Environment Systems And Decisions

Environmental Systems Science: Theory and Practical Applications looks at pollution and environmental quality from a systems perspective. Credible human and ecological risk estimation and prediction methods are described, including life cycle assessment, feasibility studies, pollution control decision tools, and approaches to determine adverse outcome pathways, fate and transport, sampling and analysis, and cost-effectiveness. The book brings translational science to environmental quality, applying groundbreaking methodologies like informatics, data mining, and applications of secondary data systems. Multiple human and ecological variables are introduced and integrated to support calculations that aid environmental and public health decision making. The book bridges the perspectives of scientists, engineers, and other professionals working in numerous environmental and public health fields addressing problems like toxic substances, deforestation, climate change, and loss of biological diversity, recommending sustainable solutions to these and other seemingly intractable environmental problems. The causal agents discussed include physical, chemical, and biological agents, such as per- and polyfluoroalkyl substances (PFAS), SARS-CoV-2 (the COVID-19 virus), and other emerging contaminants. Provides an optimistic and interdisciplinary approach, underpinned by scientific first principles and theory to evaluate pollutant sources and sinks, applying biochemodynamic methods, measurements and models Deconstructs prior initiatives in environmental assessment and management using an interdisciplinary approach to evaluate what has worked and why Lays out a holistic understanding of the real impact of human activities on the current state of pollution, linking the physical sciences and engineering with socioeconomic, cultural perspectives, and environmental justice Takes a life cycle view of human and ecological systems, from the molecular to the planetary scale, integrating theories and tools from various disciplines to assess the current and projected states of environmental quality Explains the elements of risk, reliability and resilience of built and natural systems, including discussions of toxicology, sustainability, and human-pollutant interactions based on spatial, biological, and human activity information, i.e. the exposome

Information technology is a powerful tool for meeting environmental objectives and promoting sustainable development. This collection of papers by leaders in industry, government, and academia explores how information technology can improve environmental performance by individual firms, collaborations among firms, and collaborations among firms, government agencies, and academia. Information systems can also be used by nonprofit organizations and the government to inform the public about broad environmental issues and environmental conditions in their neighborhoods. Several papers address the challenges to information management posed by the explosive increase in information and knowledge about environmental issues and potential solutions, including determining what information is environmentally relevant and how it can be used in decision making. In addition, case studies are described and show how industry is using information systems to ensure sustainable development and meet environmental standards. The book also includes examples from the public sector showing how governments use information knowledge systems to disseminate â€œbest practicesâ€ beyond big firms to small businesses, and from the world of the Internet

showing how knowledge is shared among environmental advocates and the general public.

The safe and reliable performance of many systems with which we interact daily has been achieved through the analysis and management of risk. From complex infrastructures to consumer durables, from engineering systems and technologies used in transportation, health, energy, chemical, oil, gas, aerospace, maritime, defence and other sectors, the management of risk during design, manufacture, operation and decommissioning is vital. Methods and models to support risk-informed decision-making are well established but are continually challenged by technology innovations, increasing interdependencies, and changes in societal expectations. Risk, Reliability and Safety contains papers describing innovations in theory and practice contributed to the scientific programme of the European Safety and Reliability conference (ESREL 2016), held at the University of Strathclyde in Glasgow, Scotland (25—29 September 2016). Authors include scientists, academics, practitioners, regulators and other key individuals with expertise and experience relevant to specific areas. Papers include domain specific applications as well as general modelling methods. Papers cover evaluation of contemporary solutions, exploration of future challenges, and exposition of concepts, methods and processes. Topics include human factors, occupational health and safety, dynamic and systems reliability modelling, maintenance optimisation, uncertainty analysis, resilience assessment, risk and crisis management.

This handbook provides a detailed analysis of threats and risk in the international system and of how governments and their intelligence services must adapt and function in order to manage the evolving security environment. This environment, now and for the foreseeable future, is characterised by complexity. The development of disruptive digital technologies; the vulnerability of critical national infrastructure; asymmetric threats such as terrorism; the privatisation of national intelligence capabilities: all have far reaching implications for security and risk management. The leading academics and practitioners who have contributed to this handbook have all done so with the objective of cutting through the complexity, and providing insight on the most pressing security, intelligence, and risk factors today. They explore the changing nature of conflict and crises; interaction of the global with the local; the impact of technological; the proliferation of hostile ideologies and the challenge this poses to traditional models of intelligence; and the impact of all these factors on governance and ethical frameworks. The handbook is an invaluable resource for students and professionals concerned with contemporary security and how national intelligence must adapt to remain effective.

The book discusses the indispensable connection between the environment and health via all possible aspects, focussing on human interactions with the environment. The multi-dimensional field of environmental and human health perspectives with emerging issues and current trends is illustrated through supporting case studies, reviews, research reports and examples. It also covers crucial areas of research such as vector control in a tropical climate, influence of climate change on human health and so forth, including proliferation of microbial diseases. Environmental, health and safety guidelines are discussed as well. Aimed at graduate students and researchers in environmental and medical sciences, health and safety, and ecology, this book Highlights interdisciplinary aspects of environmental changes and associated health risks Explains different aspects of environmental pollution and health risks Includes

dedicated chapters on global epidemics and biomedical and municipal waste Contains case studies pertaining to different health and safety issues.

The goal to improve the resilience of social systems – communities and their economies – is increasingly adopted by decision makers. This unique and comprehensive Handbook focuses on the interdependencies of these social systems and the technologies that support them. Special attention is given to the ways in which resilience is conceptualized by different disciplines, how resilience may be assessed, and how resilience strategies are implemented. Case illustrations are presented throughout to aid understanding.

The SAGE Handbook of Nature offers an ambitious retrospective and prospective overview of the field that aims to position Nature, the environment and natural processes, at the heart of interdisciplinary social sciences. The three volumes are divided into the following parts: INTRODUCTION TO THE HANDBOOK NATURAL AND SOCIO-NATURAL VULNERABILITIES: INTERWEAVING THE NATURAL & SOCIAL SCIENCES SPACING NATURES: SUSTAINABLE PLACE MAKING AND ADAPTATION COUPLED AND (DE-COUPLED) SOCIO-ECOLOGICAL SYSTEMS RISK AND THE ENVIRONMENT: SOCIAL THEORIES, PUBLIC UNDERSTANDINGS, & THE SCIENCE-POLICY INTERFACE HUNGRY AND THIRSTY CITIES AND THEIR REGIONS CRITICAL CONSUMERISM AND ITS MANUFACTURED NATURES GENDERED NATURES AND ECO-FEMINISM REPRODUCTIVE NATURES: PLANTS, ANIMALS AND PEOPLE NATURE, CLASS AND SOCIAL INEQUALITY BIO-SENSITIVITY & THE ECOLOGIES OF HEALTH THE RESOURCE NEXUS AND ITS RELEVANCE SUSTAINABLE URBAN COMMUNITIES RURAL NATURES AND THEIR CO-PRODUCTION This handbook is a key critical research resource for researchers and practitioners across the social sciences and their contributions to related disciplines associated with the fast developing interdisciplinary field of sustainability science.

Risk-Based Environmental Decision: Methods and Culture presents the principles of human health risk analysis as they are applied in environmental decisions. It balances the discussion of scientific theory and methods, philosophical analysis, and applications in regulatory decisions. The material is directed towards risk analysts who must apply their skills in a policy setting, and towards policy analysts who must use risk estimates. The presentation is suited ideally as an introductory text on the methods of risk analysis and on the cultural issues that underlie these methodologies. An important feature of Risk-Based Environmental Decision: Methods and Culture is that it is designed around a series of detailed case studies of environmental risk analysis which walk the reader from the historical nature of the problem, to the formulation as a risk-based problem, to the conduct of risk analysis, and on to the application, debate, and defense of the risk analysis.

Multicriteria analysis, or MCA, has been increasingly used in environmental decision-making to support the identification of suitable courses of action by integrating factual information with value-based information collected through stakeholder engagement. Multicriteria Analysis for Environmental Decision-Making provides an introduction to the key concepts of MCA and includes a series of case studies that illustrate the application of MCA to a variety of environmental decision-making problems ranging from protected area zoning to landfill siting, and from forest restoration to environmental impact assessment of tourism infrastructures. A compact reference that can be used by

researchers, practitioners and planners/decision makers, Multicriteria Analysis for Environmental Decision-Making can also serve as a textbook for undergraduate and postgraduate courses in a broad range of curricula.

Among the many ways the world has changed in recent decades, using technology for city planning has become one of the most innovative. Using new, pioneering methods that are reshaping the world into a more efficient and effective society has become the new reality. Citizen-Responsive Urban E-Planning: Recent Developments and Critical Perspectives is a collection of innovative research that presents and discusses various perspectives on facets of citizen engagement in open urban policy processes, all of them based on the widespread use of information and communication technologies in the field of urban/spatial planning. The book offers an updated outline of recent advances in this field as well as a critical perspective of the challenges with which citizen e-participation in urban e-planning is confronted. While highlighting topics including smart ecosystems, urban development, and global intelligence, this book is ideally designed for urban planners, IT consultants, government officials, policymakers, academicians, researchers, students, and industry professionals.

Decision analysis has become widely recognized as an important process for translating science into management actions. With climate change and other systemic threats as driving forces in creating environmental and engineering problems, there is a great need for understanding decision making frameworks through a case-study based approach. Management of environmental and engineering projects is often complicated and multidisciplinary in scope and nature, thus issues that arise can be difficult to solve analytically. Multi-Criteria Decision Analysis: Case Studies in Engineering and the Environment provides detailed description of MCDA methods and tools and illustrates their applications through case studies focused on sustainability and system engineering applications. New in the Second Edition: Addresses current and emerging environmental and engineering problems Includes seven new case studies to illustrate different management situations applicable at the international level Builds on real case studies from recent and relevant environmental and engineering management experience Describes advanced MCDA techniques and extensions used by practitioners Provides corresponding decision models implemented using the DECERNS software package Gives a more holistic approach to teaching MCDA methodology with a focus on sustainable solutions and adoption of new technologies, including nanotechnology and synthetic biology Given the novelty and inherent applicability of this decision-making framework to the environmental and engineering fields, a greater number of teaching tools for this topic need to be made available. This book provides those teaching tools, covering the breadth of the applications of MCDA methodologies with clear explanations of the MCDA process. The case studies are implemented in the DECERNS software package, allowing readers to experiment and explore and to understand the full process by which environmental managers assess these problems. This book is a great resource for professionals and students seeking to learn decision analysis techniques and apply similar frameworks to environmental and engineering projects

This book aims to provide a collection of early ideas regarding the results of applying risk and resilience tools and strategies to COVID-19. Each chapter provides a distinct contribution to the new and rapidly growing literature on the developing COVID-19

pandemic from the vantage points of fields ranging from civil and environmental engineering to public policy, from urban planning to economics, and from public health to systems theory. Contributing chapters to the book are both scholars and active practitioners, who are bridging their applied work with critical scholarly interpretation and reflection. The book's primary purpose is to empower stakeholders and decision-makers with the most recent research in order that they can better understand the systemic and sweeping nature of the COVID-19 pandemic, as well as which strategies could be implemented to maximize socioeconomic and public health recovery and adaptation over the long-term.

This paper proposes a novel approach to integrate a financial model and a fuzzy model to analyze both quantitative and qualitative factors. The financial model is utilized to calculate the quantitative factors, thereby assisting experts make judgments more accurately in the fuzzy model.

Environmental Systems is a component of Encyclopedia of Environmental and Ecological Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. Environmental Systems is something about data handling, modeling and decision making in the field of environmental systems. It includes related basic knowledge on measurement techniques, modeling techniques and models and their applications for decisions making. Environmental engineering / research are based on measurement techniques and related knowledge of natural and life sciences. Developed mathematical and numerical simulation models are tools and strictly purpose oriented, that means suitable for decision making. The three volumes on Environmental Systems are aimed at the following five major target audiences: University and College students Educators, Professional practitioners, Research personnel and Policy analysts, managers, and decision makers and NGOs.

From the oceans to continental heartlands, human activities have altered the physical characteristics of Earth's surface. With Earth's population projected to peak at 8 to 12 billion people by 2050 and the additional stress of climate change, it is more important than ever to understand how and where these changes are happening. Innovation in the geographical sciences has the potential to advance knowledge of place-based environmental change, sustainability, and the impacts of a rapidly changing economy and society. Understanding the Changing Planet outlines eleven strategic directions to focus research and leverage new technologies to harness the potential that the geographical sciences offer.

In an era where humans affect virtually all of the earth's processes, questions arise about whether we have sufficient knowledge of human-environment interactions. How can we sustain the Earth's ecosystems to prevent collapses and what roles should practitioners and scientists play in this process? These are the issues central to the concept of environmental literacy. This unique book provides a comprehensive review and analysis of environmental literacy within the context of environmental science and sustainable development. Approaching the topic from multiple perspectives, it explores the development of human understanding of the environment and human-environment interactions in the fields of biology, psychology, sociology, economics and industrial ecology. The discussion emphasises the importance of knowledge integration and transdisciplinary processes as key strategies for understanding complex human-

environment systems (HES). In addition, the author defines the HES framework as a template for investigating sustainably coupled human-environment systems in the 21st century.

Nanotechnology Environmental Health and Safety tackles – in depth and in breadth – the complex and evolving issues pertaining to nanotechnology's environmental health and safety (EHS). The chapters are authored by leaders in their respective fields, providing thorough analysis of their research areas. The diverse spectrum of topics include nanotechnology EHS issues, financial implications, foreseeable risks including exposure, dosage and hazards, and the implications of occupational hygiene precautions and consumer protections. The book includes real-world case studies, wherever practical, to illustrate specific issues and scenarios encountered by stakeholders positioned on the front-lines of nanotechnology-enabled industries. These case studies will appeal to, and resonate with, laboratory scientists, business leaders, regulators, service providers, and postgraduate researchers. Reviews toxicological studies and industrial initiatives, supported by numerous case studies Covers new generation of nanoparticles and significantly expands on existing material from second edition Only edited volume to collect research on the regulatory and risk implications of a wide array of industrial, environmental and consumer nanomaterials

Arguing that society has pursued short-run approaches to decision-making that in the long term are counterproductive, On Systemic Balance presents a multidimensional and interdisciplinary alternative to problem solving. The usual method of dealing with problems such as housing shortages and environmental protection is a narrow, simplistic, quick, and intrusive solution. This type of solution ultimately ignores the many interrelationships within a system. The long term effect is imbalance and destabilization. The author reinforces his argument with economic and environmental examples. He then introduces alternative approaches to decision making and applies them to several settings. By stressing slow incremental intrusions, regard for interrelationships, and longer term balance, the author suggests that we might redefine problems more appropriately, develop less harmful and more enduring solutions, and provide a more stable environment. Goldberg maintains that we cannot truly predict the consequences of our actions, particularly large-scale actions taken over a short period of time. He presents his argument first by equipping the reader with a set of multidisciplinary tools and second by demonstrating the poor results of our present decision-making style. He then introduces an alternative approach which borrows from biology, economics, management, and anthropology and applies it to three distinct settings.

Presents various challenges faced by security policy makers and risk analysts, and mathematical approaches that inform homeland security policy development and decision support Compiled by a group of highly qualified editors, this book provides a clear connection between risk science and homeland security policy making and includes top-notch contributions that uniquely highlight the role of risk analysis for informing homeland security policy decisions. Featuring discussions on various challenges faced in homeland security risk analysis, the book seamlessly divides the subject of risk analysis for homeland security into manageable chapters, which are organized by the concept of risk-informed decisions, methodology for applying risk analysis, and relevant examples and case studies. Applied Risk Analysis for Guiding Homeland Security Policy and Decisions offers an enlightening overview of risk

analysis methods for homeland security. For instance, it presents readers with an exploration of radiological and nuclear risk assessment, along with analysis of uncertainties in radiological and nuclear pathways. It covers the advances in risk analysis for border security, as well as for cyber security. Other topics covered include: strengthening points of entry; systems modeling for rapid containment and casualty mitigation; and disaster preparedness and critical infrastructure resilience. Highlights how risk analysis helps in the decision-making process for homeland security policy Presents specific examples that detail how various risk analysis methods provide decision support for homeland security policy makers and risk analysts Describes numerous case studies from academic, government, and industrial perspectives that apply risk analysis methods for addressing challenges within the U.S. Department of Homeland Security (DHS) Offers detailed information regarding each of the five DHS missions: prevent terrorism and enhance security; secure and manage our borders; enforce and administer our immigration laws; safeguard and secure cyberspace; and strengthen national preparedness and resilience Discusses the various approaches and challenges faced in homeland risk analysis and identifies improvements and methodological advances that influenced DHS to adopt an increasingly risk-informed basis for decision-making Written by top educators and professionals who clearly illustrate the link between risk science and homeland security policy making Applied Risk Analysis for Guiding Homeland Security Policy and Decisions is an excellent textbook and/or supplement for upper-undergraduate and graduate-level courses related to homeland security risk analysis. It will also be an extremely beneficial resource and reference for homeland security policy analysts, risk analysts, and policymakers from private and public sectors, as well as researchers, academics, and practitioners who utilize security risk analysis methods.

This book offers a comprehensive view on resilience based upon state-of-the-science theories and methodological applications that resilience may fill. Specifically, this text provides a compendium of knowledge on the theory, methods, and practice of resilience across a variety of country and case contexts, and demonstrates how a resilience-based approach can help further improved infrastructure, vibrant societies, and sustainable environments and ecologies, among many others. Resilience is a term with thousands of years of history. Only recently has resilience been applied to the management of complex interconnected systems, yet its impact as a governing philosophy and an engineering practice has been pronounced. Colloquially, resilience has been used as a synonym for ‘bouncing back’. Philosophically and methodologically, however, it is much more. In a world defined by interconnected and interdependent systems such as water, food, energy, transportation, and the internet, a sudden and unexpected disruption to one critical system can lead to significant challenges for many others. The Science and Practice of Resilience is beneficial for those seeking to gain a rich knowledge of the resilience world, as well as for practitioners looking for methods and tools by which resilience may be applied in real-world contexts.

Climate Vulnerability, Volume 5

Internet of Things (IoT) is an ecosystem comprised of heterogeneous connected devices that communicate to deliver capabilities making our living, cities, transport, energy, and other areas more intelligent. This book delves into the different cyber-security domains and their

challenges due to the massive amount and the heterogeneity of devices. This book introduces readers to the inherent concepts of IoT. It offers case studies showing how IoT counteracts the cyber-security concerns for domains. It provides suggestions on how to mitigate cyber threats by compiling a catalogue of threats that currently comprise the contemporary threat landscape. It then examines different security measures that can be applied to system installations or operational environment and discusses how these measures may alter the threat exploitability level and/or the level of the technical impact. Professionals, graduate students, researchers, academicians, and institutions that are interested in acquiring knowledge in the areas of IoT and cyber-security, will find this book of interest.

This comprehensive textbook provides a logical process for fact-based decision making for the most challenging systems problems. It is composed of three bedrock elements to improve readers' understanding and analysis of the most challenging systems problems that exist today: systems thinking, which identifies important interconnections between a system and its environment; systems engineering, which describes the activities of professional systems engineers; and systems decision making, which provides fact-based information to support major system decisions made at every life cycle stage.

Over the past decades, environmental problems have attracted enormous attention and public concern. Many actions have been taken by the U.S. Environmental Protection Agency and others to protect human health and ecosystems from particular threats. Despite some successes, many problems remain unsolved and new ones are emerging. Increasing population and related pressures, combined with a realization of the interconnectedness and complexity of environmental systems, present new challenges to policymakers and regulators. Scientific research has played, and will continue to play, an essential part in solving environmental problems. Decisions based on incorrect or incomplete understanding of environmental systems will not achieve the greatest reduction of risk at the lowest cost. This volume describes a framework for acquiring the knowledge needed both to solve current recognized problems and to be prepared for the kinds of problems likely to emerge in the future. Many case examples are included to illustrate why some environmental control strategies have succeeded where others have fallen short and how we can do better in the future.

This book serves as a guide for local governments and private enterprises as they navigate the unchartered waters of investing in climate change adaptation and resilience. This book serves not only as a resource guide for identifying potential funding sources but also as a roadmap for asset management and public finance processes. It highlights practical synergies between funding mechanisms, as well as the conflicts that may arise between varying interests and strategies. While the main focus of this work is on the State of California, this book offers broader insights for how states, local governments and private enterprises can take those critical first steps in investing in society’s collective adaptation to climate change.

Critical infrastructure provides essential services to citizens. The mutual dependencies of services between systems form a complex “system of systems” with a large perturbation surface, prone to be damaged by natural and anthropic events. Their intrinsic and extrinsic vulnerabilities could be overcome by providing them adaptive properties to allow fast and effective recovery from loss of functionality. Resilience is thus the key issue, and its enhancement, at the systemic level, is a priority goal to be achieved. This volume reviews recent insights into the different domains (resilience-enhancing strategies, impact and threats knowledge, and dependency-related issues) and proposes new strategies for better critical infrastructure protection.

With the growing number, complexity, and importance of environmental problems come demands to include a full range of intellectual disciplines and scholarly traditions to help define and eventually manage such problems more effectively. Decision Making for the Environment:

Social and Behavioral Science Research Priorities is the result of a 2-year effort by 12 social and behavioral scientists, scholars, and practitioners. The report sets research priorities for the social and behavioral sciences as they relate to several different kinds of environmental problems.

This book presents a systemic perspective on the broadly perceived problem of social care, meant in terms of a network engaging balanced resources and actors to assure the functionality, in an integrative approach. The approach involves individual, institutional and organizational structures, at the micro, mezzo- and macro-levels, in their interrelations, with proper contexts for understandings, interpretations and actions by stakeholders. The papers presented suggest ways of changes, involving even participant actors as changing agents, taking into account evolving behaviors and human relations, policies and inter-institutional frameworks, from many points of view. In the first part, various aspects, notably economic and emotional, of innovative and integrated approaches to long-term care are dealt with. Different aspects are considered exemplified by legal, educational, economic, environmental, cultural and those related to the perception of aging, labor market for the elderly, perceived quality of life, etc. The planning and management of social services are discussed in terms of a functional, and effective and efficient system, with the identification and analysis of actors and processes, and transformation policies. This is done at the local, regional and global levels.

This work recommends a simple yet profound shift to another decision-making technique: alternatives assessment. Instead of asking how much of a hazardous activity is safe, alternatives assessment asks how we can avoid or minimize damage.

Expertise Under Scrutiny21st Century Decision Making for Environmental Health and SafetySpringer

This book examines the phenomenon of unsubmitted and untested sexual assault kits (SAKs). Beginning with an analysis of the background of the study, it examines feminist theory, functionalism, and resource dependence theory in relation to the phenomenon. The book highlights the existence of scholarly literature on the topic of sexual assault and what sexual assault encompasses, leading to the problem of unsubmitted and untested SAKs. Sexual assault is a global problem involving women and college students. Unfortunately, there are 400,000 SAKs nationwide in the US that remain unsubmitted or untested, therefore indicating serious gaps in the criminal justice system. The book shows the need for stakeholders who have an interest in the topic to collectively engage to acknowledge the systemic gaps, and provide resolution so that officials properly utilize SAKs to apprehend and empower victims to live healthy and functional lives. It recognizes and portrays the results of the study and suggests recommendation for future research. The book will be an instrumental tool for law enforcement officers, sexual assault detectives, forensic scientists, and sexual assault nurse examiners to understand the perceptions of law enforcement as to what caused the phenomenon and how to prevent it in the future.

Since 1997, the Ecosystem Management Decision Support (EMDS) system has been used around the world to support environmental analysis and planning in many different application areas, and it has been applied over a wide range of geographic scales, from forest stands to entire countries. An extensive sampling of this diversity of applications is presented in section 2, in which EMDS application developers describe the varied uses of the system. These accounts, together with the requisite background in section 1, provide valuable practical insights into how the system can be applied in the general domain of environmental management.

This book explores the challenges that confront leaders in government and industry when making decisions in the areas of environmental health and safety. Today, decision making demands transparency, robustness, and resiliency. However thoughtfully they are devised, decisions made by governments and enterprises can often trigger immediate, passionate public response. Expertise Under Scrutiny shows how leaders can establish organizational decision making processes that yield valid, workable choices even in fast-changing and uncertain conditions. The first part of the book examines the organizational decision making process, describing the often-contentious environment in which important environmental health and safety decisions are made, and received. The authors review the roles of actors and experts in the decision making process. The book goes on to address such topics as: · The roles of actors and experts in the decision making process · Ethics and analytics as drivers of good decisions · Why managing problems in safety, security, environment, and health Part II offers an outline for adopting a formal decision support structure, including the use of decision support tools. It includes a chapter devoted to ELECTRE (ELimination and Choice Expressing Reality), a multi-criteria decision analysis system. The book concludes with an insightful appraisal and analysis of the expertise, structure and resources needed for navigating well-supported, risk-informed decisions in our 21st Century world. Expertise Under Scrutiny benefits a broad audience of students, academics, researchers, and working professionals in management and related disciplines, especially in the field of environmental health and safety.

This work contains a collection of selected, peer-reviewed papers that were presented at the First Dubrovnik Conference on Sustainable Development of Energy, Water and Environment Systems, held in Dubrovnik, Croatia in 2002. This conference was focussed on the following objectives: More...to discuss sustainability concepts of energy, water and environment and their relation to global development; to analyse potential scientific and technological processes reflecting energy, water and environment exchange; to present energy, water and environment system models and their evaluation; to consider multi-criteria assessment of energy, water and environment systems by taking account of economic, social, environmental and resource use aspects. This book is interesting for (post)graduate students, scientists and professionals from mechanical, chemical and environmental disciplines who are working on sustainable development.

Life Cycle Sustainability Assessment for Decision-Making: Methodologies and Case Studies gives readers a comprehensive introduction to life cycle sustainability assessment (LCSA) methodology for sustainability measurement of industrial systems, proposing an efficiency methodology for stakeholders and decision-makers. Featuring the latest methods and case studies, the book will assist researchers in environmental sciences and energy to develop the best methods for LCA, as well as aiding those practitioners who are responsible for making decisions for promoting sustainable development. The past, current status and future of LCSA, Life Cycle Assessment method (LCA), Life Cycle Costing (LCC), Social Life Cycle Assessment (SLCA), the methodology of LCSA, typical LCSA case studies, limitations of LCSA, and life cycle aggregated sustainability index methods are all covered in this multidisciplinary book. Includes models for assessing sustainability in environmental, energy engineering and economic scenarios Features case studies that help define the advantages and

obstacles of real world applications Presents a complete view, from theory to practice, of a life cycle approach by exploring the methods and tools of sustainability assessment, analysis and design of sustainability assessment