CARGO

Comparison of Approaches to Risk Governance

Final report

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FOREWORD

The CARGO Project (Comparison of Approaches to Risk Governance) has been organized within the Science and Society area of the European Union Sixth Framework Programme. The project started in June 2006 and ended in May 2008. It has been conduced as a Coordination Action within the Thematic Priority "Citizens and governance in a knowledge-based society".

The project has been performed with five Work Packages: 1) Risk-informed decision-making2) Precaution and risk reduction 3) Risk deliberation 4) Summer school 5) Dialogue with end users. The first three represent three approaches to risk governance. Work Package 5 was a summer school organized in Smögen at the Swedish west coast, which widened the CARGO perspective to include much of the societal context within which risk governance takes place. In work package 5 discussions were held with different categories of end users about what would be important elements in an integrated approach to risk governance.

It is my hope that the project will give a valuable contribution to the dialogue at a European level about how risk governance can effectively take place in an inclusive, transparent and democratic manner.

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Contents

1. INRODUCTION

Societal decisions in many areas, such as energy production, genetic testing, stem cell research, food safety or carbon dioxide disposal, include factual and value-laden elements of both risks and benefits. In all decisions, positive and negative factors have to be taken into account and be weighted against each other. These issues are of technical and scientific character but they also reflect social concerns and potential major democratic challenges and therefore it is critical that they are met not by technocratic decision-making.

Indeed, increased openness, public participation and transparency are all put forward as crucial for decision-making today. However, the increasing complexity of today's society and decision-making processes and a heightened concern for how both public and private organizations perform, make the issues of transparency and participation complicated. Pressure on public administration as well as corporations to be open and transparent may lead to an excessive focus on being seen to follow due procedure, on 'how to do things right' rather than on 'how to do the right thing'. The decision-making context is not only set up by internal negotiations of how to translate expert knowledge into policy, but also by stakeholder pressure groups and extensive media coverage. The seemingly unlimited availability of information on the Internet and the continuous information flow in TV channels does not make it easier for the layman to get insight and clarity.

In the domain of *risk governance,* these problems are very relevant, first of all since the concept of risk itself is differently understood among various groups in society. Moreover, in many cases the risks of new technologies are discovered and fully understood not until the technologies have been implemented and established in the market economy. The increasing understanding of this mechanism of delay in risk identification is one reason for the introduction of the precautionary principle as a means to reduce risks.

But risk management may also create new risks. The critique against a technocratic view was first discussed as a problem *within* risk analysis. Public perceptions of risk were seen as a challenge to how risk was defined and approached by technical and calculative means. From the mid-1990s, however, there has been a shift from this internal focus to the broader question of the legitimacy of government. Michael Power (2007) denotes this shift as a shift from risk analysis to risk governance. The "governing gaze" has shifted from how risk is defined, analysed and calculated to the governance of the organisations that analyse risk. Among other things this shift implies that organisations may see public perceptions *as sources of risk*, in that they could pose a threat to the legitimacy and stability of existing ways of governing risk.

The point of departure for the CARGO project is that there is a need for more knowledge about the governance of risk. Three approaches to risk governance are compared by using a number of example areas, it is explored how risk governance can be made transparent to decision makers and the general public, and recommendations are made for a comprehensive risk governance strategy.

The management of risk is an issue of concern at the highest political level. For example, in the UK, Her Majesty's Treasury (2005), has published an appraisal guidance for managing risks to the public. The document provides guidance for developing and assessing proposals that affect the risk of fatalities, injury and other harms to the public. It confirms that communication, public involvement, and risk management should be integrated into the decision-making process at an early stage. There is also a commitment that government will

explain how views obtained through consultation have been reflected in its decisions. A great deal of the document is devoted to the management of public involvement - especially there is an appendix that sets out a framework for understanding peoples concerns.

Also at the level of the European Union and on the global scale risk management principles are being discussed and used in guidance, EU Directives and international conventions. There can thus hardly be any more relevant topic for policy makers than the comparison and integration of risk management approaches.

Three work packages of the CARGO project represent three approaches to risk governance. Risk-informed decision-making is more based on quantitative assessments than the other two. The precaution and risk reduction approaches involve both qualitative (value – laden and ethical) principles and more traditional risk assessment. The deliberative approach refers to processes aiming to include lay people in discussions over science and technology and risk.

Another major work package was the second VALDOC summer school that was arranged as part of the CARGO project (VALDOC = VALues in Decisions On Complexity). The summer school took place in Smögen, Sweden on June 10-15, 2007. The programme involved lectures and group discussions with themes chosen to introduce and explain the three central themes of the CARGO project as well as the RISCOM model of transparency. Presenters were chosen to reflect a variety of theoretical and scholarly work, experiences from risk related work and life interests, as well as current EU policies and work in related areas.

Chapter 2 of this report gives a brief description of the three risk governance approaches; risk-informed decision making, precaution and deliberation and some key issues are brought forward. Chapter 3 analyses the three approaches using a special systems methodology and how they can be combined, and in the end some key questions are brought forward. In Chapter 4 we summarize the VALDOC summer school programme and issues discussed there. Finally, chapter 5 discusses the overall risk governance process and some recommendations are given about how it can be improved in clarity and quality.

2. THREE APPROACHES TO RISK GOVERNANCE

The three approaches to risk governance dealt with in the CARGO project have been studied in three work packages reported separately in the following reports:

- Risk-informed decision-making in Serbanescu and Vetere Arellano (2008), CARGO Deliverable 4
- Precaution and risk reduction in Andersson (2008), CARGO Deliverable 5
- Deliberation in Reynolds, Soneryd and Szerszynski (2008) CARGO Deliverable 6,

In this chapter we give a brief summary of each one of them. We then elaborate on some factors of importance for their application: the fact that risk governance take place in a pluralist society, the opening up versus closing down of issues, and the acceptability of risks.

2.1   Risk-Informed Decision-making

Risk-informed decision-making relies on quantitative risk assessment (QRA) which is a systematic methodology for the application of a mathematical construct of risk. It tries to identify all possible events that can lead to an undesired end state, thus evaluating an overall estimate of risk for the system being analyzed (e.g. a nuclear reactor). The QRA is a powerful instrument for finding risk-dominant sequences in technical systems which then can be taken care of to prevent the sequences from occurring. QRA is best suited for large technical systems where the failure probabilities of the components in the system can be estimated with relatively large certainty.

In spite of limitations in completeness, ability to assign probabilities and consequence analysis, QRA has enjoyed great success in nuclear safety. The confidence in the QRA method grew to the extent that the NRC established a policy for implementing *risk-informed regulation* in the 1995 policy statement on the use of quantitative risk assessment methods in nuclear regulatory activities (Nuclear Regulatory Commission, 1995)

It is important to realize what distinguishes *the risk-informed* approach to decision-making from a *risk-based* approach in which a safety decision is solely based on the numerical results of risk assessment. This would place heavier reliance on risk assessment results than is practicable. However, in spite of its success story as part of reactor safety work, risk-informed decision-making using QRA as an important element has limitations when it comes to decisions on the political level, e.g. concerning the use of nuclear power as compared to other energy sources or the siting of reactor power plants. For these decisions, the mathematical construct of risk is not sufficient. Other dimensions in a more comprehensive risk assessment which takes into account social and perceptional factors then enter the scene. For example the risk from nuclear power as calculated with QRA techniques may be lower than for many other energy sources. In addition, nuclear power is environmentally clean during normal operation. However, the consequences of a severe accident, whatever low probability it may have, are still severe. The potential harm may thus outweigh the QRA risk in policy making.

The concept of risk-informed decision-making implies that different risks can be compared. To what extent is that possible? As human beings, we take risky decisions all the time, from the hour we get up in the morning until we fall asleep. Those of us who smoke cigarettes take risks on a well informed basis. Driving our car or to taking a ride on our motorcycle are also

quite well informed risky decisions (in these cases risk is also directly measurable by the size of our insurance premium). On a societal level, annual individual occupational risks are other well known statistical facts, although as individuals we may not have the same freedom to avoid them as we have for avoiding risks associated with smoking, driving motorcycles or mounting climbing. Certain risks, notably the probability of dying as a result of certain activities, are thus statistically well known. And, as we have seen, QRA methods can often help in quantifying risks and providing information on how they can be reduced.

2.2   Precaution and Risk Reduction

The precautionary principle comes into force when there are possible serious risks with large scientific uncertainty. The precautionary principle is listed as Principle 15 of the Rio Declaration of 1992 among the principles of general rights and obligations of national authorities (Robinson and Nicholas, 1992):

> *"In order to protect the environment, the precautionary approach should be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation".*

Since 1992, the principle has been implemented in various environmental instruments for areas such as global climate change, ozone-depleting substances and biodiversity conservation. It is action-oriented, meaning that persistent dissent among scientists can not be taken as an excuse not to take action.

The precautionary principle as cited above deals with protection of the environment; however, in different forms it is used in many other areas, especially in human health protection. The principle is the subject of much deliberation and controversy on the philosophical level but also when it comes to practical applications in specific areas. Often the battle goes on between a certain industry wanting to introduce a new technology and opposing groups using the precautionary principle as an argument for a moratorium until more is known about uncertain risks. Typically, regulatory authorities find themselves being on the frontline between these two major stakeholder groups. They have to make decisions based on scientific evidence but also need to take public values into account.

It can be argued that the precautionary principle is not really action-oriented, but instead can be used to prevent the introduction of any new technology without any real factual reason. And can it be justified, for example, to use the mere existence of public concern as a reason for precautionary measures when there is no real risk at hand? Another problem is that the application of the principle can be taken over by scientists and regulators, and become just another tool in technocratic risk assessment. People with a pure scientific approach want to see that there is a substantial risk before they take action. The probability is high that they will use the mathematical construct of risk, furthermore narrowly defined to a specific type of risk. The dimensions of social values and ethics are then lost.

Regardless of different interpretations of the precautionary principle, a common ground is that the absence of proof of a risk is not reason enough *not* to take precautions. But to trigger the precautionary principle there should be an *indication* for a possible risk. An important issue for discussion is often how strong the indications should need to be for the precautionary

principle to be triggered. There is no obvious way to judge whether the authorities apply the precautionary principle in a correct manner. Therefore, there is reason to require that the authorities make transparent on what grounds they apply the principle, scientifically as well as value-based.

The politicians need to understand that it is not enough to have established the precautionary principle for environmental protection and public health. They have to take continued responsibility for the application of the principle in all policy areas, for the very simple reason that it is their responsibility to determine what the relevant risks are. The European Commission has made it perfectly clear where the expert role ends and where political responsibility takes over (European Commission, 2000, p 2):

> *The precautionary principle should be considered within a structured approach to the analysis of risk which comprises three elements: risk assessment, risk management, risk communication. The precautionary principle is particularly relevant to the management of risk*

And further on (ibid, p3):

> *The implementation of an approach based on the precautionary principle should start with a scientific evaluation, as complete as possible, and where possible, identifying at each stage the degree of scientific uncertainty.*
>
> *Decision-makers need to be aware of the degree of uncertainty attached to the results of the evaluation of the available scientific information. Judging what is an "acceptable" level of risk for society is an eminently **political** responsibility. Decision-makers faced with an unacceptable risk, scientific uncertainty and public concerns have a duty to find answers. Therefore, all these factors have to be taken into consideration.*

The Commission also states that "The decision-making procedure should be transparent and should involve as early as possible and to the extent reasonably possible all interested parties" (ibid, p3).

The precautionary principle is not thought to replace risk-informed decision making, but to be used when the latter cannot be applied because of too much scientific uncertainty (provided, that is, that there is a threat of serious or irreversible damage). The need for insight and transparency as a prerequisite for high quality decisions goes for application of the precautionary principle as well. On the factual side, we need to evaluate the scientific status of the area to see if the requirement of scientific uncertainty is fulfilled. On the value-laden side we need to evaluate the nature of the threat and compare it with some sort of standard in order to decide if action shall be taken or not. Such standards have a normative character and cannot be set by science alone. For example, for the GMO case one can identify several possible standards such as food safety, biodiversity, comparison with conventional agricultural practices and compatibility with sustainable agricultural practice. Divergence from any of these standards could set the precautionary principle into action. Which one of them (if any, or which combination of them) to use is, however, a matter of societal values and politics.

In the report "Late lessons from early warnings" from the European Environment Agency (EEA) (Harremoës et al. 2001) the authors identify a number of heuristic principles, which can help guide judgement over whether precautionary action is called for in any particular case. The report stresses the need to broaden the sources and forms of knowledge in order to avoid that issues are too narrowly framed so that early warnings of risk are never, or too late,

taken seriously. In order to broaden the sources of knowledge and to improve the use of the precautionary principle, taking public concerns into consideration is only one of several recommendations presented in the report. Other important aspects that are highlighted in the conclusions of the report are (ibid: 193-194): the need for multi-disciplinarity (the inclusion of relevant social issues alongside the physical, chemical, biological and medical aspects of technologies); the need to identify and reduce interdisciplinary obstacles to learning; the need for ongoing scientific monitoring; the need to scrutinise claimed justifications and benefits alongside the potential risks etc.

Thus, most of the recommendations in the EEA report relates to the question of improving the knowledge base. This does not mean that uncertainties or ignorance are eradicated, which the report also stresses. However, the recommendations could increase the chances of anticipating costly impacts and achieve a better balance between the pros and cons of technological innovations (ibid: 194).

Listening to the experience of social groups who might have relevant experiential knowledge as well as taking full account of the assumptions and values of social groups are also part of the reports' recommendations and this brings us to the next section on participatory and deliberative approaches to risk.

2.3 Risk deliberation

There are three rationales for the desirability of public involvement in risk governance. The first rationale is *ethical* and means that citizens have the right to be involved in decisions that concerns them. In other words, we should respect our citizens' right for self-determination and autonomy. The second rationale is *instrumental*. This means that public involvement is assumed to mitigate conflicts and aid strategies for the presentation and implementation of a decision. The third rationale concerns *knowledge*. The public should be involved because citizens have knowledge, which is different from the knowledge of experts and politicians. This lay-knowledge is often of essential importance for the issue being considered, at least meaning that the knowledge base becomes wider. This could concern local residents' knowledge of the local environment, as well as the provision of diverse social knowledges, values and meanings which could inform critical discussions about how issues are framed.

Public deliberation has been suggested as a remedy to a range of structural problems that are associated with aggregative and inflexible forms of decision-making. It is assumed that by making democratic institutions more deliberative, a 'democracy deficit', expressed in voter numbers in decline and increased mistrust in public institutions, can be overcome. What is perceived as 'good risk governance' in the EU is explicitly announced to involve deliberative participatory elements. For example, the European Commission's white paper on European Governance (CEC 2001a:3) proposes that good governance implies that "more people and organisations are involved in shaping and delivering EU policy". This includes efforts to democratise expertise, to improve access and participation and to involve relevant stakeholders at every stage of the process, from the "identification of risks to the evaluation of policies intended to manage them" (CEC 2001b: 25). Thus, making risk regulation decision-making processes more deliberative is mainly about making them more inclusive, "questions normally seen as the province of experts and functionaries, lobbyists and politicians, must somehow be brought before the public at large for comment, debate, and in some cases, resolution" (Whiteside 2006:118).

Deliberative risk governance may appear to be an adequate response to calls for a remedy to democracy deficits as well as too narrow technocratic approaches to risk. However, it is important not to confuse public deliberation as a *social phenomenon*, which may take many forms, with public deliberation as a *policy tool*, which is always framed around particular issues and objectives (cf. Plows 2007). Policy tools will always be imperfect and have undesired and unanticipated side effects, and perhaps more importantly, they will always be connected to a particular political economy.

For example, when nuclear power was discussed in the 1970s and when GM crops were debated in the 1990s, both issues were connected to powerful science communities before public discussions were generated. However, the issues arose in very different circumstances. The state had a more central role in the 1970s nuclear power debate. Three decades later, the state's role has changed, policies emerge and are formed within transnational networks, and science and technology are seen as important means for competition in a globalised market. Such changes pose new challenges to public deliberation and the policy tools aiming to stimulate public engagement and debate need to be understood in relation to them.

In many European countries, seeking lay views to inform complex technical and scientific decisions has become political orthodoxy, and it is in order to increase 'public participation' in science and technology policies that the most innovative instruments of consultations are being devised today. This new centrality of 'the public' has been accompanied by the growth of a veritable industry, one that employs different techniques of elicitation – the opinion poll, the focus group, the citizens' jury, etc – to generate and process the views and opinions of different publics and feed them into the policy-making process.

One aspect of participation is the emergence of a new type of expertise employed to organise, conduct and make claims on behalf of various groups of the public. The public consultations carried out as part of the *GM Nation* in the UK form a case that can inform us about this new type of expertise and the role of citizens in decisions over complex technologies. Another aspect is t*he conduct of the conduct* of public consultations. By this we mean the methods and models used to organize the communication and interaction in such consultations, and how legitimate constituencies of the public are constructed through the use of such methods.

For instance, in the *GM Nation* Public Debate, the distinction between 'stakeholders' and the 'general public' became an important topic and the main challenge for the organizers, since an important aim was to reach 'ordinary people' without preconceived views. This interest in the opinions of reticent publics and 'hard to hear' constituencies seem to be valuable commodities in the policy-making process; listening attentively to *silent* majorities is now a main occupation and preoccupation of governments. This ambition is today most intense, perhaps paradoxically, in policy areas that have traditionally been the domain of experts and unaccountable professionals. But it is also prone to being politicised, as the convening of 'silent majorities' can be seen as an instrumental attempt to bring into being a counterweight to the critical opinions of publics that have been mobilised around an issue.

2.4 Risk governance in a pluralist society

The barriers to integrated approaches to risk governance should not be neglected. Kerry Whiteside (2006) points out that democracies today are more pluralist than deliberative, Even though this may be more prevalent in the United States than in Europe, pluralist aspects of

democracy can counteract deliberative qualities, also within European countries. While a deliberative approach would be based on an ethos of seeking the common good and the better argument, a pluralist society is based on trade-offs among interest groups: it is short-term electoral advantage that comes to the fore in pluralist decision-making, not the long-term environmental consequences. Such tendencies are obstructing the possibilities not only to a deliberative approach, but also to risk-informed decision-making and precaution and a more sophisticated approach to information processing and knowledge production as suggested in the EEA report mentioned above.

Political mobilization usually occurs around visible problems affecting clearly identifiable victims, seldom around invisible, slowly accumulating dangers" (Whiteside 2006:132f). Whiteside argues that pluralist democracies can combine some aspects of deliberation and precaution, for example by encouraging wider rather than narrower participation, and to create legal structures that support preventive policies. Similar to Dryzek et al (2007) he points to the importance of institutions for participatory technology assessment, like the Danish Technology Board, and elsewhere in Europe.

Existing institutions for participatory technology assessment, depending on organisational factors, resources etc., differ in their capacity to combine different approaches to risk. What Dryzek et al. (2007) emphasise as crucial for successful ('successful' in terms of its ability to produce more legitimate and informed decision) public deliberations on risk is the prevailing discourse on how to balance between economic growth and environmental protection. In societies in which environmental protection and economic growth are seen as mutually reinforcing as opposed to the tendency that economic concerns override ecological concerns, the conditions for combined approaches are better than when this is not the case.

2.5   Opening up versus closing down

Instead of relying on the dichotomy between analytical expert-based approaches and more open and flexible participatory approaches Stirling suggests that we look at distinctions that are crosscutting and that may be equally relevant to both. One such crosscutting distinction is that between *opening up* or *closing down* the process of technological choice.

When the social appraisal process is about closing down, the aim is instrumentally to assist policy-making: "Whether analytical or participatory, the role of social appraisal process lies in cutting through the messy, intractable and conflict-prone diversity of interests and perspectives to develop a clear authoritative, prescriptive recommendation to inform decisions" (Stirling 2005:228). The outcome of a process aiming to close down, is a *unitary and prescriptive* policy advice, presenting only a small number of choices or courses of action to be explored, which appear as favourable in the light of how the process has been framed.

When the social appraisal process is about opening up the process of technological choice, the aim is to explore a wide range of possibilities, and the outcome is rather a *plural and conditional* advice. It involves a systematic exploration of how framing conditions relate to "the real world of divergent contexts, public constituencies, disciplinary perspectives and stakeholder interests" (ibid:229).

The distinction between opening up - expanding and enriching the scope of the debate - or closing down issues and policy options is not directly related to certain methods. For instance, the consensus conference in the Danish context aims to open up discussions over technology and enrich the political debate, and sometimes this works, for example when issues dealt with

in a consensus conference are taken up in discussions in the parliament. The same opening up approach can be used in the US-style consensus conferences, which are less participatory and inclusive. Focus groups can also be used in either opening up or closing down approaches, depending on how the results are presented and fed into a debate.

2.6 What makes a risk unacceptable?

Legislation usually stipulates that measures must be taken to mitigate those risks that are regarded as 'unacceptable'. Similarly, the presence of trivial risks is accepted as a matter of course. The issue is then what approaches are used in mitigating the non-trivial risks which fall into the "grey area" where a balance needs to be reached between risks, costs and benefits, and other wider decision criteria. For substances identified as potentially damaging, a range of regulatory controls exists at both national, EU and international levels. The approaches adopted in setting such controls vary across countries and regulatory agencies. In some countries, regulation is based on a precautionary stance, which requires that risks be minimized, even if the causes and mechanisms are unknown, when human health or the environment is under threat. In the extreme, such an approach implies that many hazardous chemicals and activities are considered unacceptable because of the uncertain nature of associated risks. This type of approach to the management of chemical risks may neglect the benefits that the chemicals could confer on society. A less strict interpretation of the precautionary principle stresses the cost of taking precautionary measures. Other approaches to risk reduction are technology-led. For example, they can be based on the concepts of making emissions 'as low as reasonably practicable' or the use of 'best available techniques not entailing excessive costs'. Both these concepts recognize, at least implicitly, that a balance should be found between the costs involved in reducing risks and the benefits gained from risk reductions. To find the balance point is a matter of values and thus a political task.

Although there is wide consensus about the limits of acceptable and unacceptable risks, the practical applications of risk management differ significantly between different countries. In particular, the extent to which QRA has gained acceptance in addressing major accident hazards varies between industries. Within Europe, while some regulators are quite enthusiastic requiring QRA studies by law, e.g. the UK and the Netherlands, other countries, e.g. France and Germany, prefer a consequence-based approach. The Netherlands has a clearly defined policy on the maximum levels of risk that are acceptable in land-use decisions (a risk-informed approach). In Germany, deterministic approaches are extensively used in the chemical process industry to demonstrate the quality of measures taken to avoid risk inside and outside the installation.

3. RISK GOVERNANCE FROM A SYSTEMS ANALYTICAL PERSPECTIVE

Peter Checkland (1998) has defined the mnemonic CATWOE to describe a human activity and its situation as part of the *Soft Systems Methodology*. From the perspective of a specific World View ("Weltanschauung"), the activity is seen as Transforming a defined input into a defined output. This Transformation is performed for Customers by Actors. The activity is controlled by Owners, and occurs within an Environment that sets certain conditions on the activity. The elements of CATWOE are thus Customers, Actors, Transformation, Weltanshauung (world view), Owner and Environment:

- Customers - those who may benefit or suffer from the process
- Actors - Those who carry out the main activities within the system
- Transformation - the conversion of some input to some output
- World view - image or model of the world which makes the transformation meaningful
- Owners – those who control the activity and have the power to stop it
- Environment - constraints from the 'world' in which the activity takes place

It can be helpful to describe our three approaches to risk governance in these terms, as we shall do so in the first section of this chapter.

3.1   The three approaches

It should be said that the conduct of the three approaches are to a certain extent stylised in this section, with the purpose of clarifying certain points for our continued discussion. The idea is that focusing on the core ideas (world views) behind the application of, for example, risk-informed decision-making will facilitate the identification of critical questions, and help us to understand how an integrated approach to risk governance might best be organized.

Risk-informed decision making

Risk-informed decision-making is typically controlled by industrial companies, who want to optimise their risk-reducing programmes or by regulatory agencies, who regulate these industries. In this case, the ***owners*** of the risk informing activity are thus the same as the ***customers*** - industrial companies or regulatory agencies. The work is done by experts ***(actors)*** who have task to ***transform*** data on components in the system, such as failure probabilities, to a risk measure. As we are dealing with risk-informed, and not risk-based, decision-making the owners must see to it that also more quantitative aspects, such as quality assurance of models and data, are also taken into account before decisions are made. The ***world view***, however, is that quantitative risk assessment can correctly and legitimately be used for decision-making for the topics being considered. In the ***environment*** of risk-informed decision-making you often find pressure from politics, non governmental organizations and the press.

Precaution

Even if the precautionary principle has been established by politicians (in the Rio declaration, in the EU context, in national legislation etc.,) the responsibility to interpret and apply it

normally rests with government agencies who can then be said to be both ***the owners and the actors*** of the activities related to its application. The ***world view*** thus seems to be, first that uncertain harm should be prevented, but also that expert authorities are competent to judge whether the precautionary principle should be set into action and, if so, what measures should then be taken. Uncertainty about the extent of the risk being considered is ***transformed*** into preventive measures. As the principle has been established to protect the citizens from harm they are the ***customers*** of risk reducing regulations based on the principle. In this case NGOs and concerned citizens constitute an ***environment*** that can challenge the legitimacy of decisions, especially decisions meaning that risk reducing measures are not needed as there are not strong enough indications of a serious harm.

Risk deliberation

In a deliberative process representatives of the public, NGOs and various stakeholders are invited to participate – they thus become the ***actors***. The ***world view*** is that deliberation promotes the common good and improves the quality of societal decisions as different viewpoints are allowed to take part. In a deliberative process these views are ***transformed*** into statements, recommendations or even decisions on the management of risk. The controlling bodies, the ***owners***, of a deliberative process can vary. Typically it is the initiator or the funding party who controls the process, and without its support it ends. Sometimes it can be organized so that the actors themselves have the ability to control the process. It is the participants themselves who should benefit from a deliberative exercise, but also the public at large can be ***customers***. If a deliberative process ends with advice to political bodies, e.g. a government or a parliament, they are also customers. A government can also be part of the ***environment*** that sets, constrains or tries to impact on deliberation.

	Risk-informed decision making	**Precaution**	**Risk deliberation**
Customers	Regulatory agencies Industry	Public	Stakeholders, NGOs, public, political bodies
Actors	Experts	Gov. agencies	Stakeholders, NGOs
Transformation	Data to risk estimate for decision	Uncertainty to preventive measures	Stakeholder views to common standpoint
World view	Quantification of risk	Uncertain harm should be prevented, expert authorities can decide	Deliberation promotes the common good
Owners	Regulatory agencies Industry	Gov. agencies	Initiator or funding party
Environment	Politics, NGOs, media	Concerned citizens, NGOs, media	political bodies, media

Table 1: CATWOE for risk-informed decision-making, precaution and deliberation

3.2   Some reflections

Having used the CATWOE concept to help us getting some further insight into the three approaches to risk governance some reflections can be made about critical questions that could be asked when each one of them is applied. It is clear that *risk-informed decision-*

making works best for relatively well defined systems for which hazard scenarios have known consequences and reliable probability estimates. Some relevant questions that the actors of QRA, its owners, and customers, but also stakeholders and the general public can put forward are:

- Has the issue been excessively narrowly framed in order to be fit for QRA and expert investigations'?
- Is the knowledge base good enough for a risk-informed approach or are the uncertainties big enough for a precautionary approach?
- Are the questions given to QRA broad enough to solve the decision-making problem or are there additional relevant issues that the QRA is not suitable for answering?
- Are there proper procedures for quality control?
- Are the uncertainties communicated properly to the decision makers?

When the *precautionary approach* is used there are questions for example about the role of authorities in judging value-laden issues:
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- Is the area (e.g. GMOs, nanotechnology, electromagnetic fields) a case for precaution, taking uncertainty and potential harm into account?
- Are the value-laden elements in decisions related to precaution explicitly exposed to politicians and the public?
- How do the competent authorises deal with the value-laden elements (purely by experts or with some sort of deliberation)?
- Is there a political interest and responsibility taken for how the precautionary principle is used?
- Do the public and stakeholders have insight into how the precautionary principle is applied?
- If the authorities say that the precautionary principle is not applicable because there are not enough indications of serious harm, are their arguments open for public scrutiny?
- If the authorities say they want to apply the precautionary principle in a certain area, are the links between uncertainty and protective measures transparent?

For *risk deliberation* there are questions with respect to legitimacy and accountability:

- Who controls the deliberation? Is there a serious intention to take the results into account?
- How are the results going to be used, and what are the links to the normal political process, including representative democracy?
- What is the role of NGOs? Are they seen as experts, stakeholders or representatives of the public?
- Is it clear who makes the decisions and who is accountable for what?
- Are the experts given a proper role so that the factual issues are clarified?

4. THE VALDOC SUMMER SCHOOL

VALDOC stands for VALues in Decisions On Complexity. The overall goal for the 2007 Summer School was to highlight and study decision-making and to explore new procedures and new arenas for public discourse, especially in relation to complex, politically and ethically controversial issues. In particular, the approaches to risk governance dealt with in the first three work packages of CARGO were presented and discussed. The summer school also dealt with the political context within which decisions on risk management ultimately take place. The summer school therefore functioned as a bridge between the different work packages of the project.

The summer school has been reported separately in CARGO Deliverable 2: Drottz Sjöberg (2008). Here we summarize the programme as well some conclusions.

Participants

There were 40 persons involved in the summer school, including the organizers, invited speakers, lecturers and participants. The largest single nationality represented was from Sweden; about 50% was citizens of the Nordic countries and 50% came from various European countries as well as Japan, USA and Canada. There were 18 participants not involved in the organisational committee or as invited speakers, of those were 8 students or doctoral students. The table below presents an overview of number of participants from different countries.

Country	Σ	Country	Σ	Country	Σ
Sweden	14	Finland	2	USA	1
The Netherlands	5	Rumania	1	Estonia	1
Norge	4	Greece	1	Japan	1
United Kingdom	4	Canada	1	Germany	1
Belgium	3	Denmark	1	Total	40

Programme

The Summer school started on Sunday, June 10, 2007 and ended on Friday, June 15. The week involved lectures, group discussions and a number of excursions. The event was officially opened at the conference site by Ms Britt Wall from the local municipality board. The announced programme is presented in Appendix 2. An overview of the lecture themes and a short summary of contents are given below.

Themes Monday

- Transparency & accountability – the VALDOC philosophy (Kjell Andersson)
- International & cross-cultural work and cooperation (Kåre Harald Drager)
- Role of values in a complex society (Patricia-Ann Fleming)
- Perception & emotions (B-M Drottz Sjöberg)
- Group work based on the prepared question: Transparency and accountability in societal decision-making – how can facts, values, and emotions be dealt with?

Themes Tuesday

- Open society & the role of media (Göran Rosenberg)
- Lobbyism & role of lobbyists in decision-making (Leif Hallberg)
- The RISCOM model (Claes-Otto Wene)
- Analyzing arguments in depth; rhetoric (Isabel Runebjörk)
- Group work based on the prepared questions: Agenda setting and arguments – how can society and its citizens increase their awareness? What are (or what should be) the roles of journalism, lobbyism, and rhetoric?

Themes Wednesday

- Social values in risk analysis; the unknown unknown (J Peter Burgess)
- Deliberation for risk governance (Linda Soneryd & Bronislaw Szerszynski)
- Views from the European Commission (Philippe Galiay)
- Ethics in technology development (Donald Bruce)

Themes Thursday

- When politics & science meet in the same individual (Marie Wahlgren)
- Risk-informed decision-making (Dan Serbanescu)
- EC mid term review on the strategy on life sciences and biotechnology (Ispas Ioana Rodica)
- Group work based on the prepared questions: Approaches to risk governance – is there an integrated approach? What are (or what should be) the roles of quantitative risk analysis, deliberation and the precautionary principle?

Themes Friday

- Summing up: organizers summary and groups' presentations of results
- Evaluation
- Departure

Summary of lectures

Kjell Andersson welcomed all participants to the course and there was a round of presentations. He introduced the themes of transparency and accountability in risk governance and societal decision-making in accordance with available reports and articles. He pointed out that the principles of transparency and accountability are applicable to a large number of areas e.g. the energy sector, land use, in relation to production and use of chemical substances, biotechnology, IT and nanotechnology. In these areas, as well in societal decision-making as whole, discussions and decisions involve various arenas where politicians, experts and citizens, NGO's and the media produce a "market of arguments". Time, attention span and low degree of "stretching" form constraints and limitations to deeper understanding and participation. Therefore it is important to include transparency and accountability as guiding principles in work related to risks and decision-making.

Kåre Harald Drager, president of The International Emergency Management Society (TIEMS) held a presentation with the title "Transparency and cross-cultural cooperation: Possibilities and problems in an international context and development". Drager reviewed his

background and career and introduced the TIEMS organization, as well as the Global Forum for Public Safety Communication. He emphasized that reducing poverty is the overall most effective risk management strategy, furthermore, that education, local efforts and participation are important for conflict solving, the prevention of spreading of diseases, and of migration.

Patricia-Ann Fleming of the Creighton University, Department of Philosophy, talked about "The role of values in a complex technical society". Fleming asserted that the first act of transparency is to clarify the meaning of words. We have to stretch ourselves and each other to be precise. She presented the differences between *Verstehen* and *Erklaren,* and pointed out that both concepts go beyond "transparency". Fleming differentiated between "constitutive values" and "contextual values". The former is an epistemic type of value generated from an understanding of the goals of knowledge, e.g. Science. Contextual values on the other hand refer to worth, preferences and "ought", as reflected in cultural values.

Britt-Marie Drottz Sjöberg, BMD Research, talked about "Perception and emotions – risk perception." The contents included an overview of the theoretical basis of the risk perception field, and of basic emotions including facial expressions and bodily reactions to stress. The psychometric paradigm and its central influencing factors of catastrophic potential, novelty, and number of exposed was presented. The steering factors of perceived risk were grouped into those a) related to the type of hazard, industry or situation, b) related to the social context, and those related to methodology or the context of a study. In addition were central themes of the cultural theory, and its views on nature, outlined.

Göran Rosenberg, Göran Rosenberg AB, held the first invited speech on Tuesday morning and presented his paper on "The media society vs. the open society: Emerging contradictions and conflicts". Rosenberg started by making some comments on transparency and the open society:

"The demand for transparency in an increasingly opaque or obscure system of global power and decision-making is sometimes seen as self-justifying and transparency as something good in itself. I think that this may serve to weaken to case for transparency. Transparency needs to be argued for. The argument for transparency is the need for an open society."

Among other things, Rosenberg portrayed the emerging Media Society as a potential enemy to the Open Society:

"I believe that we today can observe emerging conflicts and contradictions between what we may understand as the Open Society and what I here will call the Media Society. Since the emergence of modern media in society is historically linked to the widening of the public arena and the broadening of public debate and thereby to the opening of modern society, this is indeed a somewhat surprising and puzzling observation. Could it be that the Media, broadly speaking, could become yet another enemy of the Open Society?"

Leif Hallberg, Director of European Public Affairs, Intrum Justitia AB, talked about "Lobbying in Brussels, its role in policy- and decision-making". This theme raises many questions. What is lobbying? Are there different kinds? Legitimate to whom, illegitimate to whom? To the benefit of whom? Of the very stakeholder only? Is lobbying taking place within the framework of representative democracy? Who challenges the arguments of the lobbyist? Can it be reviewed and taken to account? If not, could it be seen as a threat to the democratic process or as a way to enrich the democratic process by providing further expert

advice and broadened perspectives? Any ethics and rules at play? Registration? Who are the lobbyists? He suggested "two attempts at a definition" of lobbying: (1) An activity by which you make others think like you do, (2) An activity which is purposefully organized for impacting on empowered policy-makers at a crucial time with the aim to achieve a specific and desired political decision.

In lobbying it helps to represent a "leading" organisation, to deliver timely and expertly, and to be constructive, discrete, keep confidential information, be knowledgeable, get involved early, find allies, and set priorities. This may lead to an impact and a capacity to influence. The impact also has to do with trust.

Clas-Otto Wene, Wenergy, presented "The RISCOM model of transparency". This presentation involved the development and contents of the RISCOM model and should be viewed in relation to the presentation by Kjell Andersson. Those interested in a comprehensive presentation are referred to published papers and reports[1]. Here we only refer to the definition of transparency given by the RISCOM work:

In a given policy area, transparency is the outcome of an ongoing learning process which increases the stakeholders' appreciation of related issues and provides them with channels to stretch the implementer to meet their requirements for technical explanations, proof of authenticity, and legitimacy of actions. Transparency requires a regulator to act as guardian of process integrity.

Isabel Runebjörk, Ditt Varumärke, talked about "Analyzing arguments in depth – rhetoric as an analytic tool", and was mainly focusing on the individual and the individual image, although she related those aspects to the presentation to the RISCOM model. She used the example of drilling boreholes for deep burial of nuclear waste as an illustration of some of her main points, and developed the ideas based on the field of rhetorics.

She remarked that the demand on stakeholders to be authentic, becomes meaningless unless we have a way to ensure and evaluate their authenticity. This is not a small challenge, the hardest part probably being getting the participants to submit to the stretching of their own values and authenticity. She also emphasize that the RISCOM process needs moderators who are certified in the process of uncovering underlying values and also a method to evaluate success with uncovering hidden agendas and underlying values.

J. Peter Burgess, the Security Programme at the International Peace Research Institute (PRIO) in Oslo, held the first lecture on Wednesday morning: "Telling stories about the future. Cultural values in the assessment, management and communication of risk" Burgess structured his presentation along six themes:

1. 'What we *do* know cannot hurt us'
2. The precautionary principle
3. Unknown unknowns
4. What are values?

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[1] For example: Andersson, Espejo and Wene (1998), or Andersson and Lilja (2001)

5. Situating values in decision-making
6. A representational theory of risk

He quated Donald Rumsfeld at a press conference of the Department of Defense, 12. February 2002.:

As we know, there are known knowns. there are things we know we know. We also know there are known unknowns. That is to say, we know there are some things we do not know. But there are also unknown unknowns, The ones we don't know we don't know.

These thoughtful words stimulated much discussion as they go to the heart of the concept of uncertainty and therefore to risk management in a broad sense.

Linda Soneryd, Score, Stockholm University, and Bronislaw Szerszynski, Department of Sociology, Lancaster University presented "Deliberation for risk governance". They have also contributed to the CARGO project within the deliberation Work Package. Soneryd gave three rationales for involving the public:

*   *Instrumental*: to reach particular ends
*   *Normative*: the right thing to do
*   *Substantive*: to reach better ends

And then she asked how are rationales for involving the public related to assumptions about 'the public'. Often deliberation is done by the creation of 'minipublics' with potentials to maximise view points over complex decisions, social learning, connected to a wider citizenry. This needs to be seen in relation to wider public debate and policy structure.

Philippe Galiay, European Commission, talked about "The Commission's views on European research policy and risk governance". He summarized the European Union Framework 6 portfolio of risk related projects and he also described the Framework 7 orientation in Science and Society as an emerging co-operative research processes on ethical, safety related and other societal issues.

Policy makers and scientists will be brought into closer contact together, in order to better understand the relationship between scientific advice and policy making. It is expected a greater awareness from the part of both European Parliamentarians and scientists of each other's methodologies, priorities and constraints, particularly as regards the relationship between research and policy-making. Galiay emphasized that there is a need for more practices of inclusive risk governance at the European level and a need for more exchange between practitioners and stakeholders.

Donald Bruce, Director of the Society, Religion and Technology (SRT) Project of the Church of Scotland was invited to the summer school, and talked about "Ethics in techology development". He brought up certain limitations of participative methods such as:
*   Government consultation process are geared to the 'usual suspects' existing stakeholders, not wider publics
*   There is a flood of activity on participative methods
*   There should be a toolkit of different approaches as there is no universal best method
*   The average citizen still does not normally takes part unless he/she :

- • happens to be invited to a focus group
- • happens to hear about a public meeting or consensus conference
- • contributes remotely in an TV/Internet voting programme
- • There is a need for approaches which bridge the gap to the ordinary person

Bruce also talked about ethical problems with human enhancement and social-ethical issues of technology, such as distributive justice, the driving forces, representativeness and accountability.

Marie Wahlgren, Food Technology, Lund University, and a former member of the Swedish Parliament held the lecture "When politics and science meet in the same individual". She said that politics is more like a 1000 mile walk than a marathon, but the spectators only see the last 100 meters, and this leads to misunderstandings of the political process. Politicians are skilled in making decisions based on conflicting and complex information but the long and usually unseen process makes this less obvious. She also emphasized that most politicians have a strong respect for science, however, scientists sometimes miss that values are the basis for decisions and that often you cannot wait for science to give the answer before a decision must be taken.

Dan Serbanescu, European Commission Joint Research Centre, Petten, the Netherlands held a lecture on "Risk-informed decision-making". He described a decision process as a process of generating and applying criteria to select options from among seemingly equal alternatives. Such a process includes the following steps:

1. Identify a decision you wish to make and the alternatives you are considering.
2. Identify the criteria you consider important.
3. Assign each criterion an importance score.
4. Mark the scores and weight to each alternative criterion.
5. Define the total mark by multiplying scores and weights.
6. Define the ranking of options

Serbanescu also talked about tools used in technical risk assessment such as graphical representation of decision analysis problems which commonly use influence diagrams and decision trees. Uncertainties are represented through probabilities and probability distributions. The decision maker's attitude to risk is represented by utility functions and a decision is considered by looking for an optimum between conflicting objectives / utility functions. The evaluation of the utility functions and the calculation of optimum is made by using "multi-attribute functions".

Ispas Ioana Rodica, Ministry of Education and Research, Romania, talked about the "European Commission mid term review of the strategy on life sciences and biotechnology". There is a European Action Plan as a key element for responsible policy in governing life sciences and biotechnology. It contains actions such as

- • dialogue with stakeholders
- • promoting awareness of key scientific paradigms underlying regulatory oversight such as scientific uncertainty, absence of zero risk, comparative risks

- public debates on biotechnology between scientists, industry and civil society, including specific interest groups
- research into socio economic and ethical issues for assessing the benefits of using biotechnology in agri-food production

A European Commission Mid Term Review of the action plan has revealed certain weaknesses but also recommended a number of measures to be taken such as:

- Promoting the applicative research via public-private partnership,FP7 projects
- Monitoring of EU Directives implementation in Member States
- Encouraging societal debates (establishing institutional interface with different stakeholders on benefits and risk)
- Promoting new guidelines for addressing ethical issues

Evaluation of then summer school

A request for an evaluation of the Summer school was sent by e-mail to all participants in the middle of July 2007. The feed-back from the responses received showed that the participants were rather or very satisfied with the arrangements and course contents. Examples related to "My overall impression of the VALDOC Summer School" and "other comments" are:

- "Very well organised, in a beautiful area, good content of presentation but best of all: the great variety of participants from different countries with different backgrounds. To meet and discuss with these people was what made it worthwhile for me. "

- "I like the concept of bringing together people with different perspectives in the same field like professionals, journalists, practitioners and politicians. Sometimes the mind twisting is irritating but very useful to identify distortions or blind spots in one's own perception."

- "It provided amazing insights into other ways of thinking and considering the summer school topic."

The mixture of participants was appreciated. However, several persons commented in their evaluation that they would have liked the presenters to participate more or the whole week. There were also a number of practical advices about how to improve the scheme for another summer school.

The evaluation of the work in the smaller groups showed appreciation as well as pointed to possible improvements. These group exercises provided possibilities to dig deeper into the subject matters and also contributed to more personal exchanges of experience and knowledge. Suggestions of possible improvements pointed in several directions, especially: organisational matters e.g. use of a more prepared facilitator for the working groups and more stability over the days regarding group members; related to contents, e.g. providing more focused topics for discussions and ensuring that all groups made achievements.

Summer school summary

The summer school covered a large variety of topics, all related to risk governance. The three CARGO approches to risk goverance were presented and they were included into a wide socetal context. The roles of transparency and accountability, as well as perceptions and emotions were discussed. The role of media in an open society was given a critical review and the impact of of lobbyists on decision-making was discussed. The RISCOM model was presented and views were given from a rhetorical perspective on certain aspects of the model such as the analysis of arguments and authenticity. There were presentations on social values in risk analysis, ethics in technology development and the European Commission mid term review on the strategy on life sciences and biotechnology. Political realities for risk governance was highlighted and the Science and Society programme of the European Commission was presented.

All in all, the summer school highlighted the pluralist society within which risk governance takes place with many actors such as different interest groups, their lobbyists, media, experts, politicians etc. There are also many relevant aspects such as risk and uncertainty, social values, peoples perceptions and values, ethical aspects etc. One question especially addressed at the summer school was how, taking all this into account, societal decision-making can be made with transparency and accountability and using the RISCOM model was discussed as one possible way forward.

5. DISCUSSION

In chapter 3 we highlighted some critical questions related to each one of the three approaches to risk governance: risk-informed decision-making, precaution and public deliberation. In this chapter we continue to discuss certain aspects of risk governance, especially its relation to political decision-making.

A case for deliberation

With the three strategies for risk governance as a starting point, Andreas Klinke and Ortwin Renn (2002) have offered a classification of risk types and argue that some strategies for risk management are better for some types of risks. In what they call an analytical-deliberative approach[2], they argue that the extent to which deliberation and analysis are needed are dependent on which type of risk we are dealing with. According to their reasoning, complex phenomena demand complex methods of assessments. Risks characterised by high complexity, low uncertainty and no ambiguity do not require the participation of others than scientists and experts who can handle these methods. Risks that are characterised by uncertainty (a situation when the confidence in estimated cause and effect chains are low) require, according to the authors, a precaution-based management. Issues characterised by ambiguity require, according to Klinke and Renn, a discourse-based strategy. They define ambiguity as situations in which there is a variability of interpretations based on identical observations or data assessments – for example, when there are effects that are judged as harmless by science but perceived as threats by other groups. Further, while Klinke and Renn make a distinction between three risk-management strategies – risk-based, precautionary and deliberative approaches – they argue that deliberation is an important feature of all three approaches. As we have seen, equally well, however, one can argue that there is an element of risk-informed decision-making in deliberation as well as in precaution.

Certain aspects of this analysis can be discussed. For example, the concept of complexity is not straightforward. One could argue that the most suitable areas for QRA techniques are relatively simple systems with relatively well-defined components whose failure modes can be quantified. Even if a nuclear reactor system has to be recognized as a complex technical system with for example several safety functions with both redundancy and diversity, it is in a certain sense much simpler than the total energy system and most social systems. Taking this perspective, risk-informed decision-making is best for relatively simple systems, whereas more subtle and less well defined systems where values are important are less legitimate for risk-informed decision-making. Complex issues, in this meaning, requires both a systematic analysis indeed but an analysis that incorporates values and preferably with an element of deliberation.

Public deliberations could contribute with a reflection over the framing conditions of technical approaches to risk. Exposing technological elites to discussion with publics can

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[2] The term 'analytic-deliberative' was coined to describe processes able to reconcile technocratic and citizen-centric approaches to risk. 'Analytic' refers to scientific and technological data/methods of risk assessment and 'deliberation' refers to inclusive participatory communication processes (Stern and Fineberg 1996, in Burgess et al 2007:300).

enlarge their thinking and make them reflect on the limitations of their methods, what aspects of an issue that they cover and what aspects they leave out. Participatory deliberations on risk related issues could be used to open up issues for debate, in order to decide in what direction (and when) they should be closed down.

Deliberation and citizen participation is seen by many governments as a necessary element in the political process. One example is a discussion paper published in July 2008 by the UK Ministry of Justice, *A national framework for greater citizen engagement*. The UK Government believes that providing innovative means for the public to participate ways will serve to re-invigorate and strengthen democracy. The discussion paper sets out the case for a framework for the use of engagement mechanisms by national government. The aim of the framework would be to provide clarity on where they fit with Parliament and Government. The UK Government "is confident that, over time, the application of these mechanisms of engagement will help re-invigorate and strengthen popular participation in the political process and help build the public's confidence in our democracy" (UK Ministry of Justice, 2008, p5).

Deliberation and politics – some concerns

Deliberative forums as defined in the UK document are legitimate mechanisms for any policy-making body to improve its knowledge about public views, in this case to gain more informed views than e.g. opinion polls can give. They may also have a role to increase public trust, which is one of the objectives mentioned in the UK document. If deliberative forums are not used carefully and properly, however, the opposite effect could be the result, as was said in a OECD report from 2003 (Vergez, 2003):

> *"While the benefits of engaging citizens in policy-making may be considerable, governments should not underestimate the risks associated with poorly designed and inadequate measures for information, consultation and active participation. They may seek to inform, consult and encourage active participation by citizens in order to enhance the quality, credibility and legitimacy of their policy decisions. However the opposite effect may be achieved if citizens discover that their efforts to be informed, provide feedback and actively participate are ignored or have no impact at all on the decisions reached."*

It could be added that, in the worst case, deliberative forums can work as therapy or be used for manipulative purposes. One should also ensure that they don't become expert driven, which makes them only *seemingly* a case of real participation. As the UK document itself recognizes, the integrity of the process itself is crucial. Another matter, also emphasized in the document, is that "a balance must be struck between increasing the public's participation in decision-making and maintaining the Government's accountability for its actions to the people, their representatives in Parliament and their will expressed in elections".

Some authors see a problem with the democratic accountability of participatory governance, especially considering society's on-going marketisation, (Swyngedouw 2005). As deliberative forums will take place in the "market of arguments", to achieve clarity they need to have an element of "stretching": challenging arguments, what is factual, what is value driven and so on. This does not come by itself in citizens' summits or citizens' juries described in the UK document - it has to be specifically organized for.

Precaution – a case for politics

In the case of the precautionary principle, the European Commission (2000, p2) takes sides against technocratic risk management and emphasizes the role of politicians not only in the management of risk but also in making it transparent and participatory. In practice, however, the question is whether the political system has really understood what this requires and if it has the muscle to live up to its responsibility. In order to manage risk using the results of risk assessment, politicians need to see if the assessment rests on technocratic assumptions about what is worth assessing, which questions need answers and if scientific controversy has been appropriately included in the assessment. It may well be the case that the risk assessment has excluded research deviating from the mainstream, and has thus outframed uncertainty and by that the precautionary principle from the beginning.

A case for transparency

In the end, many matters are subject for political decisions, which in a sense certainly means closing them down at some point. The quality of these decisions should be higher if there has previously been a phase of deliberate opening-up, and a phase of challenging all arguments with the objective to enhance awareness both by the politicians and the general public.

Areas such as nanotechnology, biotechnology, synthetic biology, food safety, sustainable energy production and security have a high technological and scientific content; however, they also contain social concerns, ethical aspects and major democratic challenges. It is thus critical that politicians and citizens get insight so that societal decisions are made with awareness. Ideally, efforts to provide such insight need to take place early in the decision-making process, before actual decisions are taken inside the political bodies. This is crucial since other actors (industry, academia and NGOs) take position already at an early stage. They will then do what they can to influence politicians by all means available.

Politicians are exposed to a market of arguments, often without appropriate means for challenging the arguments made by various stakeholders. Early narrow framing leads to a decision-making basis that may be insufficient, or even irrelevant, for the political decisions, resulting in frustration and inability to solve important societal problems. A more active early political involvement should help avoiding such situations.

6. CONCLUSIONS AND RECOMMENDATIONS

In this report we have described and discussed risk governance, especially the three elements of risk-informed decision-making, precaution and deliberation, from different angles. We have identified prospects and limitations, as well as critical aspects of each one of them. We have used a systems-analysis approach to become more precise in understanding their respective roles in societal decision-making. We have highlighted contemporary trends in research and politics in the risk governance arena. The CARGO project also organised a summer school to generate creative discussion about these matters, which has enriched our work. Here we summarize our conclusions and give some recommendations for the future development and application of risk governance approaches within the European Union context.

Complementary approaches

The work has clarified that there are no precise borders between the areas of application for risk-informed decision-making, precaution and deliberation – instead they re complementary . There is a place for elements of deliberation in risk-informed decision-making, in order to generate scenarios to be included and to clarify the limits is using the results, for example in the selection of energy production methods. Exposing technological elites to discussions with lay people and other stakeholders can broaden their thinking and make them reflect on the limitations of their methods, especially in a policy making context, what aspects they cover and what aspects they leave out. The role of deliberation for the application of the precautionary principle is even more obvious as value-laden issues play a key role.

Applications of the precautionary principle need to be considered in risk-informed decision-making so that great and conceptual uncertainties are not downplayed, and clearly the precautionary principle often is a central theme in deliberation. When applying the precautionary principle the question must be posed whether there is enough knowledge for risk-informed decision-making, in which case the precautionary principle might not be needed. Also, expert knowledge and therefore elements of risk-informed decision-making should be part of deliberation – otherwise it could be narrowly framed as a purely value-laden and social process and science would be lost.

Factors of importance

A key element of risk governance is to take all the relevant factors into account so that for each issue being dealt with there is a proper balance between the three approaches treated in the CARGO project; risk-informed decision-making, precaution and deliberation. To find that balance a number of factors should be taken into account in any risk governance process.

As the precautionary principle plays such an important role in policy making, ***the level of uncertainty*** is a key factor in risk governance. When there is a possible serious risk with large scientific uncertainty about an activity the principle is supposed to be set in action. When knowledge is sufficiently good, risk governance turns from precaution to risk-informed decision-making. On the other hand, to put the precautionary principle into action there needs to be some sort of indication of a possible serious risk. There can be cases when science says

there is no such indication, but when the public and stakeholders are concerned, for example due to lack of trust in expertise and authorities. In such a situation there needs to be a dialogue that includes both science and the concerned citizens in order to clarify the situation.

Another factor is the *level of complexity.* There can be a high level of technical and scientific complexity with more or less uncertainty. This would not per se motivate a high level of deliberative efforts but only that high technical and scientific competence must be involved in the governance of risk. However, in general, complexity also often means that values, ethical aspects and perceptions are in play which would motivate involvement from a large variety of stakeholders. Complex issues, in this meaning, require both a systematic analysis but also an analysis that incorporates values and preferably with an element of deliberation.
In such a situation the risk may otherwise be extra high that expert agenda setting leads to narrow framing.

The governance of risk also has to recognize that the *concept of risk* itself is multifaceted and can contain many different components. It may have to do with how society protects the individual from unacceptable risks, or how society protects the collective from excessive costs in the form of diseases, a poorer environment, poorer living conditions, economic loss or other harm. The concept of risk also includes how different individuals view risk to themselves and others. For example, an individual may be more inclined to accept greater risks at the personal level than risks imposed from the outside, in other words emotions and values control our judgments. It is therefore very important that *values be weighed into society's decision-making processes*. A risk that is imposed on the citizens should perhaps be given greater weight in the decision process than a quantitatively equally great risk that is taken voluntarily. It is clear that this aspect of risk governance requires deliberation that go beyond expert investigations whether they are within the framework of risk-informed decision-making or precaution. It thus seems justified that any effort of risk governance includes a significant element of participation and deliberation.

Type of governance situation

Risk governance in a general sense takes place in many different types of situations. In an early stage of a governance process it is important to have a broad perspective and to keep different options open. Participatory deliberations could be used to open up issues for debate, in order to provide a comprehensive point of departure for later stages in the process. When decisions are made in a political process there is typically a closing down of issues so that there are only a few options left. For example when a decision is to be made about an application to build an energy production facility or to allow a certain kind of crops to be farmed the options are to approve or disapprove the application (or to approve with certain specified conditions). However, also then, such a decision will be influenced by the earlier process such as to what extent alternative directions have been dealt with in the Environmental Impact Assessment.

Between these extreme situations (the early opening up phase and a final decision) there may be all sorts of expert investigations and deliberations with different aims, such reaching consensus among a limited number of stakeholders or clarification of the meaning of different arguments. Each situation has its own characteristics meaning that different methods of involvement may be more or less suitable.

Some concerns

In chapter 3 we collected some issues of concern for various approaches to risk governance which may be worthwhile to summarize here. In *risk-informed decision-making* the critical question is if the issue at hand has been given a proper framing or if it has been excessively narrowly framed in order to be fit for quantitative risk assessment and expert investigations. When the *precautionary approach* is used one must be convinced that the area is really a case for precaution, taking uncertainty and potential harm into account, of if there is sufficient knowledge for risk-informed decision-making, or on the other hand, if there really are indications strong enough for precaution. Furthermore, one must see to it so that the value-laden elements are taken care of by including lay people and politicians in the decision-making process. For *risk deliberation* it is crucial that participation actually leads to influence, that the link to the formal political process is clear, that accountability is clarified and that experts are given a proper role. Furthermore, it should also ensured that the deliberations don't become expert driven, which would make them only *seemingly* a case of real participation.

The responsibility of regulatory and government agencies

One observation from chapter 3 is that regulatory and government agencies have a strong position in all forms of risk governance. They control risk-informed decision-making and use the results of quantitative risk assessment. They often control and conduct the application of the precautionary principle. Finally they can initiate and/or fund, and thus control, deliberative forums. In all this it is important that the competent authorises deal with the value-laden elements in a transparent way and that their considerations are open for public scrutiny for example with regard to how the precautionary principle is applied.

The "governance of governance"

We have concluded that there is no universal method of best governance which includes an ideal mix of risk-informed decision-making, the precautionary approach and risk deliberation. Instead there are a number of risk related factors to take into account as well as specific contexts and situations within which risk governance takes place. Furthermore, in our pluralist society risk governance is not "owned" or controlled by a single type of organization. Instead many formal and informal actors make their contributions. Still one can ask how society and the European Union shall foster good practices for risk governance to be inclusive, adapted to existing democratic systems with its formal decision-making processes, and transparent. There are probably many ways forward but one of the most important elements must be to keep research and debate about governance alive, innovative and multi-disciplinary. Different types of actors and stakeholders need to meet in different arenas, theorist and researchers need to meet practioneers, different types of stakeholders need to meet each other, different governance areas need to meet and discuss common problems and ways forward.

List of CARGO reports

Drottz Sjöberg, B-M., The 2nd VALDOC second Summer school. Transparency and Accountability in Risk Governance & Societal Decision-making. CARGO Deliverable 2, March 2008

Serbanescu, D., and Vetere Arellano, A.L., Risk-Informed Decision Making, CARGO Deliverable 4, January 2008

Andersson, K., Precaution and risk reduction - Politics and expertise. Some reflections on the precautionary principle CARGO Deliverable 5, May 2008

Reynolds, L., Soneryd, L., and Szerszynski, B., Risk Deliberation, CARGO Deliverable 6, January 2008

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Andersson, K., Precaution and risk reduction - Politics and expertise. Some reflections on the precautionary principle CARGO Deliverable 5, May 2008

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Appendix 1: ARGONA participants

No.	Organisation name	Short Name	Country
1	Karita Research AB	KARITA	Sweden
2	BMD Research	BMDR	Sweden
3	Joint Research Centre	JRC	Netherlands
4	University of Lancaster	ULANC	UK
5	Stockholm University	SU	Sweden

Appendix 2: Summer School Programme

Transparency and Accountability in Risk Governance
& Societal Decision-making

Second VALDOC Summer School, Smögen June 10-15, 2007

Sunday, June 10

Noon   Bus or taxi departure from Landvetter air port outside Gothenburg for those
arriving Sunday morning. <u>Note</u>: If you plan to use this transport please notify
<u>rolfq@msn.com</u> before June 1st.

2.00 p.m.   Welcome and introduction to the programme
Kjell Andersson and Britt-Marie Drottz Sjöberg

2.30 p.m.   Excursion to Vitlycke rock carvings in Tanum world heritage site.
Bus departure.

6.00 p.m.   Welcome buffet

7.30 p.m.   The Ultimate Challenge - An Introduction to Danger and Pleasure.
Björn Holmgren & Johnny Drottz

Monday, June 11

9.00-10.10 a.m.   <u>Lecture 1</u>. **Kjell Andersson**. *Karita Research*.
Transparency and accountability – the VALDOC philosophy.
Introduction of themes and organization of group work

                                        Refreshments

10.30-Noon   <u>Lecture 2</u>: Invited speech.
Kåre Harald Drager. President, *International Emergency Management Society (TIEMS)*.
Transparency and cross-cultural cooperation: Possibilities and problems in an international context and development. **Discussion**.

Noon-1.00 a.m.   Lunch

1.00-2.00 p.m.   <u>Lecture 3</u>. ***Patricia-Ann Fleming***, *Department of Philosophy, Creighton University, USA*.
The role of values in a complex technical society.

2.00-3.00 p.m.	<u>Lecture 4</u>. **Britt-Marie Drottz Sjöberg**, *BMD Research*. Perception and emotions - risk perception.
3.00-6.00 p.m.	<u>Group work</u> (Refreshments available)
7.30 p.m.	Dinner at the hotel

Tuesday, June 12

8.30-10.00 a.m.	<u>Lecture 5</u>: Invited speech. **Göran Rosenberg.** *Göran Rosenberg AB*. The Media Society vs The Open Society; Emerging Contradictions and Conflicts .
10.00-10.30 a.m.	Refreshments
10.30-Noon	<u>Lecture 6:</u> Invited speech. **Leif Hallberg**. *Director of European Public Affairs, Intrum Justitia AB, Sweden*. Lobbying in Brussels, its role in policy- and decision making<u>.</u>
Noon-1.00 p.m.	Lunch
1.00-2.30 p.m.	<u>Lecture 7</u>: **Clas-Otto Wene**. *Wenergy* The RISCOM model of transparency
2.30-2.50 p.m.	Refreshments
2.50-4.15 p.m.	<u>Lecture 8</u>: Invited speech. **Isabel Runebjörk.** *Ditt Varumärke* Analyzing arguments in depth – rhetoric as an analytical tool.
4.15-7.00 p.m.	<u>Group work </u>(Refreshments available)
7.30 p.m.	Dinner at the hotel

Wednesday, June 13

9.00-10.30 a.m.
Lecture 9: Invited speech.
Peter Burgess. *Research Professor and Leader of the Security Programme at the International Peace Research Institute, Oslo*
Social values in risk analysis: Religion, cultural, and identity in the determination of future actions.

10.30-11.00 a.m.
Refreshments

11.00-Noon
Lecture 10: ***Linda Soneryd.*** *Score – Stockholm University, and* ***Bronislaw Szerszynski,*** *Department of Sociology, Lancaster University*.
Deliberation for risk governance

Noon-1.00 p.m.
Lunch

1.00-1.45 p.m.
Lecture 11: Invited Speech.
Philippe Galiay. *European Commission*
The Commission's views on European research policy and risk governance.

1.45-3.00 p.m.
Lecture 12: Invited Speech
Donald Bruce. *Director of the Society, Religion and Technology (SRT) Project of the Church of Scotland*.
Ethics in technology development.

3.00
Refreshments; then bus departure to excursion sites

Excursion

Organized choices: buses to

a) Ramsvik costal area (possibility for swimming)
b) Rock climbing (with climbing guids; maximum 6 persons)
c) Lysekil acqarium and city

Lists for participation will be available from Sunday June 10th at the hotel.

8.00 p.m.
Dinner at the hotel

Thursday, June 14

9.00-10.15 a.m.	Lecture 13: Invited speech. ***Marie Wahlgren.*** *Assistant Professor, Food Technology, Lund University, and former member of Swedish Parliament.* When politics and science meet in the same individual.
10.15-10.30 a.m.	Refreshments
10.30-11.15 a.m.	Lecture 13: **Dan Serbanescu**, *European Commission- Joint Research Cente.* Risk-informed decision making.
11.15-Noon	Lecture 14: ***Ispas Ioana Rodica***, *Ministry of Education and Research, Romania* *European Commission mid term review of the Strategy on Life Sciences and Biotechnology*
Noon-1.00 p.m.	Lunch
1.00-6.00 p.m.	Group work and preparation of group work reports
7.30 p.m.	Ferry to Kungshamn for the Summer School Dinner

Friday, June 15

9.00-9.30 a.m.	Summing up: Introduction. Summer school organizers.
9.30-Noon	Presentations from working groups. Discussions of case studies. (Refreshments about 10.30)
Noon-1.00	Lunch
1.00-2.30 p.m.	Discussion: Future work. Evaluations: Recommendations for the future; relevance of lecture themes, case studies, organisation, and other comments.
2.30-3.00 p.m.	Final summing up. Refreshments.
3.00 p.m.	End of VALDOC Summer School 2007.