MIDIR PROJECT

Contract n° 036708

WP 1:

Development of a comprehensive risk governance concept

Del. 1.1:

Analysis of recent EU, international and national research and policy activities in the field of risk governance

Reference code: MIDIR – Del. 1.1

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Project Acronym: MIDIR

Title: Multidimensional Integrated Risk Governance

Title of report: Del. 1.1: Analysis of recent EU, international and national research and policy activities in the field of risk governance

Reference code: MIDIR – Del. 1.1

Short Description:

The aim of this Deliverable is to present procedural and methodological requirements for a comprehensive risk governance concept. The new concept is based on an analysis of recent EU, international and national policy activities in the field of risk governance and of existing approaches. It was supported by feedback from various experts (policy, public administration, NGOs) and a literature research.

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1 Introduction

Today individuals and societies become more and more aware of the increasing risks they are facing: apart from actual risks in the political discussions (e.g. terrorism) the variety of natural, technological and socio-political risks is increasing. The key problem is not the existence of risks but the practice (or the lack of it) of how to deal with them. The understanding, acceptance and contribution of political decisions define the resiliency of a society against those risks. Actually the successful management of risks is limited. The interactions between individual sectors, disciplines, locations, levels of decision-making and cultures are not known or not considered. Additionally current risk management research and practice is fragmented by subject and by level of decision-making. Inadequate information about risks, inapprehensible procedural steps as well as insufficient involvement of the public in the risk decision-making process lead to severe criticism and distrust respecting relevant decisions in regards to a specific risk. But trust has a key role in dealing with risks and should be regarded as fundamental for risk interpretation of the public between “real” and “perceived” risks (interpretations of “risk” differ according to individual and social contexts). Public decision-making that is based only on the factual “scientific” dimension of risk leads to distrust, not taking into account the “socio-cultural” dimension, which includes how a particular risk is viewed when values and emotions are concerned (e.g. whether a risk is judged acceptable, tolerable or intolerable by society is partly influenced by the way it is perceived to intrude upon the value system of society). In addition it contributes to the vulnerability of institutional settings as well as affected individuals. This causes effects on the resiliency of a community, because only those who are well informed and integrated in the process will accept the decisions made by different authorities and undertake the right choices/decisions in cases of risks.

These aspects and problems make a new approach necessary: More public participation in risk assessments and decision-making is needed in order to make the decision process more democratic, improve the relevance and quality of technical analysis and increase the legitimacy and public acceptance of political decisions. This is the aim of the EU funded research project MIDIR (*Multidimensional Integrated Risk Governance*). The main objective of MIDIR is to develop an integrative and multidimensional resilience and risk governance concept based on existing research and an accompanying management tool. For that purpose an appropriate indicator system is going to be prepared (merged Deliverable 1.2/1.3) that consists of two parts:

- **Part A:** procedural and methodological aspects, applicable for every risk setting (core indicators) and
- **Part B:** context related aspects, to be defined individually for every risk setting (contextual indicators).

Work Package 1 (as the first part of the MIDIR-Project) aims at the development of a required scalable resilience and “multidimensional integrative risk governance concept”, taking into account existing discursive approaches. On the basis of the state-of-art on knowledge and methodologies applied for risk governance, Work Package 1 aims at

analysing the existing risk governance concepts with a special focus on Europe. Some input will be provided as well from a worldwide analysis to obtain insights into a non-European situation. This analysis phase provides the basis and is therefore crucial for the success of the whole project. It is a fundamental prerequisite for the harmonisation of information, terms and concepts and is indispensable for generating a risk governance concept that links the different phases of risk governance and builds bridges between different disciplines.

In the focus of this Deliverable 1.1 is the analysis **of recent EU, international and national policy activities in the field of risk governance and of existing approaches adopted by institutions and people to cope with new and emerging risks, taking into account current trends towards a resilience and discourse approach.** This analysis was based on a literature review of recent EU research projects carried out in particular by Science and Society projects like STARK, TRUSTNET and RISKGOV, international projects like Disaster Risk Reduction for Sustainable Development in Africa as well as international and national initiatives (e. g. IRGC). This analysis will serve, together with a research of the scientific literature, as empirical basis for the conceptual approach. The MIDIR concept will be described in detail by deliverable 1.2.

The report starts with a short overview on the understanding of key terms by the project team (see chapter 2.1). Moreover, a general outline of the key hypothesis and main features of the concept is already needed when talking about the research questions as well as the interpretation of the results of the analysis (see chapter 2.2).

2 A multidimensional and integrative view

The focus of the first stage of Work Package 1 is the analysis of international, European and national projects to illustrate and present the state-of-art on knowledge and methodologies applied for risk governance. This is the basis for the elaboration of a transferable risk governance approach. A prerequisite for this are clear definitions and a common understanding of terms, concepts and contexts. The following section aims at discussing central questions concerning risk governance in order to achieve the already mentioned common project understanding. It is structured along the questions that were the basis for the analysis of the different assessed projects and initiatives concerning Risk Governance.

2.1 Understanding of terms

The aim of the project is to produce a risk governance concept which is able to be transferred into different kinds of risks as well as settings, which characterise different applications. Therefore it calls for a multidimensional as well as an integrative view.

In addition an agreement on a common terminology is necessary in order to produce the same base of operation on the one hand and to avoid misunderstandings on the other hand.

2.1.1 Uncertainty and ambiguity

Risk governance especially centres on such risks that are characterised by **uncertainty** and **ambiguity**. This was also a main requirement for project proposals as defined in the Work Programme 2005-6 "Science & Society" where – under the headline of "Bringing research closer to society" - integrative approaches to risk governance were planned to be developed in order to identify and exploit synergies between the areas of scientific advice, public participation and risk governance for "paving the way for new management strategies and tools designed to improve the robustness of policy-making when faced with high uncertainty and ambiguity" (Work Programme 2005-6 "Science & Society", p. 6).

The following definitions of the terms are a common basis for the work within the MIDIR project:

Uncertainty: A common definition of uncertainty is offered by FAO-EMPRES[1] (quotation in IRGC, 2005): "The lack of precise knowledge of the input values which is due to measurement error or to lack of knowledge of the steps required, and the pathways from hazard to risk, when building the scenario being assessed". Uncertainty is problematic for decision-makers because there are no reference data of the past. Decisions in the area of so called "traditional" risks can be based on probability because they are past-oriented and informed by statistics. For new "uncertain" risks however the perspective changes from probability to possibility. These are characterised by possible, new, imaginable hazards, no or limited experience, complex causalities, multiple, heterogeneous and long-term effects, no scientific or historic proof but cannot be fully refuted either. The role of science in this context is problematic, too, because science cannot give a proof of risk and cannot guarantee for safety. Science in this context is inconclusive (van Asselt, 2007).

Ambiguity: A common definition of ambiguity is also offered by IRGC (2005) "Giving rise to several meaningful and legitimate interpretations of accepted risk assessments results… Interpretative Ambiguity: Different interpretations of an identical assessment result: e.g. as an adverse or non-adverse effect… Normative Ambiguity: Different concepts of criteria or yardsticks that help to determine what can be regarded as tolerable referring e.g. to ethics, quality of life parameters, risk-benefit balance, distribution of risks and benefits, etc… 'Ambiguity' is one of three major challenges confronting risk assessment; the others are 'complexity' and 'uncertainty'." Ambiguity in the context of risks means that costs and benefits of taking risky decisions cannot be clearly divided from each other. E. g. the use of a certain risky technology cannot definitely be described as positive or negative because the technology might have some negative consequences (possible high costs) but at the same time there are positive effects that are connected with its use (high benefits). This makes the risk and also necessary decisions ambiguous. But ambiguity has also another dimension because there are different views of stakeholders: One stakeholder might regard a technology as highly costly (negative) whereas the other regards it as highly beneficiary (positive).

[1] Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES) – Food and Agriculture Organisation (FAO)

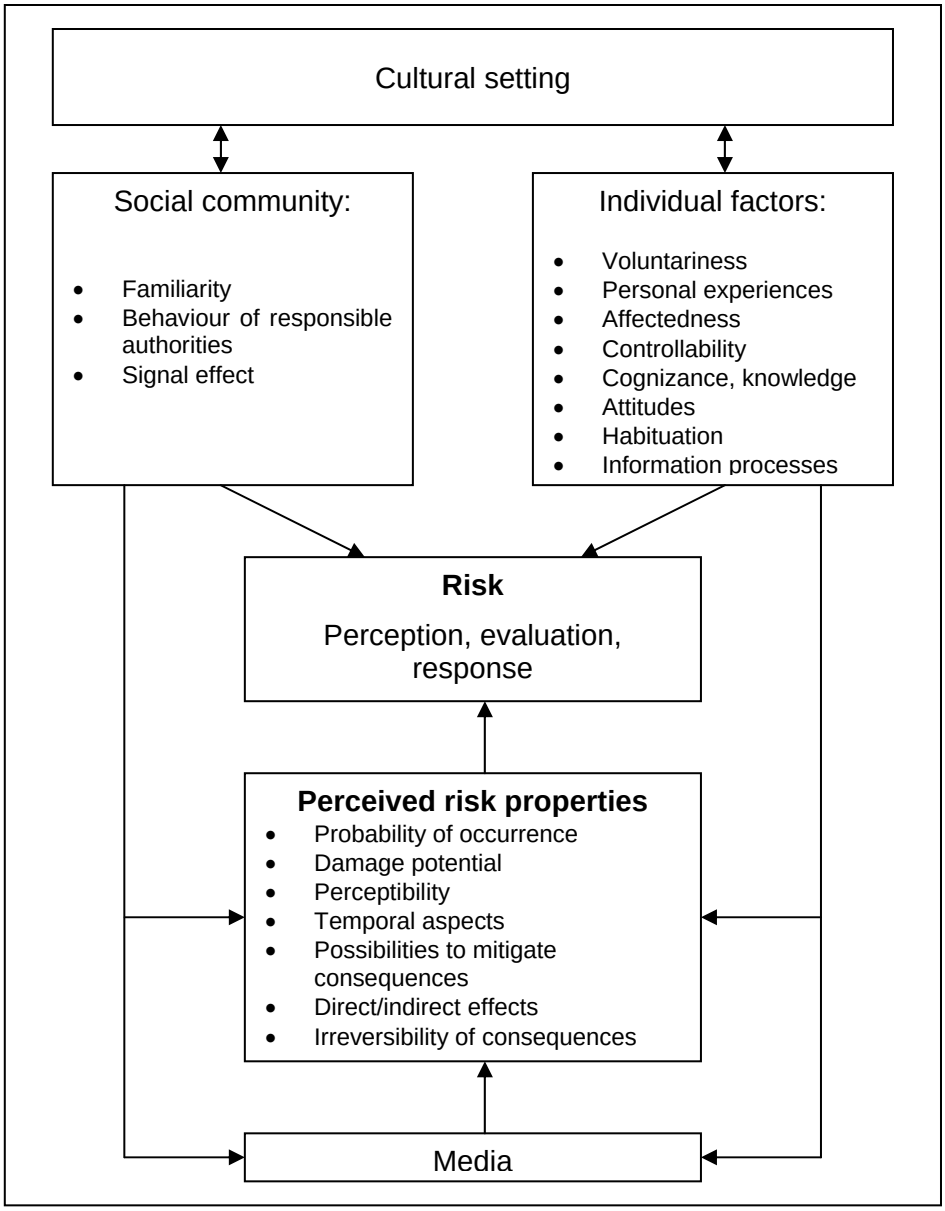
Ambiguity can also be a consequence of different areas from where risk is assessed: an internal / personnel; scientific / technical; cultural / values of society; systemic / legal (WBGU 1999). Generally speaking, each individual is embedded in the interpretative culture of a society or social group, which can be understood as a filter for many individual processes. It is essential to know the individual processes in addition to the social ones, as the former often contribute to establishing or modifying the social and societal interpretative culture. The following factors may lead to ambiguity:

- Voluntariness: The degree of voluntariness of a human being to exposure plays a key role in the risk perception of this person. Risks to which people are exposed against their will are usually felt to be larger than those which they have taken voluntarily. Acceptance is generally lower for non-voluntary risks (e.g. pollution by industrial emissions in comparison with e. g. smoking).
- Personal experience: The experience made with a certain risk is a further determinant of risk perception. Adverse previous experience with a hazard contributes to an individual feeling that the risk is very high and taking active preventive measures. Even if people have no personal experience with acute hazards, as is e.g. the case for the possible consequences of climate change, risks can be viewed as very high. This is particularly the case if such hazards are hard to perceive, are not individually controllable and the potential damage is very high. In consequence, such risks are called “dread risks”.
- Affectedness: People who do not feel affected by a potential damage generally perceive the risk as lower than others who expect to be seriously harmed in the event that the risk occurs (e.g. residents of an earthquake-prone area).
- Controllability: Risks that appear uncontrollable to the individual are felt to be very threatening. These include events that cannot be changed by the actions of the individual. People living in a high-risk situation that escapes their control usually have few alternatives for coping.
- Knowledge: Risks can be evaluated differently depending upon the level of knowledge. It is often assumed that people feel threatened by situations where they have no precise knowledge or they have no information to assess the potential damage. However, the relationship between knowledge and assessments of hazardousness is more complex. Knowledge alone is not decisive for the assessment of threat. It is always mingled with other factors, such as values, attitudes or opportunities for protection.
- Attitudes: For the perception and acceptance of large-scale technologies in particular, attitudes have proven to be an important factor. Evaluations of nuclear energy, for instance, are regularly embedded in general values and ideologies.
- Habituation: Well-known and familiar risks are generally perceived as less threatening than new, still unknown ones (Slovic, P., Fischhoff, B. and Lichtenstein, S. 1986, pp. 3–24.)

These factors might contribute in each single case in a different manner to the perception and estimation of risk. In addition, they are strongly interlinked with the more collective social-political factors mentioned before.

The following figure summarises and relates the above described factors influencing risk perception (WBGU 1999, p. 158).:

Figure 1: Factors influencing risk perception



Source: WBGU 1999, 158

However, disparities between different social groups (e.g. differentiated according to more 'technological' versus 'ecological' attitudes) were often larger within a country than between different countries (Rohrmann 1995, pp. 7–12).

2.1.2 Multidimensional

The project shortly characterised "multidimensional" as "*usable for each risk setting characterised by uncertainty and ambiguity*". However, the

multitude of dimensions is not only limited to these characteristics, but can also be extended to the aspects listed below:

Perspectives

The scientific literature reviews as well as interviews in the run-up to the project have shown that there are differences between a scientific approach and a practical implementation (IRGC, 2005, pp. 31 ff.). These two perspectives are in a way difficult to combine because the point of view of scientists does not necessarily correspond with the point of view of practitioners (problem e.g. of risk perception). The aim should be to combine and complement these two points of view.

Risk types

Risk governance can address several risks (financial risk, technological risk, natural risk, health risk, food safety risk, occupational hazard etc.). There are different ways of classifying risks in dependence of the classification criteria. Such a classification is important in order to define the appropriate risk management or – in the project's case – risk governance strategies.

There exist several approaches concerning risk classification. One example was developed by the German Advisory Council and Global Change (WBGU). The classification elaborated by WBGU depends on the criteria "probability of occurrence" and "extent of damage". The concept aims at identifying appropriate risk management strategies. On this basis, it is possible to distinguish six different types of risks. In short, these types can be described as follows (names are taken from Greek mythology; WBGU 2000: 57 ff.; see Table 1).

Table 1: Overview of risk types: characterisation and substantive examples

Risk type	**Characterisation** (*P* = probability of occurrence; *E* = extent of damage)
Cyclops	*P* is unknown; Reliability of estimation of *P* is unknown *E* is high; Certainty of assessment of *E* tends to be high
Damocles	*P* is low (approaching 0); Certainty of assessment of *P* is high *E* is high (approaching infinity); Certainty of assessment of *E* is high
Pythia	*P* is unknown; Certainty of assessment of *P* is unknown *E* is unknown (potentially high); Certainty of assessment of *E* is unknown
Pandora	*P* is unknown; Certainty of assessment of *P* is unknown *E* is unknown (only assumptions); Certainty of assessment of *E* is unknown Persistence is high (several generations)
Cassandra	*P* tends to be high; Certainty of assessment of *P* tends to be low *E* tends to be high; Certainty of assessment of *E* tends to be high Long delay of consequences
Medusa	*P* tends to be low; Certainty of assessment of *P* tends to be low *E* tends to be low (exposure high); Certainty of assessment of *E* tends to be high Mobilisation potential is high

Source: WBGU 2000, 62.

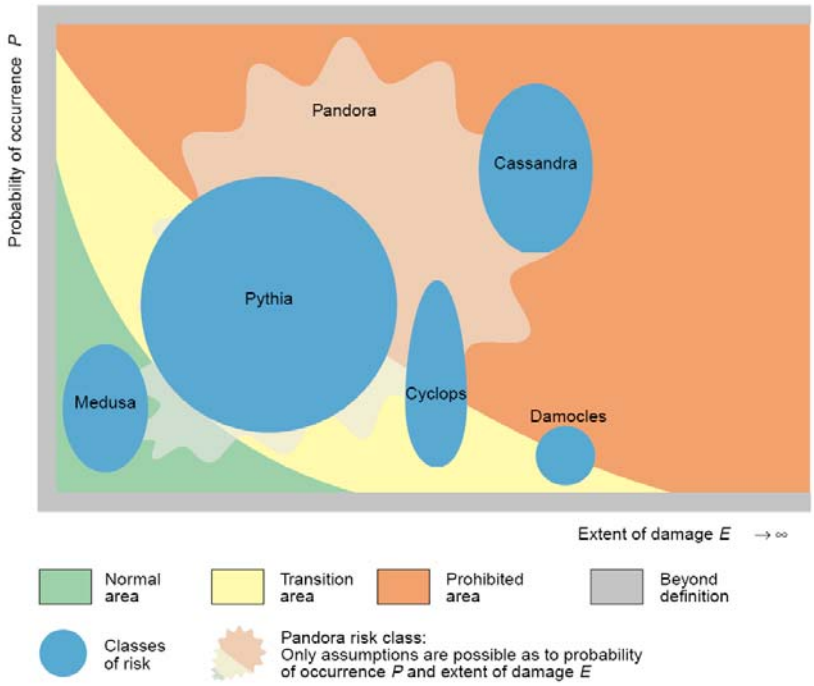
These six types allow classifying the risks and attributing them to the normal, transition and prohibited areas of risk.

This typology of risks can serve as a rationale for selecting appropriate risk management strategies:

- *Medusa and Cassandra:* The Medusa risk type is characterised by a high public sensitivity (mobilisation potential) and thus can be tackled with improved risk communication. Furthermore, this risk type is located in the "normal area". The Cassandra risk type belongs to the prohibited risk area and is characterised by a long time lack in regards to consequences. **Both risk types have to be discourse-based managed, which requires political decisions about social goals and thus cannot be solved by risk experts or regulators alone** (Klinke & Renn 2002, 1089)[2].
- *Pythia and Pandora:* These types of risk mainly belong to the prohibited risk area and are characterised by a high degree of uncertainty with regard to probability and damage potential. **They belong to the precaution-based risk management category. The priority of risk management has to be the application of precautionary measures and the development of substitutes** (Klinke & Renn 2002, 1088)[1].
- *Cyclops and Damocles:* Both risk types are characterised by rather high damage extents and also a high certainty of assessment of the damage extent. Both risk classes require the application of risk-based strategies and regulation. **For the Damocles risk class, the main approach is to reduce the risk components to reduce the possible extent of disasters. For the Cyclops class, a mixture of risk-based and precautionary strategies is useful because the distribution of probabilities is relatively unknown** (Klinke & Renn 2002, 1088)[1].

[2] Klinke, A. & Renn, O. 2002. A New Approach to Risk Evaluation and Management: Risk-Based, Precaution-Based, and Discourse-Based Strategies. Risk Analysis 22 (6), 1071-1094

Figure 2: Classes of risk and their location in the normal, transition and prohibited areas



Source: WBGU – German Advisory Council on Global Change 2000. World in Transition: Strategies for Managing Global Environmental Risks. Annual Report 1998. Berlin: Springer. 359 p.

According to this classification, the MIDIR project risk "patients under hospital treatment" belongs to the risk type "Medusa", although the certainty of assessment of the risk's probability tends to be low. But Medusa-type risks are characterised by a high public sensitivity/mobilisation potential. The risk setting "e-commerce" belongs to the "Cassandra" risk type, mainly because negative consequences are quite apparent but are not recognised due to the delay of consequences. Both risk-types shall be addressed by discourse-oriented strategies, which require political decisions about social goals and thus cannot be solved by risk experts or regulators alone.

Risk classification approaches show that such a classification helps to identify appropriate approaches to deal with risks as risk governance or risk management. Other criteria to classify and compare risks (similarities and differences) especially against the background of risk governance could be e.g.:

- Who defines risk?
- Who is affected by risk?
- Degree/type of uncertainty?
- Degree of ambiguity?
- Who is involved in risk governance?

These questions are also important to answer when dealing with the transferability of a risk governance concept to another context.

Stakeholders

During the whole risk governance process (risk assessment, risk management, risk communication) a multitude of stakeholders, representing different groups like decision makers, affected people, NGOs, scientific community/researchers are involved. Thus, multidimensional means also a variety of involved groups.

Environments

A multidimensional concept, and accordingly a risk governance concept, should address all environments (political, economic and social aspects). These environments are characterized by different settings, points of interests etc, which are important to ensure a sustainable development and resilient communities.

Levels of decision making

It should be stressed that the multidimensionality can also be seen in the light of different levels of decision-making. In this sense a multidimensional risk governance concept can be adapted to various levels of decision-making (local, regional, national, European, international).

2.1.3 Integrative

The fact that the project is aware of the multidimensionality does not necessarily mean that the way of consideration of the different dimensions is clear. The aim of the project is to bring risk governance to policy, decision-making and other societal actors by networking and disseminating the new concept. This shall be achieved by an integrative approach which is more than just an "additive" consideration of different dimensions. "Integrative" in general means to combine and co-ordinate diverse elements into a whole. There are two ways of such integration:

- **horizontal** (e.g. planning authorities at the same level, e.g. local level);
- **vertical** (cooperation between different levels, e.g. international, national, regional and local level).

The cooperation between different actors is normally the weak point (due to e.g. unclear responsibilities) of the whole system and could be seen as a problem (so called "problem of interplay", Young 2002).

2.1.4 Multidimensional and integrative Risk Governance Concept (essential parts)

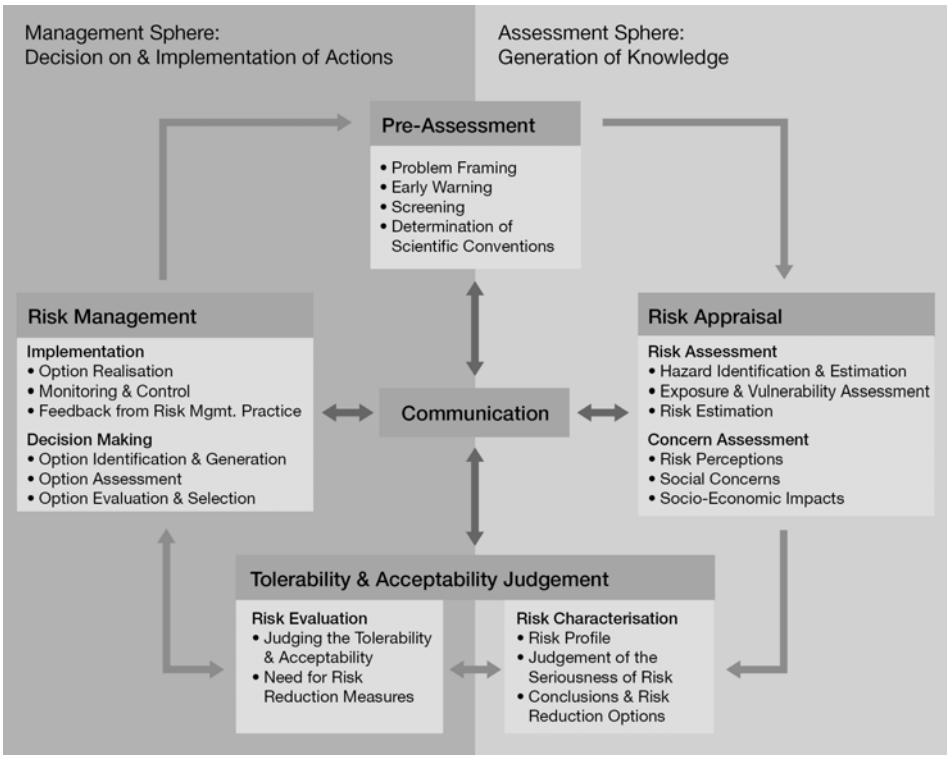
Both ways of integration (horizontal and vertical) are implemented in the Risk Governance Process. In view of the differences among the cultures and socio-economic settings on the one hand and the individual factors on the other hand good risk governance should focus on common procedural requirements for the different phases of risk governance ("integrative"). The requirements should be balanced in terms of values, cultural aspects, scientific outcomes and legal / systems aspects. In addition, the concept should be usable for every risk setting, characterised by uncertainty and ambiguity ("multidimensional").

Risk governance can be defined as a process by which risk information is collected, analysed and communicated and management decisions are

taken. It aims at enhancingthe disaster resilience of a society (or a region) and includes "*the totality of actors, rules, conventions, processes, and mechanisms concerned with how relevant risk information is collected, analysed and communicated and management decisions are taken*" (IRGC, 2005, p. 22). This definition focuses on three elements of risk governance: risk assessment and risk management that have to be embedded in a risk communication process among scientists, politicians and the public (see Figure 2).

The management of risks (or risk governance) has become increasingly politicized and contentious. The main reasons are controversies concerning risk. Risk controversies are not about science versus misguided public perceptions of science, where the public needs to be educated about "real" risks. Rather, risk controversies are disputes about who will *define* risk in view of existing ambiguity. A technology policy discourse is not about who is correct about the assessment of danger but whose assumptions about political, social, and economic conditions win in the risk assessment debate. Thus, danger is real, but risk is socially constructed. Scientific literacy and public education are important but not central to risk controversies. Emotional response by stakeholders to issues of risk is truly influenced by distrust in public risk assessment and management. Due to this fact, those who manage and communicate risks to the public need to start with an understanding of emotional responses towards risk. Ensuring a stakeholder-focused process means consulting and involving stakeholders like people living in the vicinity of risky infrastructure and likewise consumers and organisations that represent their interests. The present absence of (clear) risk governance principles makes institutional settings vulnerable and may lead to increased risks (e.g. see aftermath of hurricane Katrina). In regard to this, research on risk governance has to be understood as co-operative research: a research process, which involves both researchers and non-researchers in close co-operation. Better involvement and more openness as well as better policies, regulation and delivery have also been identified as key objectives by the White Paper on European Governance, launched by the EC in 2001 (European Commission, 2001).

Figure 3: IRGC Risk Governance Framework



Source: IRGC 2006: 13

However, literature lists a large variety of definitions of these terms used for the Risk Governance Process. Table 2 gives an overview of definitions of risk terminology by organisations and publications. Only those definitions are listed that at least contain the three elements of risk assessment, risk management and risk communication somewhere in the set of definitions. This overview can be considered as a basis for the definition of risk and risk governance in the MIDIR project.

Table 2: Overview of risk terminology by organisations and publications

	Codex Alimentarius	FAO-EMPRES	International Programme on Chemical Safety	ISO/IEC Risk Management Vocabulary Guide
Risk	A function of the probability of an adverse health effect and the severity of that effect, consequential to a hazard(s) in food.	The likelihood of the occurrence and the likely magnitude of the consequences of an adverse event to animal or human health in the importing country during a specified time period.	The probability of an adverse effect in an organism, system or (sub) population caused under specified circumstances by exposure to an agent.	
Risk analysis	A process consisting of three components: risk assessment, risk management and risk communication	A process comprising four components: hazard identification, risk assessment, risk management and risk communication.	A process for controlling situations where an organism, system or (sub) population could be exposed to a hazard. The risk analysis process consists of three components: risk assessment, risk management and risk communication.	Systematic use of information to identify sources and to estimate the risk.
Risk assessment	A scientifically based process consisting of the following steps: (i) hazard identification, (ii) hazard characterization, (iii) exposure assessment, and (iv) risk characterization.	Comprises release assessment, exposure assessment, consequences assessment and risk estimation.	A process intended to calculate or estimate the risk to a given target organism, system or (sub) population, including the identification of attendant uncertainties, following exposure to a particular agent, taking into account the inherent characteristics of the agent of concern as well as the characteristics of the specific target system. The risk assessment process includes four steps: hazard identification, hazard characterisation (related term: dose-response assessment), exposure assessment and risk characterisation.	Overall process of risk analysis and risk evaluation.
Risk characterisation			The qualitative and, wherever possible, quantitative determination, including attendant uncertainties, of the probability of occurrence of known and potential adverse effects of an	

			agent in a given organism, system or (sub) population, under defined exposure conditions.	
Risk communication			Interactive exchange of information about (health or environmental) risks among risk assessors, managers, news media, interested groups and the general public.	Exchange or sharing of information about risk between the decision-maker and other stakeholders.
Risk evaluation		Comparing the risk estimated in the risk assessment with the Member Country's appropriate level of protection. (First component in risk management).	Establishment of a qualitative or quantitative relationship between risks and benefits of exposure to an agent, including the complex process of determining the significance of the identified hazards and estimated risks to the system concerned or affected by the exposure, as well as the significance of the benefits brought by the agent. (Risk Evaluation is synonymous with Risk-Benefit Evaluation).	Process of comparing the estimated risk against given risk criteria to determine the significance of the risk.
Risk management			Decision making process involving considerations of political, social, economic and technical factors with relevant risk assessment information relating to a hazard so as to develop, analyse and compare regulatory and non-regulatory options and to select and implement appropriate regulatory response to that hazard. Risk Management involves three elements: risk evaluation; emission and exposure control; risk monitoring.	Coordinated activities to direct and control an organisation with regard to risk.

Source: IRGC (2005, 147 ff.)

The already mentioned *"resilience*" and "*risk governance*" will be combined through an interdisciplinary approach that defines a reasonable path (risk governance) towards the material goal of creating resilient communities.. However, not every risk setting refers necessarily directly to resilience, but considering risk governance principles is indispensable for when talking about resilience. The core principles of / prerequisites for successful multidimensional and integrative risk governance (elaborated by the project-team based on the scientific knowledge as well as the literature review), which are essential for the success of a risk governance concept, could be summarised as follows:

- **Flexibility** allows an adaptation to new challenges resulting from different risks and settings (in case one system element fails, the system as a whole shall not break/fail/be affected too much);
- **Clear requirements** guide the different actors involved in the risk-governance process to appropriately act in the different parts of the risk-governance-concept (risk assessment, risk management and risk communication);
- **Transparency** of used terms and methods, of decision processes;
- **Communication**, interaction and integration is needed to create a "community wisdom" that is more than just the sum of single experiences (such a community is more resilient);
- Alignment to **common goals** and willingness to agree on common goals;
- **Capacity building** of stakeholders and public: "Insight into risks" by training courses etc;
- **Trust** in public authorities / political decisions;
- **Collaboration** where possible and adequate.

One of the most important aspects concerning the Risk Governance Approach is the "communication" and the "involvement of different stakeholders" into the Risk Governance Process. To keep in mind: "Integrative" is shortly defined by the project as a "*common procedural requirement for the different phases of risk governance*". "Integrative" thus relates to integration of procedural steps as well as to the degree of integration of affected actors into the communication process. This involvement of all affected actors during a risk governance concept can be distinguished into five degrees:

- **"do nothing"** → there is no integration of e.g. stakeholder as well as a communication between e.g. stakeholders and a particular authority in the concept;
- **information** → is characterized by a one-way communication, where the interests of e.g. the public are not the focus of communication;
- **consultation** → a two-way communication, by which not only information are passed by to the e.g. stakeholders, but also the demands, interests and fears of the involved society are considered;
- **co-operation** → a two-way communication, by which the e.g. stakeholder are in a certain extend involved into in the process/concept;

- **involvement** / **collaboration** → a two-way communication, by which the implementation/involvement of all parties are given; the difference of involvement to co-operation is the degree of the involvement (an involvement is the most active way of a communication during a process).

In dependence to the level or necessity of the Risk Governance Process the appropriate degree of involvement should be chosen.

However it is necessary to modify this basic concept for the implementation in the two test cases of the MIDIR-Project, because every case (study) has its own context and characteristic which depends on characteristics of the risk setting itself (e. g. existing level of acceptance with respect to risk governance), political (e.g. legal system), economic, social (e.g. risk culture), institutional and other aspects. These characteristics have a large influence on the implementation of the forthcoming concept on risk governance. Therefore aspects/questions, which should be stressed in this context, are:

- What kind of risk type does exist?
- What kind of administrative/institutional type characterizes the case study?
- Which parts of the concept have to be modified?
- How are the structure and type of the affected stakeholders?
- How to deal with stakeholders that do not speak English?
- What does the access to local stakeholders/decision makers look like?

Even if this approach is promising it should be stressed that also could be problems or hindrances connected to it or it's realisation:

1. The analysis of the scientific literature concerning different projects handling with risk governance has shown that research on risk as well as risk management practice is fragmented by subject and according to the budget-holding organizations involved. This might be evaluated as a problem according to the responsibilities which may lead to failure of the risk governance process in times of e.g. immediate danger.
2. Another problem is the understanding of "risk" (see also before). Risk can be understood in a broad sense as a combination of the probability of occurrence and the extent of the consequences of the impacts understood as adverse effects. However there exist significant differences between "real" and "perceived" risk (interpretation differently according to individual and social contexts). Subsequently there should also be a distinction between factual and "socio-cultural" dimension of risk. It should be underlined, that public decision-making, which is only based on the factual dimension of risk leads to distrust and makes vulnerable – both institutional settings, but also affected individuals. As a consequence more public participation in risk assessments and decision-making is needed in order to make the process more democratic, improve the relevance/quality of technical analysis and increase the legitimacy and acceptance of public decision making.
3. Further, there is a distinction of the problems related to on the one hand to the context and on the other hand to organisational aspects. It is

obvious that some of the mentioned hindrances or problems could fit to both categories.

Context related problems / hindrances

- Problem of politicians (oppositions) that do not want to be involved because they need the opponents' failures to strengthen their own politics;
- Different cultural habits/ways of dealing with risks but also distrust in authorities;
- No/low access to real decision-making;
- Problems of understanding (missing common languages, different knowledge base);
- Non-transparency of the process/problem.

Problems / hindrances related to organisational aspects

- No proper representation of all stakeholder groups in the participation process;
- Problems of understanding (missing common languages, different knowledge base);
- Lack of time and financial resources for intensive participation;
- Lack of engagement/interest of potentially affected stakeholders;
- Lack of acceptance (valid for all involved actors), e.g. caused by poor integration.

2.2 Methodology of the MIDIR project

These accentuated aspects lead to a development of a comprehensive risk governance concept which aims at extensive and active involvement of decision-makers at political and administrative levels and stakeholders as well as better understanding and acceptance of research by society and vice versa bringing the legitimate interests of society and single stakeholders into research. These goals call for a tool that is able to monitor the performance of a risk governance process. This is going to be covered by the new concept elaborated by the MIDIR-Project.

This new concept will be tested in real decision-making settings and cultures by the example of two emerging risks which have a high degree of uncertainty and ambiguity (a plurality of different interests, priorities, understandings, values and visions):

- risks related to criminals under hospital treatment order (forensic psychiatry), and
- risks related to health due to e-commerce.

The users of this indicator system are persons and/or institutions that are responsible for/that are guiding the risk governance process in context of a certain risk setting (internal/external). Implementing the new risk governance concept will test its applicability in practice and lead to new, innovative knowledge about dealing with these risks in Europe.

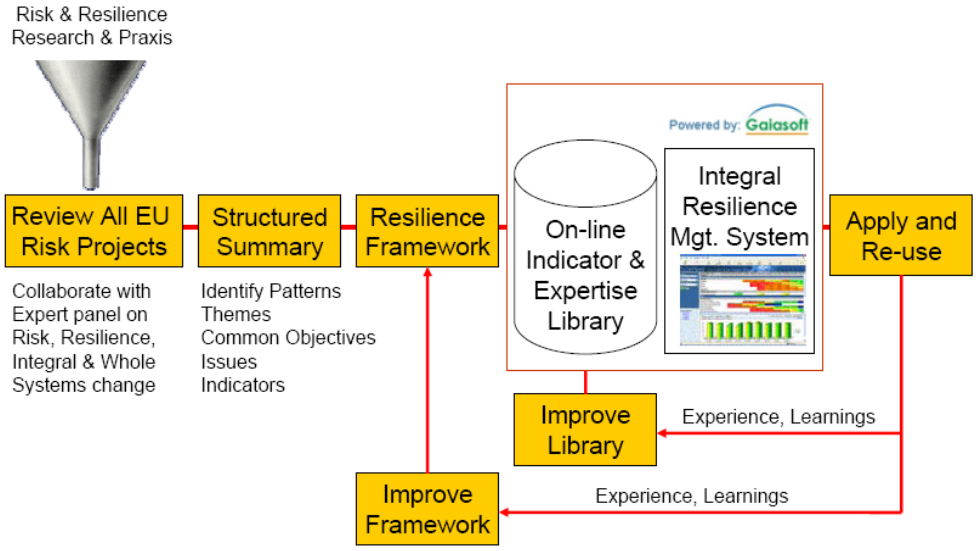
Before starting with the analysis of the projects, an important aspect should be highlighted: The creation of a multidimensional and integrative approach needs a definition of essential parts which can be seen as kind of a "frame-of-action" for the development of the envisaged risk governance concept.

The concept (especially the indicator system) is going to be composed of two parts:

- **Part A:** Procedural and methodological aspects, applicable for every risk setting.
- **Part B:** Context related aspects, to be defined individually for every risk setting.

The first phase of the MIDIR-Project (especially Work Package 1) will only concentrate on procedural and methodological aspects, which are applicable for every risk setting (Part A). Part B is in the focus of Work Package 2 (Integration of concept in real risk management settings in various cultures).

Figure 4: Process of Work Package 1



Source: own elaboration

The indicator system as a whole should be seen as an important outcome, since monitoring and evaluation of governance processes might be relevant for a learning process towards recreating trust in public decision-making. A software will serve as a digital frame for the indicator system. The figure above presents the process of the WP 1. The process is characterized by the following aspects:

- **Research**: Review and summarise outputs of EU and other risk and resilience projects to identify patterns, themes, objectives, issues, indicators.
- **Integral Framework**[3]: Develop an over-arching integral framework for indicators and expertise in resilience capacity building & management.

[3] The integral framework is a comprehensive map for an extensive cross-cultural comparison of human capacities for any given area and incorporates in particular two major aspects that are referred to as "quadrants and levels". The integral approach refers to All Quadrants and All

- **Expertise Library**: Implement a collaborative on-line Resilience Expertise Library of indicators and maturity models.
- **Resilience Management System**: A re-usable, scalable, software, monitoring, performance management and capacity building system.
- **Resilience Expertise Network**: Develop an on-line network of resilience and integral experts and practitioners cross-linked to the Expertise Library and Management System.
- **Resilience Portal**: Deploy Management System as web portal for government, business and societal systems to benchmark, learn and collaborate for resilience.
- **Continuous Improvement**: Put in place process for continuous review and improvement of Framework, Expertise Library and Resilience Management System based on experience.

3 Analysis of projects

The aspects pointed out in the previous part (definitions as well as understandings of the used terminology) build the fundament for the analysis of the projects, which is the basis and framework for the elaboration of the already mentioned indicator system.

The work on the concept and first phase of the project was characterized by three steps:

1. Analysis phase (provides the basis for the mentioned concept);
2. Analysis of existing risk governance projects and/or initiatives with a special focus on Europe; and
3. Input from a worldwide analysis to obtain insights into a non-European situation.

The selection of appropriate projects/initiatives was the basis of the analysis, the further work of the MIDIR-Project and especially WP 1. Nevertheless it was quite difficult to select appropriate approaches (amongst others due to the multitude of approaches which are only directed to one part of the whole risk governance process, e.g. risk assessment). The selection criteria for the evaluation were inter alia best-practice-examples, importance and/or high profile of the approach etc. in the context of the *whole* risk governance process. However it should be underlined, that the availability of information concerning some interesting projects was very limited. Some European projects (like Risk Network) which could be also from great relevance could not be analysed due to the lack of information.

These mentioned difficulties and eligibility criteria lead to the selection of the following 14 international/European/national projects (see section 8 “Analysed Projects”) which were chosen and researched by IRPPS, Gaiasoft, Iku and UNIDO:

Levels, and is therefore as well known as “AQAL model”. See: Ken Wilber (2000) A Theory Of Everything, Shambala

- UK Home Office (UK Project);
- Promoting safety and security at work (Italian project);
- Industrial Risk Reduction (Italian project);
- Foods Risk Reduction (Italian project);
- Risk Communication Manual (Dutch project);
- APUG – Action Programme on Environment and Health (German project)
- Risk Governance – Towards an integrative approach (IRGC).
- STARC – Stakeholders in Risk Communication (European project);
- TRUSTNET (European project);
- TRUSTNET 2 (European project);
- RISKGOV (Comparative Analysis for Radiological and Chemical Discharges of Industrial Installations) (European project);
- Nanotechnology Risk Governance (International project);
- Disaster Risk Reduction for Sustainable Development in Africa (International project);
- Community-based Disaster Risk Management (International project).

However, by choosing these projects and/or initiatives all important topics (e.g. different risk types, complete approaches) were covered.

The multitude of analysed projects was characterised by a diversity of addressed risks. This was from high relevance for the project, because the planned work on the development of a comprehensive risk governance concept calls for transferability. With this the focus of the project (concerning Part A of the system) was opened up to other risk settings than those of the two case studies.

Table 3: Projects and addressed risks

Project/ Initiative	Addressed Risks
APUG	Environmental risks related to environmental pollution during normal operation, not accidents or incidents. Chemical hazardous substances; Physical hazardous substances: Noise, Electromagnetic fields, Ionising radiation; Biological hazardous substances.
Community-based disaster risk management	Natural risks and, in particular, risks associated with natural disaster (flood, cyclone, earthquake, landslide, fire and volcano eruptions).
Food risk reduction	Health risk and food safety risk (biological risks and chemical risks).
Industrial risk reduction	Technological risk, health risk and safety risk. In particular, the dangerous events that can be determined by the use of chemical substances are: fire, explosion and environmental pollution.
Nanotechnology Risk Governance	Financial risk, technological risk, health risk, safety risk. In particular, all risks associated with those technical areas and applications of Nanotechnology, which have international implications and have the potential to harm human health and safety, the economy, the environment, and/or to the fabric of society at large.
Risk at work	Health risk and safety risk. In particular according to the following classes: Safety risks produced by (Accident risks): Structures; Machines; Electrical installation; Dangerous matters; Fire-explosion. Health risks produced by (Environmental healthy risk): Chemical Agents; Physical Agents; Biological Agents. Safety and health risks produced by (etherogeneus type of risks): Work organisation;

	Psychological factors; Ergonomic factors; Heavy Work conditions.
Disaster risk reduction for sustainable development in Africa	Natural risk, health risk and safety risk. In particular disasters arising from natural and related human induced hazards (hydro-meteorological hazards like drought, flood, windstorms, particularly tropical cyclones, landslides and wildfire), epidemics (HIV/AIDS pandemic, malaria and tuberculosis epidemics). Other major hazards are floods, droughts and windstorms. Less frequent hazards include pest infestation, earthquakes, landslides, wildfire and volcanic eruptions.
Risk Communication Manual (NL)	Risk communications about external safety issues, e.g. the storage, processing and transport of dangerous goods.
RISKGOV	Radiological risks related to public exposures to environmental radioactive releases from nuclear installations.
STARC	Risks related to chemical waste disposal sector, genetically modified food sector and the electricity sector.
TRUSTNET	Industrial and natural risks.
TRUSTNET 2	Risk to health or the environment.
UK Home Office	The approach does not define what risks are to be considered other than suggesting that Risk Categories are used to make sure that all risks are captured. The specific categories identified are: Human Resource Risks; External Risks; Activity/Operational Risks and Financial Risks.
IRGC	Risks/hazards in the focus of the IRGC´s work programme: Physical Agents (Ionising radiation, Non-ionising radiation, Noise [industrial, leisure, etc.], Kinetic energy [explosion, collapse, etc.], Temperature [fire, overheating, overcooling]; Chemical Agents (Toxic substances [thresholds], Genotoxic/carcinogenic substances, Environ-mental pollutants, Compound mixtures); Biological Agents (Fungi and algae, Bacteria, Viruses, Genetically modified organisms, Other pathogens); Natural Forces (Wind, Earth-quakes, Volcanic activities, Drought, Flood, Tsunamis, [Wild]fire, Avalanche); Social-communicative Hazards (Terrorism and sabotage, Human violence [criminal acts], Humiliation, mobbing, stigmatising, Experimentation with humans [such as innovative medical applications], Mass hysteria, Psychosomatic syndromes); Complex Hazards – Combinations (Food [chemical and biological], Consumer products [chemical, physical, etc.], Technologies [physical, chemical, etc.], Large constructions such as buildings, dams, highways, bridges, Critical infrastructures [physical, economic, social-organisational and communicative]).

Source: own elaboration

Table 4: Analysed Indicators and Key-Questions

Basic/Content	*Purpose*	Why are we doing Risk Management?
	Principles	What are the governing principles? (E.g. Requirements concerning democratic procedure)
	Values	What are the values by which we make decisions: is the importance of addressing values expressed by the project?
	Motivation	How far have we understood and engaged the motivation of stakeholders?
	Trust	How far is attention paid to the relevance of an atmosphere of mutual respect and trust?
	Behaviours	How far are appropriate (individual) behaviours defined?
	Objectives	How far are areas of objectives for protection groups defined?
	Mindset (meme)	How far is mindset (meme) and focus (quadrant) of decision makers and stakeholders mapped and understood?
	Tolerable	How far are the tolerable levels of risk for various protection groups defined?
	Values based decision	How far are decisions to be made based on values identified?
	Role of Science	How far is scientific basis for our decision making defined?
Procedure	*Senior*	How far is there a Senior Responsible Owner for the process?
	Administration	How far are the boundaries for normative decision making by the administration clearly defined and justified
	Accountability principle	How far is accountability defined at each level (process, each risk)?
	Justification	How far is the activity justified?
	Contexts	How far have contexts been evaluated for relevance, process documented and decisions recorded?
	Priority	How far are risks prioritised? (e.g. Pareto principle or 80/20 rule says that most of the risk is from a subset of sources) – recommend here 80% for likely risks and 20% extreme events
	Process	How far is there a risk governance process – e.g. objective/indicator - measurement - review - analysis - action plan - learn - repeat – improve
	Strategy Integration	How far is Risk Governance integrated into the strategy, objectives, governance and management of the organisation?
Stakeholder	*Identification*	How far are stakeholders identified (through a proper process - including prioritisation)?
	Representation	How far are all relevant social groups and their expectations known?
	Engagement	How far are all relevant social groups motivated to engagement?
	Access to Information	How far is information accessible?
	Interest	How far are the stakeholders interested in having information, in the outcome?
	Trust	How far do the stakeholders trust the decision makers, institutions and information available?
	Acceptance - Process/Outcome	How far do the stakeholders accept the process and the outcome?
	Diaglogue	How far is the dialogue constructive? (listening and mutual understanding)
Resources	*Financial*	How far do the available financial resources meet the needs of the governance process defined?
	Personnel	How far do the personnel resources available in expertise and capacity meet the needs of the governance process defined?
	Time	How far is there calendar time to meet the governance process defined?
	Equipment	How far do the equipment resources available meet the needs of the governance process defined?
Expertise	*Identification*	How far has the need for expertise been evaluated and met through an appropriate process (that needs to be defined in the standard)?
	Role	How far has the role of experts been defined?
	Involvement	How far has the accountability and involvement of experts been defined?

Source: own elaboration

The mentioned projects/initiatives were analysed on the following aspects, which allow in the first instance a general overview and a classification of the projects (see for detailed/complete table of contents section 8 “Analysed Projects”):

1. Description of the risk governance approach (Introduction; Definition/ understanding; Definition of goals; Initiator/responsible body; Who is involved? etc);
2. Characterisation of the risk governance approach (General characterisation; Degree of risk communication; Existence of clear requirements concerning the involved partners etc);
3. Conclusion (Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR?; Which elements could be used for the MIDIR risk governance concept?; General comments/observations).

Beside these questions each project analysis was finalised by a table where 35 aspects/indicators were checked (see Table 4). These aspects were the key-aspects which were elaborated to preposition of the analysis. This elaboration of the key-aspects was justified by means of literature research, interviews etc. in the forefront of the analysis. The project-team listed all significant indicators to make a detailed description as well as comparison possible. It is self-explanatory that it was not feasible to list all available indicators in e.g. literature etc. Such an amount of indicators would be difficult to handle. The analysis concentrated only on those indicators which were of high relevance for the evaluation and for the further work of the project.

Each indicator was supplemented by explanatory questions to reach a better understanding of the indicator and its aim.

These selected 35 aspects were classified into the following 5 topics:

- Basic/Content,
- Procedure,
- Stakeholder,
- Resources,
- Expertise.

The next step of the analysis was the characterisation of the aspects/indicators respectively their implementation into the analysed project. This was the prerequisite for the analysis and qualitative/quantitative evaluation of the project. Indicators were divided into three (respectively four) categories (dependent on the kind of integration into the analysed project). These categories were:

- **completely** = this indicator was completely integrated and elaborated,
- **partly** = this indicator was partly integrated and elaborated,
- **non** = this indicator was not integrated and elaborated,

- **no information** = there is no information about this indicator[4].

This allowed a comparison of the different projects concerning the various aspects/indicators. This comparison was the prerequisite for the illustration as well as elaboration of so called Key-Performance-Indicators (KPIs) which were the basis for the further work of the MIDIR-Project, the "Scorecard[5]" (see below) and the formulation of the mentioned multidimensional and integrative Risk Governance Concept. Key-Performance-Indicators could be described as quantifiable measurements (qualitative as well as quantitative) to reflect strategic performance of e.g. a process or an organisation. A detailed description of the KPIs as well as its elaboration is not in the focus of the Del. 1.1 but will be part of the Del. 1.2.

Different colours marked the different levels of coping of an indicator in order to allow a better comparison of common aspects.

According to this the already mentioned four categories were marked in three (respectively four) colours:

- **completely** = green,
- **partly** = yellow,
- **non** = red,
- **no information** = white.

An aggregation of all assessed projects/initiatives as well as their implementation of indicators could be seen in Table 5: Results of Project-Analysis.

[4] A lack of implementation of a single indicator does not mean that it is not seen as important, but only that it was not considered in the project.

[5] The Balanced Scorecard is new approach to strategic management and was developed in the early 1990's by Drs. Robert Kaplan (Harvard Business School) and David Norton. The balanced scorecard is a ***management system*** (not only a measurement system) that enables organizations to clarify their vision and strategy and translate them into action. It provides feedback around both the internal business processes and external outcomes in order to continuously improve strategic performance and results. When fully deployed, the balanced scorecard transforms strategic planning from an academic exercise into the nerve center of an enterprise.

Table 5: Results of Project-Analysis

		UK Home Office	Italian Project on Risk at Work	Italian Project on Industrial Risk	Italian Project on Food Risk	Nano-technology Risk Governance	Disaster Risk Reduction in for sustainable development	Community-based disaster risk management	STARC	Risk Communi-cation Manual NL	Trustnet 2	Trustnet	RISKGOV	APUG	Risk Governance - IRGC
Basic/Content	Purpose	Partly	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely
	Principles	Partly	Partly	Completely	Completely	Completely	Completely	Completely	Completely	Partly	Partly	Completely	Completely	Completely	Completely
	Values	No	Completely	Completely	Completely	Completely	Completely	Completely	Partly	Partly	Completely	Completely	Completely	Completely	Completely
	Motivation	No	Completely	Completely	Partly	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely
	Trust	No	No Information	No Information	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely
	Behaviours	No	Partly	Completely	Partly	Completely	Completely	Partly	Completely	Completely	Completely	Partly	Partly	Completely	Partly
	Objectives	Completely	Completely	Completely	Completely	Non	Completely	Partly	Partly	Partly	Completely	Non/Partly	Partly	Completely	Completely
	Mindset (meme)	No	Partly	Completely	Partly	Partly	Partly	Partly	Completely	Completely	Completely	Partly	Partly	Non	Completely
	Tolerable	Completely	Non	Non	Non	Non	Non	Non	No information	Partly	Partly/Non	Non	Non	Completely	Partly
	Values based decision	Partly	Non	Non	Non	Non	Completely	Non	Partly	Completely	Completely	Partly	Partly	Completely	Completely
	Role of Science	No information	Completely	Partly	Partly	Completely	Completely	Completely	Completely	Partly	Completely	Completely	Completely	Completely	Completely
Procedure	Senior	Completely	No information	No information	No information	No information	No information	No information	Partly	Non/Partly	Non	Non	Non	Completely	Non
	Administration	Completely	Partly	Completely	Partly	Non	Partly	Partly	Partly/No	Partly	Partly	Non	Non	Completely	Partly
	Accountability principle	Completely	Partly	Completely	Non/Partly	Non	Partly	Non	Non	Partly	Partly	Non	Non	Partly	Completely
	Justification	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Partly	Completely	Completely	Completely
	Contexts	Completely	No information	No information	Non	Non	Completely	No information	Partly	Completely	Partly	Partly	Partly	Partly	Completely
	Priority	Completely	Non	Non	Non	Non	Non	Non	No	Partly	Partly	Completely	Non	No	Completely
	Process	Completely	Partly	Partly	Partly	Completely	Partly	Partly	Partly	Partly/Non	Partly	Completely	Partly	Completely	Completely
	Strategy Integration	Completely	Non	Non	Non	Non	Party	Non	Completely	Partly/Non	No information	Partly	Non	Non	Completely
Stakeholder	Identification	Completely	Completely	Partly	Completely	Partly	Completely	Partly	Completely	Completely	Partly	Completely	Partly	Completely	Completely
	Representation	Partly	Partly	Completely	Completely	Completely	Partly	Completely	Partly	Completely	Partly	Completely	Completely	Completely	Completely
	Engagement	Partly	No information	Completely	Partly	Completely	Partly	Completely	Completely	Completely	Completely	Partly	Completely	Completely	Completely
	Access to Information	No information	Completely	No information	Completely	No information	Completely	Completely	Completely	Completely	Completely	Partly	Completely	Completely	Completely
	Interest	Partly	Completely	Completely	Non	Completely	No information	Completely	No information	Completely	Completely	Partly	Completely	Completely	Completely
	Acceptance Process	No information	No information	Completely	No information	Completely	Completely	Completely	Completely	"Partly"	Completely	Completely	Completely	Completely	Completely
	Acceptance Outcome	No information	No information	Completely	No information	No information	Completely	Completely	Completely	"Partly"	Completely	Completely	Completely	Completely	Completely
	Dialogue	No information	Completely	Non	Completely	Partly	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely
Resources	Financial	No	No information	No information	Completely	No information	No information	No information	Partly	Completely	No information	No information	No information	No information	Completely
	Personnel	No information	No information	No information	No information	No information	No information	No information	Partly	Completely	No information	No information	No information	Completely	No information
	Time	No information	Non	Non	Completely	Non	Non	Non	Partly	Completely	No information	Non	Non	No information	No information
	Equipment	No information	No information	No information	No information	No information	No information	No information	Partly	No information	No information	No information	No information	No information	No information
Expertise	Identification	No information	Partly	Partly	Partly	Non	Partly	Non	Partly	Partly	Partly	Partly	Partly	Completely	No information
	Role	No	Partly	Partly	Partly	Non	Completely	Partly	Partly	Completely	Completely	Partly	Completely	Completely	Partly
	Involvement	Partly	Partly	Partly	Partly	Non	Partly	Non	Partly	Completely	Completely	Partly	Partly	Completely	Completely

Source: own elaboration

4 Outcomes of analysis

Table 5 shows the similarities and differences of the analysed projects/initiatives respectively the common consideration of some indicators. A lot of strong similarities concerning the implementation of indicators in the assessed project were observed:

- Basic/Content
    - Purpose
    - Principles
    - Role of science
- Procedure
    - Justification
- Stakeholder
    - Identification
    - Representation
    - Engagement
    - Access to information
    - Acceptance Process
    - Acceptance Outcome

In consequence, the main hypothesis, the existence of commonly accepted indicators by different risk settings, was successfully proved by this analysis. This positive result can be seen as a basis for the further elaboration of the governance concept and its application in the two test cases. Moreover, it is an important scientific outcome on its own.

However, there are almost no similarities concerning other indicators listed in the topics “resources” and “expertise”. This does not mean that these indicators (concerning financial, personnel, time and equipment) are not important. If there are no resources, there is no possibility to realise the risk governance concept. The explanation of the lack of implementation of these indicators is the lack of attention paid to them by available publications. It can be supposed, that such information is existent, but not listed in the different project-papers. Therefore it would be a mistake to underestimate such indicators.

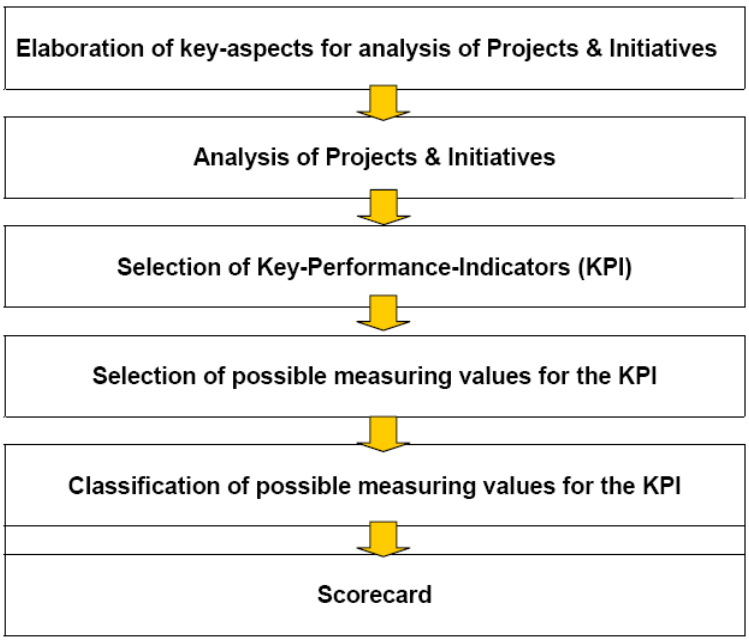
5 Further steps

The assessment of the project/initiatives analysis listed before/below is the prerequisite for the further steps of the Work Package 1.

The next steps (see Figure 5) will be the exploration and elaboration of the already shortly mentioned Key-Performance-Indicators (KPIs), the selection of possible measuring values for the KPIs and the classification of possible measuring values for the KPIs, which finally leads to the Scorecard. By combining financial and non-financial measures the scorecard provides the responsible authority with more relevant information about activities they

are managing (this will be explained in a detailed way in the forthcoming Del. 1.2, where the scorecard and the indicator-system is the main topic).

Figure 5: Further steps of WP 1



Source: own elaboration

6 Conclusions

In the first part of the MIDIR project common risk governance principles accepted by different projects designed for several risk settings and applied in different risk cultures have been identified. This is a certain value in its own. However, the final outcome of this analysis is the proposed indicator system which is an important contribution to the postulated multidimensional and integrated risk governance concept. It will serve as the basis for an ongoing monitoring tool. Such a monitoring system facilitates data collection, measurement of progress and, most importantly, a comparison of the achieved (actual) results with planned ones. This is of great relevance for a governance approach intended to be designed according to democratic principles.

Nevertheless, the indicator system is only a part of the full risk governance concept which will be completed after the test applications at the end of 2007.

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8 Annex: Analysed projects

8.1 APUG – Action Programme on Environment and Health

8.1.1 Description of the risk governance approach

Introduction to the risk governance approach

In Germany, several ministries and higher federal authorities work together to promote research projects and information campaigns in the fields of environmental protection, health protection and consumer protection. The joint Action Programme Environment and Health (German acronym: APUG) aims at strenghtening the links between environmental and health protection in order to offer better protection of human health against adverse environmental impacts. Children and adolescents are a special focus.

Definition/understanding of risk governance

One key area of the APUG-Programme is the improvement of risk regulation. Therefore, a working group, the Risk Commission, was set up. The Risk Commission reviewed risk assessment and management methods and standard setting procedures and developed proposals for remodelling existing approaches to the assessment, management and communication of environmental health risks. The proposed standards have to meet the following objectives:

- transparency, effectiveness and efficiency,
- consistent and comprehensive procedure,
- legal legitimation,
- adequate involvement of the *affected* and the public,
- implemental concerning time and personnel resources.

Core concept	Definition	German concept
risk analysis	Whole process of risk assessment and risk management including screening activities	Risikoregulierung
screening, scoping, ranking	Problem specification (e.g. early detection of risks, priority assessment), determination of general conditions	Vorverfahren
risk assessment	Process from risk potential identification to quantitative risk characterisation	Risikoabschätzung
risk evaluation	(natural)science risk evaluation	Risikobewertung
	social and political risk evaluation	
risk management	Process from identification and selection to implementation and evaluation of options	Risikomanagement

Tab.1: Five core concepts of the Risk Commission

Definition of goals for the risk governance process

The APUG-Programme aims at 1) increasing research into interrelationships in the “environment and health” complex and 2) promoting action based on the precautionary principle. Environmental factors hazardous to health are to be identified in good time and assessed scientifically. Strategic and

specific ways and means of preventing and controlling environment-related health problems are to be developed and implemented.

Who is the initiator/responsible body of the concept?

Federal Ministry of Health (Bundesministerium für Gesundheit - BMG) and Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit - BMU) (June 1999); Federal Ministry of Food, Agriculture and Consumer Protection (Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz – BMVEL) (since autumn 2002). The APUG-Secretariat is located at the Federal Environmental Agency.

Participants/Partners

Scientific back-up for the Action Programme is provided by the associated superior federal authorities: the Federal Office for Radiation Protection (Bundesamt für Strahlenschutz - BfS), the Robert Koch Institute (RKI) and the Federal Environmental Agency (Umweltbundesamt – UBA), the Federal Institute for Risk Assessment (Bundesinstitut für Risikobewertung – BfR), and the Federal Office for Consumer Protection and Food Safety (Bundesamt für Verbraucherschutz und Lebensmittelsicherheit – BVL).

Regional/National/International approach?

Within one of the key areas of the APUG-Programme, the "risk analysis", several national studies were conducted, covering aspects of risk perception, risk communication, and risk assessment. The results were reviewed by the Risk Commission (see above).

How is the practice of risk governance organised?

The APUG-Programme provides a website, where all necessary information is available. To get further information the APUG-Secretary can be contacted via E-Mail or mail.

Who is involved?

The Risk Commission included 19 experts in the field of risk assessment and management on the basis of natural, social and legal sciences as well as interdisciplinary knowledge. The members of the group came from universities, research organisations, associations, federal and state authorities.

Are stakeholders involved from the early beginning in all steps?

Yes. It is addressed to affected citizens as well as to organised public groups, to allow early and mutual participation at every step of the decision making process. The aim is to enable the "risk mature citizen" to assess the acceptability of the risk for the society on the basis of knowing the consequences, the remaining uncertainty and other risk related factors of the particular risk.

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

Within the process of risk assessment and management stakeholders are involved and at the end an action plan is proposed. Then the competent authority takes the decision. If the decision is not taken on basis of an agreement among all participants, the dissent opinions are documented

within the proposed actions plan. Stakeholder involvement is even possible subsequently during the phase of monitoring, evaluation, and appraisal of need for changes.

Which risks are addressed?

Environmental risks related to environmental pollution during normal operation, not accidents or incidents.

Chemical hazardous substances

Physical hazardous substances: Noise, Electromagnetic fields, Ionising radiation

Biological hazardous substances

Pythia	**Medusa**	**Pandora**
P is uncertain	*P* tends to be low	*P* is uncertain
Certainty of assessment of *P* is low	Certainty of assessment of *P* tends to be low	Certainty of assessment of *P* is unclear
E is uncertain (potentially high)	*E* tends to be low (exposure high)	*E* is uncertain (only assumptions)
Certainty of assessment of *E* is unclear	Certainty of assessment of *E* tends to be high	Certainty of assessment of *E* is unclear
	Mobilization potential is high	Persistency is high (generations)

The addressed risks belong to different risk types. Either to the risk type

- "Pythia" (characterised by potentially high damage extents and an unclear certainty of assessment of the damage extent), e.g. genetic engineering, or
- "Pandora" (characterised by uncertain damage extent and unclear certainty of assessment of the damage extent), e.g. endocrine disruptors, or
- "Medusa" (characterised by a rather low damage extents and high certainty of assessment of the damage extent), e.g. electromagnetic fields.

Studies:

In the field of *risk perception* a feasibility study on early identification of environmental health risks was conducted. It gives an overview of early-detection methods and presents case studies. Based on this work, proposals for a system for the early perception of risks were developed.

Within the research project on *risk communication* the aim was to show how authorities can improve risk communication. Principles and guidelines for different communication scenarios and a training programme “Risk communication” for authorities were developed.

In the field of *risk assessment* several research projects were conducted examining procedures and methods for the assessment of environmental health risks: comparison of methods for deriving health-based effect thresholds from data from animal experiments; evaluation of scaling doses from animal experiments to humans (interspecies extrapolation); estimation of pollutant concentrations using quantitative risk assessment methods.

Description of procedural steps that are used

The Risk Commission

- analysed the problem and deficits of the existing regulation practice
- presented a preliminary report about the stage of deliberations to the interested trade public (Fachöffentlichkeit)
- implemented the comments and results of a hearing into the final report

On the basis of this review the final report describes each phase of the risk analysis process and proposes recommendations for a reorganisation of the institutional context

Description of methodologies that are used

The Risk Commission analysed scientific literature on risk assessment, risk management and risk communication and implemented comments and results of a hearing. A particular model of risk governance is proposed in which the involvement of stakeholders is part of the whole process.

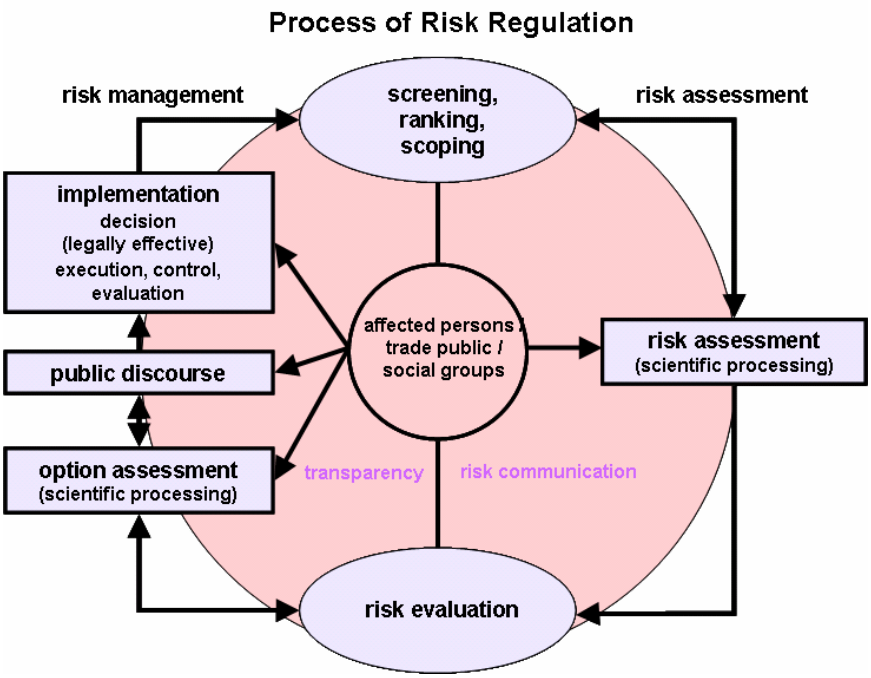


Fig. 2: Outline of the Process of Risk Regulation

8.1.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

A bottom-up participation-led model of dealing with complex environmental risk issues with a focus on human health.

Degree of risk communication? How does communication work in practice? How does information flow in practice?

The risk analysis model is characterised by involvement of stakeholders according to the situation, the type of risk and the stage of the process. Involvement means to get access to all relevant information and to give recommendations.

It differentiates between the involvement "caused by exposure" and refers to participation of affected citizens and the general public or the involvement "caused by science" (involvement of experts) or "caused by authority" (adjustment between different authorities).

Is the approach integrative?

Yes, the Risk Commission

- considered risk regulatory systems at the national and international level (EU and OECD);
- examined the role of public authorities, experts and other stakeholders;
- proposed institutional reforms;
- proposed a legal framework for standard determination to protect human health and the environment (Entwurf eines Gesetzes für Standardsetzung zum Schutz der menschlichen Gesundheit und der Umwelt)

Is the approach multi-dimensional?

Yes, the following dimensions were addressed: a) the guiding principles of the risk regulation process; b) the role of expertise; c) the type of stakeholder involvement at each stage of the risk analysis process; d) the factors integrated into preliminary proceedings to risk analysis; e) the implementation of decisions and review.

Is the approach transparent?

Yes, all necessary steps and their relationship are well explained and visualised.

Do clear requirements concerning the involved partners exist?

Yes, the proposed guidelines explain the role and the requirements of the involved stakeholders at each stage of the risk analysis process.

Does capacity building of involved partners exist?

Yes, an institutional reform is proposed, including the appointment of a "Risk Council" together with an additional risk communication service.

8.1.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR?

Yes, it consists of the following steps, which can be transferred into different risk settings:

- Institutional framework
- Process elements (Inclusiveness of participants; Inclusiveness of issues; Collective learning; Mutual learning)
- Governance Culture (Multi-level governance; Resilience of the process)
- Evaluation and Re-initiation
- Outcomes (Trust, confidence, acceptance of decisions, sustainable development)

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

Especially the flow charts for 1) risk regulation, 2) risk assessment and 3) risk management including at each step different types stakeholder involvement could be used for MIDIR.

Area			Context											Governance								Stakeholder								Resources				Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance Process	Acceptance Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role	Involvement
Project	Indicator?	Addressed?	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Non	Completely	Completely	Completely	Completely	Completely	Partly	Completely	Partly	No	Completely	Non	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	No information	Completely	No information	No information	Completely	Completely	Completely
	APUG		Nomination of purpose	fairness and competence		Arena-Theory: gain of resources	openess													naming of steps			selection procedure	selection procedure	internet, newsletter	participation of stakeholders in meetings		no disagreement of stakeholders	no disagreement of stakeholders or majority vote	integration of stakeholders in decision-making		Reputation or vitae of experts					

8.2 Community-based Disaster Risk Management

8.2.1 Description of the risk governance approach

Introduction to the risk governance approach

The Community-Based Disaster Risk Management (CBDRM) project has the task to develop a framework for the governance of disaster risks, in which communities 'at risk' are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities.

The main objectives of the CBDRM's project are 1) to provide a framework for disaster risk management in Asia for practitioners to help them understand the recent concepts and advancements in understanding the risks and planning actions to reduce risks; 2) to provide examples from various parts of the world to demonstrate the use of tools and successful methodologies.

Who is the initiator/responsible body of the concept?

The Asian Disaster Preparedness Center (ADPC), Bangkok, Thailand.

Participants/Partners

United Nations Economic and Social Commission for Asia and Pacific (UNESCAP), Bangkok, Thailand; the European Commission Humanitarian Aid Department (ECHO), Brussels, Belgium.

Definition/understanding of risk governance

Risk Governance is necessary to generate the political will to drive the development, implementation and maintenance of the national disaster risk management framework.

This risk governance system should meet a number of objectives, including:

- Recognising the need for a national disaster risk management policy;
- Establishing a policy formulation process;
- Defining the main policy elements;
- Arranging for implementation and maintenance procedures, including monitoring and reviewing the effectiveness of risk reduction actions.

Definition of goals for the risk governance process

The Community-Based Disaster Risk Management (CBDRM) project aims at: 1) providing common goals and approaches for disaster risk reduction; 2) directing and securing resources (human, financial, information and material) towards disaster risk reduction; 3) promoting coordinated efforts and partnerships in reducing disaster risks.

Regional/national/international approach?

Disaster risk management has to be incorporated into the practices of **national** and **sub-national** (provinces / regions, local governments) organisations. Each ministry, department and individual becomes responsible for proactively identifying and acting to address the concepts

and principles of sustainability in design, planning and engineering decisions.

How is the practice of risk governance organised?

The Asian Disaster Preparedness Center (ADPC) provides a website, where all necessary information (documents) about the CBDRM's project is available.

Who is involved?

The ADPC group includes members from several countries of the South East Asian region such as: Bangladesh, Lao PDR, Sri Lanka, Vietnam, Thailand and Cambodia.

Multiple sectors and disciplines are involved in the CBDRM project. Different economic, education, religious, social, local municipal, environment, etc. sectors have a vested interest in how they can reduce their susceptibility and build resilience to the risk of disasters. In particular, involved people can be classified as:

- Insiders: those located inside the community such as individuals, households, businesses, community organisations, local NGOs.
- Outsiders: international and regional NGOs, sector organisations and private sector consultants used to enhance the capacity of the community.

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

The CBDRM's project proposes a methodology for ensuring stakeholder participation in all stages of the project cycle management. In fact, a disaster risk management programme is unlikely to succeed without the participation of all stakeholders who will be affected by the implementation of risk reduction actions.

The stakeholders include the government, ministry departments, private sector companies, city developers, NGOs and communities.

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

The formulation of policy, as well as risk management in general, must be driven by political will, but this must be supported by the government, private sector, NGOs, media and the general public. In particular, 1) stakeholders have an important role to play in planning, supporting or implementing disaster risk reduction actions and 2) the community plays an important role in information gathering through experiences, knowledge and understanding of the local people who prepare disaster risk management plans in this approach.

Which risks are addressed?

The project addresses natural risks and, in particular, risks associated with natural disaster (flood, cyclone, earthquake, landslide, fire and volcano eruptions). Moreover, the project focuses on disaster risks in the South East Asian region.

Description of procedural steps

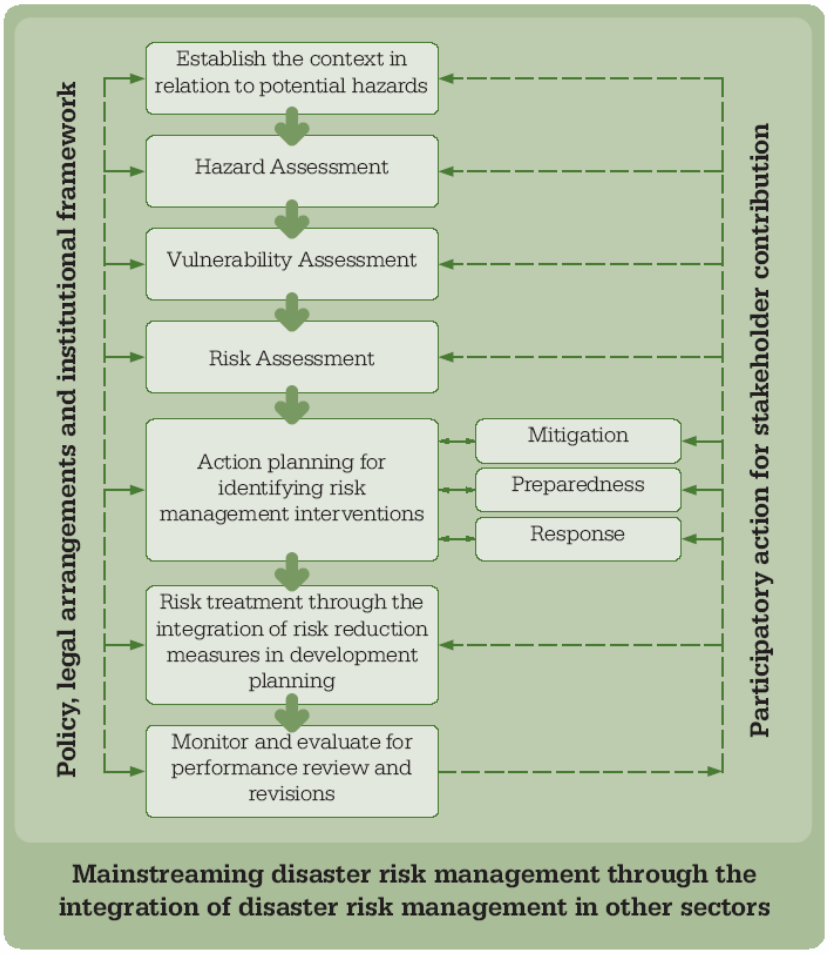


Fig 1. Steps in Disaster Risk Management Framework

The Disaster Risk Management Framework, depicted in Figure 1, breaks down into four main phases:

- establish the context of the disaster risk management process: the circumstances surrounding the initiation of the disaster risk management process will influence the level of effort, types of issues and concerns to be addressed.
- formulate disaster risk management policies: disaster risk management policies set the course of action to be followed to reduce potential risks. Policies reflect the context of the disaster risk management process. The context typically changes as part of the disaster risk management process. This emphasises the iterative nature of this process and the importance of on-going communication and consultation.
- establish legal arrangements to enact or encourage the implementation of disaster risk management policies: legal arrangements include the laws, executive orders, acts, etc. necessary to translate policy into action.

- establish the institutional framework necessary to enact disaster risk reduction policies: the institutional framework establishes the roles and relationships among entities charged with implementing the disaster risk management programme.

Description of methodologies that are used

The project provides a disaster risk management framework that is composed of the following fields of action:

- Risk awareness and assessment including hazard analysis and vulnerability / capacity analysis;
- Knowledge development including education, training, research and information;
- Public commitment and institutional frameworks, including organisational, policy, legislation and community action;
- Application of measures including environmental management, land-use and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments;
- Early warning systems including forecasting, dissemination of warnings, preparedness measures and response capacities.

8.2.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

The project aims at the co-operation among both government ministries and departments with responsibilities related to disaster risk management (such as community development, land-use planning and public works), and political as well as professional categories. These collaborations can take the form of round-table discussions, workshops to exchange information on inter-related activities, etc.

Degree of risk communication? How does communication work in practice? How does information flow in practice?

Risk communication and consultation are essential and on-going parts of the disaster risk management process. Risk Communication and consultation with all stakeholders ensures that the risk assessment addresses issues of concern, keeps stakeholders up-to-date on progress and provides evolving information on the nature of the risk.

Is the approach integrative?

Yes. The framework takes into account:

- laws, executive orders, regulations, acts and other legal instruments that establish basic guidelines for governmental and non-governmental actions related to disaster risk management,
- the socio-political impacts of disaster event,
- environmental policies (environmental impact assessment process and recommendations),
- government commitment to global forums (Agenda 21, Kyoto Protocol, WCDR 2005),

- national policies for the conservation of natural resources.

Is the approach multi-dimensional?

Yes, the approach is multidimensional as it addresses each element of risk: hazard severityand frequency, elements at risk (e.g. population, critical infrastructures) and vunerability. Moreover, the people involved in process are manifold and include decision makers, technical bodies, NGOs and civil society.

Is the approach transparent?

Yes. The transparency is supported by the documentation. As the aim is to promote an informed, alert and self-reliant community, it is essential to achieve information dissemination, public awareness and transparency of the regulating process.

Do clear requirements concerning the involved partners exist?

Not mentioned.

Does capacity building of involved partners exist?

Not mentioned.

8.2.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR?

Yes. The disaster risk management framework consists of the following steps, which can be transferred into different risk settings:

- establish the context of the disaster risk management process;
- formulate disaster risk management policies;
- establish legal arrangements to enact or encourage the implementation of disaster risk management policies;
- establish the institutional framework necessary to enact disaster risk reduction policies.

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

The structure of the Disaster Risk Management Framework could be used for MIDIR.

Project: CBDRM

Area	Key-Word	Addressed?	Indicator?
Context	Purpose	Completely	Project name
Context	Principles	Completely	Public risk awareness
Context	Values	Completely	
Context	Motivation	Completely	Degree of collaboration
Context	Trust	Completely	Level of transparency
Context	Behaviours	Partly	
Context	Objectives	Partly	Degree of risk protection
Context	Mindset (meme)	Partly	
Context	Tolerable	Non	
Context	Values based decision	Non	
Context	Role of Science	Completely	Percentage of scientific partners
Governance	Senior	No information	
Governance	Administration	Partly	
Governance	Accountability	Non	
Governance	Justification	Completely	
Governance	Contexts	No information	
Governance	Priority	Non	
Governance	Process	Partly	
Governance	Strategy Integration	Non	
Stakeholder	Identification	Partly	
Stakeholder	Representation	Completely	Number of social groups involved
Stakeholder	Engagement	Completely	Degree of stakeholder engagement
Stakeholder	Access to Information	Completely	Participation of stakeholders in meetings
Stakeholder	Interest	Completely	Participation of stakeholders in meetings
Stakeholder	Trust	Completely	
Stakeholder	Acceptance - Process	Completely	
Stakeholder	Acceptance - Outcome	Completely	
Resources	Dialogue	Completely	
Resources	Financial	No information	
Resources	Personnel	No information	
Resources	Time	Non	
Resources	Equipment	No information	
Expertise	Identification	Non	
Expertise	Role	Partly	
Expertise	Involvement	Non	

8.3 Foods Risk Reduction

Italian Project on Foods Risk

8.3.1 Description of the risk governance approach

Introduction to the risk governance approach

Institutions and consumer associations have the role to perform monitoring and surveillance activities on foods risks. The goal of this activity is to produce information useful for consumers able to orientate them towards healthy products and habits.

Definition/Understanding of risk governance

In the last decades the food production and distribution have been characterized by relevant changes. Now there is not a strict relation between producers and consumers. In this context, food certification, safety, quality and preservation play an important role for the foods safety. A growing part of the population is now conscious of the foods safety problem and asks to public institutions to carry out specific actions and controls to guarantee the safety and the quality of foods.

Definition of goals for the risk governance process

The primary goals of the risk governance process are:

- to diffuse the consciousness and the knowledge about risks related to the intake of food items, especially related to the presence of phyto-pharmaceutical products in foods and other contaminants, to a non correct preservation and quality of foods,
- to define and perform monitoring and control campaigns,
- to inform about control campaigns and their results.

Who is the initiator/responsible body of the concept

The CNSA (*Comitato nazionale per la sicurezza alimentare*) is the public Institution that has the role to promote and coordinate the definition of standard methodologies to evaluate the foods risk, to propose methodologies for planning monitoring and surveillance programs finalized to the control on the security of the food items and for the verification of the correct application of the law on the safety.

Regional/National/International approach?

The approach is national, however each country take into account directives from the European Union concerning methodologies to follow and rules that have to be established at national level.

How is the practice of risk governance organized? (existence of an office, website, personnel input, input of other resources)

A network of public institutions and associations are involved in the practice of risk governance on agro-food products. A website on these themes is available and periodically updated with the goal to inform about synergies developed and results obtained. The website is just one of the informative channels. Other informative products are:

- informative booklets concerning the presentation of formative or informative events;
- multimedia products for facilitating the presentation and the diffusion of obtained results.

Who is involved? (decision makers, affected people, NGOs, scientific community/researchers)

The CNSA performs the monitoring activity in cooperation with other public institutions and associations. Several kinds of public institution, organisations, associations and competences are involved: Each participant is involved with its personnel and resources. In particular, some of the partners involved are:

- Federconsumatori Nazionale (a national federation of consumers)
- Confagricoltura (a national federation of farmers)
- Catholic University of Piacenza – Institute of Agricultural Chemistry
- Azienda USL di Piacenza
- Istitute of Experiments on Cereals – Fiorenzuola d'Arda
- Coldiretti di Piacenza (a local federation of farmers)
- Confederazione Italiana Agricoltori di Piacenza (a national federation of farmers)
- Unione Provinciale Agricoltori di Piacenza (a local federation of farmers)

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

In the foods risk management stakeholders are mainly involved in the phase of problem identification.

The involvement of the stakeholders (together with consumers) in the first phase of the problem identification of foods risk allows to understand the relationship between the risk perception and effective risk and to analyse the effective risk from different points of view.

Who takes the decision in the end? Is the decision taken on basis of an agreement among participants?

Although the approach is based on the active participation of several public institutions and consumer's associations, decisions on food risks are mainly taken by policy makers in order to guarantee the safety of citizens.

Which risks are addressed? (characterized by ambiguity and uncertainty? To which risk type do the risks belong?)

The project addresses the following risks: health risk and food safety risk.

Food risks can be divided into two main categories:

- Biological risks and
- Chemical risks

Biological risks concern direct infections or derived from toxins produced by viruses, bacteria, yeasts present into foods and dangerous for people.

Chemical risks concern the damage produced by pesticide, preservatives and contaminants of the environment.

Description of procedural steps

The approach is based on the application of three phases:

Phase 1: Definition and specification of the monitoring system and of an informative map concerning the presence of contaminants and phyto-pharmaceutical products in foods, and related to a non correct preservation of foods.

Phase 2: Dissemination of the acquired knowledge and production of informative, multimedia, didactical and interactive material.

Phase 3: Making aware, communication and formative activities devoted to teachers, students and citizens.

Description of methodologies that are used

The available documents on the web don't present the methodologies used for the risk characterization. However, in the entire project the scientific consultants from the Academy, Public Institutions and Associations collaborate constantly for the implementation of the several actions need to perform the project goals.

8.3.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

The presence of consumer's associations makes the approach mainly co-operative. In particular the consumer's associations have the important role to stimulate several institutions involved in the activity control.

Degree of risk communication? How does communication work in practice? How does information flow in practice?

The communication plan addressed to citizens is mainly based on the implementation of the following actions:

- press release, conferences for stakeholders and policy makers, seminars, round table, public manifestations, web and newsletters, publicity campaign. It is important, in order to improve the trust between institutions and citizens, to balance available resources with pursued communication goals.
- Definition of a temporal planning of the several information actions to perform as ordinary activity to make citizens consciousness and trustful respect to the public administration. The implementation of this temporal planning can facilitate the reciprocal trust between authorities and citizens during emergencies.

Is the approach integrative?

The policy of the safety of foods is based on an integrative approach. In fact, the approach considers the overall food chain, all sectors of food-producing, directives from European Union and the several political decisional phases.

Is the approach multi-dimensional?

Multi-dimensionality in foods risk management arises from the different disciplines and expertises involved, where experiences, goals and methodologies cover defined aspects of the foods risk management and all together can offer a multi-dimensional perspective.

Is the approach transparent?

The approach is transparent and involves all participants that can furnish an efficient contribute for new developments. It is important that the information on foods risk is presented clearly and trasparently to the consumers.

Do clear requirements concerning the involved partners exist?

The partners involved on specific goals must have technical competencies on one or more of the arguments concerning contaminants, additives, production processes, preservation, biological products, OGM, allergies etc.

Does capacity building of involved partners exist?

The partners involved on specific activities have (should??) be able to build the following aspects:

1) To develop controls on contaminants using coordination and synergies between public and private partners;
2) To diffuse a culture based on the knowledge of the agricultural products with a particular attention to eventual contamination's risk;
3) To improve the sense of responsibility of agricultural producers using a correct quantity of chemical products and using production's techniques that can increments the safety of foods;
4) To promote communication processes toward citizens. This allows to develop a critical and consciousness opinion on foods risk.

8.3.3 Conclusion

Is the type of the approach appropriate for the types of risk that are addressed by MIDIR? Conclusion

The kind of risk is not included into the thematic of the MIDIR project. However the approach, proposed by the project, presents all the specific characteristics considered in MIDIR as:

- multidimensionality
- transparency
- integrative point of view

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

The integrative point of view used in this project that considers the overall food chain, all sectors of food-producing, directives from European Union and the several political decisional phases is particularly interesting for the MIDIR Project.

Area			Context										Governance								Stakeholder								Resources				Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance - Process	Acceptance - Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role	Involvement
Project	Addressed?		Completely	Completely	Completely	Partly	Completely	Partly	Completely	Partly	Non	Non	Partly	No information	Partly	Non/Partly	Completely	Non	Non	Partly	Non	Partly/Completely	Completely	Partly	Completely	Non	No information	No information	No information	Completely	Completely	No information	Completely	No information	Partly	Partly	Partly
	Indicator?				Level of safety		Level of pubic involvement;		Level of risk protection				Percentage of scientific stakeholders									Number of social groups involved		Degree of stakeholder engagement	Participation of stakeholders in meetings					Level of involvement							

8.4 Industrial Risk Reduction

Italian Project on Industrial Risk

8.4.1 Description of the risk governance approach

Introduction to the risk governance approach

Starting from 1970, several repeated and serious accidents in some industries and pressures of the public opinion stimulated the member states of the European Community (European Union) to carry out more effective actions in order to prevent and to reduce risks connected to very dangerous industrial activities. In particular, the European Union Directive (known as "Seveso") that was enacted in order to front this type of accidents, faced this problem in a more adapted and specific way than in the past. It was included in a context of laws and specific constraints that were already adopted in the member states. However, these laws and constraints were mainly used for the safeguard of the environment from the water and air pollution, taking into account normal conditions of working in the plant. Instead the "Seveso" Directive enlarged the protection of the population and of the environment taking into account relevant events according to the gravity of the consequences.

Definition/understanding of risk governance

The industrial risk is connected to anthropic activities and to the presence of industrial plants and technological infrastructures on the territory. The treatment of some substances in these plants constitutes dangerous sources due to their potential release. In particular the industrial risk is connected to:

1) the release of one or more than one dangerous substances, that exceed established thresholds of quantity during specific industrial activities;
2) the possibility of not controlled evolution of an industrial activity that could generate a serious danger which could be immediate or postponed both for persons that are indoor or outside of the plant and for the environment.

Definition of goals for the risk governance process

In the field of the control systems concerning industrial risk, one of the main aims is the creation and the update of a risk map about remarkable accidents. It is connected to the industrial activities that are located in the national territory in order to promote information about existing levels of safety of the people.

Who is the initiator/responsible body of the concept?

APAT (*Agenzia per la Protezione dell'Ambiente e per i Servizi Tecnici*) is the institution dealing with these problems. It carries out national technical-scientific activities that are connected to its public functions. Its main activities concern the protection of the environment by elaborating, checking and promoting programs in order to deliver information and teach about environmental problems.

Regional/National/International approach?

The approach is national.

How is the practice of risk governance organised? (existence of an office, website, personnel input, input of other resources)

The main instruments to support this approach are:

1) the informative system that is the main support system to:
   - identify areas that have high concentration of industrial plants;
   - define the borders of the areas that have an high concentration of industrial plant;
   - planning of emergency areas;
   - identification of interventions related to prevention or protection of an area.
2) A database is predisposed by Environment Ministry and by APAT. It is defined in collaboration with several Regional Agencies (Piemonte, Emilia Romagna, Veneto, Toscana, Umbria, Campania), that have collaborated according to their territorial management.

Who is involved? (decision makers, affected people, NGOs, scientific community/researchers)

The Institutions involved are:

- The Environment Ministry;
- Regions and Provinces;
- Prefectures;
- Municipalities;
- Technical Committees of the "*Corpo Nazionale dei Vigili del Fuoco*"

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

Environmental problems and their effects on the every day life often effects the public opinion. Using specific instruments, like questionnaires, this approach aims to detect the degree of consciousness of people, their opinions and their behaviour related to the environmental protection. In particular the purpose of the involvement activities of the stakeholders is to spread methodologies and knowledge in order to support local management environmental economical and social aspects. Performed activities are connected to:

- dissemination of updated environmental data that is useful at the local level using specific indicators
- improvement the presence on the territory using seminar about local environmental protection assistance and consulting activities about main topics and problems concerning the environmental protection at the several territorial levels.

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

In this approach, stakeholders are actively evolved in the decision process concerning with public politics. This active involvement allows stakeholders to suggest political choice and to point dialog about politics. However, the Environment Ministry has the main role in the final decision process and in political processing.

Which risks are addressed? (characterised by ambiguity and uncertainty? to which risk type do the risks belong?)

The project addresses the following risk types: technological risk, health risk and safety risk. In particular, the dangerous events that can be determined by the use of chemical substances are:

- Fire,
- Explosion;
- Environmental pollution

Description of procedural steps

The evaluation of the industrial risk is composed of four phases:

1) risk identification: looking on harmful things for the environmental;
2) risk characterisation: determining relationships action/results;
3) exposure estimation: computation of predictable concentration in the several environmental divisions;
4) computation of the risk: determining quantitative measures between action/results and of the concentration in the several environmental divisions.

Description of methodologies that are used

This approach for studying ambient problems is based on three operative instruments:

- "*Ecocatasto*": that collects and describes the main environmental data produced by municipalities using specific indicators that have the purpose to disseminate information about environmental protection in the territory;
- "*Ecopiano*": that allows to analyse and evaluate environmental features using graphical integrated visualization of local situation according to the data stored in the data base.
- "*Ecobilancio*": that provides a technical-scientific support to the local administration. It focuses on the comparison among data stored in the "*Ecocatasto*" database and average values and values that can be derived from the international and national normative.

8.4.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

This approach is mainly informative. Using its Databases ANPA aims to disseminate:

a) a general information about the vital statistics of the plant about position of the plant, about main activities made in the plan;

b) information about the main sensitive activities near the plant;

c) information about administrative status;

d) information about matters related to identification, typology of danger and quantity;

e) information related to controls.

Degree of risk communication? How does communication work in practice? How does information flow in practice?

The industrial risk is studied with a cultural process that considers the citizen's safety as one of the fundamental values that the P.A. has to transmit. These values need a complete and transparent communication, for this reason, the policy makers have to consider the citizen's opinions and necessity in order to develop a direct and positive relationship.

Is the approach integrative?

This approach integrates all the environmental problems that arise during the cycle of activities: this cycle is connected to dangerous matters that are present in specific industrial activities and related to the not-controlled evolution of specific industrial activities that involve serious dangers. This integrative approach allows to detect the effect of the decisions and it provides the instruments for a long time planning.

Is the approach multi-dimensional?

This approach turns out to be multi-dimensional because it overdraws the analysis on several areas as:

a) industrial processes: chemical processes, production processes, dynamics of the reactors, security system;

b) accident analysis: characteristics of dangerous products, historical analysis and accident databases, accident identification, accident sequences analysis, reliability;

c) effect analysis: exposure and poisonous aspects, sporting of accident scenarios, evaluating effects, area risks;

d) operative and managerial factors: human factors, safety managing system, audit safety, emergency planning,, post-accident re-establishment.

Is the approach transparent?

Due to the need to consider potential recipients of the communication, it is necessary make the information that is scientifically trustworthy transparent. The fundamental necessity is to encourage a sharing of

meanings that afford to reach different recipients according to their cultural levels.

Do clear requirements concerning the involved partners exist?

The partners involved on specific goals must have technical competencies on one or more of the arguments concerning risks connected to the activity, plants and chemical product type, accidental scenarios, identification of possible dominos effects, identification of effects due to the characteristics of the area, biological products, OGM, allergies etc.

Does capacity building of involved partners exist?

This study about environmental problems needs specifics ability. That can be enlarged in three different areas:

1) Analysis and evaluation ability (safety analysis, evaluation of accidental affects, etc.);
2) Managing and control ability (analysis of managing system of safety inspective evaluation about managing system of safety, etc.);
3) Communicative ability (social perception, information, involvement of citizens).

8.4.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR? Conclusion

This approach seems to belong to the MIDIR project according to all its aspects.

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

The multidimensionality as well as the transparency ensure a full involvement of the public opinion to enlarge the knowledge about data that emerge from each phase of analysis. In fact, the main reasons that have led to the development of this approach by APAT are founded on the desire to make an experience of monitoring and surveillance about environmental risks in order to enlarge data sources for giving an advantage to the consumer that solicits the vigilance. Giving an answer to the growing informative needs is a harder task and it systematically increases the attention of citizens and the institutions toward the environmental context.

Area			Context											Governance								Stakeholder								Resources					Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance - Process	Acceptance - Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role	Involvement
Project	**Addressed?**		Completely	Completely	Completely	Completely	Non/Partly	Completely	Completely	Completely	Non	Non	Partly	No information	Completely	Completely	Completely	No information	Non	Partly	Non	Partly	Completely	Completely	No information	Completely	No information	Completely	Completely	Non	No information	No information	Non	No information	Partly	Partly	Partly
	Indicator?				Degree of safety				Degree of risk protection				Percentage of scientific stakeholders				Number of industrial accidents						Number of social groups involved	Degree of stakeholder engagement		Degree of stakeholders participation											

8.5 Nanotechnology Risk Governance

Analysis of adequate risk governance approaches in the development of nanotechnology products

8.5.1 Description of the risk governance approach

Introduction to the risk governance approach

The International Risk Governance Council (IRGC) has the mission to develop a framework for the governance of risks associated with those technical areas and applications of Nanotechnology for which there is an apparent need for more than just the existing approach to risk and safety issues. The main objectives of the IRGC's Nanotechnology Risk Governance (Roco M.C., 2005 "International Perspective on Government Nanotechnology Funding in 2005", Journal of Nanoparticle Research, Vol. 7, N° 6, pp707-712) project are to address longer-term and broad societal implications of nanotechnology that are not well covered by national studies, and provide a framework for national and particularly global governance of nanotechnology. The project has as its final deliverable an international workshop and corresponding report in which efforts will be made to achieve consensus on a framework for governance of the risks (both positive and negative) associated with certain Nanotechnology applications.

Who is the initiator/responsible body of the concept?

Chairman of the IRGC's Scientific and Technical Council: Prof. Dr. M. Granger Morgan, Department of Engineering and Public Policy, Carnegie Mellon University (US)

Participants/Partners

Dr. *Lutz Cleemann*, Allianz Technology Centre (DE); Prof. *Jean-Pierre Contzen*, Technical University of Lisbon (P); Academician *Konstantin Frolov*, Director of Mechanical Engineering Research Institute (Russian Federation); Prof. Dr. *Manuel Heitor*, Technology and Higher Education (P); Prof. Dr. *Hou Yunde*, State Center for Viro-Biotech Engineering and State Key Laboratory for Molecular Virology and Engineering (China); Prof. *Ola M. Johannessen*, Nansen Environmental and Remote Sensing Center (N); Prof. Dr. *Fotis Kafatos*, Imperial College of Science, Technology and Medicine (UK); Prof. Dr. *Wolfgang Kröger*, Laboratory for Safety Analysis (CH); Dr. *Patrick Lagadec*, Ecole Polytechnique (FR); Dr. *Jeff McNeely*, World Conservation Union (CH); Prof. Dr. *D. Warner North*, Department of Management Science and Engineering at Stanford University (UK); Prof. Dr. *Norio Okada*, Disaster Prevention Research Institute (Japan); Prof. Dr. *Ortwin Renn*, University of Stuttgart (DE); Dr. *Mihail Roco*, National Science and Technology Council's, (US); Prof. Dr. *Joyce Tait*, University of Edinburgh (UK); Dr. *Bernard Tinturier*, Electricité de France (FR); Prof. Dr. *Hebe Vessuri*, Department of Science Studies at the Venezuelan Institute of Scientific Research (Venezuela); Dr. *Timothy Walker*, Health and Safety Executive (UK).

Definition/understanding of risk governance

Risk Governance: includes the totality of actors, rules, conventions, processes and mechanisms concerned with how relevant risk information is collected, analysed and communicated as well as management decisions are taken.

Encompassing the combined risk-relevant decisions and actions of both governmental and private actors, risk governance is of particular importance in, but not restricted to, situations where there is no single authority to take a binding risk management decision but where instead the nature of the risk requires the collaboration and coordination between a range of different stakeholders.

Risk governance however not only includes a multifaceted, multi-actor risk process but also calls for the consideration of contextual factors such as institutional arrangements (e.g. the regulatory and legal framework that determines the relationship, roles and responsibilities of the actors and coordination mechanisms such as markets, incentives or self-imposed norms) and political culture including different perceptions of risk.

Definition of goals for the risk governance process

The Nanotechnology Risk Governance project aims at: 1) developing and making available specific advice for improving risk governance; 2) providing a neutral and constructive platform on the most appropriate approaches to handle risks and opportunities of nanotechnology; 3) if possible, enabling all actors to reach a global consensus.

Regional/national/international approach?

The project considers the ability for governance regimes to address the social and economic risks and benefits and, additionally, whether all nations would be able to act under an **international** risk governance framework. Moreover, it analyses the role played by **national** governments in adapting guidance to their own social and political contexts.

How is the practice of risk governance organised?

The International Risk Governance Council (IRGC) provides a website, where all necessary information (documents) is available.

Who is involved?

The IRGC group includes members from Europe, the USA and Asia that have experience as decision makers, policymakers, regulators, and science, environmental and social science experts.

The Nanotechnology Risk Governance project aims at establishing a cooperation with a wide range of individuals and research organisations involved in nanotechnology and risk governance. Predominantly with other research bodies and international organisations but also, where appropriate, with national governments, industry, trade associations, NGOs and the public, although this latter collaboration is based more on an analysis of public perceptions and provision of information rather than public engagement.

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

Stakeholders are mainly involved in the problem identification phase, as their involvement aims at selecting the appropriate risk and concern assessment policy, defining priorities in handling risks, organising the appropriate participation procedures and specifying the conditions under which the further steps of the risk handling process will be conducted.

Furthermore, they are involved in a roundabout way in the other phases, indeed the project provides that the concerns of the stakeholders will be represented in the decision-making process and that the interests and values of those who will later have to live with the risk effects will be taken up appropriately and integrated into the decision- making process.

The central aim of applying the IRGC model is to stimulate participatory innovation in this area, and generate better platforms for stakeholder involvement.

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

The final decision appertains to decision makers, but it must be ensured that the concerns of the stakeholders will be represented in the decision-making process and that the interests and values of those who will later have to live with the risk effects will be taken up appropriately and integrated into the decision-making process.

Which risks are addressed?

The project addresses the following risk types: financial risk, technological risk, health risk, safety risk. In particular, the project considers all risks associated with those technical areas and applications of Nanotechnology, which have international implications and have the potential to harm human health and safety, the economy, the environment, and/or to the fabric of society at large.

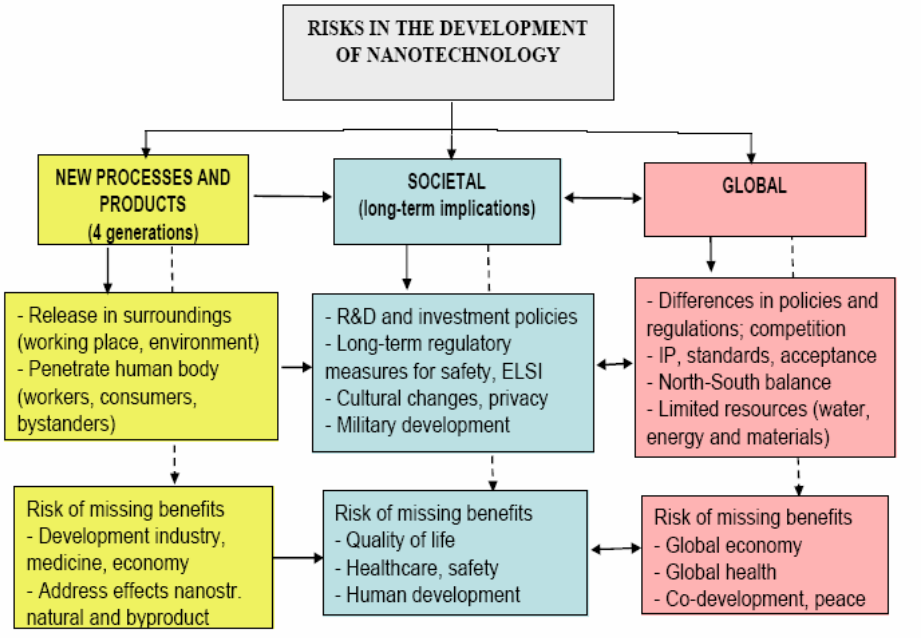


Fig 1. Risks in the development of nanotechnology

Description of procedural steps

The Risk Assessment and Management Framework for Nanotechnology, depicted in Figure 2, breaks down into three main phases:

- pre-assessment: A systematic review of the potential benefits and risks for an emerging technology needs to start with an analysis of what major societal actors (such as governments, companies, the scientific community, NGOs and the general public) define as areas of concern or impacts that they will label as risk problems.
- appraisal: this phase consists of two parts: risk assessment and concern assessment. The risk assessment phase covers the usual steps of hazard identification and estimation, exposure and vulnerability assessment, and, risk estimation and conclusion on the major challenges for nanotechnology risk assessment.
- The concern assessment phase analyses physical impacts as well as the social impacts expected from the application of the technologies.
- management: this phase consists in: the identification and generation of risk management options; assessment of risk management options with respect to predefined criteria; evaluation of risk management options; selection of risk management options; implementation of risk management options; monitoring of option performance.

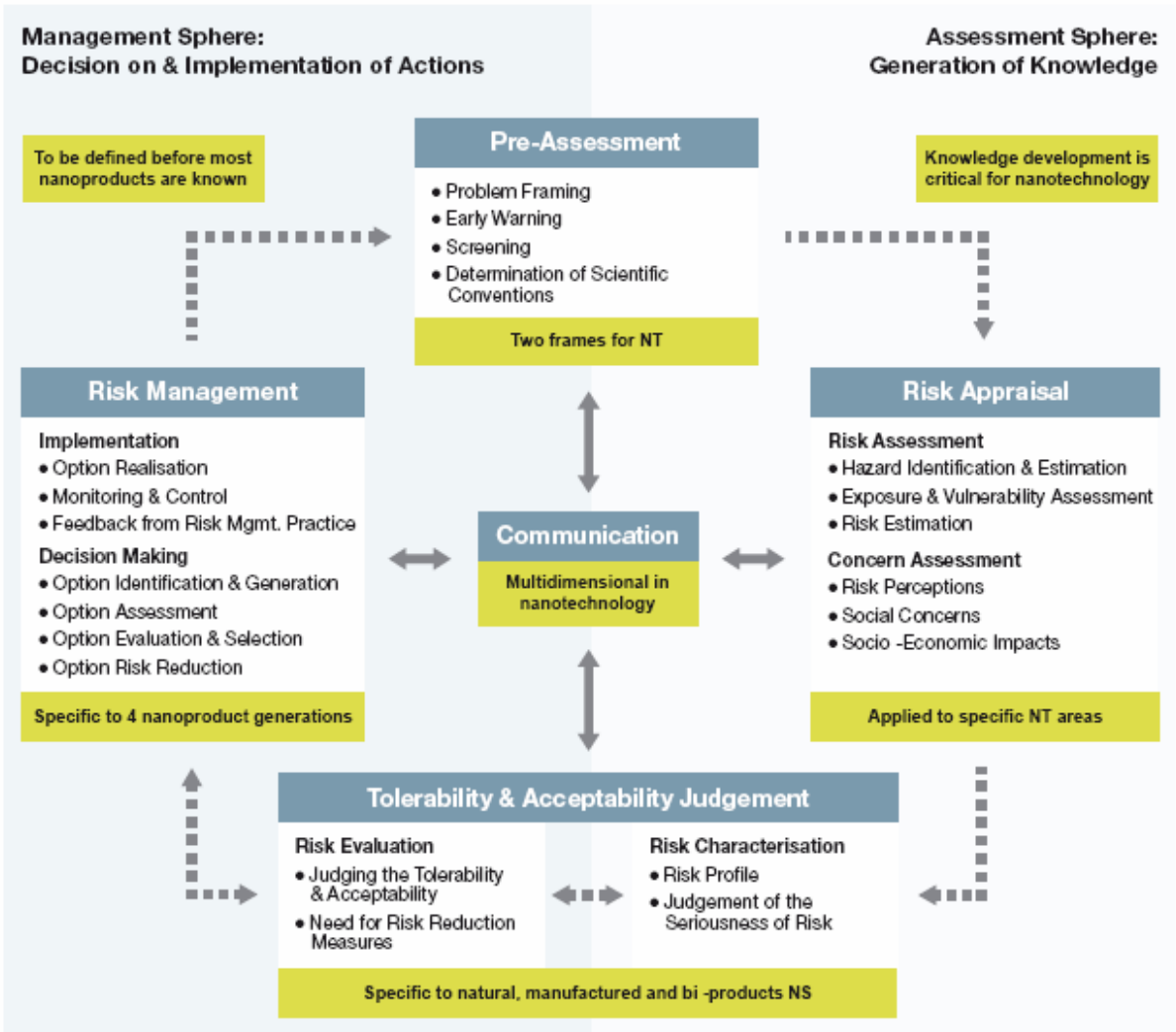


Fig 2. Steps in IRGC Risk Assessment and Management Framework for Nanotechnology

Description of methodologies that are used

The project provides a questionnaire targeted at research organisations to describe their interest in nanotechnology research and particular issues/areas which they are investigating. Moreover, the project provides a conceptual framework for understanding, analysing and designing risk governance systems at the international level. This framework has two generic and several application-specific components and it also proposes a categorisation of risk which is based on different states of knowledge about each particular risk, distinguishing between simple, complex, uncertain and ambiguous risk problems.

8.5.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

The project aims at the co-operation with other sectors both nationally and internationally and communication of potential risks to the attention of policymakers and other interested parties.

Degree of risk communication? How does communication work in practice? How does information flow in practice?

Risk communication is needed throughout the whole risk handling chain, from the framing of the issue to the monitoring of risk management impacts.

Communication has to be a means to ensure that:

- those who are central to risk framing, risk and concern assessment or risk management understand what is happening, how they are to be involved and, where appropriate, what their responsibilities are;
- others outside the immediate risk appraisal or risk management process are informed and engaged.

Risk communication occurs through four forms of communication: documentation, information, two-way communication or dialogue, and participation in risk analyses and management decisions.

Is the approach integrative?

Yes. The framework takes into account:

- institutional responses, such as policy-making or regulatory style,
- the socio-political impacts prevalent within the entities and institutions involved in the risk process,
- the organisational imperatives of the entities and institutions involved in the risk process;
- the capacity needed for effective risk governance.

Moreover, the framework integrates scientific, economic, social and cultural aspects.

Is the approach multi-dimensional?

Yes. The framework is inspired by the conviction that both the factual and the socio-cultural dimensions of risk need to be considered if risk governance is to produce adequate decisions and results.

Moreover, the application-specific components include a consideration of international dimensions, educational implications, human development implications, political and security issues.

Is the approach transparent?

Yes. The transparency is supported by the documentation. Indeed, it is essential that the public not participating in the regulating process learns of the reasons why the regulators opted for one policy and against another.

Do clear requirements concerning the involved partners exist?

Not mentioned.

Does capacity building of involved partners exist?

Not mentioned.

8.5.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR?

Yes. Primarily, the IRGC approach introduces an integrated concept for risk governance (that is also an objective of MIDIR), considering scientific, economic, social and cultural aspects, and providing guidance for the development of comprehensive risk assessment and management strategies.

Secondly, the IRGC risk governance process consists of the following steps, which can be transferred into different risk settings:

- pre-assessment;
- appraisal;
- management.

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

The questionnaire could be used for MIDIR. The aim of the questionnaire is to check the research organization's interest in nanotechnology, their collaborations, their knowledge of current regulations and knowledge of risks in the nanotechnology field.

Also the structure of the risk governance framework could be used for MIDIR.

Area			Context											Governance								Stakeholder								Resources					Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance - Process	Acceptance - Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role	Involvement
Project	**Indicator?**	**Addressed?**																																		
Nanotechnology Risk Governance	Project name	Completely	Completely		Completely	Completely	Partly	Completely	Non	Partly	Non	Non	Completely	No information	Non	Non	Completely	Non	Non	Partly/Completely	Non	Partly	Partly/Completely	Completely	No information	Completely	Completely	Completely	No information	Partly	No information	No information	Non	No information	Non	Non	Non
	Degree of stakeholder involvement					Completely																				Completely										
	Level of dialogue						Partly																		No information											
	Number of scientific partners												Completely										Number of involved social groups			Participation of stakeholders in meetings				Degree of communication							
																								Degree of stakeholder engagement													

8.6 Promoting safety and security at work

Italian project on Risks at the Work environment

8.6.1 Description of the risk governance approach

Introduction to the risk governance approach

Promoting safety and security at work is an important goal for the political strategies of the European Union that is extending its boundaries. The social and work environment transformations, the rising of new risks, data on accidents and occupational diseases suggest following a global strategy to improve the work environment quality.

Definition/understanding of risk governance

The focus on the topics of security at work is a quality (of) life factor. The specific goal of the approach is to promote the risk threshold reduction and to reduce accidents in the work environment in a more general context, according to rules and laws. The approach proposes actions aimed to adopt prevention and security systems and to update equipments and plants.

Definition of goals for the risk governance process

The approach aims at:

- enhancement of the work conditions to improve safety, according to the health obligations of the work organisation;
- better knowledge of the causes of work injuries and occupational diseases, in order to identify and evaluate risks, and to apply the most effective methods of control and prevention;
- enhancement of the human behaviour in order to develop and to promote the culture of the need to preserve health and safety.

Who is the initiator/responsible body of the concept?

The organization whose primary mission is the occupational safety, health and prevention is ISPESL (Istituto Superiore per la Prevenzione e la Sicurezza del Lavoro). In particular ISPESL is a technical-scientific body in the National Health Service and reports to the Ministry of Health as regards all aspects of occupational safety, health and prevention.

Regional/National/International approach?

The approach is a national one.

How is the practice of risk governance organised? (existence of an office, website, personnel input, input of other resources)

The approach uses some software such as:

1) WINSORVE: Computerisation of health surveillance methodologies for exposed industrial workers;
2) BIOCASC: Computerised catalogue of biological agents and carcinogenic substances;
3) GEMPI: it is the information system for local prevention services that permits ordinary registration of occupational injuries and diseases;

4) SE.PRO.: Computerised management of the production sectors;
5) ASPED 2000: Computerised management of the risk profiles and the health folder.

Who is involved? (decision makers, affected people, NGOs, scientific community/researchers)

The organisations involved into the approach are:

- The European Agency for Safety and Health at Work, whose mission is to provide the scientific, technical and economical information on safety and security at work to the EU organs and to the Member States;
- The European Foundation for the Improvement of Living and Working Conditions;
- Advisory Committee on Safety and Health at Work whose mission is to help the Commission to propose and execute decisions on Safety and Health at Work. This Committee is formed by representants of Governments, of trade-union organizations and representants of the employers. It collaborates with the Agency.
- The Istituto Nazionale per l'Assicurazione contro gli Infortuni sul Lavoro (INAIL). It is a national institute for the Insurance against accidents at work.

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

The approach adopts communication tools to promote the Safety culture at the Work environment and the adoption of safety behaviours for workers. According to this goal it uses both, information tools and the necessary alliances involving experiences of the different social groups such as institutions, trade-union organisations, employers' organisations and so on. Communication can produce changes if the process converges on common goals with the social disadvantaged workers cathegories. In the same work environment there are frequently workers belonging to different socio-cultural contexts. For this reason an adaptation to the context of work in order to favourite the access to the information is necessary.

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

According to this approach the workers have a primary role in the design and in the implementation of the Safety and Health programs.

Which risks are addressed?

The project addresses the following risk types: health risk and safety risk. In particular, risks at the Work can be shared according to the following classes:

A)	**SAFETY RISKS PRODUCED BY:** (Accident risks)	Structures Machines Electrical installation Dangerous matters Fire-explosion
B)	**HEALTH RISKS PRODUCED BY:** (Environmental healthy risk)	Chemical Agents Physical Agents Biological Agents
C)	**SAFETY AND HEALTH RISKS PRODUCED BY:** (etherogeneus type of risks)	Work organisation Psychological factors Ergonomic factors Heavy Work conditions

Description of procedural steps

Evaluation of Risk at Work is complex. In each work environment it requires the following steps:

1) identification of the sources of risk that characterise the work circle;
2) identification of the potential consequent risks due to the exposure related to the working activities;
3) estimation of the entity of the exposure risks connected to the different identified situations of interest about prevention.

Description of methodologies that are used

The approach involves a combined methodology to evaluate risks. In particular, evaluation is based on the following aspects:

- observation of the work environment (for example access ways, floor conditions, safety machineries, smokes and dusts, temperature, light, noise etc.);
- identification of tasks carried out at work (in order to define all tasks and implement them in the risks evaluation);
- examination of tasks executed at work (evaluation of risks connected to the different duties);
- observation of work procedures (procedures are respected or they involve other risks);
- examination of the work model (to evaluate the exposure to risks);
- examination of the external factors that can have effects at the work (for example climatic conditions and their effects on workers outdoor);
- inspection of the psychological, social and physical factors that can contribute to produce stress at work, and study of their interaction as well as other factors in the organisation of the work environment;
- examination of the organization that has to maintain good work conditions.

The carried out observations can be compared according to the established criteria to guarantee safety and health:

- taking into account legal norms;

- taking into account norms and published lines, such as national technical norms, best practice codes, etc.;
- taking into account hierarchical principles for risks prevention;
- avoiding risks;
- substituting dangerous elements with less or no dangerous ones;
- avoiding risks at source;
- applying a collective measure instead of individual one (for example controlling the exposition to the gaseous discharges by an air plant, instead of using individual life support-systems);
- acquiescing the technical evolution and the changes of the information environment guaranteeing an improvement in the protection level.

8.6.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

The approach is based on cooperation between employees and workers because it contains effective actions for: 1) communication among all levels and safety/health functions at work activities, 2) participation and consultation of workers (where necessary).

Degree of risk communication? How does communication work in practice? How does information flow in practice?

The injury prevention and the health claim at work are the results, in addition to the normative actions, of a cultural process that considers the right to work and dignity of workers the basic values of a solidarity agreement. Risk communication is needed throughout the whole risk handling chain, and, in particular, risk communication has to take into account the relevance of a correct application of laws by all involved actors and the role of enterprises and workers in providing and exchanging evolving information on the nature of the risk.

Is the approach integrative?

The approach considers safety integrated with quality globally considered such as:

- Work quality: devoted to protect the worker's safety and health needs. It can be obtained according to a systematic approach (certification of safety and health at work systems management OHSAS 18001);
- Information quality: devoted to preserve privacy and to enable a correct and effective information use. It involves both, the economic operators and the citizens as a whole. It can be based on both: system approaches (certification of systems management for information security- norm BS 7799) and process/service (certification of activities carried out using INTERNET);
- Ethic quality: it concerns the social responsibility of companies and the social problems connected to the production activities in general. It has to protect the socially deprived persons, to guarantee the correct financial resources management, the intellectual honesty, the moral integrity, etc.; it can be obtained using different system's approaches (for example norms SA 8000).

Is the approach multi-dimensional?

The goals of the approach about safety at work closely match with social, economic and institutional goals. In particular they refer to:

a) economic sustainability: ability to produce occupation and long income according to the need to rationally use available resources and to reduce the use of no-renewable resources;

b) social sustainability: ability to guarantee fundamental assets (security, health, instruction) according to constraints such as serenity, sociality and entertainment;

c) Institutional sustainability: ability to censure stability, democracy, participation information, formation and justice.

Is the approach transparent?

The responsibility and authority levels to implement norms for health and safety management are clearly and transparently identified, documented and delivered into the organization by this approach. Though safety and health preservation functions can be delegate, the supervisor is responsible. The employees' responsibility about their own safety and the safety of their colleagues must be managed according to an agreement that provides resources, tools, training and capabilities to work at safe manner.

Do clear requirements concerning the involved partners exist?

To guarantee safety at work involved partners have:

- to know sector's products and services as well as the corporate context;
- to be able to use work techniques, methods, work technologies and tools;
- to know and to use individual security measures and measures for the environmental preservation.

Does capacity building of involved partners exist?

The approach provides a mix of promotional measures devoted to deliver the prevention culture and to support companies by information and incentive politics and a closer coordination of the control activities.

Consequently, the following abilities are fundamental in involved partners:

- coordination ability, entrusted to an interministerial Committee that is presided by the Welfare Minister. The Committee is connected with regions in order to define an agreement according to uniform criteria;
- ability to improve the safety culture as a collective legacy, extending the assistance and advice initiatives developing a network of all available organizations and institutions. Particular attention is paid to the bureaucratic simplification (see legislative decree for the INAIL reform);
- ability to activate control coordination starting from the work inspectors and inspectors of INAIL, considering all resources and nationalizing interventions.
- ability to give to the public administrations suggestion to consider safety costs in the bid evaluation process, looking forward to the law on contracts.

8.6.3 Conclusion

Is the type of the approach appropriate for the types of risk that are addressed by MIDIR? If yes, what elements could be used for the MIDIR risk governance concept?

Conclusion and/or general comments/observations

The approach can be used by MIDIR. Especially aspects such as:

- multidimensionality (of safety);
- intersectoriality (collaboration and integration between different sectors and structures): it has to be a prerequisite in the health promotion strategies, to promote the operative synergies and to emphasize the person as a whole;
- transparency: the ability to satisfy the actual needs without hazard the chances for the future generations to satisfy their own necessities according to the environmental, social and economical point of view.

Area			Context											Governance								Stakeholder								Resources					Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance - Process	Acceptance - Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role	Involvement
Project	**Addressed?**	**Promoting safety and security at work**	Completely	Partly	Completely	Partly/Completely	Non/Partly	Partly	Completely	Partly	Non	Non	Partly/Completely	No information	Partly	Partly	Completely	No information	Non	Partly	Non	Completely	Partly	No information	Partly/Completely	Partly/Completely	No information	No information	No information	Partly/Completely	No information	No information	Non	No information	Partly	Partly	Partly
	Indicator?				Level of safety				Level of risk prevention				Percentage of scientific stakeholders				Number of working accidents					Number of social groups involved			Participation of stakeholders in meetings	Degree of stakeholders participation											

8.7 Disaster Risk Reduction for Sustainable Development in Africa

Africa regional strategy for disaster risk reduction

8.7.1 Description of the risk governance approach

Introduction to the risk governance approach

The Africa Regional Strategy for Disaster Risk Reduction will build on existing disaster risk reduction institutions and programmes available in African countries and in the Regional Economic Communities (RECs), and aims to mainstream them into development so that they can better contribute to disaster risk reduction. Disaster risk reduction is the systematic development and application of policies, strategies and practices to minimize vulnerabilities and disaster risks and avoid or limit the adverse impacts of hazards, within the broad context of sustainable development. The strategy recognizes that some of these interventions are best undertaken at the national level. Therefore, its focus is not to establish a regional mechanism for disaster risk reduction, but to facilitate initiatives by RECs and countries to develop and implement their own strategies in harmony with the strategy. In recognition of the different status of disaster risk reduction in RECs and countries, the strategy provides a broad range of strategic directions that RECs and countries can select from to suit their respective contexts and needs.

Who is the initiator/responsible body of the concept?

International strategy for Disaster Reduction (ISDR) promotes this strategy.

Participants/Partners

The following stakeholders have to play key institutional roles in the implementation and monitoring of the Strategy: AU/NEPAD, Regional Economic Communities (RECs), the Africa Working Group on Disaster Risk Reduction1, national governments, major groups (mainly civil society bodies and the private sector) and international development partners.

Definition/understanding of risk governance

The strategy is comprehensive in that it takes into account the need to reduce disaster risks sustainability, including those induced by conflicts. Complex humanitarian emergencies arising from conflicts complicate the effects of natural hazards, such as famine and epidemics. This is because they increase the vulnerability status of populations and ecosystems already stressed, thereby worsening the level of disaster risks. In turn, the type, onset and intensity of conflicts are also influenced by natural hazards, particularly environmental hazards. Therefore, both issues need to be integrated in disaster risk reduction interventions.

Definition of goals for the risk governance process

The aim of the Africa Regional Strategy for Disaster Risk Reduction is to contribute to the attainment of sustainable development and poverty eradication by facilitating the integration of disaster risk reduction into development.

The Strategy's objectives are to:

- increase political commitment to disaster risk reduction;
- improve identification and assessment of disaster risks;
- enhance knowledge management for disaster risk reduction;
- increase public awareness of disaster risk reduction;
- improve governance of disaster risk reduction institutions; and
- integrate of disaster risk reduction in emergency response management.

The Strategy suggests strategic directions to achieve these objectives.

Regional/national/international approach?

The Strategy is addressed to regional and sub-regional organizations and countries of Africa, that have to develop their policies, legislation, plans and agencies for disaster risk management.

How is the practice of risk governance organised?

International Strategy for Disaster Reduction (ISDR) provides a website, where all necessary information and documents about this Strategy are available.

Who is involved?

The strategy was adopted by African ministers at the 10th Meeting of the African Ministerial Conference on the Environment (AMCEN) from 26-30 June 2004 and submitted to the AU Assembly Summit, where the strategy was positively received by Heads of State at the 3rd Ordinary Session of the Assembly in Addis Ababa, Ethiopia, from 6-8 July 2004, with a call to develop a Programme of Action for its implementation.

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

Yes. Stakeholders are involved in all steps of the risk process. Indeed, they participate in a series of risk identification, assessment and management actions, and they have key institutional roles to play in the implementation and monitoring of the Strategy.

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

Disaster risk reduction comprises a series of management actions that require the involvement of communities and various stakeholders as well as partners.

Which risks are addressed?

The project addresses the following risk types: natural risk, health risk and safety risk. In particular the Africa Regional Strategy for Disaster Risk Reduction will focus on disasters arising from natural and related human induced hazards.

Ones of these risks are hydro-meteorological hazards (drought, flood, windstorms, particularly tropical cyclones, landslides and wildfire), that occur most pervasively and account for most of the people affected by disasters. On an individual hazard basis, epidemics are the major cause of disasters. In particular, the effects of the HIV/AIDS pandemic, and the

malaria and tuberculosis epidemics are impacting households and communities so severely that they place downward pressure on sustainable development, particularly in sub-Saharan Africa. Other major hazards are floods, droughts and windstorms. Less frequent hazards include pest infestation, earthquakes, landslides, wildfire and volcanic eruptions.

Description of procedural steps

At a follow-on "African Consultative Meeting on Disaster Risk Reduction in Africa" in June 2003, a decision was made to develop the Regional Strategy on Disaster Risk Reduction in two phases: (1) undertaking a baseline study to establish the status of disaster risk reduction in Africa; and (2) drafting the Regional Strategy on Disaster Risk Reduction. The baseline study has identified gaps and issues to form the basis for developing the regional strategy.

Description of methodologies that are used

The strategic directions to increase political commitment to disaster risk reduction are:

- *to* strengthen lobbying and advocacy for political commitment, responsibility and accountability;
- *to* strengthen institutional frameworks for disaster risk reduction;
- *to* increase resource allocation for disaster risk reduction; and
- *to* strengthen capacities of RECs to facilitate implementation of this Strategy.

The strategic directions to improve identification and assessment of disaster risks are:

- *to* improve the quality of information and data on disaster risks;
- *to* improve identification, assessment and monitoring of hazards, vulnerabilities and capacities;
- *to* strengthen early warning systems, institutions, capacities and resource base, including observational and research sub-systems;
- *to* improve communication and information exchange among stakeholders in risk identification and assessment; and
- *to* engender and improve integration as well as coordination of risk identification and assessment processes and interventions.

The strategic directions to enhance knowledge management for disaster risk reduction are:

- *to* enhance generation of information (statistics and data);
- *to* increase access to information;
- *to* improve communications in disaster risk reduction;
- *to* develop inventory and exchange of best practices;
- *to* develop outstanding academic institutions in disaster risk reduction; and
- *to* expand research on disaster risk reduction.

The strategic directions to raise public awareness of disaster risk reduction are:

- *to* improve information dissemination and communication;
- *to* promote integration of disaster risk reduction in education;
- *to* expand the role of the media;
- *to* strengthen the role of traditional and local authorities and experience; and
- *to* strengthen the role of the youth and other major groups in disaster risk reduction.

The strategic directions to improve governance of disaster risk reduction institutions are:

- *to* harmonize terms and policies in disaster risk reduction;
- *to* develop national platforms for disaster risk reduction;
- *to* strengthen decentralization of disaster risk reduction interventions;
- *to* increase public participation in planning and implementing disaster risk reduction interventions;
- *to* increase gender sensitivity of disaster risk reduction policies, legislation and programmes; and
- *to* promote increased inter-country cooperation and coordination.

The strategic directions to integrate disaster risk reduction in emergency management are:

- *to* advocate the inclusion of disaster risk reduction in development strategies at local, national, sub-regional and regional levels;
- *to* prepare and disseminate guidelines for integrating disaster risk reduction in development planning and activities;
- *to* facilitate the orientation of emergency response management towards disaster risk reduction; and
- *to* facilitate the strengthening of contingency planning and other preparedness measures in emergency management.

8.7.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

The approach is information and co-operation oriented.

Information plays an essential role in this process. In effect, the development of the institutional framework can be facilitated through several means, including information, knowledge and experience sharing. So, one of the focus of the Strategy is to expand the scope of national information systems.

Moreover, another strategic direction to improve disaster risk governance is to promote increased inter-country cooperation and coordination.

Degree of risk communication? How does communication work in practice? How does information flow in practice?

The strategy aims at increasing the availability of and accessibility to the means of disaster risk information and communications, but it doesn't explain how it occurs in practice.

Is the approach integrative?

Yes. The strategy is integrative in that it takes into account:

- basic mindset and practices of national authorities;
- the role of public and stakeholder partners regarding the reduction of disaster risks;
- complex humanitarian emergencies arising from conflicts complicate the effects of natural hazards, such as famine and epidemics;
- the type, onset and intensity of conflicts are also influenced by natural hazards, particularly environmental hazards.

Is the approach multi-dimensional?

Yes, the approach is multidimensional as both it addresses several kinds of risks and it involves a multitude of actors (like academic institutions, researchers, the community, the political institutions).

Is the approach transparent?

Yes. Transparency appears in the fact that the approach analyses actions at all levels to assist Africa to deal effectively with disasters induced by natural hazards, and take into account also the context in which these actions have to be done.

Do clear requirements concerning the involved partners exist?

Yes. The Strategy is addressed to African countries, so partners must aim at improving and enhancing the effectiveness and efficiency of disaster risk management in Africa by emphasizing disaster risk reduction.

Does capacity building of involved partners exist?

Not mentioned.

8.7.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR?

Partly. The approach proposes a strategy (guidelines) for disaster risks reduction in Africa that can be partially followed also for the types of risks that are addressed by MIDIR.

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

There aren't practical methodologies that can be used for the MIDIR risk governance concept.

Area			Context											Governance								Stakeholder								Resources					Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance - Process	Acceptance - Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role	Involvement
Project	Indicator?	Addressed?																																		
	Disaster risk reduction in Africa																																			
	Name of the project		Completely	Completely	Completely	Completely	Completely	Completely	Completely	Partly	Non	Completely	Partly/Completely	No information	Partly	Partly	Partly/Completely	Completely	Non	Partly	Party	Completely	Partly	Partly	Completely	No information	No information	Partly/Completely	Partly/Completely	Completely	No information	No information	Non	No information	Partly	Completely	Partly
	Improvement of information																																			
	Degree of stakeholder involvement																																			
	Strategic direction																																			
	Level of accountability																																			
	Meeting																																			
	No disagreement of stakeholders																																			
	Integration of stakeholders in decision-making																																			

8.8 Dutch Risk Communication Manual

8.8.1 Description of the risk governance approach

Introduction to the risk governance approach

The Risk Communication Manual is intended to help communications consultants and policy officials in the communication of public risks. In addition, administrators can use this Manual to familiarize themselves with the issue.

This approach on risk communication is focused on the public's wishes with respect to public risks and how the public deals with these risks.

Definition/understanding of risk governance

Here, not exactly the risk governance is in the focus of the Manual, but the risk communication as a connecting point in the whole risk governance process (that is the reason why the other aspects of risk governance, such as risk management and assessment are not in the focus of this Manual)

Definition of goals for the risk governance process

The objective of this approach is the following: "*Communications consultants and policy officials are offered a Manual that will assist them their specific situation in finding a suitable balance between the use of communications informing the public about the risks associated with dangerous substances and the resultant response to those communications that is in proportion to the actual hazards. The Manual offers a tested framework that is suitable for use in all situations*."

Who is the initiator/responsible body of the concept?

The Manual is the end result of the national "Risk Communications in Balance" project carried out under the management of the Province of Zuid-Holland

Participants/Partners

Not mentioned.

Regional/National/International approach?

Although this Manual is the final outcome of a national program, it gives recommendations for the local/regional risk communication (through a guide on risk communication).

How is the practice of risk governance organised?

There exists a Manual, which deals like a guideline for the whole communication process. The included recommendations give advice about risk communications in situations which a disaster has not (yet) occurred.

Who is involved?

The target group of the Manual is: public authority, high-risk companies and the public.

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

Yes, the involvement of the stakeholders is the key point of the Manual. It is seen as not a one-off activity but as a cyclical process.

Fig.1: Three dimensions

Interprovinciaal Overleg: Risk Communication Manual „The keys within reach" – Section 1, 13

Tab.1: Levels of public participation and characteristics of risk communications

"Arnstein´s ladder of citizen participation"	**Examples**	**Risk-communication approach**
Empowerment	Community development: The promotion of local communities ability to take care of themselves	The provision of resources and the furtherance of local communities
Collaboration	Community education: Problem-solving at local-community level, e.g. by means of participation in spatial-planning policy. Two-way communications	Sounding-board groups that join in discussions about relevant developments
Consultation	Community education: Problem-solving at local-community level, e.g. by means of the provision of courses and training programmes. Two-way communications	Workshops, open days, demonstrations, etc.
Information	Risk awareness: "When the siren sounds"; One-way communications	Newsletters, brochure, newspaper, meeting, digital risk map, etc.
Manipulation/therapy	Social marketing: One-way communications focused on exerting an influence	Advertisement campaign
Non-participation	Disaster announcement: One-way communication, mandatory compliance	Warning (siren sounds, weather alarm, evacuation)

Interprovinciaal Overleg (??): Risk Communication
Manual „The keys within reach“ – Section 2, 17

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

As already mentioned, the Manual is a kind of support for the decision-makers to communicate risks. So it could be concluded, that the responsible authorities make the decisions on basis of cooperation with all appropriate actors (stakeholders, companies etc.).

Which risks are addressed?

The Manual is focused on risk communications about external safety issues, e.g. the storage, processing and transport of dangerous goods (the “Guidelines on Disaster Scales” classifies this risks under accidents with flammable/explosive substances and accidents with toxic substances respectively). Therefore public risks such as terrorist attacks, crime and natural disasters are not in the focus of this Manual.

Description of procedural steps

There exists a step-by-step plan for risk communication, which describes the different steps in the risk communication process (see 19pp)

Description of methodologies that are used

The public surveys are in the focus of the Manual. The following aspects are mentioned:

- (small scale) public surveys
- quantitative studies with a written questionnaire
- qualitative studies with (in-depth) interviews

8.8.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

The approach emphasises the co-operation with the stakeholders (risk communication is a “continual interactive process between the public and the other parties).

Degree of risk communication? How does communication work in practice? How does information flow in practice?

The results of the Manual will enable to determine the scale and frequency of the communication, the most effective means of communications, and the time (and stuff) that will be required. Risk communication is seen as the key-factor according to the development of a sustainable relationship between the local authorities, high-risk companies and the public (receiver-oriented communication).

Is the approach integrative?

Yes, because the Manual emphasises, that risk communication is a cyclical process so the initial activities will be followed by subsequent activities. So, different phases of the risk governance process are, even if indirect, addressed.

Is the approach multi-dimensional?

Yes/Partly, because in the context of risk communication the multi-dimensionality is limited to the local/regional scale (the national scale has a subordinated function). But on the local/regional scale all concerned actors are involved into the risk communication process. Although the Manual focuses on the storage, processing and transport of dangerous goods, the recommendations are "open" to other risk settings.

Is the approach transparent?

Yes, because all parts of the communication process are clearly explained and comprehensible. The needs and steps are well elaborated and the relationships between the different steps are also clear.

Do clear requirements concerning the involved partners exist?

Yes, all important roles in the risk-communication process are well described.

Does capacity building of involved partners exist?

Indeed it is not mentioned, but it can be adopted.

8.8.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR?

Yes, because it concerns the methodology for a successful risk communication, which is very important for effective risk governance. In this context the type of risk takes on a subordinate function (transferability to other risk settings is possible).

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

Especially the methodology in particular the recommendations, i.e. the "step-by-step plan for risk communications" (including the risk communication plans), public surveys (including the time schedule for such a survey and communication) as well as the identification of factors and players involved in risk communications.

Area			Context										Governance								Stakeholder								Resources				Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance Process	Acceptance Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role	Involvement
Project	Indicator?	Addressed?	Completely	Partly	Partly	Completely	Completely	Completely	Partly	Completely	Partly	Partly/Completely	Partly	Non/Partly	Partly	Partly	Completely	Completely	Partly	Partly/Non	Partly/Non	Completely	Completely	Completely	Completely	"Completely"	Partly/Completely	"Partly"	"Partly"	Completely	Partly/Completely	Partly/Completely	Completely	No information	Partly	Partly/Completely	Partly/Completely
	Risk Communication Manual NL		Problem framing				Public surveys	Clear definition of responsibilities														Identification of groups				Number of requests	Step-by-step Plan for risk communications	Integration of stakeholders into the process of decision-making Appropriate and accessible information	Integration of stakeholders into the process of decision-making Appropriate and accessible information					Indication of weeks, which are need for the process				

8.9 RISKGOV

Comparative Analysis for Radiological and Chemical Discharges of Industrial Installations

8.9.1 Description of the risk governance approach

Introduction to the risk governance approach

This project is part of the 5th Framework Nuclear Energy - Research and Training Programme of the European Commission (EC), contract n°: FIKR-CT2001-00168.

The objective of the RISKGOV Project is to analyse and identify quality criteria for the governance of industrial activities giving rise to risks to people and the environment from radioactive and chemical discharges during normal operations and to offer recommendations specifically with regard to systems governing radiological risks.

Who is the initiator/responsible body of the concept?

Project Coordination: Centre d'étude sur l'évaluation de la Protection dans le domaine nucléaire (CEPN) (FR).

Participants/Partners

Mutadis Consultants (FR) ; Institut de Radioprotection et de Sûreté Nucléaire (IRSN) (FR) ; Health and Safety Laboratory (HSL) (UK) ; University of Westminster (UoW) (UK) ; Kungl Tekniska Högskolan (KTH) (S).

Definition/understanding of risk governance

Risk governance takes account of all of the political, social, legal, ethical, scientific and technical components that allow the operation of hazardous activities. This risk governance system should meet a number of objectives, including:

- to provide a level of protection which is widely recognised as acceptable;
- to promote accountability and autonomy of the actors concerned in or by the risk generating activity;
- to allow sustainable development and give access to worthwhile scientific and technological developments that may help to solve current and future social concerns;
- to contribute to the improvement of social trust and confidence among stakeholders, public authorities, and experts.

Definition of goals for the risk governance process

The Project RISKGOV aims at: 1) analysing and comparing the elements contributing to the quality of governance systems associated with environmental discharges from nuclear and chemical installations; 2) providing a series of criteria to assess the quality of the governance of risk activities.

Regional/national/international approach?

8 case studies were conducted, covering radioactive and chemical releases related to **local** and **international** contexts and referring to innovative risk governance processes in France, Sweden and the United Kingdom

How is the practice of risk governance organised?

The project RISKGOV provides a website, where all necessary information (documents) is available. But it should be criticised, that e.g. in cases of any questions, no clear information about a responsible person/institution is appointed on this website (you have to search the responsible authority in the listed documents).

Who is involved?

The RISKGOV work was carried out by six teams from three European countries (France, Sweden and the UK) and combined public authorities and research organisations in radiological risk and chemical risk, as well as consultants and universities involved in risk governance. The group included experts in the following fields: radiation protection, risk assessment, economics, risk governance, sociology, political science, regulation and risk policy.

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

Yes. It is addressed to *all* of the parties who may be involved in such risk governance processes presently or in the future: to those public or commercial actors who may have a lead role in their establishment *and* the other stakeholders who may be asked to participate. Further, these people should be involved who will benefit and who will incur costs as a result of the decision.

The aim is especially to allow the participants to *assess the quality* of the processes, whether at the design stage or as they go forward and evolve.

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

The responsibility for decisions is shared: these remain firmly with those who have legal duties, whether as regulators or as operators, or who retain direct control over the technological processes in question.

Which risks are addressed?

Radiological risks related to public exposures to environmental radioactive releases from nuclear installations. This risk belongs to the risk type “Cyclops” (characterised by rather high damage extents and also a high certainty of assessment of the damage extent[6]). The risks belonging to this risk class require the application of risk-based strategies and regulation. For the Cyclops class, a mixture of risk-based and precautionary strategies is useful because the distribution of probabilities is relatively unknown (Klinke & Renn 2002, 1088).

[6] Probability of occurrence is unknown; Reliability of estimation of probability of occurrence is unknown; Extent of damage is high; Certainty of assessment of extent of damage tends to be high.

Case studies:

- The reauthorisation of radioactive discharges from the Devenport Royal Dockyard in the UK;
- Dialogue process around the discharges from the COGEMA – La Hague facility in France;
- Risk communication and dialogue procedures with the local population around the Barsebäck Nuclear Power Plant in Sweden;
- Monitoring of radioactive discharges by Local Information Commission around the Gravelines Nuclear Power Plant in France;
- The dialogue forum established by Rohm and Haas in Sweden;
- Management of air quality around the industrial site of Etang de Berre in France;
- Implementation of the OSPAR Convention for chemical and radioactive releases.

Description of procedural steps

The RISKGOV project:

- analysed the quality of governance systems for radiological risks associated with environmental releases from nuclear installations; and
- compared them with the quality of governance systems for chemical risks associated with environmental releases from non-nuclear installations; with a view to
- providing guidance and operational recommendations for the improvement of existing radiological risk governance systems.

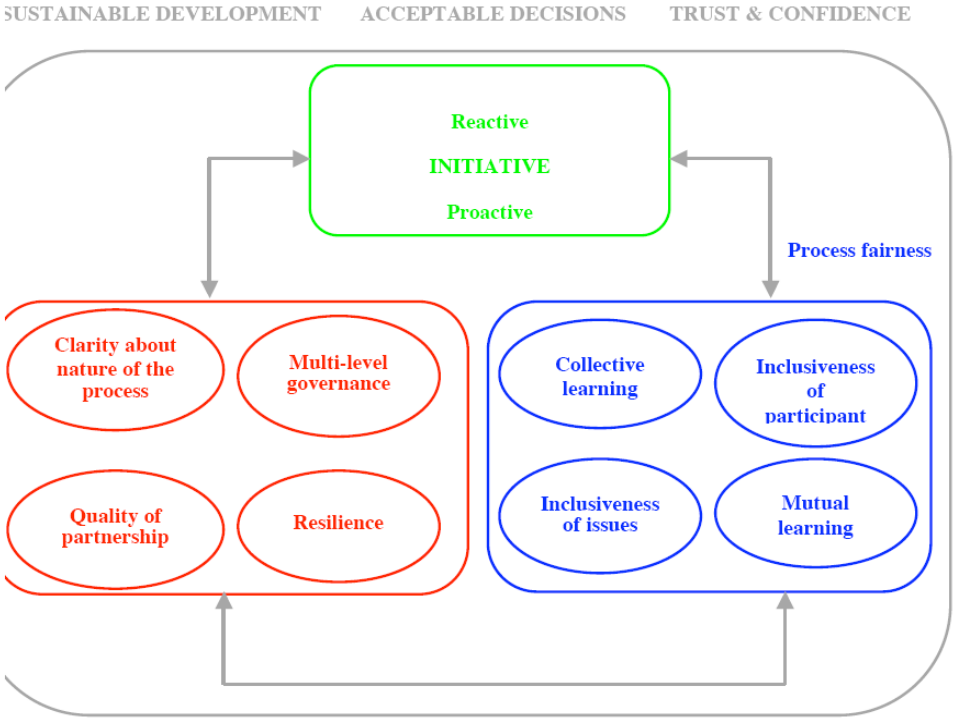
Description of methodologies that are used

For each case study, interviews were conducted with key stakeholders and relevant documentation was gathered and studied. The studies were then written up on the basis of a common interdisciplinary analysis framework to allow a common interdisciplinary assessment to be carried out in due course. Both the preparation for the interviews and the development of the common interdisciplinary analysis framework drew heavily on the experience of the TRUSTNET Concerted Action.

RISKGOV has proposed a particular model of risk governance in which certain elements are seen to reinforce others which in due course leads to a robust process that is well focused on desirable objectives such as trust, confidence and sustainable development.[7]

[7] Confronted with the common themes and elements emerging from the common interdisciplinary analysis, the challenge facing the team was to attempt to move beyond the simple list and to offer a coherent picture of their inter-relationships. A first analysis of the existing theoretical context was performed and is presented in Annex 1. Working with the common themes and elements and referring back to case studies a framework for the evaluation of innovative risk governance processes was gradually developed. At each stage of its development the framework was tested against the concrete experience of the case studies and refined where necessary to reflect empirical findings as opposed to theoretical presuppositions.

Figure 1. A framework for the evaluation of risk governance processes



8.9.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

The project turned away from the top-down expert-led model of dealing with complex risk issues in functionally differentiated societies.

Degree of risk communication? How does communication work in practice? How does information flow in practice?

This project is characterised by an involvement/collaboration, e.g. a two-way communication, by which the implementation/involvement of all parties is given; the difference of involvement to co-operation is the degree of the involvement (an involvement is the most active way of a communication during a process).

Is the approach integrative?

Yes, for each case the (interdisciplinary) research:

- considered the regulatory system at the local, national and European levels, as appropriate;
- examined the role of public authorities, experts, and other stakeholders;
- evaluated the innovative aspects of the risk governance decision making process, specifically those related to the involvement of other stakeholders.

The value of the study lies not in identifying particular issues and features for one or the other industry but rather in the fact that strong similarities in

each domain increases confidence that certain issues and themes are potentially common to a wide range of risk governance situations

Is the approach multi-dimensional?

Yes, the following dimensions were addressed: a) The guiding principles of the decision-making process; b) The role of expertise; c) The stakeholders involvement process; d) The factors integrated into the decision-framing and decision-taking processes; e) The implementation of decisions and review.

Is the approach transparent?

Yes. All necessary steps and its relationship are well explained and make the concept coherent.

Do clear requirements concerning the involved partners exist?

Yes. The available project-documents explain the role (e.g. why are the partners important) and the requirements of the involved partners (e.g. what should the partners consider during the process).

Does capacity building of involved partners exist?

Not mentioned.

8.9.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR?

Yes. It consists of the following steps, which can be transferred into different risk settings:

- Initiation
- Process elements (Inclusiveness of participants; Inclusiveness of issues; Collective learning; Mutual learning)
- Governance Culture (Clarity on the nature of the process Quality of the partnership; Multi-level governance; Resilience of the process)
- Evaluation and Re-initiation
- Outcomes (Trust and confidence; Acceptance/Acceptability of decisions; Sustainable development)

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

Especially the questionnaire could be used for MIDIR. The aim of the questionnaire is to check the realisation of the risk governance process.

Area			Context										Governance							Stakeholder							Resources					Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance - Process	Acceptance - Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role	Involvement
Project	**Addressed?**	**RISKGOV**	Completely	Completely	Completely	Completely	Completely	Partly	Partly	Partly	Non	Partly	Completely	Non	Non	Non	Partly/Completely	Non	Non	Partly	Non	Partly	Partly/Completely	Completely	Completely	Partly/Completely	Partly/Completely	Partly/Completely	Partly/Completely	Completely	No information	No information	Non	No information	Partly	Completely	Partly
	Indicator?		Nomination of problem	Inclusiveness of participation		Mutual learning																	Representation of all social groups			Participation of stakeholders in meetings	No disagreement of stakeholders	No disagreement of stakeholders	No disagreement of stakeholders	Integration of stakeholders in decision-making							

8.10 STARC – Stakeholders in Risk Communication

8.10.1 Description of the risk governance approach

Introduction to the risk governance approach

The STARC project examines the role and place of risk communications in the risk governance structures and processes of modern society. The project will identify how risk decision-makers, stakeholders, the media and the public should be involved and able to participate in the development of a more dynamic risk governance culture and how to ensure interaction between all stakeholders and the public. While the focus of the project is on risk communications, other risk governance issues (e.g., risk detection, risk assessment, risk management, mitigation measures) are also addressed in relation to risk communications. This project is a Coordination Action performed under the 6th Framework Programme of the European Community, Priority: Science-and-Society, and funded by the European Commission, DG RTD. It started in June 2005 and has a duration of 18 months.

Definition/understanding of risk governance

Risk Governance[8] encompasses the pre-assessment phase, risk assessment, risk evaluation and risk management. Risk communication should provide the necessary links and feedbacks between those phases in order to enhance the overall effectiveness and robustness of risk governance. It may even be seen as the glue that holds the entire process together.

Source: http://www.ukresilience.info/preparedness/risk/communicatingrisk.pdf

[8] The eight principles of good governance mentioned in the report are: transparency, responsiveness, effectiveness, efficiency, participation, accountability, consensus oriented and rule of law.

Definition of goals for the risk governance process

Although the project focuses on risk communications also other risk governance issues (e.g., risk detection, risk assessment, risk management, mitigation measures) are also addressed in relation to risk communications.[9]

The goal of STARC project is to promote co-ordination of national approaches on risk communication and to propose initiatives for involving all stakeholders and civil society in a more dynamic risk governance culture.

Who is the initiator/responsible body of the concept?

Not obvious from the available documents. The EDF (Électricité de France) is the project-coordinator.

Participants/Partners

Electricité de France (EDF); INERIS (France); European Commission Joint Research Centre – IPSC (Italy); International Risk Governance Council (IRGC) (Switzerland); Trilateral Research & Consulting (UK); Süddeutsches Institut für empirische Sozialforschung (SINE) e.V (Germany)

Regional/National/International approach?

International approach: examination of the risk communication strategies and practices of France, Germany, Greece, UK, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Australia, Canada, Japan, Norway, Switzerland and USA.

How is the practice of risk governance organised?

It exists a website where all project-outcomes and -reports are available.

Who is involved?

Because risk communication is an interactive process it involves risk managers, risk assessors, experts, stakeholders, the media and the general public (or publics) interested in or affected by a risk.

Are stakeholders involved from the early beginning in all steps?

Yes, project emphasised, that the identification of stakeholders and stakeholder groups (in as fine-grained detail as possible) and the encouragement according to their participation in the risk management process should be regarded as very important (in all project phases). The project identifies the role of policy-makers, risk managers, the media, NGOs, the private sector and others in the development of a more dynamic risk culture. It sets out the features of best practice in risk communications and ways of promoting co-ordination of national approaches towards risk communications, both within and among countries.

[9] The four key-questions of the project are: What are risk communications? Why is there a need for risk communications? What are the dimensions of risk communications? Who are the stakeholders involved in and concerned by risk communications?

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

It could be concluded, that the responsible authorities make the decisions on basis of cooperation with / information of all appropriate actors (stakeholders, companies etc.).

Which risks are addressed?

Risks related to chemical waste disposal sector (Pandora[10]), genetically modified food sector (Pythia[11]) and the electricity sector (Damokles[12]).

Description of procedural steps and methodologies that are used[13]

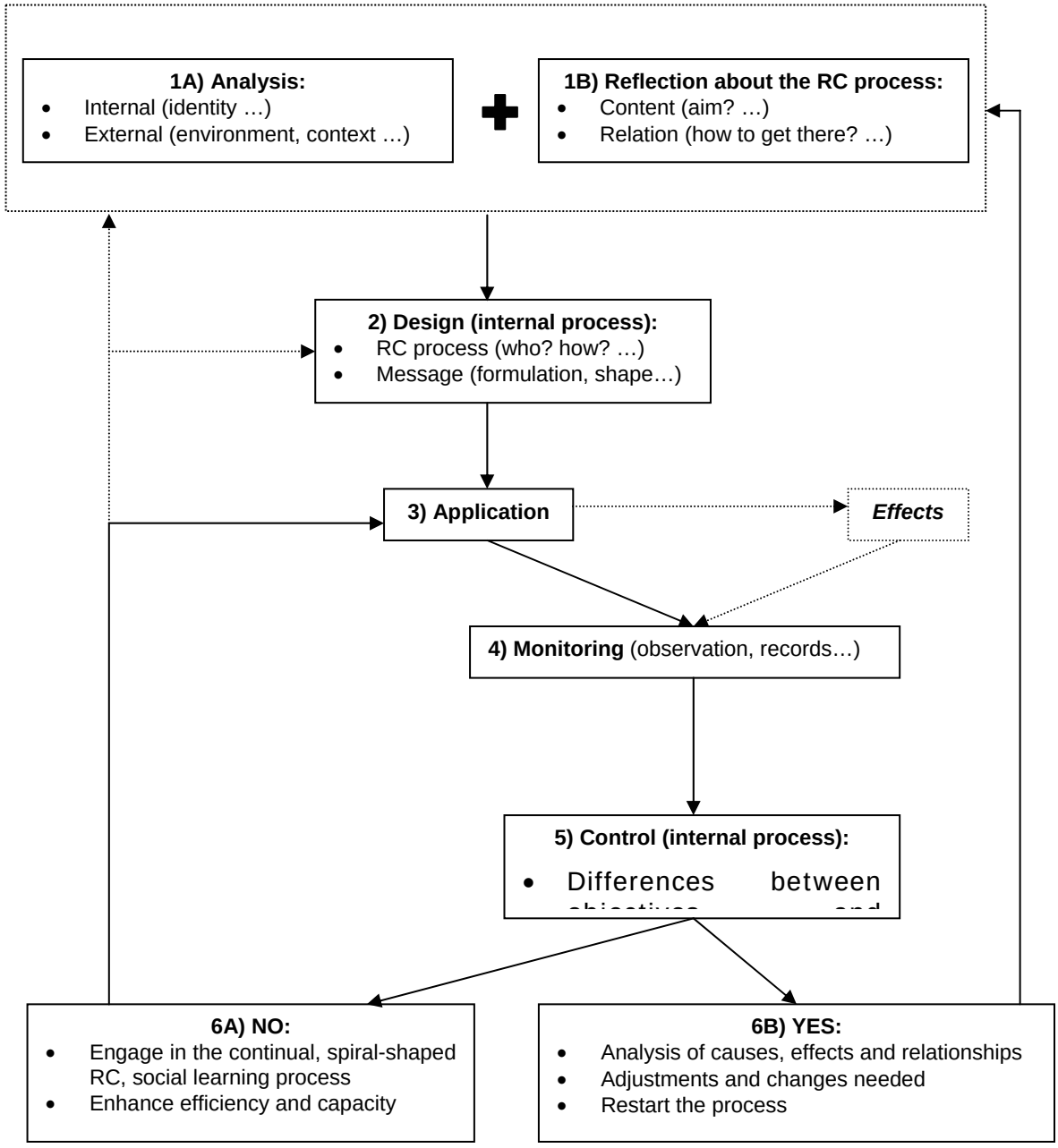
The first step was a production of a risk communication questionnaire by the STARC-Team sent to the 31 countries. Through this, it examines the dimensions of risk communications and the extent to which the EU 25 have risk communications plans at the national level and within specific risk domains (e.g., natural and/or man-made, accidental and/or deliberate). Further it examines the role and place of risk communications in the risk management process, policy-making and decision-making, and how stakeholders and those interested in or affected by risks should be able to participate in the decision-making process. From the responses to this the STARC partners drew a number of conclusions and identified good practices, differences or similarities and recommendations. Further STARC made an analysis of risk communication practices in three sectors in four countries (France, Germany, Hungary and Switzerland). The project-partners conducted in-depth interviews with representatives from the chemical sector, with a particular emphasis on chemical waste; the biotechnology sector, with a particular emphasis on genetically modified food and crops (GM food/crop); and the energy sector, with a particular emphasis on production and transport of nuclear fuel.

[10] Probability of occurrence is unknown; Reliability of estimation of probability of occurrence is unknown; Extent of damage is unknown (only assumptions); Reliability of estimation of the extent of damage is unknown; Persistence is high (several generations).

[11] Probability of occurrence is uncertain; certainty of assessment of probability of occurrence is low; Extent of damage is uncertain (potentially high); Certainty of assessment of extent of damage is high.

[12] Probability of occurrence is low; Certainty of assessment of probability is high; Extent of damage is high [towards infinity]; Certainty of assessment of the extent of damage is high.

[13] *The STARC approach combines analytical observations, theoretical framework and current observed practices to propose a process that may prove satisfying in terms of time, money and possibilities.*


1A) Analysis:
Internal (identity …)
External (environment, context …)
1B) Reflection about the RC process:
Content (aim? …)
Relation (how to get there? …)
2) Design (internal process):
RC process (who? how? …)
Message (formulation, shape…)
3) Application
Effects
4) Monitoring (observation, records…)
5) Control (internal process):
Differences between
6A) NO:
Engage in the continual, spiral-shaped RC, social learning process
Enhance efficiency and capacity
6B) YES:
Analysis of causes, effects and relationships
Adjustments and changes needed
Restart the process

The STARC model of a good risk communication process:[14]

	Who?	With whom?	What? Why?	How?
1A) Analysis	**Risk 'officials'**: analysts, managers and regulators	**Stakeholders**	**Get information** from all relevant stakeholders**, collect input** for the analytic process	**Listen** to stakeholders in public meetings; **ask** for their opinions…
1B) Reflection	**Risk communicator**[15]	**Stakeholders**	**Define options** for the larger governance process, create a **common language and culture** …	(Internal) **information processing, brainstorming, debates**…
2) Design	**Risk communicator**	**Internal process, involving stakeholders**	Design the **message** and the **structure of exchange relations**	Rely on **good examples**; **test** with target group core persons…
3) Application	**Risk communicator**	**Stakeholders**	Depends on 2)	**Participatory techniques**[16] (citizen panels, working groups…)
4) Monitoring	**Risk communicator** or **analyst**	**Stakeholders**	**Collect and record data** about the RC process as it is implemented and its effects	**Observation** of risk communication actions, creating **databases**
5) Control	**Risk communicator** or **analyst**	**Stakeholders**	**Detection of differences** or **failures** (process, outcomes, relations…)	**Critical comparison** of the wanted and the observed outcomes
6A) Enhancement *The process of risk communication is spiral-shaped and implies continual 'double loop' learning*[17]*.*	**Risk communicator** or **analyst**	**Stakeholders**	Take into account **evolution and dynamics**; enhance **efficiency**, financial and/or social **cost reduction**… ***Get to a 'higher level' in the spiral-shaped process of RC***	**Reconsider** analysis, design and application in the light of gained insights and new experiences, brainstorming…
6B) Restart	**Risk communicator** or **analyst**	**Stakeholders**	Risk governance implies a good risk communication process!	See 1), but **learn** from the (bad) experience

[14] Like any model, the STARC model of the risk communication process is only one simplified vision of reality and cannot be more than this. It is the vision of the model maker; it may not integrate all of the parameters; reality is dynamic; relations are not stable… So, the outcomes provided by the model's resolution are not prescriptive or normative, but should serve as input for decision-makers: a model's aim is to provide input for making better informed decisions.

[15] In the glossary (Annex B), the risk communicator is defined as the person in the organisation responsible for preparation and implementation of the risk communication plan, who collaborates with the risk manager in ensuring effective risk communication throughout the risk assessment – risk management process. The risk communicator initiates and facilitates a two-way exchange of information between stakeholders and the risk manager.

[16] For an interesting review of participatory techniques, see OECD, *Stakeholder involvement tools: criteria for choice and evaluation*, Organisation for Economic Co-operation and Development, Paris, 2003.
http://www.nea.fr/html/rwm/docs/2003/rwm-fsc2003-10.pdf

[17] Argyris, C., and D. Schön, *Organizational Learning: A Theory of Action Perspective*, Addison Wesley, Reading, MA, 1978.

8.10.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

The project embark on a strategy of cooperation (e.g. a two-way communication, by which the e.g. stakeholder are in a certain extend involved into in the process/concept), if not even an involvement or a collaboration (a two-way communication, by which the implementation/involvement of all parties are given; the difference of involvement to co-operation is the degree of the involvement [an involvement is the most active way of a communication during a process])

Degree of risk communication? How does communication work in practice? How does information flow in practice?

STARC underline that "*an exchange of experiences about what has worked and what hasn't in what situations would presumably lead to improved risk communication, better consultation with stakeholders and improved co-ordination, both horizontally and vertically, especially between governments*". So a good communication is the basic requirement for successful risk governance.

Is the approach integrative?

Yes, because the sector analyses were based on interviews with experts, senior risk managers and risk communicators from administrations, industry and civil society organisations. Further the project stresses that an in-depth consideration of risk communication must also include consideration of emergency communication and crisis communication.

Is the approach multi-dimensional?

Yes, the project emphasise, that it is a matter of good practice for countries to co-ordinate the risk communications, not only horizontally with other government departments and vertically with other levels of government, but also with stakeholders and with neighbouring countries. These dimensions include those that are strategic, political, institutional, operational, technical and perceptional.

Is the approach transparent?

Yes, clear requirements concerning the different steps of risk communication are described and explained (see below)

Do clear requirements concerning the involved partners exist?

The available project-documents explain the role (e.g. why are the partners important) and the requirements of the involved partners (e.g. what should the partners consider during the process).

Does capacity building of involved partners exist?

Not mentioned.

8.10.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR?

Yes, because the aspects and minimum requirements addressed to risk communication developed by the STARC-Project are transferable to other

risk settings, *to any stage in the global process of risk governance and to any risk communication process' nature*.

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

Especially the questionnaire could be used for MIDIR. The aim is to show/check the involvement and participation of different actors during as well as the realisation of the risk governance process.

Area			Context											Governance								Stakeholder[18]									Resources				Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance Process	Acceptance Outcome	Dialogue	Financial[19]	Personnel	Time	Equipment	Identification	Role	Involvement
Project	Addressed?	STARC	Completely	Completely	Partly	Completely	Completely	Completely	Partly	Completely	No information?	Partly	Partly/ Completely	Partly	Partly/No	Non	Completely	Partly	No	Partly	Completely	Completely	Partly	Completely	Completely	No information	Partly/ Completely	Partly/ Completely	Completely	Completely	There are some information about the topics (e.g. what aspects should be regarded during the risk communication)				Partly	Partly	Partly

[18] If the recipients of the message responded to the message as the sender wanted, the communication was regarded as having been successful. (p. 69)

[19] In determining resource requirement, the risk communicator should ensure that he or she takes into account all direct and indirect costs, including the need for training not only staff but also, as appropriate and necessary, external stakeholders; conducting exercises; documenting the process; the consultation process; co-ordination; audit; evaluation etc.

	Indicator?		Problemframing	openness, participation, accountability, effectiveness, consistency, proportionality and				Clear requirements concerning every step of the process / stages of decision-making [20]												Principles of risk governance represented in all steps of the concept [21]			Open the room for and promotion of participation and dialogue				Early involvement of the stakeholders in the risk governance process	Protest; openness of results; Dialogue between stakeholders and the formulation of a joint	Kind of communication: one-way (information) or two-way (dialogue) communication	*Nevertheless, practicalities (e.g., budgetary resources, time) may affect how inclusive and how active one can be in identifying, consulting, communicating and co-ordinating with stakeholders.*			

[20] Objectives should be as specific as possible so that it is easier to frame actions necessary to meet the objectives.; should be measurable, i.e., it should be possible to determine whether the results have met the objectives.

[21] According to STARC external stakeholders could also be grouped by:

- Location (geographic area) – Households, neighbourhoods, towns, municipalities, cities, regions, states or provinces, the country as well as other countries or regions.
- Shared-experience – Interest groups, ethnic groups, professional groups, language groups, religious groups, age groupings, those exposed to a particular hazard.
- Sector – Agricultural, manufacturing, commercial, mining, education sectors. It may be necessary to consider groups within these sectors, e.g., the food processing group within the manufacturing sector.
- Function – Service providers responsible for systems or networks that provide for the movement of people, goods, services and information on which health, safety, comfort and economic activity depends.

8.11 TRUSTNET

8.11.1 Description of the risk governance approach

Introduction to the risk governance approach

TRUSTNET is a pluralistic and interdisciplinary European network involved in the field of Risk Governance. The objective of TRUSTNET is to contribute to the quality of the decision-making processes within the governance of hazardous activities in Europe.

It concentrated on identifying the significant difficulties and blockages affecting the credibility, effectiveness and legitimacy of traditional frameworks for regulating hazardous activities. This phase of the work indicated the need for a more inclusive model for decision-making in those important areas where traditional approaches are failing to deliver satisfactory outcomes.

Definition/understanding of risk governance

The TRUSTNET project used the expression 'Risk Governance' rather than 'risk assessment and risk management' in order to stress that the scope of the framework is not restricted to the issue of risk alone, but embraces the justification of the activities that give rise to the risks. Much of the time such justification is implicitly acknowledged; sometimes, however, it is explicitly questioned by society.

Definition of goals for the risk governance process

The aims of TRUSTNET were to:

- determine the factors which influence the credibility, effectiveness and legitimacy of the regulatory framework of hazardous activities;
- set up a European network of decision makers amongst the civil services, government departments, experts and stakeholders to identify deficiencies and other features of the problems;
- develop more coherent, comprehensive and equitable approaches for evaluating, comparing and managing health and environmental risks;
- establish a common basis for an interdisciplinary approach involving the stakeholders to determine the main thrust of a future research programme covering the protection of health and environment from industrial and natural risks.

Who is the initiator/responsible body of the concept?

It is not clear, but it could be supposed, that the initiator of the project is Mutadis (an independent research group, more information available: http://www.mutadis.fr/).

The TRUSTNET steering committee involves representatives of major organisations dealing with risk governance, among them European national regulatory bodies and representatives of the European Commission. The concept is especially targeted to Public Authorities, stakeholders and experts.

Participants/Partners

There is a wide partnership within the scope of the project. The key-players are representatives of major organisations dealing with risk governance, among them European national regulatory bodies and representatives of the European Commission.

Regional/National/International approach?

The case studies are not limited to a single "administrative" level. So it's transferability into different levels (regional, national and international) is given.

How is the practice of risk governance organised?

It exists an office responsible for the project, but there is hardly any information available about the results and the project in the world-wide-web.

Who is involved?

The findings of the project are targeted to e.g. following recipients: regulators (including large national and supra-national groups who are involved in setting the framework for decision-making), politicians, local authorities, industry, inspectorates, environmental and other pressure groups, various other non-governmental organisations, experts, educators, risk assessors and representatives of citizens and consumers.

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

Yes, stakeholders (beside public authorities and experts) play in this approach an important role. The project recommends an early, collaborative involvement of stakeholders in the successive stages of the decision making process, including:

- formulating the problem in the relevant context
- analysing the risk
- defining the possible options
- making sound decisions
- implementing the decisions
- performing an evaluation of the effectiveness of the actions taken

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

It is not clearly mentioned but it could be supposed, that the basis for decision making is the mutual-trust paradigm propagandized by the project.

Which risks are addressed?

Industrial and natural risks are in the focus of this approach[22]. The natural risks belong to the risk type "Cyclops" (characterised by rather high damage

[22] Case studies:
- Management of Potential Risks from 50Hz Magnetic Fields (Sweden)
- Issues of Trust in the Development of the Sizewall B Nuclear Power Station (UK)
- Regulation of Pharmaceutical Risks (France)
- Riverine Flooding (Germany)

extents and also a high certainty of assessment of the damage extent[23]). The risks belonging to this risk class require the application of risk-based strategies and regulation. The industrial risks belong to the risk type "Damocles" (low probability of occurrence, certainty of assessment of probability is high; extent of damage is high [towards infinity] and the certainty of assessment of the extent of damage is also high).

Description of procedural steps

The first step was the analysis of the case studies mentioned above. These results lead to an identification of the main challenges to risk governance (top-down-paradigm per contra mutual-trust-paradigm). This was the basis for recommendation offered by the project (see goals of TRUSTNET)[24].

Description of methodologies that are used[25]

The methodologies used are characterised by:

- pluralistic involvement;
- interdisciplinarity of expertise;
- duration of the dialogue-process;
- quality of risk governance

8.11.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

The project is constructed to cooperation. In the focus of the project is the "mutual trust" paradigm, e.g. *it is characterised by a broad involvement of stakeholders in the risk assessment and management process as well as in the justification of the hazardous activities.*[26]

- Implementation of the Agenda 21 at the Local Community Level (Sweden)
- A Chemical Siting Process in the Freiburg District (Switzerland)
- An Environnmental and Industrial Framework for the Dunkirk Conurbation (France)
- International Management of Long Range Trans-boundary Air Pollution (International)
- Genetic Modification (Europe)
- The Nord Contentin Commission on Radiological Risk Assessment (France)
- A Citizens Conference on Genetic Modification (France)

[23] Probability of occurrence is unknown; Reliability of estimation of probability of occurrence is unknown; Extent of damage is high; Certainty of assessment of extent of damage tends to be high.

[24] The keyquestions/aspects are: Conveying the Message: How?; Spreading the Message: To Whom?; Acknowledging Possible Resistance; Education; "Pilot Trials".

[25] The work programme of TRUSTNET is based on a participatory methodology, involving experts and nonexperts and learning through actual case studies and direct engagement of members in real, complex decision-making situations.

[26] Public Authorities govern as much as possible by framework and process oriented regulations, including a broad participation of the concerned stakeholders. Decision-making is decentralised as much as possible to the relevant local context [...]. Science is no longer presented to the public as an exclusive determining factor in the decision making process. Expertise becomes pluralistic and available to all parties involved. The Mutual Trust paradigm gives room for open political processes involving the concerned stakeholders to justify the activities giving rise to social concerns in the relevant context.

Degree of risk communication? How does communication work in practice? How does information flow in practice?

Risk communication is one of the most important aspects of the project. The aim is to spread the message of the project-findings to all recipients in the risk process.

Is the approach integrative?

Yes, the approach is integrative, because it includes actors at different levels (both horizontal and vertical integration).

Is the approach multi-dimensional?

Yes, because TRUSTNET is assessing the emerging concepts and experiences (precautionary principle, pluralistic expertise, decentralisation of risk management) as well as the innovative institutional arrangements (agencies, stakeholder participation, citizen conference) that may enhance the quality, the legitimacy and the practicability of the decision-making processes on risk.

Is the approach transparent?

The approach is transparent. But it should be criticised, that there is marginal or no information about the project available in the world-wide-web. Information is only available of the successor-project “Trustnet in Action”.

Do clear requirements concerning the involved partners exist?

Yes, there are clear requirements according to the role of especial experts to encourage the building of trust.

Does capacity building of involved partners exist?

Not mentioned.

8.11.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR?

Yes, the approach is appropriate for risk addressed by MIDIR, because the concept is independent of the risk.

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

Especially the new paradigm (Mutual-Trust Paradigm) could be of particular interest for the MIDIR risk governance concept because it is the key factor in handling risks.

Area			Context											Governance								Stakeholder								Resources					Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance Process	Acceptance Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role[27]	Involvement
Project	**Addressed?**	**TRUSTNET**	Completely	Partly/Completely	Completely	Completely	Completely	Partly	Non/Partly	Partly	Non	Partly	Completely	Non	Non	Non	Partly	Partly	Completely	Partly/Completely	Partly	Completely	Partly/Completely	Partly	Partly	Partly	Partly	Partly/Completely	Partly/Completely	Completely	Not mentioned	Not mentioned	Non	Not mentioned	Partly	Partly	Partly
	Indicator?		Clear definition of problem				Position of "trust" during the process (e.g. high, middle, low))																				Participation of stakeholders in the process										

[27] The new paradigm emphasises the necessity for experts to modify their contribution to the decision-making process and to adopt a different attitude.

8.12 TRUSTNET 2

8.12.1 Description of the risk governance approach

Introduction to the risk governance approach

TRUSTNET is supported by the European Commission (DG Research – Radiation protection) as a Concerted Action. The work programme of TRUSTNET is based on a participatory methodology and a co-expertise in the exploration of actual case studies involving experts and non-experts.

TRUSTNET 2 characterise the key attributes of effective and inclusive governance and provide a framework for its adoption, implementation and embedding. This work is carried out under the European Atomic Energy Community R&T specific programme "Nuclear energy, Key action 2: Nuclear fission 1998-2002"; Area: "Radiation Protection".

TRUSTNET 2 indicated the need for a more inclusive model for decision-making in those important areas where traditional approaches are failing to deliver satisfactory outcomes.

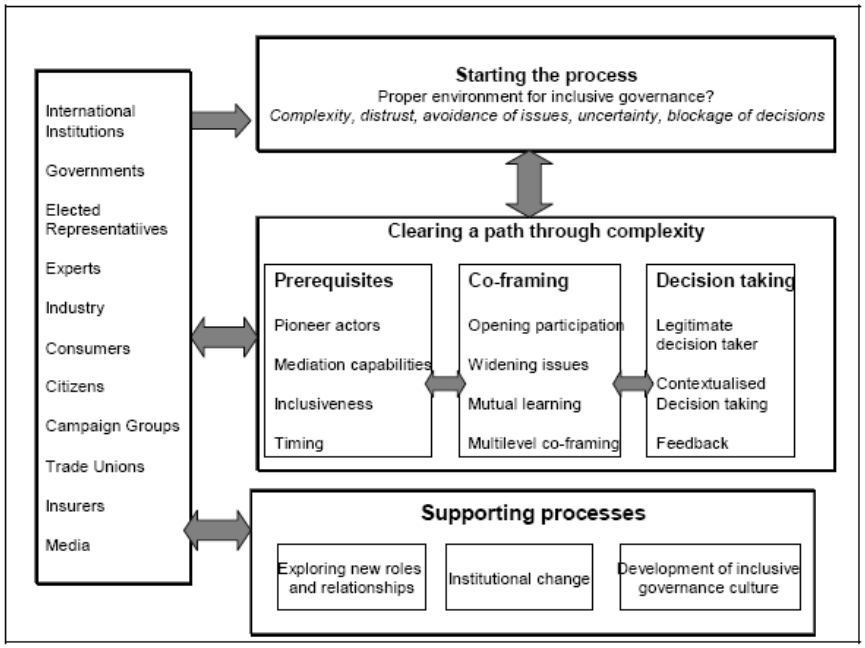
Furthermore, the project underlines, that "*Decisions taken at national or global level should be as flexible as possible in order to open the possibility for decisions at lower levels to integrate consistently and meaningfully the various dimensions or concerns at stake in each (regional, local or individual) context. Multi-level decision-making is an opportunity to increase the accountability of the concerned actors for the decision taken. Contextualisation should not be confused with the European subsidiarity principle or devolution.*" (p. 6)

Definition/understanding of risk governance as well as goals for the risk governance process

TRUSTNET 2 emphasised, that there are two aspects/indicators which lead to the failure of traditional approaches:

- presence of irreducible complexity in the decision-making context
- existence of conditions (perverse influences) that create or reinforce ambiguities and engender distrust among the actors

Fig. 1: The process of change towards inclusive risk governance



European Commission (2002): TRUSTNET 2 – Towards Inclusive Governance of Hazardous activities, 23p

So, the project identifies criteria that characterise Inclusive Risk Governance:

- Widely empowered individuals and groups of stakeholders;
- A collaborative atmosphere of mutual respect and trust;
- Stakeholders able to access, consider and question all relevant scientific evidence;
- Practicable decisions and strategies, flexible and open to revision with time;
- An open and transparent decision-making process recognised as legitimate and fair by the stakeholders;
- Feed-back automatically provided to the involved stakeholders on the decisions taken and at key points in the decision-making process;
- A shared risk governance culture among the involved actors.

Who is the initiator/responsible body of the concept?

Coordinator: MUTADIS (an independent research group, more information available: http://www.mutadis.fr/).

Regional/National/International approach?

This approach is transferable into a regional, national and international context.

How is the practice of risk governance organised? (existence of an office, website, personnel input, input of other resources)

There exist an office responsible for the project, but there is hardly any information available about the results and the project in the world-wide-web. The report “Towards Inclusive Risk Governance” mentions a website of the project, but this website exists no longer.

Who is involved?

The participants of TRUSTNET are representatives of public authorities at national and European levels, industry, trade unions, local governments, NGOs, consumers/lay citizens and a multi-disciplinatory group of experts (risk management, public health, political sciences, sociology, psychology, economic, law and ethics).

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

Yes, TRUSTNET 2 emphasised, that the experience shows, that "*Participants in inclusive governance are moving away from being reactive to a position where they contribute and provide the process with proactive inputs*".

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?[28]

TRUSTNET 2 distinguishes between "decision framing"[29] and "decision taking". While the decision framing process is an open and free dialogue, decision taking should be seen as the duty of the body bearing the responsibility to take the decision. TRUSTNET 2 emphasise the need for contextualised multilevel[30] decision-making, because "decision framing[31]" and "decision taking" could be two phases which are formalised in two different political instances. So *decision-making should be distributed among the relevant levels of action.*

Which risks are addressed?

Two risks are addressed: risk to health or the environment.[32] These risks can be classified to the risk type "Cyclops" (characterised by rather high damage extents and also a high certainty of assessment of the damage

[28] One of the participants criticised: "Somebody has been at the origin of the creation of a group of stakeholders and somebody in the end is in charge of the decision. It could be an authority, it could be an industry, because simply they do pay, and they have decided to consult or to create a group to inform the decision. But they are in the position to take the decision in the end. It doesn't mean the stakeholder group has legitimacy in itself. It simply says that there is somebody who in the end is in a position to take the decision. It will be this person or this board because it is elected in the democratic process. Or it will simply be a private actor who is to decide in the end."

[29] The objective of the decision-framing phase is to create the conditions for all the actors concerned to build common understanding of the issue(s) at stake and to review and assess the possible options to be adopted. It involves bringing together the relevant expertise and the concerned actors at the different levels and stages of the decision-making process. (page 6)

[30] Multi-level decision-making is an opportunity to increase the accountability of the concerned actors for the decision taken. (page 6)

[31] in this context, co-framing is regarded as very important. It has been described as a "pluralistic process involving all the relevant expertise as well as all the concerned actors at the different (local, national, international) levels of action involved".

[32] Case studies: Gas distribution pipes replacement in UK, Accidental consumption of lamp oil and banning of phthalates at EU level, British beef embargo in France, European food regulation at EU level, Protection of wild bears in France, Energy policy framing in Germany, Food and farming policy framing in UK, Sustainable forestry in Europe, Occupational safety policy framing in UK, Airport extension in Germany and Austria.

extent[33]). The risks belonging to this risk class require the application of risk-based strategies and regulation. For the Cyclops class, a mixture of risk-based and precautionary strategies is useful because the distribution of probabilities is relatively unknown (Klinke & Renn 2002, 1088).

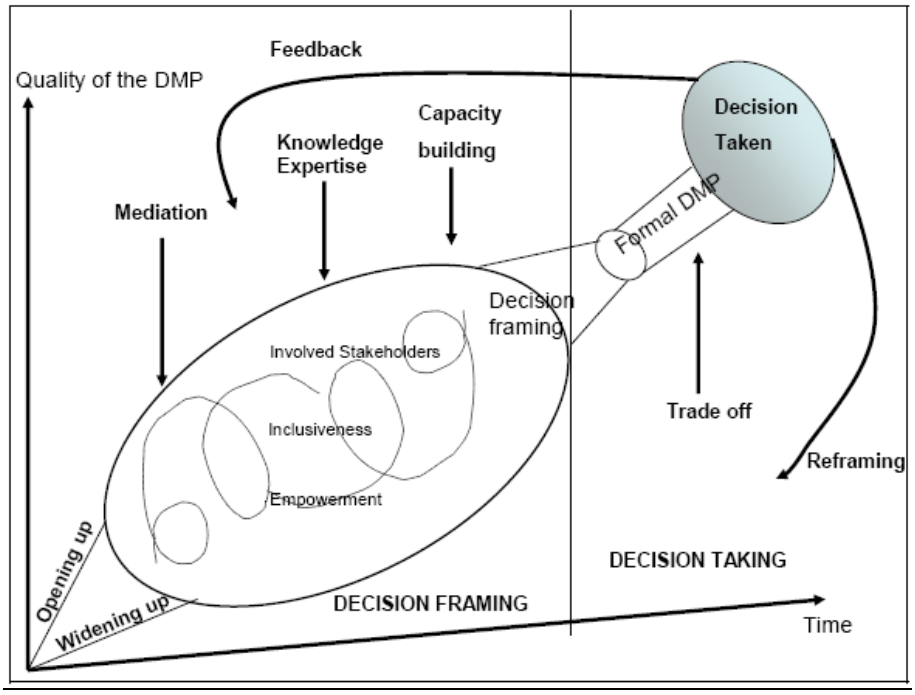
Description of procedural steps

The Project concentrates on the structured examination, dissection and evaluation of ten case studies. These are characterised by a diversity of decision-making processes entailing risk to health or the environment, set in different European countries or at EU level and still highly topical. All case studies were presented by a pluralistic group of involved stakeholders and a multi-disciplinary mix of specialists and other interested parties.

These case studies were considered at three European seminars[34]. This work was summed up at a workshop in London (April 2003). It was dedicated to reviewing and refining the framework and to agreeing with the main conclusions and outcomes from this work.

According to the Figure listed below, there is a strong differentiation between the decision-framing and decision-taking phase.

Fig.2: Description of the inclusive decision-making process



European Commission (2002): TRUSTNET 2 – Towards Inclusive Governance of Hazardous activities, 27p

Description of methodologies that are used

The work programme of TRUSTNET is based on a participatory methodology, involving experts and non-experts and learning through

[33] Probability of occurrence is unknown; Reliability of estimation of probability of occurrence is unknown; Extent of damage is high; Certainty of assessment of extent of damage tends to be high.

[34] London (May 2001): "The role of specialised Agencies"; Stuttgart (February 2002): "Practicalities of stakeholder involvement"; Paris (October 2002): "Decision framing, decision taking in risk governance"

actual case studies and direct engagement of members in real, complex decision-making situations.

TRUSTNET 2 Concerted Action will develop new approaches of risk governance with regard to nuclear (as well as other hazardous) activities, according to the conclusions of TRUSTNET 1 Concerted Action, assessing innovative experiences, and ongoing research in order to improve the current risk governance system in Europe. TRUSTNET 2 will adopt a pluralistic, interdisciplinary methodology, involving an extended network of some 100 regulators and stakeholders, concerned with risk governance in the nuclear sector and other hazardous activities, in 4 seminars during 3 years.

8.12.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

According to the TRUSTNET 2 Program, inclusive governance necessitates exploring new roles and mutual trust relationships. Participants in inclusive governance are moving away from being reactive to a position where they contribute and provide the process with positive inputs.

Degree of risk communication? How does communication work in practice? How does information flow in practice?

Risk Communication is seen as a prerequisite for successful inclusive governance, so it is necessary to track a good and comprehensive risk communication. Such risk communication is seen in the available approach through e.g. participation in the decision-framing and –making processes.

Is the approach integrative?

Yes, because it includes horizontal (e.g. planning authorities at the same level) as well as vertical (cooperation between different levels, e.g. international, national, regional and local level) integration of diverse elements. TRUSTNET 2 calls it “Multilevel Co-Framing”.

Is the approach multi-dimensional?

Yes, because it includes strategic, institutional and cultural patterns that characterise the social interactions in the context of hazardous activities. Further, a multi-disciplinatory group of experts (risk management, public health, political sciences, sociology, psychology, economic, law and ethics) is included.

Is the approach transparent?

Yes, it emphasised the key aspects as well as requirements relating to inclusive governance which should be regarded in cases of risks or dealing with risks.

Do clear requirements concerning the involved partners exist?

Yes, there are clear requirements available.

Does capacity building of involved partners exist?

Yes, the capacity building is an important aspect (see fig. 2)

8.12.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR?

Yes, it is appropriate for MIDIR, because the recommendations etc. are transferable to other risk settings.

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

Especially the recommendations concerning the inclusive governance are helpful in cases of risk communication and decision-making.

Area			Context										Governance							Stakeholder								Resources				Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance Process	Acceptance Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role	Involvement
Project	**Addressed?**	**TRUSTNET-2**	Completely	Partly	Completely[35]	Completely	Completely	Partly/ Completely	Partly/ Completely	Completely	Partly/Non	Partly/ Completely	Partly/ Completely	Non	Partly	Partly	Completely	Partly	Partly	Partly	No information	Partly	Partly	Completely	Completely	Completely	Completely[36]	Completely	Completely	Completely	No information	No information	No information	No information	Partly	Completely	Completely

35 it should be underlined, that the project make a clear distinction between the decision-framing and decision-making (so these steps differ also according to the analysed aspects). *The case studies illustrate different procedures for explicitly articulating both decision framing and decision taking.*

36 "*Another goal will be to identify the non-scientific dimensions (normative issues, judgmental dimensions) involved in the expertise and necessitating a democratic debate…*"

	Indicator?		The traditional "system" is not sufficient				A collaborative atmosphere of mutual respect and trust																Stakeholders able to access, consider and question all relevant scientific evidence Opening up the participation Establishing a common and reliable basis of relevant (scientific and technical) knowledge among the participants		Feed-back automatically provided to the involved stakeholders on the decisions taken and at key points in the decision-making process An open and transparent decision-making process recognised as legitimate and fair by the stakeholders Contribution of knowledge.						Existence of experts with different backgrounds		

8.13 UK Home Office

Summary from: A Practical Guide for the Home Office

8.13.1 Description of the risk governance approach

Introduction to the risk governance approach

The document stresses balanced business decision making and operation based on good risk management practice. A comprehensive support package is outlined, together with rating criteria and guidelines, for example, for submission to ministers. Where possible, this summary quotes from or summarises the document.

From the Foreword: Good risk management will help us achieve our aims, using it to keep delivery on track and to explore new ways of working. Risk management is for anyone who has business objectives to deliver. The more challenging the objectives, the greater the need for good risk management to keep delivery on track.

The approach advocates building risk governance into the management process of the organisation. It involves 5 steps:

1. Clarify Objective
2. Identify risks
3. Assess risks
4. Address risks
5. Review and report risk

Who is the initiator/responsible body of the concept?

UK Government Home Office responsible for Police, Prisons, Security etc.

Participants/Partners

This is focussed on the business of the UK Home Office and covers, for example, the Risk Appetite of the Home Office.

Definition/understanding of risk governance

Risk governance is the process by which risks are systematically identified, assessed, addressed, reported and reviewed, all in the context of the clear business objectives of the organisation concerned.

According to the guide, from a business perspective the main reason for managing risk is to increase the probability of business objectives being successfully achieved.

At a strategic level, risk management can help protect the Home Office reputation, safeguard against financial loss, and minimise service disruption. At an operational level risk management can be a key component in helping deliver major programmes of work to cost, time and quality as well as providing an early warning system before things go wrong.

According to the guide, risk management involves:

- Identifying, assessing and judging threats to achievement of objectives;
- Taking action to anticipate or manage them;
- Monitoring them and reviewing progress.

Risk management asks key questions:

- Are business strategy and objectives clear?
- What could go wrong?
- How likely is the event to happen, and what would be the impact?
- What should we do to reduce/transfer the risk?
- Who needs to know about this key risk?
- Who owns this risk?

Definition of goals for the risk governance process

The guide sets out how the Home Office should think about risk and provides practical steps for managing risk. The main reason, from a business perspective, for managing risk is to increase the probability of business objectives being successfully achieved. The Home Office recognises that to deliver its objectives, it must embrace change. The guide is intended to help manage risks better to get the right balance between risk and reward, all within the context of the Home Office Board's Risk Appetite.

Regional/national/international approach?

This is a UK Government Department Approach and hence a national approach, based on good practice for Home Office and government generally.

How is the practice of risk governance organised?

The Home Office Risk Management Framework is broken down into five steps shown below.

Step 1 Clarify Objectives

- Strategic direction;
- Understanding the organisation;
- Risk management scope;
- Establish risk appetite.

Step 2 Identify Risks

- What can happen?
- What can go wrong?
- How and why can it happen?

Step 3 Assess Risks

- Identify existing controls;
- Determine likelihood/impact;
- Evaluate risk scores.

Step 4 Address Risks

- Acceptance;
- Avoidance;
- Transfer;
- Reduction.

Step 5 Monitoring & Review

- Review and Report Risk;
- Corporate;
- Delivery plans;
- Projects and programmes.

Who is involved?

The guide is targeted at someone who is responsible for risk management and provides a process and resources for implementing risk management.

Review of top risks is recommended to be at the top of the agenda of management meetings. The owner of a risk is recommended to be the primary person accountable for delivery in the area where the risk would have an impact.

The guidelines document resources available including training for roles of:

- SRO: Senior Responsible Owner
- Heads of Unit
- Heads of Unit
- Team Leaders
- Project Managers
- Teams

There are also guidelines for briefing to ministers. There is an implied involvement of any manager/executive responsible for a business objective.

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

The approach does not stress involvement of stakeholders, communities, affected parties, other than to say that the impact of risks and risk management on effected parties.

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

The approach refers to ‘when agreement has been reached’ but does not determine how agreement should be reached. The ‘risk appetite’ is defined by the ‘Home Office Group Executive Board’.

The approach appears to be inward facing, treating Risk Management as a management activity performed by the organisation. (Vs recognising that the organisation is a part of a system and the risk management approach impacts stakeholders and thereby the risks identified and managed.)

Which risks are addressed?

The approach does not define what risks are to be considered other than suggesting that Risk Categories are used to make sure that all risks are captured. The specific categories identified are:

- Human Resource Risks;
- External Risks;
- Activity/Operational Risks and
- Financial Risks

The guide suggests thinking in terms of:

- Human Resource Risks for example: inability to retain key staff; absence of risk taking attitude; serious breaches of health and safety.
- External Risks for example: physical disasters; changes in European policy.
- Activity/Operational Risks for example: failure of outsource provider to deliver; inadequate programme management; loss of physical assets.
- Financial Risks for example: unreliable accounting records; poor financial awareness; failure to show best value.

Description of procedural steps

The procedural steps identified are as follows (see before), with further detail provided.

Step 1 Clarify Objectives

Step 2 Identify Risks

Step 3 Assess Risks

Step 4 Address Risks

Step 5 Monitoring & Review

Description of methodologies that are used

Formats and guidance are provided for:

- Risk Likelihood Ratings
- Risk Impact Ratings
- Risk Register
- Training in Risk Management – available resources
- Individual Target Performance Reports Guidance
- Risk Assessments in Submissions to Ministers
- Guidelines are provided for running a Risk Identification Workshop:
  - What to do before the workshop
  - Material circulated
  - Introduction/scene setting
  - Identification

  - Rating
  - Reality Check
  - Ownership
  - Next Steps
  - After the workshop
- Risk Management Matrix
- Home Office Group Executive Board Risk Appetite

8.13.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

Internal management focussed, with little attention to external stakeholders as contributors.

Degree of risk communication? How does communication work in practice? How does information flow in practice?

Through internal management and governance processes supported by a Risk Register and monitoring of risks and risk metrics.

Is the approach integrative?

It could be depending on the Categorisations used. For example, by taking an Integral and Whole Systems categorisations, the approach could yield an integral and whole systems risk register.

Is the approach multi-dimensional?

Again, not explicitly, but with the right categorisations it could be.

Is the approach transparent?

Internally, depending on the availability of the risk register and review in management meetings of high priority risks, but not transparent to stakeholders externally.

Do clear requirements concerning the involved partners exist?

No.

Does capacity building of involved partners exist?

Focussed internally.

8.13.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR?

The approach could be highly appropriate as a process, particularly when used with the MIDIR categorisations of Integral. The approach ignores wider stakeholder involvement, other than asking “Who needs to attend?” the Risk Identification Workshop.

If yes, what elements could be used for the MIDIR risk governance concept?

General comments/observations

- Use the process;

- Use standard forms;
- Use workshop framework;
- Extend with integral and multidimensional categorisations;
- Extend with systematic stakeholder inclusion;
- Extend with awareness that involvement of stakeholders may impact the actual risk level and likelihood.

Area			Context											Governance								Stakeholder								Resources					Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance - Process	Acceptance - Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role	Involvement
Project	Addressed?	UK Home Office	Business Objective	Narrow definition in context of Risk	No	No	No	No	Yes	No	Yes	In risk context based on appetite	Not covered	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	In risk id workshop	In risk id workshop	No covered/implied	In risk id workshop	Not covered	Not covered	Not covered	No	Not covered	Not covered	Not covered	Not covered	No	Only if identified as stakeholder	Only if identified as stakehol;der
	Indicator?										Risk Appetite																										

8.14 Risk Governance – Towards an integrative approach

IRGC – International Risk Governance Council

8.14.1 Description of the risk governance approach

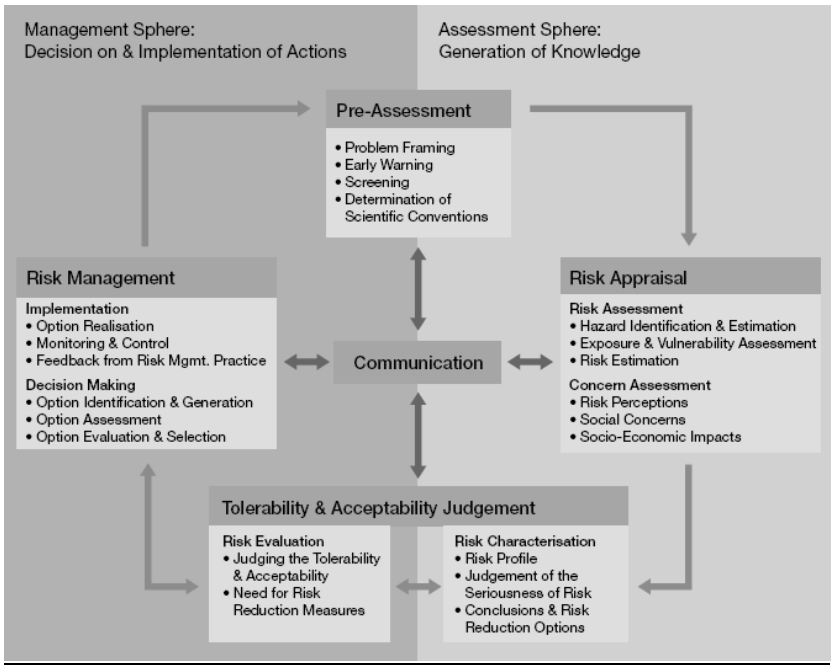
Introduction to the risk governance approach

In this white paper IRGC puts forward an integrated analytic framework for risk governance which provides guidance for the development of comprehensive assessment and management strategies to cope with risks, in particular at the global level.

Definition/understanding of risk governance

According to IRGC's risk governance includes the totality of actors, rules, conventions, processes, and mechanisms concerned with how relevant risk information is collected, analysed and communicated and management decisions are taken.

The concept of risk governance comprises a broad picture of risk: not only does it include what has been termed 'risk management' or 'risk analysis', it also looks at how risk-related decision-making unfolds when a range of actors is involved, requiring co-ordination and possibly reconciliation between a profusion of roles, perspectives, goals and activities.



Risk Governance also illuminates a risk's context by taking account of such factors as the historical and legal background, guiding principles, value systems and perceptions as well as organisational imperatives.

Principles of 'good' governance: beyond the crucial commitment to participation these principles include transparency, effectiveness and efficiency, accountability, strategic focus, sustainability, equity and fairness,

respect for the rule of law and the need for the chosen solution to be politically and legally realisable as well as ethically and publicly acceptable.

Definition of goals for the risk governance process

The overall objective of this document is to establish a comprehensive and consistent yet flexible prototype analytic framework and unified set of guidance for improved risk governance. This framework integrates the following components:

- Harmonised terminology with respect to key terms and concepts;
- A robust and coherent concept of framing and characterising the essential physical as well as social elements of coping with risks, including both the classic components (i.e. risk assessment, risk management and risk communication) as well as the contextual aspects such as a wider framework of risk appraisal, governance structure, risk perception, regulatory style and organisational capacity;
- A categorisation and enhancement of approaches to risk assessment and risk management including suggestions for basic safety principles and integrated appraisal and management strategies based on scientific analysis, precautionary considerations and vulnerability assessment;
- Inclusion of risk-benefit evaluation and risk-risk tradeoffs;
- A conceptual framework for integrating civil society (stakeholders from the corporate sector, NGOs, associations, science communities as well as representatives of the public) in risk governance;
- Principles of “good” risk governance;
- Requirements for improving risk governance capacity including the new perspective of integrated disaster risk management (IDRM).

Who is the initiator/responsible body of the concept?

The International Risk Governance Council (IRGC), a private, independent, not-for-profit Foundation based in Geneva (Switzerland) is responsible for the concept. The mission of the IRGC is to support governments, industry, NGOs and other organisations in their efforts to deal with major and global risks facing society and to foster public confidence in risk governance.

Participants/Partners

IRGC is a public-private partnership in which governments, industry and academia can freely discuss such issues and, together, design and propose appropriate risk governance recommendations that have relevance to both developed and developing countries.

Regional/National/International approach?

This approach provides guidance for the development of comprehensive assessment and management strategies to cope with risks, in particular at the global level. Nevertheless it is possible to transfer this approach into different levels (national, regional and local).

How is the practice of risk governance organised?

IRGC provides a website, where all necessary information (documents, responsible persons etc.) is available.

Are stakeholders involved from the early beginning in all steps (problem identification, risk assessment and risk management)?

Yes, the involvement of the stakeholders is the key point of the concept.

Who takes the decision in the end? Is the decision taken on basis of an agreement among all participants?

IRGC underlines that there exist several questions which should be addressed. One of the key-questions is: were all interests and values considered and was there a major effort to come up with fair and balanced solutions? It shows that a fair decisions on basis of an agreement is necessary.

Which risks are addressed?

Globally relevant risks include *transboundary* risks, i.e. those that originate in one country and affect other countries (such as air pollution), *international* risks, i.e. those that originate in many countries simultaneously and lead to global impacts (such as carbon dioxide emissions for climate change) and *ubiquitous* risks, i.e. those that occur in each country in similar forms and may necessitate a coordinated international response (such as car accidents or airline safety).

To following risks/hazards are in the focus of the IRGC´s work programme: Physical Agents (Ionising radiation, Non-ionising radiation, Noise [industrial, leisure, etc.], Kinetic energy [explosion, collapse, etc.], Temperature [fire, overheating, overcooling]; Chemical Agents (Toxic substances [thresholds], Genotoxic/carcinogenic substances, Environmental pollutants, Compound mixtures); Biological Agents (Fungi and algae, Bacteria, Viruses, Genetically modified organisms, Other pathogens); Natural Forces (Wind, Earthquakes, Volcanic activities, Drought, Flood, Tsunamis, [Wild]fire, Avalanche); Social-communicative Hazards (Terrorism and sabotage, Human violence [criminal acts], Humiliation, mobbing, stigmatising, Experimentation with humans [such as innovative medical applications], Mass hysteria, Psychosomatic syndromes); Complex Hazards – Combinations (Food [chemical and biological], Consumer products [chemical, physical, etc.], Technologies [physical, chemical, etc.], Large constructions such as buildings, dams, highways, bridges, Critical infrastructures [physical, economic, social-organisational and communicative]).

Description of procedural steps

See Definition/Understanding of risk governance.

Description of methodologies that are used

After the framework was elaborated, the IRGC will test its application in a number of areas where the risks appear not fully understood or where there is a desire or need to improve risk governance.

8.14.2 Characterisation of the risk governance approach

General characterisation: information, co-operation or credibility oriented?

IRGC underline that: "*The potential benefits resulting from stakeholder and public involvement depend, however, on the quality of the participation process. It is not sufficient to gather all interested parties around a table and merely hope for the catharsis effect to emerge spontaneously. In*

particular, it is essential to treat the time and effort of the participating actors as spare resources that need to be handled with care and respect (Chess et al. 1998). The participation process should be designed so that the various actors are encouraged to contribute to the process in those areas in which they feel they are competent and can offer something to improve the quality of the final product."

Degree of risk communication? How does communication work in practice? How does information flow in practice?

IRGC states, that effective risk communication has to be at the core of any successful activity to assess and manage risks.

According to IRGC risk communication needs to address the following topics:

- explain the concept of probability and stochastic effects;
- explain the difference between risk and hazard;
- deal with stigmatised risk agents or highly dreadful consequences (such as nuclear waste or cancer);
- cope with long-term effects;
- provide an understanding of synergistic effects with other lifestyle factors;
- address the problem of remaining uncertainties and ambiguities;
- cope with the diversity of stakeholders and parties in the risk appraisal and management phase;
- cope with inter-cultural differences within pluralist societies and between different nations and cultures.

Is the approach integrative?

The framework integrates scientific, economic, social and cultural aspects and includes the effective engagement of stakeholders. Further it calls for coordinated effort amongst a variety of players beyond the frontiers of countries, sectors, hierarchical levels, disciplines and risk fields.

Is the approach multi-dimensional?

Yes, see Definition/understanding of risk governance.

Is the approach transparent?

Yes. All necessary steps and its relationship are well explained and make the concept coherent.

Do clear requirements concerning the involved partners exist?

Yes. The available project-documents explain the role (e.g. why are the partners important) and the requirements of the involved partners (e.g. what should the partners consider during the process).

Does capacity building of involved partners exist?

Yes, the concept envisages capacity building to perform all the tasks described in the White Paper of Risk Governance (a kind of handbook produced by the IRGC, which is the basis for this analysis).

8.14.3 Conclusion

Interpretation: Is the type of the approach appropriate for the types of risk that are addressed by MIDIR? What elements could be used for the MIDIR risk governance concept?

Yes. It consists of the following steps, which can be transferred into different risk settings:

- Pre-Assessment
- Risk Appraisal
- Tolerability & Acceptability Judgement
- Risk Management

These steps are the basics of the risk-governance-concept and can also be transferred into the MIDIR-Project

Area			Context											Governance								Stakeholder									Resources				Expertise		
Key-Word			Purpose	Principles	Values	Motivation	Trust	Behaviours	Objectives	Mindset (meme)	Tolerable	Values based decision	Role of Science	Senior	Administration	Accountability	Justification	Contexts	Priority	Process	Strategy Integration	Identification	Representation	Engagement	Access to Information	Interest	Trust	Acceptance Process	Acceptance Outcome	Dialogue	Financial	Personnel	Time	Equipment	Identification	Role	Involvement
Project	Indicator?	Addressed?	Completely	Completely	Completely	Completely	Completely	Partly	Partly/Completely	Completely	Partly	Partly/Completely	Partly/Completely	Non	Partly	Completely	Completely	Partly/Completely	Partly/Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	Completely	No information	No information	No information	No information	Partly	Completely	Partly
		Risk Governance - IRGC																				Inclusion and selection		Participatory methods												