

Contradictions Between Risk Management and Sustainable Development

Odd Einar Olsen, Oluf Langhelle & Ole A. Engen
University of Stavanger
Departement of Media, Culture and Social Science
Stavanger
NORWAY

1. Introduction

The aim of this paper is to discuss how risk management as a methodology and mindset influence on priorities and decisions concerning sustainable development. Management of risks and hazards often rely on partial analysis with a limited time frame. This may lead to a paradoxical situation where risk management and extended use of risk analysis could hamper long term sustainable development. The question is: *Does the use of risk and vulnerability analysis (RaV-analysis) hamper or contribute to sustainable development?*

Risk management is often based on past experience. This may create courses of action that might lead to critical failures in a rapidly changing environment (OECD 2003). Changes in society may reshape conventional hazards and create new risks, transforming channels through which accidents spread, and altering the responses in society. Consequently, new threats have to be addressed by developing new strategies using quite different means and assign new roles for international, national and local levels of authority in the process of creating a less vulnerable and more robust society. In its report from Nov 2004, The UN Secretary-General High-Level Panel on Threats, Challenges and Change concluded: *“Today’s threats recognize no national boundaries, are connected, and must be addressed at the global and regional as well as the national level”* (p. 1).

2. Concepts of Risk Analysis: Partial Focus and Limited Time Perspective

Risks and threats have become independent of where you live and work (Hovden 2004). Risks have become more global in nature, and events at one place have faster and more direct consequences on other places (Beck 1992; WCED 1987, OECD 2003). The integration of global infrastructures and global economic and technological systems create new mutual dependencies between companies, communities and societies. The interdependencies make the society more vulnerable to events and developments occurring outside our control. Increased complexity and rapid changes in modes of production produce ambiguity and uncertainty. Hence, business and technology management becomes more risky and vulnerable. To meet such challenges, new laws, regulations, international standards and international management tools for risk control are introduced both at a national and international

level.¹ As a consequence, both private and public organisations need to make risk factors visible and produce strategies and management tools to control the risks and hazards they are dealing with.

Risk management has become trendy. Public and private companies in different sectors try to develop better tools for risk management. They are - through laws, regulations or statements - encouraged to conduct RaV-analysis before deciding about implementation of new projects and activities. One argument is that all organisations should contribute to a more sustainable development. As a consequence, risk management and RaV-analysis are introduced as regular means for desired behaviour within public administration and business activities. *It is a mindset, a way to structure our knowledge and behaviour, and a way of making decisions that probably will have an increasing impact on society in the future.*

Risk management is not only a question of meeting laws and regulations (conformance). It has appeared as an important tool to meet overall objectives within the organisation (performance). This also includes the new fashion of “corporate social responsibility” emphasising the companies’ long-term responsibility for social development. “Triple line reporting” has materialised in many big companies as a way of making their efforts for economic profitability, occupational health and safety, and social responsibility visible for the public.

Risk management implies strategies and decisions to meet the new demands for risk and hazard control. To support decision making on design and operation, risk analyses are conducted in order to describe problems and possible solutions. The analyses normally cover hazard identification, cause analyses, consequence analyses and risk description. Evaluations of the results are carried out, and the totality of the analyses and the evaluations are referred to as risk assessments. These assessments are often combined with cost/benefit or cost/effectiveness analyses. Risk assessment is followed by risk treatment, which is the process of implementing measures to modify risk, including measures to avoid, reduce (“optimize”), transfer or retain risk (Aven & Kristensen 2004).

Risk analysis is often used in combination with risk acceptance criteria, as inputs to risk evaluation. Sometimes the term risk tolerability limits is used instead of risk acceptance criteria. The criteria state what is deemed as an unacceptable risk level. The need for risk reducing measures is assessed with reference to these criteria. In some industries and countries, it is a requirement in regulations that such criteria should be defined in advance of performing the analyses. The criteria are normally established based on historical data, but also economic considerations are involved (Aven & Kristensen 2004, Vrijling et.al. 1998).

Risk management rely on an instrumental technical-economic rationality based on existing knowledge, historical data and scientific methods. Common methods used when conducting RaV-analysis are basically grounded in positivistic scientific approaches. They tend to reduce risks and hazards to simple and manageable

1 For example the Basel-II directive about financial activities, common international (EU) standards concerning technology or OHS (occupational health and safety), common ethical standards for corporate social responsibility (organised by the UN), ISO (2002): Terminology of Risk Management, requirements to national RaV-analysis in different sectors such as health services, road authorities, oil production, education, public administration etc.

problems, a narrow scope on activities, and a limited time frame appropriate to short term profit demands. The classical approaches assumed that we could calculate the “objective” risks expressed in exact terms if we only had the right input (see for instance Aven 2003, Berdford & Cooke 2001). This approach has partly been replaced by a predictive approach where uncertainty is highlighted through considerations about input data, analysis methodology and results. In this Bayesian approach, “non-scientific” arguments (such as statements based in political or cultural values) are accepted as valuable contributions. But also risk analysis based on the Bayesian thinking would apply rational models with a partial scope and limited time frame (Aven 2003). Furthermore, it is still the experts who most often are defining the problems, analytical designs and represent the authoritative interpretations of results.

Many attempts have been made to establish analytical models unifying the traditional technical-economic approaches with perspectives from the social sciences (Renn and Klinke 2002, Kaspersen 1992, Stern and Fineberg 1996, Aven 2003, Aven & Kristensen 2004). Such risk analysis designs may include risk-based, precautionary or discursive strategies for risk management. Furthermore, they include social, psychological, institutional and cultural processes and deliberations as part of the RaV-analysis. A major drawback with most of these approaches, is the inbuilt complexity and ambiguity making it very difficult to make the models operational. Or quite opposite: The models are so simple and the output is so inaccurate that they barely can be used for decision purposes (Nilsen & Olsen 2004, 2005; Olsen 2004). As a consequence, they are hardly in use for practical purposes in organisations aiming to work efficient and produce manageable solutions to complex problems.

3. Sustainable development: Global Focus and Long Term Perspective

The World Commission on Environment and Development put sustainable development on the international political agenda in 1987 (WCED 1987). The World Commission defined sustainable development as “*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*”. It contained two key concepts:

- The concept of ‘needs’, in particular the essential needs of the world’s poor to which overriding priority should be given; and
- The idea of limitations imposed by the state of technology and social organisation on the environment’s ability to meet present and future needs (WCED, 1987: 43).

Sustainable development is concerned with basic needs and has the global environmental and developmental problems as the point of departure. As such, it is global poverty, inequality in resource consumption between North and South, between rich and poor, developed and underdeveloped countries, climate change, loss of biodiversity, pollution and food security which to a large extent influence the implications and strategic imperatives of sustainable development. In short, the core story-line of sustainable development has been described the following way by John Dryzek (1997):

The core story line of sustainable development begins with a recognition that the legitimate developmental aspirations of the world’s peoples cannot be met by all countries following the growth path already taken by the

industrialised countries, for *such action would over-burden the world's ecosystems*. Yet economic growth is necessary to satisfy the legitimate needs of the world's poor ... Sustainable development is not just a strategy for the future of developing societies, but also for industrialised societies, which must reduce the excessive stress their past economic growth has imposed upon the earth (Dryzek, 1997:129)ⁱ.

In *Our Common Future* the ultimate limits to global development was seen as being determined (perhaps) by two things: the availability of energy, and the biosphere's capacity to absorb the by-products of energy use. These limits were assumed to have much lower thresholds than other material resources, mainly because of the depletion of oil reserves and the build-up of carbon dioxide leading to global warming (WCED, 1987: 58). The global environmental problems addressed in *Our Common Future* (1987) have stayed on the sustainable development agenda. In the meantime, some have been added or moved higher on the agenda, especially water scarcity and the depletion of renewable resources (OECD 1995, UNEP 2002).

Moreover, sustainable development as conceived in *Our Common Future* (1987), can also be seen as an explicit and implicit attempt to solve the limits to growth debate. It was "solved" by a two-tracked response: Yes, we can have economic growth, but it must be a different kind of economic growth. Economic growth was seen as *environmentally and socially sustainable* only under the following conditions:

- (1) If industrialised nations continue the recent shifts in the content of their growth towards *less material- and energy-intensive activities* and the *improvement of their efficiency* in using materials and energy (WCED:51).
- (2) A change in the content of growth, to make it more *equitable* in its impact, that is, to improve the distribution of income (WCED:52).²

In the international debate following *Our Common Future*, the conditions of economic growth have been weighted differently. Some have put energy efficiency as the main strategy (Hawken, Lovins & Lovins, 1999), others have argued that a reduction in material- and energy-intensive activities is necessary (Jänicke 1997, Chambers, Simmons & Wackernagel 2000). Some have argued for massive global redistribution (Langhelle 2000, Yanarella & Bartilow 2000). And others have focused primarily on changing production and consumption - and depending on which of the above elements highlighted - either patterns and/or levels of production and consumption (Pearce 1995, Hille 1995, Pearce & Barbier 2000).

4. Risk Analysis, Societal Safety and Sustainable Development

Taking the development and epistemological foundation of risk analysis and risk management into account, it is likely to claim that there have been weak linkages between trends within risk management on one side, and sustainable development on the other side. Societal safety, defined as "*the ability of society as such to sustain important societal functions and to secure the life, health and basic needs of its citizens under different types of stress*" (Olsen, Kruke & Hovden 2006), could have been the linking pin between risk analysis and sustainable development.

The concept of societal safety tries to integrate organisational, institutional and societal perspectives on the management of risks, hazards and vulnerability. Consequently, it also covers main areas of interest in RaV-analysis and risk

² Our italics

management. Simultaneously, the term also implies societal aspects of development beyond the partial perspectives that is characterizing risk analysis.

Compared with sustainable development, societal safety has a specific frame of reference which is different. Sustainable development starts at the global level, with the global environmental and developmental problems. Implications for national policies, therefore, must in principle be deduced from the global level. Societal safety, on the other hand, starts with the national level and looks at risks, hazards and threats to national or societal safety and security. Although societal safety also to some extent looks at regional and global threats, the logic of the approach is the inverse of sustainable development. Societal safety as a concept and practical perspective has its point of departure at the national level and is concerned about national safety and security problems (including willed evil actions such as terrorism).

Actually, there is some common ground between sustainable development and societal safety through concepts like “risk society” (Beck 1992) and risk perspectives focusing on for instance creeping crisis (e.g. long-term environmental hazards), global technological hazards, and the overall objective to secure life, health and basic needs. But the concepts on societal safety and sustainable development are usually founded on different interpretations of risk. There are also some common debates on the precautionary principle within risk management and sustainable development. The general impression, however, is that institutions, researchers and research traditions within societal safety and sustainable development for the most part operate on different tracks (Jaeger et al 2001).

Looking at the definitions of societal safety and sustainable development, however, there are nonetheless some similarities. Societal safety is used in a broad sense to include the containment of natural and man-made crisis threatening life, health, environment or material values. Furthermore, it is used to describe security challenges which could threaten the independence or existence of the nation (Aven 2003). This includes a preventive element in the sense that the likelihood of unwanted incidents should be reduced through mitigation, what is termed causal reduction. Moreover, the goal of societal safety is to limit the consequences to the extent possible if an event is to occur, what is termed consequential reduction (Parliament White Paper no 17, 2001-2002). Furthermore, it focuses on societal resiliency, making it possible for critical institutions in society to restore from a major crisis. An important aspect, however, is that the term “societal safety” is rather new and still waiting to be firmly developed in scientific terms. This opens a very interesting opportunity to establish meaningful linkages to sustainable development.

But still sustainable development and social safety have some common features difficult to distinguish. Even though the perspectives on sustainable development and societal safety have a different point of departure, different perspectives on scope and time frames, different understandings about causes and consequences and different values defining its contents, they are interdependent concepts. Sustainable development is an ethical concept, or a developmental goal, were the ultimate aim is the reconciliation of the global environmental and developmental concerns. Societal safety can be seen as an ethical goal aiming to stimulate national developments and protect society from losses of life, health and physical values.

It is hard to see how it should be possible to acquire a sustainable development without societal safety, and it is hard to see how it should be possible to acquire societal safety without a sustainable development. After all, the concepts of societal

safety and sustainable development both require actions now, and not sometimes in the future. The means of risk management and RaV-analysis may serve as the key for a more fruitful understanding of the relationships between sustainable development and societal safety.

Traditional understandings have regarded risk and safety as a design-, action- and organisational problem, but also as a political process focusing on resilience. Seen from the perspective of societal safety, using RaV-analysis and risk management to reduce unwanted incidents (causal reduction) and to limit the consequences if a crisis emerges (consequential reduction) is sensible. All activities include an element of risk and we all make judgements and trade-offs between risk and possible gains in our daily life. Industrially produced risks usually result from the generation of socially valuable processes and products, being transport, electricity, employment or consumer goods. The balancing act for policy-makers is to ascertain the socially acceptable (or tolerable) level of risk so that it does not exceed derived benefits. This is a main business in societal safety. But it is also a balancing act to make sure that the benefits to the present generation is not obtained at the expense of those living in other parts of the world or not yet born. This is the main business of sustainable development (Mehta, 1997).

Given this starting point, securing the development aspirations of the developing world and safeguarding the environment for future generations while at the same time promoting present economic prosperity, health and safety, should be achieved through an optimal balance between medium and long-term risks and short-term benefits. Risk management no doubt may provide an added bonus of protecting those presently living from unacceptable large risks. But within the ruling paradigm of risk analysis and management, it is doubtful that risk management also promote a long term sustainable development.

5. Some Examples on Potential Contradictions Between Sustainability and Risk Analysis

The cases have been selected to pinpoint certain areas where explicit contradictions between sustainability and risk management may occur. The three case areas are vital to the modern society, but differ with respect to production structure, market characteristics and environmental consequences. Accordingly, the concept of sustainability and risk management will appear differently.

5.1 Finance: Contradictions Between Investments in Sustainability and Profitable Risk Aversion

BASEL II is a new international standard for risk management in bank and finance institutions. The main principle of BASEL II is to improve the relationship between the capital requirement imposed on the individual institution and the financial risk the institution takes. BASEL II is supposed to be implemented in 2008. In order to prepare for this implementation most finance institutions actively seek to establish routines and systems capable to handle the new standards for risk management.

BASEL II brings about consequences for all business customers. The finance institutions will establish a standardised system to estimate the risk premium in all their potential investment projects. In order to satisfy the requirements of Basel II, the borrowing companies have to develop a sufficient organisational and financial capacity together with the finance institution. Entry firms with a new and unknown

technology capable of promoting a sustainable development, will be evaluated in accordance with the same criteria as established and highly competent corporations operating well known technologies.

Entrepreneurship involving a sustainable production, has probably not the ability to develop sufficient organisational capacity. Hence, they will not be able to guarantee the same risk premium as large industrial companies. Moreover, investments in sustainable projects often imply low net present value in the short run because new technologies, competing products and low market shares increase the risk premium. Accordingly, they may therefore be rejected when the interest rent is increasing or the risks are considered too high. Basel II may thus imply an increased threat towards entrepreneurial projects complying with sustainable development as part of the concept, but at the same time represents a financial risk due to a low net present value – at least in the short run. Based on this we may derive the following hypothesis: *Risk management lead to a more restrictive attitude towards granting loan to entrepreneurs basing their production philosophy on the idea of sustainability.*

5.2 Petroleum: Contradictions Between Rational Risk Analysis and Precautionary Principles

According to the regulatory regime within the Norwegian petroleum sector, the oil companies are instructed to work out impact assessments when opening new petroleum fields. This implies analysis of social and economic impacts, potential conflicts with other industrial activities, environmental consequences and impacts on biological resources. The impact assessments are in principle based on rational calculations aiming to estimate risks connected to emission, environmental consequences and impacts on fisheries. They are based on historical data, expert analysis and other sources of information.

Nevertheless, the prevailing governance structures and interest groups will (try to) exercise influence on the assessment input and output. The analysis may thus become an object for interpretation and discourse. The opening of new petroleum fields very often produces controversies because different social and political groups have different risk perceptions and value different goals. And all interest groups and alliances use RaV-analysis as “scientific proofs” for their arguments.

The RaV-analysis has a main focus on technical risk components, and draws the attention towards limited safety issues and probabilities of serious incidents. In this “struggle of truth”, the concrete and short-term threats is therefore normally be considered as more significant than long term perspectives on sustainability. Moreover, quantifiable factors tend to be regarded as more trustworthy than qualitative variables when judging technical risks. This lead us to the following hypotheses: *The established principles of RaV-analysis and risk management in the petroleum sector underestimate considerations concerning sustainability.*

5.3 The Power System: A Regression From a General to a Partial Strategy?

In general, privatisation and deregulation of public companies may lead to a reduced responsibility for maintaining and reinvesting in the critical societal infrastructure - responsibilities the companies traditionally where obliged to enforce as public entities. One example is the electrical power system in Norway. The deregulation of the Norwegian electrical power market has lead to a significant transformation of the companies as well as the market structure. The consequences have been stiffer

competition, intensified requirements concerning efficiency and stronger commercial claims from the owners.

In this situation, the energy companies have to balance demands from profit seeking owners with their responsibility as energy providers to a society heavily depending on reliable supplies. Risk management in the privatised energy companies has to reflect these double-edged threats from the owners and society. One consequence has been that the producers have delayed maintenance if possible, and also delayed investments in production facilities (Fridheim et.al 2001).

In order to satisfy the requirements to reliability and at the same time increase profits, the energy companies have also entered into new markets, introduced new products and started utilising other energy sources. Electrical power based on natural gas emerges as a complementary production facility in addition the hydro electrical power production. Without an appropriate technology, contemporary gasworks are a threat to the sustainable global environmental strategy. The question is therefore whether the use of RaV-analysis and risk management has de-emphasised the focus on long-term sustainability. This leads us to the following hypothesis: *Balancing between commercial claims and reliability of supply will exclude technologies and organisational behaviour that could meet a concept of sustainability.*

6. Conclusion

Risk management and RaV-analysis are introduced as regular means for desired behaviour within public administration and business activities. One argument is that all organisations should contribute to a more sustainable development. The perspectives on sustainable development and risk management have a different point of departure, different perspectives on scope and time frames, different understandings about causes and consequences and different values defining its contents.

Because risk management and assessment has a more narrow scope and a limited time perspective based on well established methodologies, the tangible impacts of risk reducing measures in a project is easier to calculate than long-term and intangible impacts on global development. Empirical evidence is still scarce, but our preliminary conclusion is that mainstream risk management and assessments is counterproductive to sustainable development.

References

- Asheim, G. B. 1999. 'Economic Analysis of Sustainability'. In :W. M. Lafferty and O. Langhelle (eds) *Towards Sustainable Development. On the Goals of Development – and the Conditions of Sustainability*, MacMillan Press
- Aven, T & Kristensen V (2004): Perspectives on risk – Review and discussion of the basis for establishing a unified and holistic approach. Article submitted for publication in *Reliability Engineering and Systems Safety*
- Aven, T (2003): *Foundations of Risk Analysis. A Knowledge-based and Decision-oriented Perspective* John Wiley & Sons Ltd London
- Beck, U. (1992) *Risk Society*, SAGE Publications, London.
- Bedford, T. and Cooke, R.M. (2001) *Probabilistic Risk Analysis*, Cambridge University Press, Cambridge.

- Chambers, N. Simmons, C. and Wackernagel, M. (2000). *Sharing Nature's Interest. Ecological Footprints as an indicator of sustainability*. London: Earthscan Publications. Ltd.
- Daly, H. E. (1996). *Beyond Growth. The Economics of Sustainable Development*. Boston: Beacon Press.
- Dobson, A. (1996). "Environment Sustainabilities: An Analysis and a Typology". In: *Environmental Politics*, Vol. 5, No. 3, pp. 401-428.
- Dobson, A. (1998). *Justice and the Environment. Conceptions of Environmental Sustainability and Theories of Distributive Justice*. Oxford University Press.
- Dryzek, J. S. (1997). *The Politics of the Earth. Environmental Discourses*. Oxford University Press.
- Fridheim, H et.al (2001): *En sårbar kraftforsyning. Sluttrapport etter BAS3 (in Norwegian only)* FFI rapport 2001/02381 Forsvarets Forskningsinstitutt
- Hajer, M. A. (1995). *The Politics of Environmental Discourse. Ecological Modernization and the Policy Process*. Oxford: Clarendon Press.
- Hajer, M. A. (1995). *The Politics of Environmental Discourse. Ecological Modernization and the Policy Process*. Oxford: Clarendon Press.
- Hawken, P., Lovins, A. B. and Lovins, L. H. (1999). *Natural Capitalism. The Next Industrial Revolution*. London: Earthscan.
- Hille, J. (1995) *Sustainable Norway. Probing the Limits and Equity of Environmental Space*. The Project for an Alternative Future.
- Hovden, J (2004): *Public policy and administration in a vulnerable society: regulatory reforms initiated by a Norwegian commission*. Journal of Risk Research 7 (6), 629–641 (September 2004).
- Jaeger C, Renn O, Rosa E & Webler T, (2001): *Uncertainty, and Rational Action*. London: Earthscan
- Jänicke, M. (1997). «The Political System's Capacity for Environmental Policy». In: M. Jänicke og H. Weidner (eds.), *National Environmental Policies. A Comparative Study of Capacity-Building*. Berlin: Springer.
- Kasperson, R.E. (1992) The Social Amplification of Risk: Process in Developing an Interactive Framework, in Krinsky, S. and Golding D. (eds.), *Social Theories of risk*. (Praeger, Westport, 1992): p. 153-178.
- Lafferty, W. M. and Meadowcroft, J. (eds.) (2000). *Implementing Sustainable Development. Strategies and Initiatives in High Consumption Societies*. Oxford University Press.
- Lafferty, W.M. and Langhelle, O. (eds.) (1999). *Towards Sustainable Development. On the Goals of Development – and the Conditions of Sustainability*. MacMillan Press LTD.
- Langhelle, Oluf (2000): "Sustainable Development and Social Justice - Expanding the Rawlsian Framework of Global Justice". *Environmental Values* 9 (2000), pp. 295-323.
- McManus, P. (1996). "Contested Terrains: Politics, Stories and Discourses of Sustainability". In: *Environmental Politics*, Vol. 5, No. 1, pp. 48-73.
- Mehta, M.D. (1997) "Risk assessment and sustainable development: Towards a concept of sustainable risk." *Risk: Health, Safety, and Environment*, 8(2): 133-156.
- Nilsen, A.S & Olsen, O.E (2004): Universal and contextual tools as a double strategy in emergency planning *International Journal of Emergency Planning Vol 2, no 1-2*

- Nilsen, A.S & Olsen, O.E (2005): Different strategies - equal practice? Risk assessment and management in municipalities *Risk Management: An International Journal* 2005, 7(2) pp. 37-47
- OECD (1995). *OECD Workshop on Sustainable Consumption and Production: Clarifying the Concepts*. Rosendal, Norway, 2-4 July, 1995, Final Report.
- Olsen, O.E (2004): *Risiko- og sårbarhetsanalyser i en globalisert verden*. Paper presentert på Nordisk sikkerhetspolitisk forskerkonferanse, København 30-31 aug 2004. (in Norwegian only). Publisert i
- Olsen, O.E; Kruke, B.I; & Hovden, J (2006): *Societal Safety: Concept, Borders and Dilemmas*. Paper to be published
- Pearce, D. (1993). *Blueprint 3. Measuring sustainable development*. London: Earthscan.
- Pearce, D. (1995). *Blueprint 4. Capturing global environmental value*. London: Earthscan.
- Pearce, D. And Barbier, E. B. (2000). *Blueprint for a Sustainable Economy*. London: Earthscan.
- Renn, O. & Klinke, A. (2002) A New approach to risk evaluation and management: Risk-based precaution-based and discourse-based strategies. *Risk Analysis* 22 (6): 1071-1094
- St.m 17 (2001-02): *Samfunnssikkerhet. Veien til et mindre sårbart samfunn* (in Norwegian only)
- Stern, P.C. and Fineberg, H.V. (eds.) (1996): *Understanding risk*. National Academy Press, Washington
- Turner, K. R. (ed.) (1993). *Sustainable Environmental Economics and Management: Principles and Practice*. London: Belhaven Press.
- UNEP (2002). *Global Environmental Outlook. (GEO-3). Past, Present and Future Perspectives*. United Nations Environment Programme (UNEP)/London: Earthscan.
- World Commission on Environment and Development (WECD) (1987). *Our Common Future*. Oxford University Press.
- Yanarella, E. J. and Bartilow, H. (2000). "Dreams of sustainability: beyond the antinomies of the global sustainability debate". In: *International Journal of Sustainable Development*, Vol. 3, No. 4, 370-389.