

## SUSTAINABLE DEVELOPMENT –WHAT DOES IT MEAN, HOW DOES IT AFFECT DECISION-MAKING, AND CAN ECONOMICS HELP?

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- 1. In this note I will focus on the varying meanings of sustainable development, the confusion that sometimes results, and opportunities to make progress in a way which helps to improve decision-making. It helps to set the scene for the Review of the Economics of Sustainable Development which I am undertaking for the Government Economic Service. I hope that the questions I raise are provocative. Some of the views are my own and do not represent Government policy – I will be clear about which is which.**
2. What is sustainable development? The term is very widely used, and probably over-used, and it is hard to say that it is not a good thing. But are we all agreed on what we have signed up for? There is a multiplicity of definitions. Tim O’Riordan, a respected environmental economist – argued in 1988 that “it may only be a matter of time before the metaphor of sustainability becomes so abused as to be meaningless”.<sup>2</sup> Some think that, two decades on, that time may have come.
3. In his work for the World Bank,<sup>3</sup> John Pezzey found there are thousands of definitions of sustainable development, many of them remarkably vague, with a real lack of consensus on which concept or concepts is relevant in decision making: “I see little point in expanding the collection of fifty sustainability definitions which I made in 1989, to the five thousand definitions that one could readily find today”. This lack of clarity has led, understandably, to concerns that when we talk about sustainable development we are covering everything and ultimately saying nothing.
4. The conceptual basis for sustainable development has been emerging for some time. In the early 1970s, Nicholas Georgescu-Roegen developed some of the first theory linking ecological sciences and entropy to economic processes.<sup>4</sup> This work was later developed by Herman Daly – a senior economist at the World Bank – who became frustrated with the prevailing narrowly-focussed approach of economists and

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<sup>2</sup> O’Riordan, T. (1988): The Politics of Sustainability, in Turner R.K. (ed.), *Sustainable Environmental Management: Principles and Practice*, London: Belhaven Press.

<sup>3</sup> Pezzy, J. (1992): Sustainable Development Concepts: An Economic Analysis, *The World Bank Environmental Paper Number 2*.

<sup>4</sup> Georgescu-Roegen, N. (1971): *The Entropy Law and the Economic Process* (1971). Harvard University Press: Cambridge, Massachusetts.

produced a set of simple rules (see Box 1).<sup>5</sup> The Daly Rules are clearly stated, nearly measurable, and are somewhere between weak and strong sustainability.<sup>6</sup>

### **The Daly Rules**

1. Renewable resources such as fish, soil, and groundwater must be used no faster than the rate at which they regenerate.
2. Nonrenewable resources such as minerals and fossil fuels must be used no faster than renewable substitutes for them can be put into place.
3. Pollution and wastes must be emitted no faster than natural systems can absorb them, recycle them, or render them harmless.

Herman E. Daly and Kenneth N. Townsend (1993): *Valuing the Earth: Economics, Ecology, Ethics*; MIT Press

5. This work at the Bank had a big impact in forcing mainstream economists to take a broader perspective of development, going beyond financial and traded measures of economic success, and incorporating the environmental and (later) social and institutional factors which are meat and drink to most economists today. This had a hugely beneficial impact on development programmes across the world.
6. A more widely recognised starting point for sustainable development was the report of Gro Harlem Brundtland's Commission in the early 1980s which summed sustainable development up with the memorable but vague "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."<sup>7</sup> Nevertheless, this firmly established the a common element to many definitions of sustainability – that it is a long-term objective that involves more than one generation.
7. The World Bank produced its own definition during the mid-1980s, identifying three key dimensions of sustainable development: *"Economic growth, the alleviation of poverty and sound environmental management are in many cases mutually consistent"*

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<sup>5</sup> Meadows, Donella H., Meadows, Dennis L., and Randers, Jorgen (1992): *Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable Future*. (Post Mills, Vermont: Chelsea Green)

<sup>6</sup> See below for a discussion of weak and strong sustainability.

<sup>7</sup> World Commission on Environment and Development, (1987): *Our Common Future*, Report of the World Commission on Environment and Development ('The Brundtland Report').

*objectives*".<sup>8</sup> These three dimensions of sustainable development are often labelled: (i) economic, (ii) social, and (iii) ecological.

8. Since then the whole world and his dog seems to have had a go at defining sustainable development. There is certainly there is no universally accepted theory. What we do have is a general acceptance that this is about sustaining well being across generations, about the tradeoffs and tensions between current consumption and the opportunities available in the future; and about recognising the systemic (and often non-marginal) nature of the social and environmental factors which underpin these tradeoffs.
9. Ultimately it is about enhancing human welfare across time and requires a recognition of the responsibilities of the current generation to future generations. I use 'welfare' in the economist's sense of utility, which is what most of our fellow human beings would probably think of as 'enjoyment of life'.
10. The UK Government has a Sustainable Development framework<sup>9</sup> - its own attempt to convey clearly what all this means and how we should conduct policy as a result. It comprises 5 principles:
  - Living within environmental limits
  - Ensuring a strong, healthy and just society
  - Achieving a sustainable economy
  - Promoting good governance
  - Using sound science responsibly
12. These are plainly very sensible principles – indeed it is difficult to disagree with them. But the challenge to us as advisors on policy is how to make them useful in policy making – that is, identifying how these principles might have traction on decisions. How, objectively, could we test if an existing or proposed policy meets the criteria? At present it is very difficult to do this and – in my view - the result is a profusion of policies claiming 'sustainability' status, but without any rigorous way of showing it.
13. **So, what can we say as economists?** Economics can cut a useful way through the well-intentioned, but often woolly, rhetoric in the sustainable development world.
14. We want to sustain (per capita) welfare through time. Welfare derives from the consumption possibilities that we get from wealth or assets. So to sustain well being we

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<sup>8</sup> World Bank (1987): *Environment, Growth, and Development*. Development Pamphlet 14, Washington D.C.

<sup>9</sup> HM Government (2005): *Securing the Future: the UK Government Sustainable Development Strategy*; see also Annex 1 below.

need to sustain, or enhance, our assets or capital stocks – on a per capita basis where we are dealing with population change. We can also improve the productivity with which we use these assets in ‘creating’ welfare.

15. Our total capital or wealth is comprised of produced capital – machines, buildings, equipment – intangible capital – human capital, social and institutional capital – and natural capital, which is the sum of renewable and non-renewable natural resources from which humans derive benefits.

16. Setting welfare and sustainability out in terms of this kind of ‘capitals framework’ provides some helpful rigour to the discussion – and supplements the economist’s usual market failure approach. It provides a basis from which we can start to think about where we are in terms of sustainability and the possible implications of various policy decisions.

17. Sadly, however, the capitals approach does not solve one of the underlying conceptual problems in sustainable development. A perennial debate - which is both informative and potentially distracting - concerns so-called weak and strong sustainability.

18. Weak sustainability places a constraint that the (value of the) total stock of capital is non-declining over time. This implies that different elements of the capital stock are substitutable for each other. But there is no special place for the environment as such – as long as the portfolio is held constant that is all the matters; for example, we could trade off the loss of an environmental resource if it were replaced by produced capital of equal or greater value.

19. Strong sustainability is a stricter constraint, arguing that natural capital cannot be traded off for other capital and that the stock of natural capital should be non-declining over time (although substitution within the natural capital stock may be possible ie substituting a renewable resource for a non-renewable one).

20. Weak and strong sustainability are essentially caricatures and the ‘real’ world is neither one nor the other. Obviously we cannot substitute all elements of the natural resource stock for physical capital, but neither is the entirety of nature ‘critical’ to human welfare.

21. A way through the “weak or strong” debate is to get a better understanding of which resources are critical to human welfare – because of the ‘services’ they provide – ecosystems services for example - and the environmental limits and thresholds within which we therefore need to operate so that our ability to consume these services in the future is subjected to levels of risk which we are not prepared to face. Avoiding going above 550ppm of carbon in the atmosphere is probably a good example of this.

22. How do those critical resources function and what do we need to do to manage them, what are sensible levels of precaution? These are questions of natural science and of ecology that we are steadily addressing through the Ecosystems Approach, but there are still many gaps in our understanding, which Defra and our partners are working hard to address.
23. To what extent are these frameworks reflected in our current approaches to policy making and appraisal? How close are we to operationalising the concept of sustainability?
24. Some say that our approach to cost-benefit analysis – and microeconomic analysis more generally – is fundamentally unable to cope with all this. Often they do so without having checked to see what we actually do, and without suggesting ways in which our approaches could be improved to help us to identify better options and take better decisions.
25. Others argue that methodology must be wrong simply because they don't like the trade-offs and difficult decisions it forces us to deal with – based on an assessment of social costs and benefits, rather than on their own preferences. Anyone who has followed the debate among lobbyists on the methodology for appraising the proposed third runway at Heathrow will recognise this. This is not a good basis on which to have a debate about improving our approach.
26. As public servants, our job is to ensure that our advice properly reflects the trade-off which Ministers will inevitably face in taking public policy decisions on matters such as regulation, infrastructure investments and so on. We need to try, as objectively and comprehensively as we can, to assess and advise on which policy options have the best chance of adding over time to society's welfare without breaching some of the fundamental limits which risk undermining our ability to enjoy a well-functioning economy with high levels of utility into the future – including enjoying the benefits from ecosystems.
27. There is a continuum of approaches contributing to varying degrees to making these concepts operational. They range from well-developed, robust and useful in generating real policy insights, to vague flim-flam which is big on good intentions but weak on substance and application.
28. One example of this is a proposition I saw recently which gave equal weight to the importance of making people feel their behaviour is good for the environment; and actual environmental benefits. It would have distracted from actually cutting carbon emissions, but left people feeling they had done something worthy instead. This makes little sense, and in my view shows how woolly thinking, unchecked, can lead to bad policy advice.

29. We've seen the Government's five principles and noted the difficulty in making them operational. What do we have in our toolkit, and what might help us make better policy?

30. In terms of appraisal within government, we have the Green Book.<sup>10</sup> It does not explicitly cover sustainability. Its overarching guidance centres on cost-benefit analysis. The key point is that this, implicitly, accepts a weak sustainability framework: as long as the net present value (NPV) of a policy option is positive we can accept tradeoffs and substitution. But a positive NPV is only a necessary, not sufficient, criterion for sustainability.

31. The Green Book has guidance on distributional impacts – which goes some way to informing the social equity considerations in sustainable development. It gives a framework for discounting – and quite sophisticated guidance on dealing with long-term, uncertain and intergenerational impacts. And it comes with plenty of supplementary guidance, including Defra's environmental impact assessment tool

32. We also have the Better Regulation Executive's Impact Assessment guidance and toolkit.<sup>11</sup> Sustainability is covered in the online toolkit (though not yet in the guidance – hence my Review). It has a Sustainable Development Impact Test – asking whether the 5 principles are met – but this is a tick box exercise and doesn't really do much to inform or constrain decisions.

33. What else has the potential to contribute to understanding sustainability? More than anything else I think we need to continue to build our understanding of shadow prices. I think the ecosystems approach has a lot to offer in this respect and can also help us to understand key issues around thresholds and limits. In Defra we are about to publish our guidance on valuing ecosystem services<sup>12</sup> which goes some way towards making this operational and informing policy decisions across government.

34. We have a shadow price of carbon accepted across government and already being integrated into Impact Assessments across government.<sup>13</sup> We are undertaking further work to develop and improve the basis for this. And we have made and

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10 HM Treasury (2003): The Green Book: Appraisal and Evaluation in Central Government, Treasury Guidance; TSO, London

11 Better Regulation Executive (2006): Impact Assessment Guidance; BRE, London. Toolkit available at [www.berr.gov.uk/bre](http://www.berr.gov.uk/bre)

12 Defra (2008): An introductory guide to valuing ecosystem services, London – available at [www.defra.gov.uk/wildlife-countryside/pdf/natural-enviro/eco-valuing.pdf](http://www.defra.gov.uk/wildlife-countryside/pdf/natural-enviro/eco-valuing.pdf)

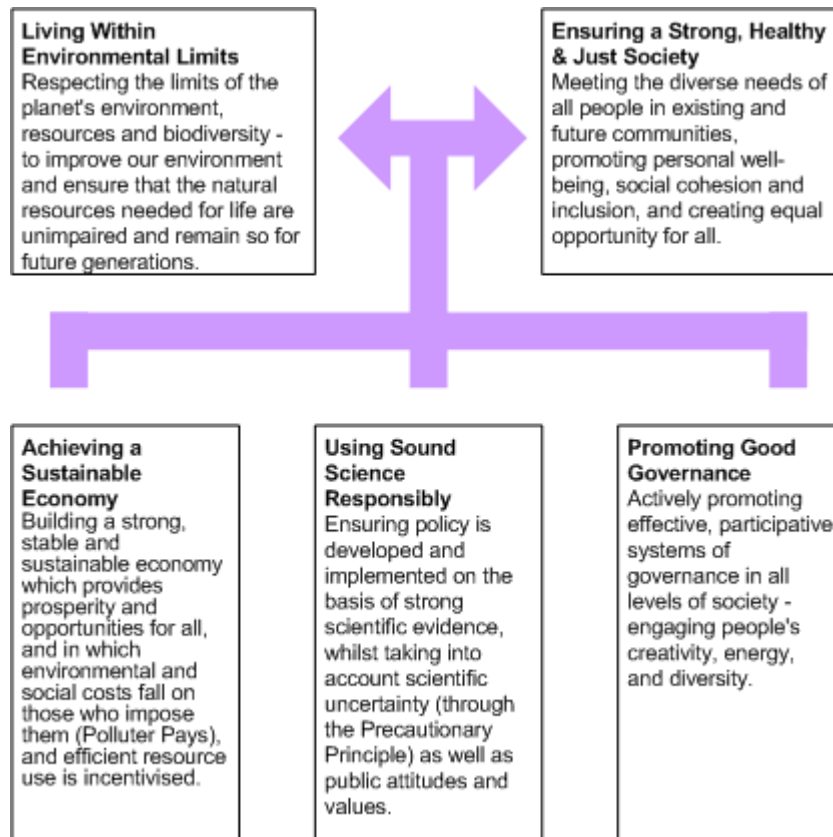
13 Richard Price, Simeon Thornton and Stephen Nelson (2007): The social cost of carbon and the shadow price of carbon: What they are, and how to use them in economic appraisal in the UK; Defra, London

continue to make significant progress in developing shadow prices for air pollutants and some aspects of biodiversity.

35. I described earlier how a capitals approach might provide a useful economic foundation from which we can start thinking about sustainability. It is interesting to consider further whether this could be made operational, in particular at the level of policy appraisal, but we need to be sure that the additional complexity may not justify the effort.
36. Sustainability is essentially about inter (and intra) generational welfare, so I am sure there is scope for better use of equity weights – the Green Book covers this, but largely in the context of current generation; is there scope for more on distribution between generations – and this needs to tie in with discounting.
37. There is lots of good work on how we think about happiness and wellbeing. I remain to be convinced that this is conceptually distinct from utility – though new approaches to measuring it may well take us forward.
38. What else? We want your thoughts. I will be chairing a GES group, starting work in the Autumn, to assess the robustness and usefulness of the available approaches. The hurdle for admission to GES guidance is rightly very high, and that is the standard we will apply to new propositions. But I am also interested in thoughts on things which are already in our guidance but where we could improve what we do in practice.
39. This is an important area to get right – so that we properly inform decisions which profoundly affect the future of the environment and the economy. That is why we set a high standard. But I think there is a real opportunity to tighten up what we mean by sustainability and to make progress on methodologies, so that this has traction on decisions.

## Annex 1: The UK Government's Principles of sustainable development

This diagram sets out the shared UK principles of sustainable development in the UK. They apply to the UK Government, Scottish Executive, Welsh Assembly Government and the Northern Ireland Administration. For a policy to be sustainable, it must respect all five principles. We want to live within environmental limits and achieve a just society, and we will do so by means of sustainable economy, good governance, and sound science.



Source: HM Government (2005): Securing the Future: the UK Government Sustainable Development Strategy