

Tutorial solns

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Notes: Environmental Decision-Making - Exploring Complexity and Context - Ronnie Harding, Carolyn MHendriks, Mehreen Faruqi - The Federation Press - 2009 Chapters 1, 3, 7, 8 Page 237 Fig 9. 2

Chapter 1 - Environmental Decision-making in a complex world * Layers of complexity associated with contemporary environmental dilemmas- contemporary Environmental Decision-Making (EDM) * Issues under consideration are complex & involve a host of moral & economic factors * EDM not only encompasses broad temporal and spatial scales, but also typically involves multiple actors with different values and competing interests and competing knowledge as well as significant risks and uncertainties * Areas of public policy - health, environmental issues tend to overwhelm decision makers because of their scale, interdependencies and unknown consequences (Dovers 2005a) * Environmental issues are also inherently complex because they provide goods and services (such as clean air and water, aesthetics, wilderness) that are difficult to quantify and include in dominant valuation systems such as money * The concept of sustainability is often used to denote the ultimate goal in development where social, environmental and economic needs are all achieved concurrently * Refers to the ability of human society to persist in the long term in a manner that satisfies human development demands without threatening the integrity of the natural world (Dovers 2005a, p7) * Sustainable development refers to development which allowed the present generation to meet their needs without undermining the ability of future generations to meet theirs (WCED 1987) * Details for methodology for ecological footprinting - [www. footprintnetwork. or/en/index. php](http://www.footprintnetwork.org/en/index.php) & [wwf.](http://www.wwf.org)

org. u/publications/livingplanet report2008/ * A further major concern for Australia is climate change * Anthropogenic (human induced) * Persistent organic pollutants POPs, characterised by their persistence in the environment, their ability to bioaccumulate through food chains, their potential to adversely affect human health and environment * Acid rain * Bioaccumulation * Ever-increasing biological footprints * EDM process begins when a person, group of people or organisation perceives and identifies a problem, a risk or a need. At this point a solution to a perceived problem or issue is sought * Page 16 Fig 1. 2 Chapter 2 Sustainable Development and Sustainability Complex interrelationships between environmental issues, the need to take an anticipatory and long-term view, and to recognise the environmental problems are embedded in social, political and economic contexts, and need to be addressed accordingly * Environmental management is shaped by the concepts of sustainable development and sustainability, forming the framework through which we aim to achieve economic and social development whilst maintaining the long-term integrity of ecological systems * Problems with sustainability multi-layered in that there may be a range of possible causative factors, with complex interrelationships and underlying problems * Sustainability problems demand an integrated approach where environmental, economic and social factors are taken into consideration * Characteristics of sustainability: Dovers (1997, 2003a, 2005a) (2005a, p 44) * Extended temporal & spatial scales * Possible ecological limits & thresholds * Cumulative impacts * Irreversible impacts * Complex connections between issues * Typically high level of uncertainty & poor information * New moral dimensions Lack of agreement on appropriate research methods, policy instruments and management approaches * Non-

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traded and non valued asserts as typical components * Ill defined property rights and responsibilities for assets * Mixed public and private costs and benefits * Need for community involvement * Novelty of problems * Need for integrative and interdisciplinary research to address the problems * Ecological limits, irreversible impacts, poor information and high uncertainty * The precautionary principle * Aims to anticipate serious or irreversible environmental harm and hence reverse earlier modes of operation that waited for clear evidence of harm before taking preventive action * Public participation * Recognising that environmental decisions typically involve social values and may entail risks (Robinson 2004) http://css.snre.umich.edu/css_doc/CSS04-12.pdf Possible areas of improvement arise from a holistic approach in evaluating and assessing cement's impact on the global environment * w/in this thesis a LCA model is developed and applied to compare various environmental impacts * LCA is often described as a "cradle to grave" examination of a product or process, highlighting environmental impacts and hidden costs that are often not reflected in conventional assessments, which may focus on narrower boundaries and short-term issues * E. g Cement - valuable source in the application to the infrastructure * Requires significant energy to supply high temperatures to the kiln, chemical reaction/calcinations requires driving CO₂ out of the rock into the atmosphere - CO₂ is released from fuel combustion * However, durability may prove to be more important in the life cycle perspective than the impact of production and therefore a tradeoff between production impacts and performance during application may have to be made