. Sustainability may prove elusive to define, but it will not go away. I am not convinced we can do this, so we will be confronted with a troubling mix of environmental crises, violence, terrorism, local conflict and huge injustice. But we will also witness heroes, local survival and adjustment, innovation and heartening acts of charity and humanity. These will give us the hope and energy to continue the transition.

We are slowly grasping that wellbeing and posterity matter. These will increasingly become the guiding lights of new economic and social analysis where we finally fully promote the requirement to integrate environmental considerations into all areas of policy making, with new approaches to measuring and establishing social resilience and sustainable economic livelihoods. All of these phenomena will require new participatory measures and many experiments of trial and error. Finding the right mix between government and governance at a variety of spatial scales is the key to all of this. I see much more focus on sub-national activity, possibly a new form of co-operative federalism of the land that Frey and Eichenberger (1999) chart for Europe, and which may result in new configurations of governance. There is much to be done in terms of identifying and experimenting with new forms of federal co-operation (Benson and Jordan, 2008).

As for possible research topics, Tim O'Riordan suggests the following.

*At the civic level, there is a need for much better interpretations of wellbeing for many different groups in modern society, locally, regionally and across the globe. Wellbeing therefore needs to be grounded in culture, in social class and social justice, across all manner of localities. It needs a local and regional framing, as this perspective is desperately missing in current research. And we need to discover that if*

we invest in sustainability incentives, maybe we can create a wellbeing community where none existed before. For example, if immigrants became the basis of building insulation and low-carbon transformation, and converted used electrical products and used bicycles into reconstructed, valuable items, would they be better assimilated and recognised in a sustainability culture? This is certainly a research objective worth pursuing.

*Civic virtue has, in part, to be learnt.* Schools as sustainability laboratories offer exciting new approaches to sustainability education the world over. We need to establish and monitor the achievements of schools for sustainability as test beds for ecological citizenship. Investing in sustainability may lead to greater peace and security, more settled populations, and improved means for creating the mix of ecological and social resilience we all seek. Again, this should be the basis of a network of experiments shared culture by culture, the world over. I confess I am not yet convinced that even serious and comprehensive commitments to sustainability will change the existing order and outlook. To test that such sustainability investments will actually work to effect a genuine transition will require fundamental and carefully evaluated research. Doing such evaluative work will be no mean achievement. We also need to take seriously the critique of Mat Paterson, namely that the ascendant economic and political order will always strive to retain power and control over any transformation, particularly following crises and calamities.

*New forms of federalism deserve special analysis.* These may embrace various configurations of space, policy integration, long-term thinking and the capacity to design novel measures for future sustainability states to chart development in science, technology and infrastructure through the present time. Setting decision making for policy and projects in fresh frameworks and then testing them would be a good start (Benson and Jordan, 2008). Charting the private sector as amalgams of public and civic responsibility is very much in need of careful assessment. New approaches to co-operative research, grounded at local levels of activity would, as Katrina Brown argues, be highly beneficial.

*Boundary organisations need to be tied down.* They are, as Jill Jäger suggests, potentially creative and innovative centres of actions, thinking, experience and co-operation involving people, agencies, governmental levels and behaviour. The more these are formed and

are created, the more their success or failure needs to be charted and guided. This is a vital arena for sustainability science partnerships. Research is needed to define them, evaluate them and encourage them.

*We need to know far more about how China and India and other highly energising societies will develop their economies.* We need to follow the advice of Katrina Brown and test various forms of development against the millennium development goals. We need to see how new forms of sustainable livelihoods could be generated by transfers under carbon credits or other sustainable investments by the new private–public and civil sectors. Dealing with the emerging issue of allocating embedded carbon in trade will rank high in future climate change negotiations.

*Localism may well become the vogue for governance for sustainability in the decades to come.* We still have no idea how networks of sustainable experimentation can play out locally yet not be thwarted by a failure at higher levels of government to deliver the appropriate conditions for sustainable development to flourish. A combination of serious thinking plus carefully monitored experiments would be most valuable here. I see this as a central plank in what Jill Jäger refers to as sustainability science. Somehow we need to examine forms of governance that are respected by, and which encourage, virtue in civic outlooks and behaviour. Yet the paradox is that real virtue may be anarchic. It may lie in the hearts, minds and spirits of citizens, beyond government and maybe even governance.

*There has to be a link between earth system tipping points and some more profound societal transformation to sustainability.* In all important positive tipping points, there also has to be experimentation in new forms of governance, new patterns of participation and new ways of learning about wellbeing and virtue. I do not know if society can achieve this: at present it is not evident in the international climate change discussions or the endless struggle for survival for at least half the world's peoples. But the human is a reflexive creature: it can understand that its survival requires full-blooded governance for sustainability. This is why this book is important, why there is a vital need to experiment, evaluate and explore the transformation that will create governance that is genuinely *for* sustainability. I remain optimistic that this will indeed happen. I will not be alive when the outcome is evident, but I hope my grandchildren will be able to judge its success.

## Acknowledgement

I owe a huge debt of gratitude to Neil Adger and Andrew Jordan for organising the conference in 2005 and editing this publication to mark my retirement from academia. Equally, all of the contributors are also highly valued friends, whose ideas and support have hugely encouraged me to be the person I am in the academic world. To conclude this enormously valuable collection of essays is a massive honour. I cannot do justice to all of the ideas in the previous chapters, but I have done my best.

## References

- Benson, D. and Jordan, A. 2008. 'Understanding task allocation in the European Union: exploring the value of federal theory', *Journal of European Public Policy* 15: 1–20.
- Downing, P. and Ballantyne, J. 2007. *Tipping Point or Turning Point? Social Marketing and Climate Change*. London: IPSOS Mori Social Research Institute.
- Downs, A. 1972. 'Up and down with ecology – the issue-attention cycle', *Public Interest* 28: 38–50.
- Frey, B. and Eichenberger, R. 1999. *The New Democratic Federalism for Europe: Functional, Overlapping, and Competing Jurisdictions*. Elgar: Cheltenham.
- Horlick-Jones, T., Walls, J., Rowe, G., Pidgeon, N., Poortinga, W., Murdoch, G. and O'Riordan, T. 2007. *The GM Debate: Risk, Politics and Public Engagement*. London: Routledge.
- Klein, N. 2007. *The Shock Doctrine: the Rise of Disaster Capitalism*. London: Allen Lane.
- Milligan, J. and O'Riordan, T. 2007. 'Governance for sustainable coastal futures', *Coastal Management* 35: 499–509.
- Monbiot, G. 2007. *Heat: the Politics of Climate Change*. London: Allen Lane.
- Naylor, R. L., Liska, A. J., Burke, M. B., Canmany, L., Falcon, W. P., Gaskell, J. and Rozelle, S. D. 2007. 'Ripple effects of coop-based biofuels on global security and the environment', *Environment* 49(9): 30–43.
- Porritt, J. 2007. *Capitalism: As If the World Matters* (revised edition). London: Earthscan.
- Schellnhuber, H. J., Crutzen, P. J., Clark, W. C., Claussen, M. and Held, H. (eds.) 2004. *Earth System Science for Sustainability*. Cambridge: MIT Press.

- Stern, N. H. 2007. *The Economics of Climate Change: The Stern Review*. Cambridge University Press.
- Urwin, K. and Jordan, A. 2008. 'Does public policy support or undermine climate change adaptation? Exploring policy interplay across different scales of governance', *Global Environmental Change* 18: in press.
- Verweij, M. and Thompson, M. (eds.) 2007. *Clumsy Solutions for a Complex World: Governance, Politics and Plural Perceptions*. Basingstoke: Palgrave.