

Precautionary Principle: Risk Uncertainty and Rational Action Prof. Ortwin Renn, University of Stuttgart, Germany

Highlights

- Precaution is a vague concept that has ambiguous meaning depending on the context, however a precautionary approach in risk *assessment* is deemed prudent.
- The role of precaution in risk *management* is more controversial. Issues include the avoidance of arbitrary regulation and discounting of expert opinion.
- Five risk management regimes are elaborated: routine risk management using standard risk assessments; risk-based management with expanded risk assessments requiring risk-benefit ratios; precaution-based management allowing negotiated safety levels dealing with high levels of uncertainty; discourse-based management with extended public input and stakeholder involvement; and prevention - the crisis management situation.

Summary

Simon Webb, representing AllChemE, welcomed delegates to the fourth AllChemE Seminar at the European Parliament and introduced Lorenzo Allio of the European Policy Centre (EPC), cosponsor for the seminar, before a short speech from MEP Mme Beatrice Patrie who was hosting the event. Mme Patrie has been actively involved in the development of the precautionary principle approach within the European Institutions as rapporteur for the Commission Communication in 2000. She welcomed open discussion between the various stakeholders to ensure greater understanding of the complex issues involved in the application of the precautionary principle. It is essential, she said, to ensure an appropriate level of consumer protection without over-regulation. Professor Ortwin Renn then presented an overview of the issue and recommendations in applying the principle to the audience, composed of representatives of the Parliament, the Commission, Industry and NGOs.

According to Renn, the policy dilemma at the heart of risk management is that policies responding to the risk perceptions of lay people will over regulate, whilst those entirely based on scientific expertise may not be supported by the public. Three generic characteristics underlie the definition of risk: complexity, uncertainty and ambiguity. According to Renn, these characteristics are often confused in the public debate due to linguistic blurring of definitions. Complexity assesses causal and temporal relationships and is the area where expert risk science input is required. Uncertainty, which includes variation, (systematic and random) errors in applying statistical procedures, understanding the limits of the system and evaluating unknowns, describes the realm of unintended consequences where scientific data is either not available or inconclusive. Ambiguity in interpretation of risk analysis, he said, is very much an ethical issue as it deals with the moral evaluation of intended consequences. The factors that matter in assessing risk include not only the classic components, probability and potential for harm, but also criteria such as remaining uncertainties, ubiquity, persistence, delayed effects, equity violations (i.e. is the risk fair - or not - for all) and the potential for social mobilisation.

Definitions of precaution are varied - a general definition is an act of caution in the face of uncertainty. Three elements are always involved in the elaboration of the precautionary principle: the role of science; the role of legislation and the role of subjective interpretation. The EC Communication on the Precautionary Principle in 2000 laid down useful criteria for guidance. Renn defined five risk management strategies to cope with the different combination of complexity, uncertainty and ambiguity : routine risk; complex and sophisticated risk; highly uncertain risk; highly controversial risk; and risk involving 'clear and present danger' where fast response is needed.

Based on Renn's model, routine risk management requires standard assessment and deals with known parameters and low complexity. More complex risk, where causal links are not clear, require good modelling and mechanisms that incorporate dissenting expert opinion. Coping with highly uncertain risk, he continued, requires a precaution-based approach. The goal of this exercise should be to avoid irreversible effects and to strive for resilience rather than optimal risk modelling. To identify the appropriate balance of precaution (i.e., between being too cautious and risking to impede innovation or being not cautious enough and hence risking to damage people and the environment) is best achieved via negotiation between the stakeholders involved. In situations with high ambiguity, a discourse-based approach broadens the debate with a goal of finding a common consensus or tolerance between conflicting values or visions. The debate is essentially about moral or ethical values and questions like "do we want to do this?" Finally, Renn concluded, the strategy of prevention is essentially risk crisis management to deal quickly with clearly intolerable risks. The concept of this risk management escalator moving from simple via complex and uncertain to ambiguous phenomena is a useful tool to screen risk and provide coping strategies.

Debate

In a lively debate following his presentation, Renn indicated three concepts that could boost the confidence of the public in science: transparency/ openness about scientific process, two-way communication, and participation with the public. Assessing a uniform public opinion on any subject across Europe is not easy, he conceded, as concerns are not ubiquitous, however common concerns can be discerned. Difference between experts is often a problem in application of the precautionary principle, as pointed out by MEP Rolf Linkhor in the discussion, however Renn believed that on questions of complexity (i.e. the science), agreement among experts should be possible. Dissent on issues of uncertainty and ambiguity are normal human traits, he pointed out. In certain examples, science (e.g. analytical chemistry) could drive uncertainty, but regulation needs to remain practical and useable. Policy makers need to understand what science can provide and how to use it prudently for regulatory purposes.