

Book reviews

Measuring sustainability: the problems and some solutions

Alan Bond

***Sustainability Indicators: Measuring the Immeasurable?* by Simon Bell and Stephen Morse**

Earthscan (London) 2008 228 pages, approx. £20.00/\$US30.00, ISBN 978-1-84407-299-6

I was happy to review this book given my current involvement in a sustainability appraisal (SA) which is leaving me buried in sustainability indicators (SIs) – many of them rather troublesome! The fact that this is a second edition (and I never saw the first) perhaps suggests I'd missed some important literature before beginning the SA.

The book sets out, in the first three of seven chapters, some history of the human race's quest for sustainability and a critique of some of the approaches taken to deriving and using sustainability indicators to date. In Chapters 4–6 it moves on to detailing an approach the authors have refined over the years to overcome many of the problems they identify in the first three chapters, using what they refer to as a systemic manner for the derivation of SIs. They are at pains to point out that they do not feel they have solved all the problems with SIs, but through a process of reflection based on practice have derived an approach which is appropriately grounded.

The first chapter considers sustainability and introduces SIs as a means of measuring progress towards what is a concept with multiple meanings that are somewhat context dependent. Some nice examples are given to illustrate the pervasive problems of measuring sustainability, namely that the system

under investigation needs to be bounded by space and time. The problems caused by measurements made at the wrong timescale, or in relation to different baselines, are made clear. Examples are given of different approaches to deriving SIs, and the point is made that there is a tendency for reductionism and quantification whereby complex systems are summarised on the basis of selected component parts, sometimes with a single index being calculated.

The second chapter looks at SIs in practice and chooses two particular approaches as examples of an individual SI (Maximum Sustainable Yield, MSY) and a means of representing several SIs in a single diagram (AMOEBAs). Both examples relate to natural environment systems (which is a narrow focus – an issue addressed in Chapter 3). MSY has many uses, the best known of which relates to fish stocks and the calculation of sustainable catches from fisheries. The chapter highlights the caution with which such SIs should be used based on some well known examples of fishery collapse. AMOEBA, on the other hand, is a diagram which looks like a spider's web, with each of the radial segments representing a separate SI, and the performance of a system being represented by a web thread connecting the SIs at the appropriate point. The web thread would produce a circle if a system matched its reference condition (which depends on the condition of the system at a point in time – a well-known current example might be CO₂ emissions measured against 1990 levels under the Kyoto Protocol) for every SI. The AMOEBA approach is praised for not attempting to aggregate SIs, but has weaknesses related to the selection of the individual SIs (which may be inappropriate surrogates for the system) and the arbitrary choice of reference state – which can dramatically affect the diagram.

Chapter 3 acknowledges the fact that socio-economic factors are critical in any definition of

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sustainability. The focus is initially on sustainable cities and institutional sustainability, and then moves on to 'projects' as the vehicles for delivering sustainability. For sustainable cities the importance of public participation is emphasised in terms of developing a framework that can be understood by the local community and as a means for engendering engagement where possible. In terms of institutional sustainability the point is made that institutions are key in delivering development which has implications for sustainability. Development funding is used as a particular example whereby institutions in receipt of donor funding are often expected to become self-sustaining and have progress towards this position monitored through the use of SIs. Microfinance is used as a case study whereby the outcomes of achieving sustainability, as measured by particular SIs, can be counter to the intentions of the funding in the first place (in order to become self-financing, institutions may adopt to take a risk-based approach to their lending activities, thereby preventing the poorest members of communities from accessing their loans – the reverse of the intended funding outcome). In terms of project appraisal, the focus is placed on cost–benefit analysis and multicriteria analysis. The pitfalls inherent in these two approaches are well known and are simply summarised here.

Chapter 4 moves us into the second part of the book, which is dedicated to introducing the authors' own approach to the development of SIs. This chapter introduces systems thinking and approaches to problem solving. The authors contend that reductionism is inappropriate in the context of sustainability, and that a systems-based approach can better deal with the holism required and is specifically designed to take on board stakeholder views. The contention is that subjectivity on the part of stakeholders is unavoidable. In reaching these conclusions, the authors take us through a range of systems approaches, including soft systems method; learning organisation approach; participatory rural appraisal; and the logframe approach.

Chapter 5 sets out how SIs should be derived using systemic approaches. The emphasis is very much placed on stakeholder world views of sustainability and incorporating these into the measures to be used in analysing any project. The specific approach derived by the authors is called 'Imagine' and the steps inherent in its applications are introduced.

Chapter 6 covers the five steps involved in 'Imagine' in greater detail. In brief, these are:

1. Understand the context;
2. Agree upon sustainability indicators and bands of equilibrium;
3. Develop the AMOEBA approach and scenario-making;
4. Conduct a review and engage in meta-scenario-making;
5. Publicise and market the message.

It is clear that the AMOEBA approach reviewed in Chapter 2 has been adapted to remove some of its perceived weaknesses. In particular, rather than have a reference frame as the basis for drawing the 'web', the stakeholders together agree bands of equilibrium for each of the SIs which set out the boundaries below which there is underachievement and above which there is overachievement. What is within the band is sustainable in the view of the stakeholders. It is also emphasised that different AMOEBA's must be prepared over time, so that changes can be observed from the past through to the present and then be projected for future scenarios. It is encouraging that the authors also specifically emphasise using the results to influence policy rather than simply undertaking an academic exercise.

Chapter 7 sets out what the authors' consider to be key messages to reflect on.

I enjoyed reading the book and the first three chapters are, in my view, an essential read for anyone who has any involvement (or should I say 'stake') in any sustainability indicators. The examples used are informative, and the development of the same case studies by the authors throughout the book is very useful to clarify the points being made.

The second part of the book, which sets out the authors' own 'Imagine' approach, also has value. The authors do not assume that they have solved the problem of sustainability appraisal and derivation of SIs, but through their emphasis on a systems-based approach they make it very clear that sustainability as a concept is very context dependent and subject to interpretation by a large number of stakeholders. If any process is to be successful, it needs to engage with, and continue to engage, a diverse set of stakeholders and to take into account their shared view of a particular system.

That said, I think there are problems with the 'Imagine' approach which the authors would probably acknowledge. The book makes it very clear that sustainability is subject to interpretation and different worldviews, and this is an important point. The modified AMOEBA approach better takes into account time-dependent factors than did its predecessors, and is based on a better-grounded set of SIs. However, an underlying issue is that the agreed bands of equilibrium are very likely setting out the acceptable trade-offs for the stakeholders involved, i.e. they set out their worldview of what is sustainable at a particular point in time. For me this raises two problems:

1. Worldviews change over time. The modified AMOEBA is designed so that changes in sustainability can be monitored over time based on a worldview set at one specific point. For example, what might be an acceptable band of equilibrium one day may be unacceptable another day simply because of a specific event recorded in the media which changes the worldviews of one or more stakeholders.

2. Box 1.3 in Chapter 1 gave definitions of weak and strong sustainability. Strong sustainability, in essence, is a stance whereby natural capital should not be eroded. That is, it is a position whereby trade-offs against certain environmental assets are considered to be inappropriate, as they do not preserve this natural capital for future generations. The systems approach taken will almost certainly lead to a weak sustainability definition because that allows social and economic benefits to be accrued at the expense of environmental capital. The approach taken to the derivation of SIs almost guarantees that a short-term timescale is adopted, as that will be the timescale familiar to the stakeholders and the one over which they want to see sustainable outcomes. This is acceptable in the 'Imagine' approach, and is the way sustainability is interpreted by almost all decision-makers. Whether it provides for intergenerational equity is another question!

Another concern I have is that despite the rhetoric about a system approach being appropriate for a holism and overcoming some of the weaknesses

inherent in reductionism, 'Imagine' still has reductionist elements. The derivation of SIs is better grounded than it might be, but the basic issue still remains that a relatively small number of SIs is being used to represent a very complex system. Just because there is 'buy-in' to the SIs does not mean that some of them might not be flawed. If stakeholders consider biodiversity to be important, for example, how do they measure it? If they use a few species as surrogates, then surely the review of AMOEBA plots over time is likely to lead to advice to policy makers which focuses on these indicator species rather than the countless others which are not measured?

Despite these criticisms I did appreciate the book. It is to the authors' credit that they have not simply identified problems: they have built on past experience and gone some way towards developing more robust approaches for developing and using SIs. They are the first to acknowledge that there is far more work to be done. I would recommend that anyone interested in SIs use this book as a starting point – it makes far more sense to build on the experience outlined here rather than having to start from scratch.

Just a companion, or a friend in need?

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Methods of Environmental Impact Assessment, 3rd edn, edited by Peter Morris and Riki Therivel

Routledge (Oxford) 2009; 560 pages, UK £29.99; ISBN 978-0-415-44174-2 (hardback) and 978-0-203-89290-9 (electronic). ISBN: 978-0-415-44175-9 (paperback)

The first edition of this book was published in 1995 and the front cover portrayed the devastating scars of the Twyford Down road cutting through a chalkland escarpment in Hampshire, UK. Mitigation works in this project included a wholesale transportation of chalk grassland to other locations. Such extreme measures and many others are covered in this latest edition of this most comprehensive tome. Covering a wide range of specialist areas inevitably necessitated the cooperation of

many authors. As with the preparation of any major environmental statement, the need to coordinate specialists' input and ensure that they remain intelligible and interesting to lay readers has been expertly achieved by the two main editors, Peter Morris and Riki Therivel, who are themselves significant chapter authors. Described as a companion volume to the *Introduction to EIA*, another Oxford Brookes University-based bestseller, this book is also a friend in need. Not only does it appeal to any budding student of EIA, it is equally attractive and useful to EIA practitioners. Although it could be argued that certain specialist areas are more comprehensively served by separate books, the overview given in this book is impressively practical and insightful.

The book is structured along similar lines to previous editions in two parts, comprising separate specialist methods of environmental assessment in Part 1, and four final chapters in Part 2 headed Shared and Integrative Methods. The latter section is possibly the most updated and inventive in terms of meeting future EIA methodology needs.

The Introduction suggests that the methods focus on the UK but that the principles could also meet

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universal needs. This is questionable. There are, for example, no sections relating to tropical rainforest analysis or mangrove ecosystems, and there are no references to oil wells in Alaska or copper mines in New Guinea. Clearly, there is a need for more books with detailed case studies that could test how well the basic methodologies of baseline survey work described here can be adapted to different habitats, developments and regions of the world.

The initial framework of EIA procedures in Figure 1.1 could perhaps be further added to with the activities of follow-up and decommissioning. Reference to scoping also raises the thorny problem of how detailed do you go before finding yourself producing a full EIA? Further advice on the scope of scoping might have been useful.

Part 1 is conveniently structured to allow the interested reader to dip into a chosen specialist area, and this reference capability is the book's main strength, rather than a read-through facility. Areas such as air, water, soil and noise pollution are well researched, and if more in-depth knowledge is required the reference lists are not only extensive but comprehensively updated. Terrestrial and coastal ecology are complex subjects and well referenced in the text. The frequent use of tables, charts and figures provide a welcome conciseness to the presentation, and I particularly like the suitable periods to survey taxa in Figure 11.7 which act as useful guides in maximising feedback from survey work. What the book does not invest in quite so well are photographs, plans and images, which again would serve to communicate useful data in limited space.

Socioeconomics features strongly in two of the earlier chapters, and renowned experts in the field contribute much-needed advice to a surprisingly under-practised field. Although the scope of impacts is well covered, the methods of obtaining feedback from affected persons are omitted, presumably because they are covered in the companion volume. The importance of identifying stakeholders and using alternative techniques to record their concerns would seem to warrant a review of

such survey techniques, highlighting drawbacks and suggesting solutions.

Landscape and heritage are reviewed separately, but attitudes that may prevail in developing nations are not fully discussed. For example, building on hilltops in Malaysia can be conceived locally as important to project a nation's developed image, and preserving colonial heritage may not gain too much local support in Kenya. A missing factor that falls between these two areas is cultural sensitivity. Worryingly serious ignorance has been displayed in the creation of tourist resorts that may adversely affect religious and cultural rights, whether this relates to a case in Bali where a hotel was built overlooking a Buddhist temple at Tanah Lot, or developments in close proximity to Aboriginal and Maori lands. Methods to recognise precisely how these rights can be recognised and fought for need to be considered. The UK issues on landscape are well researched but lack important references, for example discussion on PPG2 on Green Belts, which have served so well in preventing the coalescence of cities with their surrounding countryside, or with the county-wide landscape assessments and establishment of county wildlife sites. These designations can be instrumental in alerting developers and consultants to the local values established for landscapes.

A book of substance such as this is inevitably open to criticism owing to the sheer volume and complexity of the content. The difficulty of dealing with so many specialist areas, and particularly with so many different authors, is considerable. Not only students and practitioners in EIA, but specialists themselves, could learn a thing or two. True to the composition of the EIA statement document itself, where the specialists' inputs need to appear as a coordinated whole, this book's structure and content meets a high standard. The use of a well-structured approach in following the EIA processes for each chapter provides a means getting the authors to toe the line.

This is a book you cannot fail to want, but more importantly, it will indeed be a friend in need.