



**Environmental Risk Identification (ERI)  
Strategy Paper  
Rosersberg Initiative Working Group  
Tunis, 3-5 December 2007**



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Paper prepared  
by the Joint UNEP/OCHA Environment Unit

**November 2007**

*Foreword*

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This document aims to inform the members of the Rosersberg Initiative Working Group on the strategy being pursued for the development of the Environmental Risk Identification. We strongly encourage all members to provide their comments and suggestions, as we believe this would improve the outcome of the project.

**Introduction**

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It is well known that large infrastructure and industrial installations can pose a risk for human health and the environment. Technological accidents as Chernobyl and Bhopal are the best-known examples. While incidents of such a magnitude might be rare, much more common is infrastructure being damaged by natural disasters. These so-called 'NaTechs' result in secondary risks for the population, such as landslides after earthquakes, dam breaks by extensive rains or exploded pipelines when hit by hot lava after a volcano eruption. Exact data on the occurrence of NaTechs are non-existing, however examples are not scarce and the frequency of NaTechs can be expected to increase due to the continuous global industrialization.

**1. Environmental Risk Identification (ERI): An overview**

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The danger associated with human infrastructure

The goal of the ERI is to limit the consequences of natural disasters and technological accidents on man, hence to reduce the number of victims.

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The ERI builds on the idea that the identification of hazardous installations contributes to this goal.

can be decreased by identification of hazardous facilities.

At the moment, the ERI uses accessible information on the type and location of hazardous facilities gathered from public and subscribed databases and the Internet. Its continued development is based on gaining greater access to information which would provide a more complete picture of a country.

The ERI is a standard response tool of emergency response.

In the format of a 3-page document, an ERI indicates hazards in the affected area that could cause environmental emergencies and become secondary risks - second to the primary risk of the natural disaster or accident - to the local population and responders. It assumes the hazards based on generic information about the industrial process being undertaken or type of installation present and is not based on the specific facility found.

For example: Hexane and ammonia are commonly used in the production of chocolate. If these chemicals entered the environment, emergency responders may wish to know that these materials are toxic and flammable and therefore pose a (additional) risk.

## 2. Strategic Framework: A roadmap for the ERI

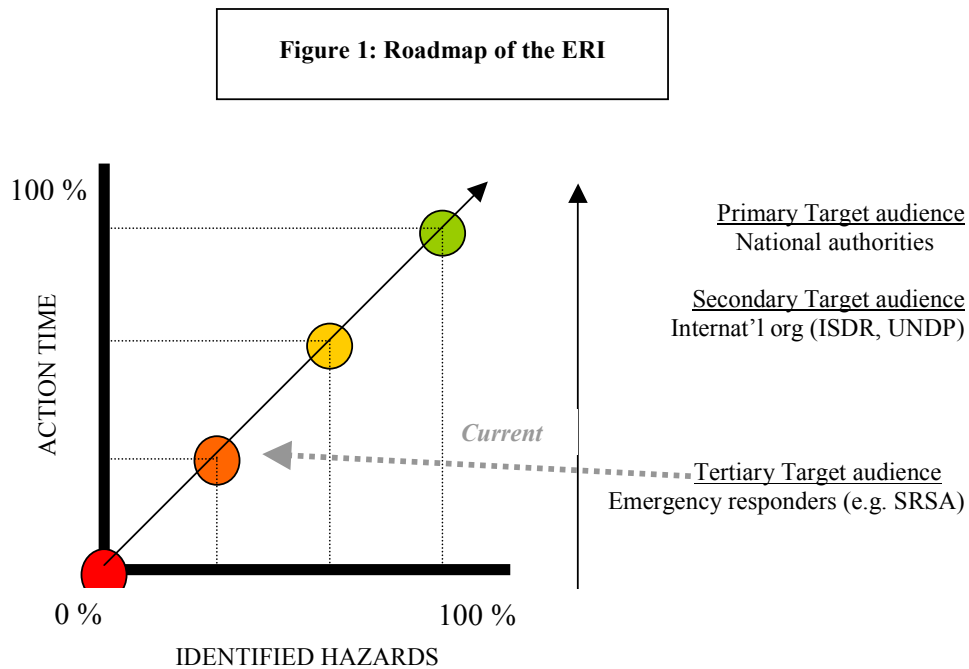
The ERI has multiple outcomes

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The intent of the ERI therefore is to alert relevant stakeholders to a potential hazard as early as possible in order to provide them with enough time to develop a contingency plan for dealing with the identified hazards. As a result, the development goal for the ERI is to use it to identify hazards before natural disasters or accidents occurred. It would then profit not only response operations, but disaster risk reduction activities as well.

The following figure visualizes the roadmap:



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and several related target audiences

If we would compare the number of identified hazards to the time to take safety measures before the occurrence of a disaster, one would be able to differentiate four different levels, as reflected in the roadmap. Each level corresponds to specific follow-up activities for the ERI-project. In general these activities are undertaken by different actors in the disaster management community, so that the ERI will benefit multiple target audiences.

### • Level 0 Before the ERI

Without ready available data, only response activities can be taken.

Before the start of the ERI-project, environmental risks were mostly identified and located only after they caused casualties. No straightforward, user-friendly information was available on the type and the location of large infrastructure and industrial facilities within an affected area. As a result, only (clean-up) response activities could be taken.

Two *reservations* need to be made here:

- In some countries such information does exist on the national level. However, by making this information available during an emergency to responders, the risks posed by large infrastructure and/or industrial facilities could be recognized timely and mitigated.

For example: During the recent eruption activities of Mt. Kelud in Indonesia in October 2007, authorities welcomed the ERI. While the main source of the data in that specific ERI was a website of the authorities themselves, the ERI allowed them to have that same information in a ready-for-use and case-specific format.

- The ERI will not be applied to countries within the European Union because of the existence of the Seveso Directive.<sup>1</sup> The Seveso II Directive offers a much more comprehensive framework for the prevention and control of chemical accidents than the ERI. Nonetheless the identification of major-accident hazards is a part of this legislation to ensure safety of hazardous installations.

• **Level 1**                      **The ERI at the response level**                      *Current status*

The ERI has been recognized as a standard tool of environmental emergency response system in the report of the Secretary-General to the 62<sup>nd</sup> General Assembly on “International cooperation on humanitarian assistance in the field of natural disasters, from relief to development” of 2 November 2007.

Secondary risks are taken into account in the emergency phase after natural disasters

The objective of the ERI at the response level is to assist in guiding real-time assessments in the immediate aftermath of natural disasters. The ERI provides an initial review of hazards that exist in an area affected by a natural disaster. If these facilities are damaged, this results in an increased risk for the local population and responders. Emergency responders, including UN Country Teams and UNDAC teams, are alerted to the danger of secondary risks posed by these hazards. It also serves to alert them to look for similar threats that may not have been identifiable through the sources used to compile the ERI. Emergency responders can then inspect a site to determine its state as soon as possible during the response phase.

The findings of the ERI can be used as a first basis in the application of the Flash Environmental Assessment Tool (FEAT). While the ERI identifies the hazards present in the affected areas, the FEAT goes one step further and identifies the actual urgent/acute environmental risks from disasters.

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<sup>1</sup> The Seveso Directive was adopted by the Council of Ministers of the European Communities in June 1982 (Directive 82/501/EEC) and aims to improve the safety of industrial sites, to plan for off-site emergencies, and to cope with broader regional and transboundary aspects of industrial safety. A central part of the Directive is a requirement for public information about major industrial hazards and appropriate safety measures in the event of an accident. It is based on recognition that industrial workers and the general public need to know about hazards that threaten them and about safety procedures.

• **Level 2**      **The ERI at the response preparedness level**

The methodology of the ERI can also be used to identify the hazards before a disaster takes place. The objective is to better inform emergency responders, but also national authorities, UN agencies and other relevant stakeholders on the location and threat of hazardous facilities:

Cooperation of national authorities is essential

- By providing as much information as possible in as much time in advance as is required to take the desired preparedness action, emergency responders and/or other relevant stakeholders can be better prepared for secondary risks.
- In addition, if a disaster occurs, information on hazards would be readily available in a user-friendly format ensuring that no time is lost in gathering this data. This would improve the speed as also the quality of response.

Since data on industrial facilities is very dynamic, a crucial aspect in setting up databases of hazards is to keep the information up to date. A reporting mechanism will need to be established, preferably on the country level.

• **Level 3**      **The ERI at disaster risk reduction (DRR) level**

A clear link to DRR should be made

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so that technological disasters can be prevented.

Data on hazardous facilities, once compiled from several sources, can be used/inserted by national authorities and/or internal mechanisms to serve as a basis for disaster risk reduction and/or capacity building activities. DRR is about understanding the nature, the causes and the potential consequences of vulnerability and consequently developing a strategy to decrease this vulnerability. When the location of hazardous facilities is known as well as the associated risk, proper safety measures can be taken to prevent 'NaTechs' and technological accidents. In the context of the Seveso II Directive, the identification of hazards resulted in better planning, land-use policies, safety policy, etc. DRR should also be considered in recovery plans so to ensure that new risks are not created during that phase.

### **3. ERI in the framework of the Rosersberg Initiative**

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▪ **Structural support**

In June 2007, the 7<sup>th</sup> meeting of the Advisory Group on Environmental Emergencies (AGEE) recommended the ERI be developed as a response preparedness tool. The AGEE established the *Rosersberg Initiative*, a mechanism to enable its members to implement priority recommendations in a participatory manner. The expansion of the ERI is part of the initiatives Thematic Area 2, which is tasked with the: "Review

*international structures related to identification, notification and monitoring in case of environmental emergencies, and international good practice, and propose improvements.”*

▪ **Interagency cooperation**

In fulfilling this recommendation the **Joint UNEP/OCHA Environment Unit** began **collaborating with the Swedish Rescue Services Agency (SRSA)** and the **Swedish Defence Research Agency (FOI)**.

The Joint Environment Unit is also cooperating with the **Joint Research Centre (JRC)** of the European Commission, guided by the Memorandum of Understanding between the JRC and UNEP, which, in part, states: “[JRC will] support UNEP in the field of risk and damage assessment related to large-scale natural hazards such as tsunamis and tropical cyclones, in particular with respect to their humanitarian impact, through the **Global Disaster and Alert Coordination System (GDACS)** hosted by the JRC.” The JRC already identifies critical infrastructure such as nuclear power plants, large dams and air and seaports that are potentially affected by disasters. This information is shared with disaster management community as alert messages issued by **Global Disaster Alert and Coordination System (GDACS)**, a joint initiative of the United Nations and the European Commission, after a natural disaster has struck. Since the ERI project can complement the work of the JRC, both it and the Joint Environment Unit recognize the benefits of collaboration, which will raise awareness about secondary risks that result from natural disasters. Information and data collected through ERIs will result be placed in the GDAC system constituting an environmental layer of information. It can be used in compiling a complete analysis of a country that has been affected by a natural disaster or technological accident.

Limitation

*It needs to be emphasized that the recommendation of the AGEE does not cover the full development of the ERI until the end of the roadmap. This responsibility falls out of the scope of the Rosersberg initiative as well as of the partners involved. At the same time, links with disaster risk reduction and prevention activities need to be considered from the beginning of the development in order to ensure relevant information is inserted in national disaster risk reduction platforms.*

**3.1 First project phase**

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After discussions between the Joint Environment Unit, RSRA, FIO and the JRC and consultation with OCHA’s Emergency Preparedness Section (EPS) and UNEP- Post-Conflict and Disaster Management Branch, it was suggested that the development of the ERI be carried out through three distinct activities:

- 1. Improving the response tool through analysing past experiences**
- 2. Determining the accuracy of the information through conducting a pilot project to map one hazards in one country**
- 3. Investigating other means of obtaining data**

### 3.2 Second project phase

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The aim of the second project phase would be to map more countries, based on the outcomes of the first phase. The partners plan to make use of the pilot project in order to develop this comprehensive ERI process. This phase will include computer-based research and field work leading to a more robust data collection.. In this second phase, new partners can be included and the work plan can be revised.

*Funding* This project would require external funding of a substantial amount.

*Output* A database that would complement existing products, such as in GDACS, Humanitarian Information System (HIS) and national disaster risk reduction platforms.

*Deadline* The implementation of phase 2 would take approximately two years.

#### Limitation

*It is important to indicate the limits of the ERI. The aim is only to identify the location and type facility to determine the generic hazard. It would not endeavour to identify each specific material house in an industrial complex. Industries of the same type may use different processes and related hazardous materials.*

### 4. Questions to the members of the Rosersberg Initiative Working Group

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**Members of the Rosersberg Initiative Thematic Area 2 are invited to consider following questions:**

- How useful would such a tool be for your specific country?
- Are you aware of the existence of data identifying industrial facilities within your country? What are the conditions for its use?
- Would your country be interested in implementing the ERI?
- What criteria should information sources have?
- Should the ERI continue to be used as an alert of the danger of secondary risks after a natural disaster once databases of hazardous installations have been established?
- Do you have suggestions on the existence of related disaster risk reduction activities, such as APELL, that can follow-up on the outcome of the ERI in the Rosersberg framework?
- ...

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## **ANNEX I: Project partners**

### **The Joint UNEP/OCHA Environment Unit**

The Joint Environment Unit is the United Nations mechanism to mobilize and coordinate the international response to environmental emergencies and natural disasters with major environmental impacts. Initiated over fifteen years ago by governments, the Joint Environment Unit integrates the United Nations Environment Programme's (UNEP) technical expertise into the Office for the Coordination of Humanitarian Affairs' (OCHA) response coordination structure.

### **Swedish Defence Research Agency (FOI)**

FOI is an assignment-based authority under the Swedish Ministry of Defense. The core activities are research, method and technology development, as well as studies for the use of defense and security. Since 2001 FOI has supported the Swedish Armed Forces (SwAF) in the field of Medical and Environmental Intelligence, making Environmental and Health Threat Assessments in Afghanistan, DRC, Liberia, Kosovo, Bosnia and Herzegovina, Darfur, Chad and Central African Republic. Its work includes the development of tools for early identification, hazard assessment and risk area estimate industrial facilities or other installations in crisis and conflict areas, and is implemented in a collaboration with FOI/SwAF and UN DPKO.

### **Swedish Rescue Services Agency (SRSA)**

The SRSA has been active in the international humanitarian sector since the earthquake in Armenia in 1988. Over the 19 years, SRSA has broadened its contribution from disaster response to humanitarian mine action, reconstruction, and capacity building. On the 1<sup>st</sup> of January 2006 the Swedish government granted SRSA an expanded mandate, which now includes disaster related capacity building and recovery. The new mandate gives SRSA the responsibility to initiate and participate in projects all components of the disaster management cycle: risk reduction, preparedness, response and recovery.

### **Global Disaster Alert and Coordination System (GDACS)**

GDACS is a joint initiative between the United Nations and the European Commission. It provides real-time alerts of natural disasters around the world and tools to facilitate response coordination. GDACS is a web-based platform that combines several web-based disaster information management systems into a single entity to alert the international community., disasters are It classifies disasters into three classes, ranging from green - very low likelihood of humanitarian disaster, orange - potential humanitarian disaster to red - very high likelihood of humanitarian disaster, based on the location, magnitude of the disasters, the size of the local population and their vulnerability.

### **The Joint Research Centre**

The Joint Research Centre provides customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. It serves the common interest of the Member States, while being independent of special interests, whether private or national. As a founding partner of the Global Disaster Alert and Coordination System (GDACS), JRC created the current disaster impact and alert component, multi-hazard disaster monitoring and the GDACS website, which automatically combines and integrates information from various organizations.

## **ANNEX II: Details of activities in the first project phase**

### **Activity 1: Survey among the receivers of the past ERIs**

*Objective:* To identify gaps in the demands/needs of the field and emergency responders

*Method:* To determine how useful is the ERI for emergency responders?

*Questions:*

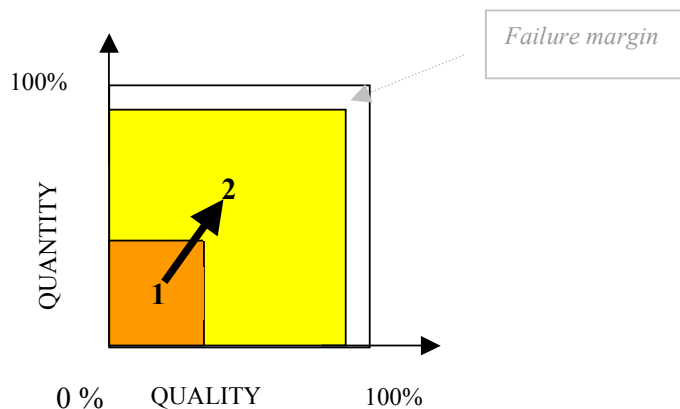
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- What actions were taken following the receipt of the ERI?
  - Who are the end users of the ERI?
  - Were the facilities identified by the ERI investigated after its receipt? If yes, were they damaged? How many?
  - Were additional sites identified? If yes, how were these identified? And were these sites damaged?
  - Would more precise location, geographical coordinates help? How important are exact geographical coordinates?
  - Was the ERI shared with other partners? If yes, how? And what was their impression of the product?
  - Did the team receive similar information to the ERI through another means?
  - What was the value of the information on hazards/hazardous materials?

*Outcome:* Feedback on the usefulness of the ERI and ideas for improvement of the response ERI as for the further development of the ERI.

### **Activity 2: Pilot project of the ERI**

*Objective:* Both the quantity as the quality of the data needs to be sufficient in order to guarantee accuracy and completeness. This requires *verification* of the information and identifying *other means of gathering information*, such as collecting information from national sources, private companies, other organisations, etc.

*Figure:*  
*Purpose of the Pilot Study:*  
*Improve the reliability of the ERI*



*Method* This can be done by conducting a pilot study of the ERI, namely to provide an overview of one country regarding the presence of

environmental risks, including a map with the exact location of these sites.

*Requirements* The choice of the pilot country would depend on a number of important requirements that need to be fulfilled in order for the project to start:

- National authorities of the selected pilot country identify a need for the project in their country.
- A request to conduct an ERI by national authorities or a UN agency is received.
- In-country security situation allows verification on-site and access to the facilities
- Fit into existing capacity building mechanisms, disaster risk reduction and prevention activities of the country

*Outcome* The first aim of conducting a pilot project is to improve the methodology of the ERI A pilot phase would also indicate what and how much information is already accessible on a national level and strengthen the need for the ERI project.

At the same time, the specific data on the country would also be of use to emergency responders in case of an emergency and could already start to fit into disaster risk reduction activities that are already being undertaken in the pilot country.

*Output:*

- List of reliable information sources
- Additional information sources
- Full mapping of environmental risks in the country
- Proposal for best format of presenting/keeping data
- Investigate the already available knowledge that national authorities possess- investigate the need for national authorities for an ERI
- Idea how much information private companies have?
- Proposal how to best access data in national databases – ask for their support
- Identification of possible difficulties that were not foreseen before
- Identify best custodians of the information
- Provide a sample format of the ERI to promote ERI and to prove usability of product
- Proposal on how to extrapolate experiences on identified disaster risk reduction mechanisms in the country

*Considerations:*

- What is the failure margin for a source not to be used again?
- What is the acceptable percentage of lack of information?
- *Field-visit:* How to define what to identify? What should local partners identify? Big facilities checked by local partners? Easier to do oneself? What exactly expected from the team? Just identify location? Should take pictures and collect to a map? Accept limits of field visits: no

impact assessment, no population density, and thorough assessment of threat/facility

**Activity 3: Broaden the information basis**

- *Define applicability of the 'space charter' for certain (very expensive) databases*

One way of overcoming the financial obstacle in accessing the information in the database is the use of the 'International Charter on Space & Major Disasters'. Through this charter, civil defense organizations can request satellite data from several space agencies in the case of natural or technological disasters under certain conditions. If used for the purpose of the ERI, data would remain with the company maintaining the database on secondary risks, but upon the occurrence of a disaster, the relevant information can be released to the Joint Research Centre and the Joint Environment Unit for the use in compiling an ERI.

- *Overview of the added value and (costs) of commercially available databases*

E.g. Raw Materials Group possesses an extensive database on global mining activities (cost: around 5000€). This Group would be interested in exploring possibilities to include additional information on our request for the purpose of the ERI.

**ANNEX III: BASIC WORKPLAN**

<b>Activity</b>	<b>Main responsible partner</b>	<b>Deadline</b>
1. Survey	JEU (with input from FOI)	30 November
2. Pilot phase: preparatory activities (information quality criteria, definition...)	FOI (with JEU)	30 November
2. Pilot phase: implement ERI on pilot country	SRSA	<i>open</i>
3. New info sources	JEU (with input from FOI)	30 November
Presentation on progress activities on RIWG	SRSA	30 November