

PREFACE

Environmental Risk Assessment - Approaches, experiences and information sources

The mission of the European Environment Agency (EEA) is "to provide the Community and the Member States with objective, reliable and comparable information at the European level". Among the different goals, the EEA shall provide information for environmental policy development and implementation and ensure broad dissemination and accessibility. Important principles in this context are; pooling of existing information and know how and facilitating harmonisation of data.

This is the general background to this product on Environmental Risk Assessment produced by the Monitoring and Assessment Research Centre at King's College, London, UK. The primary objective of the work has been to increase the accessibility to approaches, experiences and information sources to this extensive area. Although, the focus of this book is on chemicals, the topic of risk assessment is chosen because of its importance for policy development and implementation, demonstrated in the work with radiation, chemicals, accidents, consumer products, food and gene modified organisms (GMOs). The managing of the human risks has an especially long tradition, but there is now an evolving interest to apply the concept on ecological effects. In the development of environmental management systems and tools as a basis for decision making (expressed in the work with ISO 14000), environmental risk assessment can also be seen as a supplement to financial risk assessment. Agenda 21 also recognises risk assessment as an important tool to improve the environment.

Environmental risk assessment within the broader concept of risk management is not an undisputed concept. The case studies described in the book clearly demonstrate the opinions about environmental risk assessment between different actors on the environmental scene, such as industry, NGOs, authorities and the general public. Assessing, managing and communicating the risks of endocrine disruptors, BSE and dumping the Brent Spar are only a few recent examples.

The interpretations of the word "risk" as a positive or negative probability or a consequence reinforce the different perceptions in discussing risks.

The main advantages of risk assessment are the encouragement to use scientific data and competence as a basis for decision making, and in that process, discriminating between scientific facts (as far as possible) and values. In this context, this ambition is very close to the mandate of the Agency.

There are however many drawbacks that are, or should be, addressed in development work concerning for example. (see section III):

Environmental risk assessment

- Harmonisation of risk assessment methods,
- filling the gap of data deficiencies,
- harmonisation of test protocols for chemicals,
- understanding of mixtures or multiple stressors,
- improvement of exposure assessment,
- internationally harmonised assessment factors,
- speeding up risk assessments, and
- taking into account sensitive groups.

Environmental risk management

- Explicit methodologies for risk management,
- increased transparency of decision-making,
- peer-review of risk management assessments, and
- increased participation in risk management.

This need of development work and uncertainties in connection with risk assessment (especially concerning "new" agents, like non-assessed chemicals or GMOs), must not delay the implementation work reducing the use of chemicals or other exposures. The precautionary principle is of uttermost importance for risk assessment/management.

The development and finalization of this publication has involved many contributors other than the three authors involved. The report has been reviewed by the Scientific Committee of the EEA, for which EEA is thankful.

The EEA hopes that this publication and the Internet -version with the prepared meta database containing information sources, will give increased accessibility to information in the area of environmental risk assessment.

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INSTRUCTIONS TO READERS

The aim of this book is to give an overview of the methods for, and application of, environmental risk assessment in the European Union. It is not a technical "how to" guide but examines the basic concepts applicable to all environmental risk assessments including human health risk assessments, ecological risk assessments and industrial applications of risk assessment. Existing knowledge and research in this field is vast and this book aims to identify unifying concepts, discuss currently used methodologies, examine their application and give examples of risk assessment in practice, and guide the user to information sources relevant to their needs.

The book consists of an introductory text (Part I) and an information source-book (Part II). The first section of the text (Chapters 1–4) introduces the concepts of risk assessment, summarising its role as an environmental management tool and the methodologies currently being used. This section is targeted towards a wide, general audience. The information should be useful for individuals in government, NGOs, as well as semi-experts, students and the public interested in environmental management. The second section (Chapters 5–7) provides details of two general methodologies used primarily in a regulatory capacity (health risk assessment and ecological risk assessment) and the application of environmental risk assessment in industry (primarily site-specific application of health and/or ecological risk assessment). Chapters 5 and 6 are targeted at semi-experts in local government, industry, interest groups or the general public requiring information on how risk assessments used to protect human health and the environment are derived, the methods used, and the constraints and limitations of each. The chapters will also prove interesting to NGOs and students. Chapter 7 is primarily targeted

towards small to medium sized enterprises (SMEs) to provide them with a background knowledge of risk assessment processes being carried out by major industrial organisations and to provide information on how this environmental management tool can be used to benefit industry. Certain parts of the text target particular industrial sectors such as off-shore, contaminated land and waste management. Much of the chapter will also be of interest to the general public and interest groups. The third section (Chapters 8 and 9) is devoted to risk management and evaluation (Chapter 8) and future policy and development directions (Chapter 9) for risk assessment. Chapter 8 includes the examination of the important trade-off between perceived risks and benefits in evaluation. Chapter 9 examines current thoughts on the problems of risk assessment and the proposed solutions. It also looks at possible future policy moves in ERA. This section is relevant to those decision-makers contemplating risk-based decisions and needing an introduction to evaluation and management principles, and a wide audience interested in the sociological aspects of the risk management process and the problems associated with risk assessment and management.

Part I of the guidebook provides an introduction or a "taste" of the subject area, Part II provides comprehensive sources of specific, further information for each area covered in the text. It is a guide to "what is out there" on environmental risk assessment.

Part II of the guidebook is an information sources directory comprised of seven sections:

- 1) **Organisations;** information on international, EU and national organisations involved in a broad range of work on environmental risk assessment.

- 2) **Databases;** information on databases providing data which can be used in the environmental risk assessment process such as toxicological data on chemicals and information used in food safety and industrial site-specific risk assessments.
- 3) **Software Models;** information on a wide range of risk assessment software models available.
- 4) **Publications;** bibliographic lists of books and journals covering all aspects of risk assessment and management, and a list of bibliographic databases available in the EU.
- 5) **Directories;** lists of directories of environmental consultants available in the EU and sources of relevant information.
- 6) **Web Sites;** information on web sites providing material relevant to environmental risk assessment.
- 7) **Legislation;** European legislation relevant to environmental risk assessment.