

## Book Reviews

### *Handbook of Environmental Risk Assessment and Management*

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This Handbook covers the topic of environmental risk moving from the natural science viewpoint through legislation and social science perspectives to finish with case studies. A range of subjects are included, such as the introduction of genetically modified organisms, psychological approaches to risk, economic valuation, and product design for sustainable development. In a volume covering twenty chapters with thirty-six authors there is a wealth of information, and much to interest those concerned with how environmental values are viewed within the risk assessment community.

The overall impression of the Handbook is that environmental risk is an unavoidable part of human activity. Therefore the scientific community must assess the risk and aid the development of management strategies. A 'dose-response' methodology is most commonly advocated, where scientists produce 'objective' functional relationships which are then supplied to policy makers. Although ensuring the policy usefulness of the resulting information might be an argument for interdisciplinary communication, especially between human and natural sciences, a recommended division of tasks is maintained. Assessment is defined as being at the 'objective' science end of the scale while management is described as having more to do with political or social views or judgements. While the difficulty of drawing such clear lines is recognised in the introduction, the overall dichotomy is generally supported. Thus, the question as to the extent to which a purely scientific approach can be applied goes unanswered.

As the Handbook shows, the subject of environmental risk covers a spectrum of economic activities. The acceptance of new processes and products and in particular chemicals has implications for human health and ecosystems, as most famously expressed by Rachel Carson in *Silent Spring*. Industrial facilities fail, leading to toxic releases, such as at Bhopal and Chernobyl. As discussed in two of the chapters, the introduction of genetically modified substances presents the prospect of releasing organisms which will evolve and reproduce changing the evolutionary path. Up to 1993, more than 1000 applications to allow the test release of genetically modified organisms had already been made, and most will be or have already been released in the USA (p. 110). Historical experience with the introduction of natural organisms has shown the extent of potential impacts, e.g., from bacterial and viral infections killing the natives of North and South America with the arrival of Europeans, to the spread of mammals to Australia and New Zealand.

Thus, the language and principles of risk assessment may seem cold and removed from the problems: calmly accepting that introducing new substances is a part of a complex industrial society and awaiting the appearance of problems so they can be assessed as 'systematically and objectively as possible' (p. 7). Yet, there is recognition in the Handbook that standard risk assessment fails to address uncertainty as ignorance, and the way individuals, populations and communities change through time. Once established, genetically modified organisms cannot be recalled.

## BOOK REVIEWS

Irreversibility, ignorance, complexity, evolution and long term impact are all aspects of social and economic systems which environmentalists recognise as having been neglected. Unfortunately, the two chapters on economics are likely to reinforce the opinion that, in economics, such important issues are simply either to be brushed aside or reduced to fit preconceived theoretical requirements. Defending the belief in universal cost-benefit analysis as the only rational economic approach leads Pearce to such statements as 'Willingness to pay for non-use may well capture so-called "ethical" preferences'. The one and only rule is that everything should be regarded as a 'trade-off' and given a price. For example, talk of rights is derided as unreal, of limited policy relevance, and such 'philosophising' is regarded as 'independent of the real-world context of environmental change' (p. 347). This is quite interesting in light of the unreal abstract approach famously promoted within neo-classical economics and attacked by economists of the critical realist school (see Lawson, 1997). The 'trade-off' position also leads to the neglect of common alternatives such as hierarchical choice. For example, the chapter on sustainable product development by industrial consultants promotes an environmental priority system. More generally, hierarchical risk assessment might exclude activities which qualify as unacceptable on such grounds as threatening irreversible evolutionary change.

The two chapters preceding that of Pearce clearly find problems with the psychological model in economics and the rationalist expected utility theory (EUT) by which economists have tried to approach risk. The prevalence of reification in economics is also clear in the position of Starmer who states: 'While there are some notable dissenters, there is widespread agreement amongst decision theorists that the axioms of EUT are sound principles of rational choice. For those who accept this judgement, EUT provides a model for how people ought to choose and one which can be used to aid practical decision-making in at least some contexts' (p. 342). Unfortunately this does not seem to be how people do choose, and Starmer himself remarks that the model is unsatisfactory as an explanation of actual behaviour.

The chapter on the psychology of risk and uncertainty by Pidgeon and Beattie is most instructive in showing a wider perception of risk than elsewhere in the Handbook and in expanding the concept of evaluation. As in other areas of environmental evaluation, social processes play a key role in amplifying some risks (values) while seeming to neglect others. Political and institutional arrangements must then be explicitly considered in evaluation. Those scientists and economists promoting their concerns as objective, their aims as a search for the truth and their personal perspective as reflecting reality could learn much from the literature in social psychology. As Pidgeon and Beattie note, 'a participatory decision process, involving both experts and the public, offers a richer and more complete understanding of the problems of environmental risk assessment and management than will be offered by conventional analysis on its own' (p. 312). There is some concern amongst other contributions to the Handbook for risk communication but this appears more as a one-way process of getting the public to understand the 'objective' outcome of risk assessment.

A missing element is a chapter devoted to a philosophical perspective and a discussion of the role of scientists in addressing economic and social issues. For example, risk is broadly regarded throughout the handbook as the likelihood of a potential harm being realised. The object of harm can be human or non-human and the relevance of the latter

raises questions over the meaning of ecosystem health. In raising this issue in the introduction the main point made is that 'deep green' positions, Gaia, or regarding ecosystems as self regulating organisms are in direct conflict with a scientific approach. The implication is that these concerns should therefore be ignored as being at odds with the scientific approach of the Handbook. The thrust of the Handbook is in favour of 'an optimised balance' between economic development as usual and managing potential environmental problems (p. 377).

Overall this is an interesting source of thought-provoking material which gives insight into how environmental risk is being addressed. Reading the Handbook raises issues relating to environmental values (e.g., evaluation methodology, value incommensurability, objectivity versus subjectivity), although their explicit discussion is limited or absent. Coverage of ethical issues, methodology and epistemology would have been greatly beneficial. As the editor notes, this is a rapidly moving field of study and the Handbook will need revision, so hopefully such contributions will appear in the next edition. Otherwise the Handbook brings together an informative set of material on the subject of environmental risk and provides a useful source for reference.

### *Reference*

Lawson, T. 1997. *Economics & Reality*. London: Routledge.

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