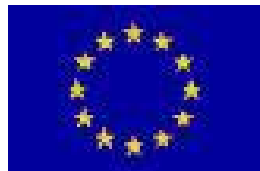


*Seminar Publication*

# Round Table Discussion on Crises and Environment

CMC Finland, Kuopio  
11.8.2007

Regional Development  
Programme for Security and  
Civilian Crisis Management



**CMC**Finland

**Kriisinhallintakeskus**  
Crisis Management Centre

ISSN 1797-1667 (PDF)

# CONTENT

Round Table Programme	3
Environment and Crises Initiative	4
"Ympäristö ja kriisit" -aloite	7
Purpose of the Round Table	8
Pyöreän Pöydän tilaisuuden tavoite	10
Presentations	
Ari Kerkkänen	12
Shafqat Kakakhel	13
Jani Bergström	17
Jussi Viitanen	22
Pekka Vapaavuori	23
Jouko Tuomisto	25
Tapani Vaahtoranta	35
CMC Finland Working Papers	37
Editorial information	38



Ari Kerkkänen



Shafqat Kakakhel



Jani Bergström



Jussi Viitanen



Pekka Vapaavuori



Jouko Tuomisto



Tapani Vaahtoranta



Kari Karanko

## Round Table Discussion on Crises and Environment

Saturday, 11 August 2007, 16.00 –18.00  
Crisis Management Centre Finland, Kuopio

Opening Words: Dr. Ari Kerkkänen, Director, Crisis Management  
Centre Finland

Guest Speaker: Mr. Shafqat Kakakhel, Assistant Secretary General/  
Deputy Executive Director, United Nations Environment  
Programme, Nairobi: *"Crises and Environment"*

Requested comments by the following professionals:

Researcher Jani Bergström, Geological Survey of Finland:  
*"Environmental Risk Assessment Mechanism in Crisis  
Management"*

Forestry advisor Jussi Viitanen, Ministry for Foreign Affairs:  
*"Crises and forests"*

Doctor of Music, Lecturer Pekka Vapaavuori, Sibelius Academy:  
*"Crises and local cultures – strength or weakening aspects"*

Professor Jouko Tuomisto, University of Kuopio:  
*"Environmental changes and transboundary effects"*

Chief Editor Tapani Vaahtoranta, The Finnish Journal of Foreign  
Affairs: *"Climate Change and regional crises"*

Moderator of the Round Table discussion: Mr. Kari Karanko,  
Ambassador from the Ministry for Foreign Affairs

# Environment and Crises Initiative

*Crisis Management Centre Finland*

*Round Table Discussion 11.8.2007, Kuopio, Finland*

The Round Table Discussion on Environment and Crises at the Crisis Management Centre can be condensed into four different themes:

- 1) Linkage between environment and crises
- 2) Crisis management and crisis prevention
- 3) Cultural healing
- 4) Civilian crisis management research

## *1) Linkage between environment and crises*

In general, there are two types of environmental issues that can cause violent conflict: the abundance or the scarcity of natural resources (and grievance). *The honey pot explanation* is applied to resources such as diamonds, forests and oil. For example, competition to use and exploit land and timber resources in forested areas can trigger, exacerbate, or finance conflict. Behind *the deprivation explanation* is the scarcity of natural resources and the grievance caused by it. It has been suggested that the scarcity caused by climate change may result in violent conflict in two ways: 1) either those affected by the increasing scarcity start fighting over the remaining resources; 2) or people are forced to leave the area.

The linkage between the environment and crises requires more information and new ways of thinking from institutions engaged in crisis training and research. For example, the CMC Finland does not want to focus only on traditional perception of crisis management and conflict resolution but it aspires of being in a fore-front in preparedness to meet challenges posed by the new threats. This challenge requires awareness and long-term vision.

## *2) Crisis management and crisis prevention*

The integration of environmental issues to the different phases of the crisis management is needed. Especially during the recovery and reconstruction phase it is necessary to take environmental factors into account. Otherwise, the conflict-afflicted or disaster-affected countries or societies can once again become more vulnerable to either a recurrence of conflict or greater damages when hit by natural disaster. The revitalization of the natural resource base, which is often the foundation for economic development, must be a priority during the early recovery period.

Even though the internal issues mostly explain the escalation of different political and social problems into a violent conflict, the international cooperation is sometimes

the only way to manage crises linked to the environmental issues since the crises most often have transboundary effects. For example, the consequences of forest and oil field fires are real risks to inhabitants living in all the countries at the region in concern, even though these risks are not prioritized in post-crisis situation.

The major question is how to implement the international conventions and treaties dealing with environmental issues at the operational level. For example, the UNEP reports (for ex. *Sudan – Post-Conflict Environmental Assessment*, June 2007) can give plenty of tools to manage the post-crisis situation but the efficient implementation can be achieved only by the grass root level actors and by the political will. Therefore the environmental issues should be taken into account in the training directed to the civilian crisis management personnel at all levels.

### *3) Cultural healing*

Humanity has survived different natural and man-made crises by using a variety of means that can heal the traumatized minds. The physical reconstruction is of course important after the crisis situation, but the shattered minds should be taken into consideration when thinking the sustainability of the recovery at the individual level and in the long run. Cultural healing for instance by music or other expressions of spirituality is important to be noticed along the crisis management process. Also the role of local traditional leaders on crisis situation should be recognised even though the crisis management workers are usually working with governmental authorities.

In the cultural healing process the envionring nature has an important role. In the reconstruction phase, hearings with local inhabitants should be organised in order to respect the original milieu in which people lived before. It is also important to understand that there are long traditional ways of using natural resources. Crisis management workers should be trained to respect the local ownership from the environmental point of view.

### *4) Civilian crisis management research*

Management and prevention of crises require a capability to predict them. This can be achieved by a professional research, which is focusing on the linkage between the crises and environment. Also new definitions about this linkage are needed to be elaborated more thoroughly. In the research agenda the emphasis should be on the multidisciplinary approach towards the crises.

Research is needed also because those responsible for civilian crisis management need more specific knowledge on how exactly does the environment cause crises. For example, clean water and fisheries have become increasingly scarce in the Baltic Sea, but nobody expects a violent conflict because of it. Besides the environmental causes

there are also other factors involved: social and political factors that exacerbate or mitigate the potential for violent conflict. The focus should be on internal civil strife in the developing countries especially in Africa and parts of Asia. Asymmetrical consequences of climate change should be looked for (positive and negative consequences, geographical differences), as well as different capacities to adapt to the climate change, and the strength of state and political institutions.

Environmental risk assessment mechanism in crisis management can help in evaluating which kind of risks should be foreseen and activities thereon prioritised in the post-crisis or post-conflict situation. Still, there is a need for on-site assessment during the crisis situation. In order to facilitate the actual assessment a knowledge system for decision making in crisis should be created. *Geological Survey of Finland* is engaged in planning and creating above mentioned mechanism. In future prospects there would be a small team of environmental scientists (*iCrisis-team*) who would be prepared to work on-site at the crisis area.

*Recommendations:*

- *Recognising and understanding the linkage between environment and crises;*
- *Integrating environmental security concerns in crisis management;*
- *Including environmental issues in crisis management training;*
- *Building effective partnerships to strengthen good governance, regulatory frameworks and information sharing;*
- *Formulating the linkage between environment and security by new definition and normative analysis based on research and lessons learned;*
- *Creating a multidisciplinary cooperation in risk assessment in pre-crisis, crisis and post-crisis situations.*

## "Ympäristö ja kriisit" -aloite

Kriisinhallintakeskus järjesti 11. elokuuta 2007 Pyöreän pöydän keskustelutilaisuuden ympäristökysymysten merkityksestä kriiseissä sekä kriisinhallinnassa. Keskustelu voidaan kiteyttää neljän eri teeman ympärille:

- 1) Ympäristökysymysten ja kriisien keskinäinen yhteys
- 2) Kriisinhallinta ja kriisien ennaltaehkäisy
- 3) Kulttuurin merkitys kriisistä toipumisessa
- 4) Siviilikriisinhallinnan tutkimus

Keskustelutilaisuuden pohjalta keskustelijat esittävät kuusi suositusta otettavaksi huomioon:

- *Ympäristökysymysten ja kriisien keskinäinen yhteys on tunnistettava ja ymmärrettävä entistä paremmin;*
- *Ympäristöturvallisuuskysymykset on sulautettava osaksi kriisinhallintaa;*
- *Ympäristökysymykset on huomioitava kriisinhallintakoulutuksessa;*
- *Yhteistyötä on rakennettava eri toimijoiden välille hyvän hallinnon, yhteisten sopimuskäytäntöjen ja tiedonjakamisen vahvistamiseksi.*
- *Ympäristökysymysten ja turvallisuuden keskinäisen yhteyden selvittämiseksi on luotava tutkimukseen ja kokemuksiin pohjautuvaa uutta normatiivista ajattelua sekä käsitteellistä määrittelyä;*
- *Poikkitieteellinen yhteistyöverkosto on luotava ympäristöriskien arvioimiseksi kriisin eri vaiheissa.*

## Purpose of the CMC Finland Round Table

During the past few years the recognition of the links between crises and environmental factors has grown significantly. Crises have multiple causes and effects, including political, ideological, economic, demographic, cultural and social. Only recently environmental factors, such as ecosystems' degradation, lack or shortage of, or access to drinking water, desertification, land degradation, deforestation have been added. Climate change is not only an environmental problem in itself; it will also make the other environmental problems far worse. Deforestation, disruption of agricultural activities, land degradation, etc., result in creating environmental refugees which cause tensions with local populations. And reversely conflicts create refugees and IDPs, putting additional stresses on environment, which further compound the existing tensions.

Efforts to address the twin problems of environmental degradation and political insecurity and crisis, require a new definition of crisis and security and integration of environmental protection in the prevention of crisis and solving them, if they do arise. It is now clear that unless crisis-affected countries establish effective means of environmental governance and management, the process of recovery and reconstruction will be difficult if not impossible. To be able to effectively do this, the sociocultural aspects of the area or region in question, need to be taken into consideration in both governance and recovery. Here we need to remember the different needs based on gender.

Another fact is that many transboundary environmental issues, such as rivers and lakes shared between and among several countries, forest fires and resulting haze, transboundary pollution can only be addressed through bilateral and regional cooperation. Border river and transboundary river commissions between various countries are very valuable tools also to address common environmental problems, such as quality of water, watershed conditions and flood control.

The Darfur crisis is one example of multiple problems from environmental to human suffering. Decades of long and devastating droughts and desertification have undermined food security and created tension between Arab nomads and African farmers, as herders encroached on farmlands to the south. The effects of floods are more serious on the Blue Nile because of deforestation and overgrazing in upper catchment area of the river. One of the serious impacts of watershed degradation and associated flooding is severe river bank erosion in the small but fertile Nile riverine strip. We face the same phenomena of floods in some Asian countries at the moment. Countries suffering from the crises situation have another burden to carry due to the extreme weather conditions.

The Round Table at the Crises Management Centre in Kuopio brings together experts in crisis management, a senior representative of the UN Environment Programme,



an expert from the Finnish Geological Survey, a forest expert, an environmental economist and a culture specialist. Each of us will address the environment and crises linkage from different academic and professional angle. We hope to have a rich discussion aimed at finding answers to the pertinent question: How can governments, societies and the international community improve both the prevention of crisis and address more their impacts by an increased awareness of the links between environment and security? We also question in which way we are able to include environmental knowledge to the civilian crises management learning and actual crises prevention and management operations.



# Kriisinhallintakeskuksen Pyöreän Pöydän tilaisuuden tavoite

Viimeisten vuosien aikana yhteyden tunnustaminen erilaisten kriisien ja ympäristötekijöiden kesken on lisääntynyt merkittäväällä tavalla. Kriiseillä on moninaisia syitä ja seurauksia, joihin lukeutuvat niin poliittiset, ideologiset, taloudelliset, kulttuuriset, sosiaaliset kuin väestönkasvuun liittyvät kysymykset. Vasta viimeaikoina ympäristötekijät on listattu mukaan syiden ja seurausten ongelmavyöhytiin, mukaan lukien ekosysteemin vaurioituminen, juomaveden puute tai suoranainen vesipula sekä pääsy veden äärelle, aavikoituminen, maanpinnan kuluminen ja metsien katoaminen. Ilmastonmuutos ei ole pelkkä ympäristöongelma itsessään, se pahentaa myös jo muita olemassa olevia ympäristöongelmia entisestään. Metsien katoaminen, maanviljelystoiminnan keskeytyminen, maanpinnan kuluminen, ja niin edelleen aiheuttavat ympäristöpakolaisuutta, joka puolestaan aiheuttaa jännitteitä paikallisen väestön kanssa niillä alueilla, joihin pakolaiset ovat asettuneet. Ja käänteisesti: konfliktit synnyttävät pakolaisia sekä evakkoja, joiden siirtyminen ja uudelleenasettuminen lisäävät ympäristöön kohdistuvaa ylimääräistä painetta, mikä taasen entisestään hämmentää jo olemassa olevia jännitteitä.

Yritykset puuttua ympäristövaurioiden sekä poliittisen turvattomuuden ja kriisien ongelmavyöhytiin vaativat uudenlaista ajattelua koskien kriisien ja turvallisuuden määrittelyä sekä ympäristönsuojelun integroimista kriisien ennaltaehkäisyyn ja ratkaisujen löytämiseen. Mikäli kriisien uhreiksi joutuneet maat eivät luo tehokkaita keinoja ympäristökysymysten hallinnoimiseksi, on aivan ilmeistä että kestävä rauhan aikaansaaminen on paljon vaikeampaa, ellei suorastaan mahdotonta. Jotta rauhan aikaansaamisessa onnistutaan, on otettava huomioon kriisialueen yhteiskunnalliset ja sosiaaliset tekijät yhtäläillä hallinnossa ja niissä toimissa, joiden avulla tilannetta pyritään parantamaan. Prosessissa tulee myös muistaa pitää mielessä naisten ja miesten erilaiset tarpeet.

Aivan eri asia ovat erilaiset valtioiden rajat ylittävät ympäristöongelmat, kuten yhteiset joki- ja järviolueet sekä metsäpalot ja niistä aiheutuneet savuhaitat. Rajoja ylittävään saastumiseen voidaan puuttua ainoastaan monenkeskisellä ja alueellisella yhteistyöllä. Erilaiset rajajokiin ja yhteisten jokialueiden hallintaan paneutuneet neuvottelukunnat maitten välillä ovat arvokkaita kanavia yhteisten ympäristöongelmien hoidossa, kuten esimerkiksi veden laatuun, vedenjakaja-alueitten suojeluun ja tulvien ennaltaehkäisyyn liittyvissä kysymyksissä. Suomella on hyviä kokemuksia rajajokikomissioista Venäjän, Ruotsin ja Norjan kanssa. Komissioiden tehtäviin on liitetty muitakin kuin ympäristöön liittyviä vastuita.

Darfurin kriisi on yksi esimerkki moninaisesta ongelmavyöhydistä ulottuen ympäristökysymyksistä aina inhimilliseen kärsimykseen. Vuosikymmeniä kestänyt pitkä ja mursertava kuivuus ja aavikoituminen ovat heikentäneet ruuansaintia ja aiheuttaneet jän-

nitteitä etnisesti jakautuneiden arabipaimentolaisten ja afrikkalaisten maanviljelijöiden välillä, nomadista karjanhoitoa harjoittavien heimojen laajentaessa laidunalueitaan eteläisille maanviljelysalueille. Tulvien aiheuttamat vahingot ovat paljon vakavampia Sini-sellä Niilillä johtuen metsien katoamisesta ja liiallisesta laiduntamisesta joen yläjuoksulla. Yksi vakavista vedenjakaja-alueen ympäristöongelman seurauksista ja siihen liittyvien tulvien lisääntymisestä on huomattava jokipenkereiden eroosio pienellä mutta hedelmällisellä Niilin jokikaistaleella. Samaa tulva-ilmiötä esiintyy eräissä Keski-Aasian maisissa juuri tällä hetkellä. Erityisesti kriisin keskellä elävät maat joutuvat kohtaamaan äärimmäisistä sääilmiöistä johtuvaa lisätaakkaa.

Pyöreän Pöydän tilaisuus Kuopiossa sijaitsevassa Kriisinhallintakeskuksessa tuo yhteen kriisinhallinnan asiantuntijoita, YK:n ympäristöohjelman kokeneen edustajan, Geologian tutkimuskeskuksen asiantuntijan, metsäasiantuntijan, ympäristötaloustieteilijän sekä kulttuuriasiantuntijan. Jokainen heistä käsittelee ympäristön ja kriisien keskinäistä yhteyttä erilaisista akateemisista ja ammatillisista näkökulmista. Keskustelussa on tarkoitus saada aikaan näkökulmia, joiden avulla pyritään löytämään vastauksia ajankohtaiseen kysymykseen: Miten hallitukset, kansalaisyhteiskunta ja kansainvälinen yhteisö voivat sekä parantaa kriisien ehkäisyä että keskittyä enemmän kriisien vaikutuksiin lisäämällä tietoisuutta ympäristön ja turvallisuuden keskinäisestä yhteydestä. Kysytään myös millä tavalla voisimme sisällyttää ympäristötietoutta siviilikriisinhallinnan koulutukseen sekä varsinaiseen kriisien ehkäisyyn ja kriisinhallinnan kenttäoperaatioihin.



# Opening Words

*Ari Kerkkänen*

The CMC Finland is a new institution under the Ministry of Interior in Finland. It has a national mandate to train experts for international civilian crisis management/civilian peace-keeping missions and rescue operations. Rapidly developing civilian crisis management sector in the EU has led to the establishment of the CMC Finland. We, however, do not exist only for the EU; our training serves also needs of the UN and OSCE.

Armed conflicts, post-conflict stabilisation and institution building, conflict resolution and disasters (natural or man-made) are the reason for our activity. The training is supported by research undertaken in co-operation with national and international universities and research institutions.

We fully recognise challenges ahead us in the field of crisis management caused by new threats. We must address problems of today's conflicts but at the same time we also must recognise threats leading to conflicts and disasters in a longer term. Climate change is perhaps a prime example of the nature of these new threats. This challenge, emerging now rapidly and in a very worrisome way, requires new way of thinking and strategy from institutions engaged in crisis training and research.

It certainly underlines the importance and timing of today's Round Table. The CMC Finland does not want to focus only on traditional perception of conflict management and resolution but it aspires of being in a fore-front in preparedness to meet challenges posed by the new threats. This challenge requires awareness and long-term vision from us. It requires us to look at our trainings and research in order to find new ways in education, research and awareness raising in order to mitigate looming threats.

We have started to move to this direction. We have established a research co-operation with Geological Survey of Finland from the onset of the establishment of the CMC Finland. Among speakers of the Round Table is one of their researchers whose research is funded by our regional project. I'm convinced that this opening will give results of which value cannot yet today be fully comprehended. Furthermore, I also encourage all the speakers to give some advice to us, how we should develop our activity in the field of today's topic.

# Crises and Environment

*Shafqat Kakakhel*

## *Introduction*

For our discussion this afternoon, crises would refer to abnormal situations caused by

- Tensions and armed clashes or conflicts among groups or regions within a country as well as accidents in nuclear installations, mines, industrial unit, shipping, etc.
- Natural disasters such as earthquakes, tsunamis, storms and hurricanes, floods, persistent droughts/famines and health epidemics.

Crises in both categories result in short to medium term disruption of normal economic and life conditions, damage or destruction of economic infrastructure, industry, agriculture, human settlements, basic needs of life such as shelter, water, food, medicines, education, health care inflicting hardship upon human beings, forcing some of them out of their homes/jobs.

Crises in both categories involve, either as underlying causes or inevitable outcomes, environmental considerations such as the health and resilience of ecosystems, deforestation, land degradation, water contamination and sanitation, mismanagement of chemicals factories and mines, etc.

Obviously during the first phase immediately after crises has erupted, it is necessary to pay priority attention to prevent further losses of life and ensure provision of food, water, shelter and address health needs of those affected. However, in phase 2, that is recovery and reconstruction, it is necessary to take environmental factors into account. Otherwise, the conflict-afflicted or disaster-affected countries or societies can once again become more vulnerable to either a recurrence of conflict or greater damage by cases of natural disaster.

This consensus has led to initiatives and efforts to promote inter-disciplinary, integrated, multi-factor and multi-stake holder approaches within countries by national institutions and regionally and globally by regional and global partners, including different organizations of the UN system, in addressing crises. These include the Office for the Coordination of Humanitarian Assistance (OCHA), the International Disaster Reduction Strategies and the newly established Peace Building, to mention a few.

UNEP has been engaged in the efforts of the international community to address the causes and consequences of crises. Our activities have been led and carried out by all UNEP offices in general and by our Geneva-based Post Conflict Assessment and Disaster Management Branch and UNEP's Regional Office for Europe also located in Geneva, through the Environment and Security Initiative (EnvSec) in particular. Both sets

of activities which are mutually complementary have been generously supported by Finland.

UNEP's Post-Conflict and Disaster Management Branch, set up in 1999 under the guidance of Pekka Haavisto, works in close cooperation with the OCHA, the multi-agency United Nations Development Group (UNDG) and several other UN and multilateral agencies as well as the European Commission and Community. The main objective of the Branch, which has carried out field missions in 25 countries all over the world, including Kosovo, Macedonia, Albania, Serbia and Montenegro, Iraq, Bosnia and Herzegovina, Liberia, post-tsunami assessments in Sri Lanka, Maldives etc. Gaza, Lebanon and Sudan is to strengthen the capacity of conflict and disaster affected countries to address the environmental impacts of crises through assessment, technical advice and targeted capacity building. In 2005-2006 the Branch produced the Sudan Post Conflict Environment Assessment, the Gaza Post Disengagement Assessment and the Somali Joint Needs Assessment and conducted capacity building activities in Liberia, Afghanistan and Iraq. Like the previous reports, the Sudan report which was launched in June 2007 has been widely reported by the world media and is receiving attention by the international community.

The EnvSec initiative launched at the Environment for Europe Conference in Kiev in 2003, is a partnership of UNEP, UNDP, OSCE, ECE, NATO and REC, which has been engaged in efforts in Central Asia, the Caucasus, East Europe and South East Europe to identify, in partnership with Governments and civil society organizations, to help address environmental issues which are seen to create or sustain tensions between or within countries for either easing tensions and/or resolving issues, such as chemical pollution, water management issues, biodiversity loss, nuclear fuel dumps, pesticides stockpiles etc. EnvSec also seeks to promote preventive measures by assisting the countries to address the deep rooted social, economic, cultural, environmental, institutional and other structural causes of conflicts.

Based on the several assessments of post conflict and post-disaster situations carried out by UNEP, I would offer examples of how the linkages and the inter-relationship between environment and crises have demonstrated themselves and a few lessons drawn from them.

### *Conflict and the Environment*

In Sudan, the country's long history of conflict has had serious adverse impacts on the environment. On the other hand, environmental issues continue to contribute to deepening the causes of the conflict. There is a strong link between land degradation, desertification and conflict in Darfur. Areas around camps for refugees and camps for the in-

ternally displaces persons (IDPs) have become severely degraded, leading to clashes over diminishing resources, food insecurity and human rights abuses. The cycle may result in further degradation of fragile ecosystems. In addition, desertification and climate change in contributing to poverty and conflict - declining rainfall is predicted to result in a 20 % drop in food production.

The environment can be directly affected by conflict, for example:

- Use of weapons containing depleted uranium in Iraq in 1991 and 2003;
- Spill of 10.000-15.000 tons of oil in the Mediterranean Sea as a result of the bombing of a power plant in Lebanon in 2006.

However, conflict also has indirect impacts on the environment, for example the mass movement of displaced people and long term presence of refugees can cause negative environmental impacts. Living in camps in marginal areas affected by drought and floods, refugees and displaced populations frequently have no option but to rely on natural resources for survival (eg. using nearby wood to construct shelters; making charcoal or gathering wood to fulfil domestic energy needs; selling bush meat to generate income). The reversal of the flow of refugees and IDPs during the resettlement process also has implications on two fronts:

- Areas that have been degraded by camps should be rehabilitated to restore the natural resource base for use of local populations and to ensure they are not exposed to an increased risk from natural hazards (such as floods, landslides).
- Areas where people are resettled should be selected according to a resettlement plan that takes account of the capacity of the natural environment to sustain the resettled population. Failure to do this could create new conflicts.

Conflict often leads to the breakdown of effective governance. This also has implications for environmental management. For example:

- During 23 years of conflict in Afghanistan traditional forest and water management structures that existed in some regions collapsed. As a result, the pistachio woodlands across the north of the country were reduced by 80-100%.
- In Sudan, the absence of strong environmental management and planning practices has contributed to rapid and uncontrolled urbanization. Poorly managed mechanized rain-fed agriculture has been particularly destructive and an explosive growth in livestock numbers has resulted in wide spread degradation of rangelands.

In a post-conflict environment, revitalization of the natural resource base which is often the foundation for economic development must be a priority during the early recovery period.

### *The linkage between Environment and Natural Disasters*

Disasters caused by natural hazards and events such as hurricanes, floods and earthquakes converge with human vulnerability and result in social, economic and environmental damage and increased vulnerability and exposure to similar disasters in future. A few years ago in Mozambique, floods washed away years of economic achievement.

Environmental degradation can exacerbate the impact of disasters on communities by weakening their resilience. There is also a strong relationship between poverty, environmental degradation and higher disaster risk, with the poor usually being the most vulnerable to disasters. Sound environmental management can help to make communities more resilient to disasters by building sustainable livelihood and preventing conflict over scarce natural resources.

Healthy ecosystems play an important role in providing natural defences against hazards:

- Wetlands function as natural sponges that trap and slowly release surface water – thereby helping to alleviate or prevent floods.
- As was witnessed during the Tsunami disaster, in coastal ecosystems mangroves, dunes and reefs create physical barriers between communities and coastal hazards.

Similarly, the Haitian floods of 2004, during which over 2000 people were killed in mudslides, were considerably worsened by deforestation in the upper catchment – up to 97 % of original forest cover had been removed, most within the last 20 years. This disaster adds to the burden of a country that is already trying to cope with the aftermath of conflict.

In both conflict and disaster situations relief and recovery operations can have unintended consequences for the environment, some examples are:

- Inappropriate decisions regarding the location of camp sites (for example in ecologically sensitive areas);
- Improper waste management practices;
- Over-extraction of groundwater.



# Environmental Risk Assessment Mechanism in Crisis Management

*Jani Bergström*

## Environmental Risk Assessment

### “NORMAL SITUATION”

- These days it takes about 2 years.
- Slow process

### CRISIS

(an unstable situation of extreme danger or difficulty)

- Time limit: 5 days MAX.
- So called “normal” environmental risk assessment is not working.
- In post crisis situation “normal” environmental risk assessment is possible

✓What environmental scientists can offer in CRISIS SITUATION?

✓How science can help in crisis?

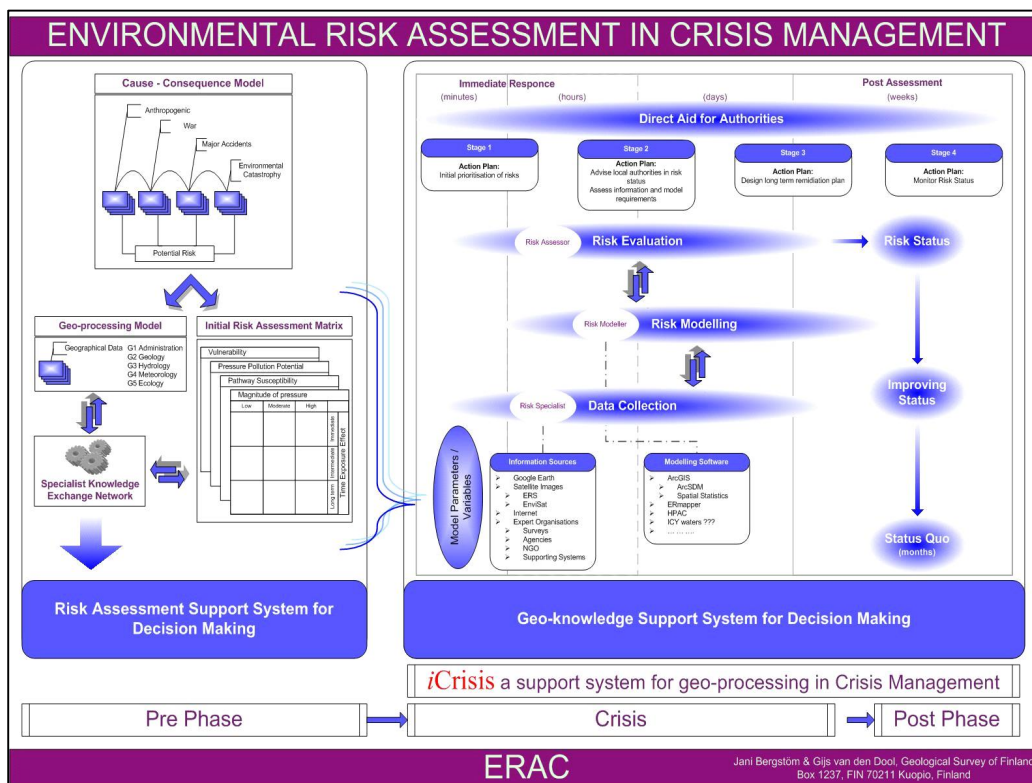
# Geo Knowledge Support system for Decision Making in Crisis

## • Pre Crisis • Crisis • Post Crisis

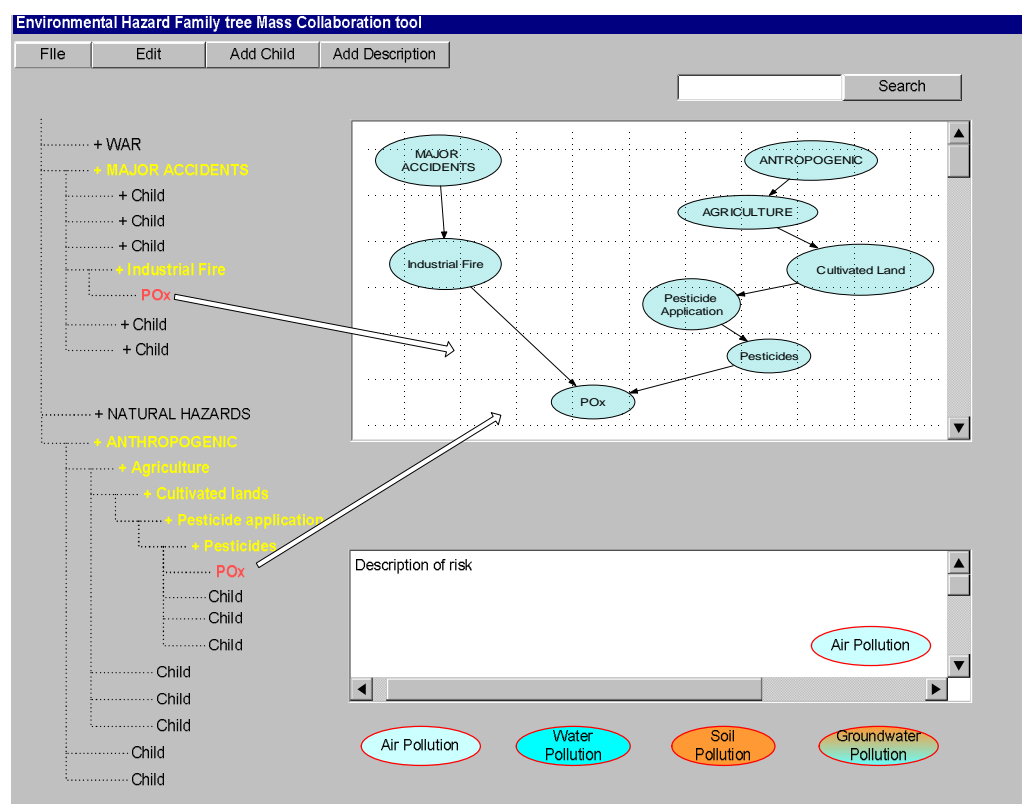
- ✓ Collecting data (=modeling parameters)
- ✓ Building a specialist network
- ✓ Multi disciplinary mass collaboration
- ✓ iCrisis support system
- ✓ Risk Prioritization
- ✓ Direct aid for authorities
- ✓ Risk modeling
- ✓ Risk evaluation
- ✓ Defining risk status
- ✓ Remediation plan for improving the risk status towards either "good status" or "status quo"



## FRAMEWORK



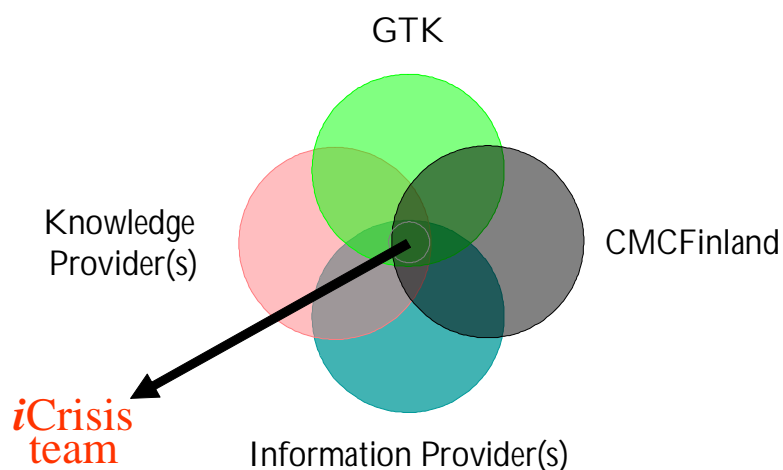
- The method is created for local, regional, national and international use
- It is based on a multidisciplinary cooperation and specialist knowledge
- Apply the mass collaboration idea to build an overall Cause-Consequences model of all the possible environmental risks for the use of decision making



## The *i*Crisis –scheme

- *i*Crisis (=Intelligent Method for Decision Making in Crisis Management)
- Is a specialist method based on Geo-Knowledge providing the risk evaluation procedures with tools to assess the on-site risk level more accurately
- Includes: Direct aid for authorities in crisis area, data collecting and modeling, and risk evaluation

## Multidisciplinary specialist network



## Future Prospects

- **GLOBAL MULTIDICIPLINARY COOPERATION**
- Develop the method
- Test the method
- Apply the Mass Collaboration idea
- Participate to exercises and Conferences, (collect as much relevant information as possible)
- Visit variable crisis areas:
  - Potential crisis areas
  - Actual crisis areas
  - Post crisis areas

During the project the *iCrisis* –scheme (Intelligent Method for Decision Making in Crisis Management) has been developed. The scheme is based on modeling techniques, borrowed from the paradigm of geo-processing, neural networks, fuzzy logic and artificial intelligence. These will support efficient data-exploration and processing the information, including risk domain, magnitude of the risk, and evaluation of the required actions and decision making. The main goal of this project is to develop a specialist network and a universal *iCrisis* –scheme.

The developed method is very promising and seems to be applicable for local, regional, national, and international crisis. The role of *iCrisis* in risk management can be defined as a specialist method based on Geo-Knowledge providing the risk evaluation procedures with tools to assess the on-site risk level more accurate. In addition, *iCrisis* could generate risk dependent shortlists of specialists, who would travel to crisis areas and provide direct aid to authorities, thereby lowering the burden of decision making.

# Crises and Forests

*Jussi Viitanen*

- Competition to use and exploit land and timber resources in forested areas can trigger, exacerbate, or finance conflict.
- Timber extraction could have close links to arms trafficking, human rights violations, and environmental destruction.
- Timber is exploited and traded as a conflict commodity because, in proportion to its high value, it is relatively accessible and is easy to transport and requires no processing;
- Stronger institutions and regulatory frameworks, improved forest management and better governance of indigenous land-rights can help prevent and mitigate forest-related conflicts and crises.

In poor countries, forested areas are more likely to become areas of conflict because they tend to be remote and inaccessible, located on disputed land, inhabited by multiple ethnic groups and minority populations, inadequately governed, or claimed simultaneously by several different groups. In addition the majority of forest-dwelling and forest dependent households suffer from poverty, lack public services, are excluded from national democratic institutions, and resent outsiders who often reap most of the benefits from forests.

Crises force millions to flee their homes and farms and devastate the country's national economies. Africa, in particular, has been hit hard by armed conflicts in recent years, and that is one major reason for worsening poverty there. Most wars are civil wars, although many of them spill over into neighbouring countries. They tend to take place in poor countries with weak governments.

An increasing number of countries find themselves in post-conflict situations. These can pose particular risks to forests, as governments remain weak, there are often many armed people looking for ways to make a living, and economic activity recovers in the forested areas.

Governments and international society could have an important role in the prevention of crises and sustainable reconstruction. Key issues are:

- policies and legislation which support equitable land tenure and user rights
- participatory processes and information sharing in land use planning
- food security
- well coordinated emergency relief and reconstruction process

International cooperation, policy process and political dialogue are needed to strengthen good governance, regulatory frameworks and information sharing.

## Crises and local cultures – strength or weakening aspects?

*Pekka Vapaavuori*

“Sometimes I feel like a motherless child”. So sang North American black slaves about their rootless loneliness and anxiety. This song reveals in many ways the meaning of culture in a situation in which people lived subdued and rootless in a foreign country and culture.

1. It tells about the longing for a lost home.
2. It makes audible the depressing feelings and makes possible to handle them.
3. It tells about solving the problem: when the home is far away, singing about the longing helps and kindles a spark of hope.
4. The singing helps to manage the depressing situation, wherefrom it seems to be no way out and helps to find a way forward to a new start.
5. The message has become universal because of the religious dimension of the song.

The American slaves from the past are not alone with their anxiety. Jewish prisoners in the ghettos of Nazi Germany formed a symphony orchestra. When they played classical music, they could easier survive their hopeless and terrible situation. At the same time they could also rise with the help of their incomparable culture above their capturers. Also in Finland, for example during the so called “konikapina” revolt in the beginning of the 1930s, those who felt being arrested wrongly, strengthened themselves by singing a hymn: “Injustice has taken power”. At the same time the singing had a strong meaning of defiance. It was this same kind of defiance expressed by a great amount of people that made possible the “singing revolt” in Estonia in the beginning of the 1990s. When the Karelian Finns after the Second World War had to leave their home district, they strengthened their ranks by organizing diverse forms of activity along their traditional culture. Everyone can continue this list based on each person’s own experiences.

The word *environment* is not only a concrete geographical term. It has also a spiritual meaning. When we speak about culture, we move on this spiritual level. Every culture has its local roots. It is born somewhere. But the people, who have to leave their home districts or who have lost their possibilities to live normal life in the middle of catastrophes or wars, they keep their local culture in their hearts. They feel sick when they cannot practice their culture in various forms.

It is natural that in an unexpected catastrophic situation the people need clean water, warm cloths, something to eat etc., but at the same time they also need spiritual


aid. This kind of aid can best be given by people who know deeply the local culture. The locals naturally know their own culture best. However, often in large scale catastrophes the local resources are insufficient and perhaps the working methods are not effective enough. When outside help is needed, for example missionaries, who have worked long time among the local people at grass roots, can give a great value to the aid work. For example, after the Tsunami in Thailand almost all of the local workers of the Finnish Missionary Society were mobilized to the first aid work.

I am sure that everyone who is sitting around this table has much more experience about this kind of issues than I, and I don't try to teach you. It is better to stay on the area, with which I am most familiar. I am working as teacher in Sibelius Academy, the Music University of Finland. My special area is education of church musicians. The education is traditionally very conservative being concentrated on organ playing, singing and choir conducting. There is in study plans only a flicker from other cultures. Music teachers have this kind of material much more. However, the work of church musician is nowadays not only sitting and playing organ in the back of the church on the high balcony. It is more and more working with musical methods among different kinds of people. To these people belong also immigrants including refugees. Working with them requires knowledge about their culture; at least it requires understanding that there are different cultures also in Finland. Studying and practicing foreign cultures should be included in our educational programs more than previously. It is the same situation also among those who are studying in order to work with these people, not only as deacons and ministers in church, but also in all service branches in the society, such as teachers, social workers, all kinds of leadership positions, etc. If we know enough about each others, we can perhaps learn to admit the representatives of foreign cultures as neighbours, fellow workers, even as friends. Perhaps we also get better workers to the crisis areas. I think that the basic question is not whether the local culture is strength or weakening aspect in the crisis situation. The local cultures are a reality which we cannot pass. Knowing and accepting this fact helps everyone to improve his own or other people's life as well at home as in crisis areas.



# Environmental Changes and Transboundary Effects

*Jouko Tuomisto*



## Health impact assessment of fine PM exposures from long-range transport of smoke

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Acknowledgements: data, courtesy of  
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Raimo O. Salonen, MD, DMedSci  
Kimmo J. Koistinen, PhD  
Timo Lanki, MSc  
Matti J. Jantunen, PhD  
John Evans, ScD  
Patrick N. Breyse, PhD  
Jouni T. Tuomisto, MD, DMedSci

1

4.9.2007



## Health effects from wildfire smokes in literature

- Lithuania 2002 (Ovadnevaite et al. 2006)
  - up to 20 times higher incidence of documented respiratory diseases and exacerbations of bronchial asthma
- Southeast Asia 1997
  - increased hospitalisation rates in subjects >65 years (Mott et al. 2005)
  - increased cytokine levels in circulating blood (van Eeden 2001) and an increased bone marrow neutrophil response (Tan et al. 2000) in US national service men



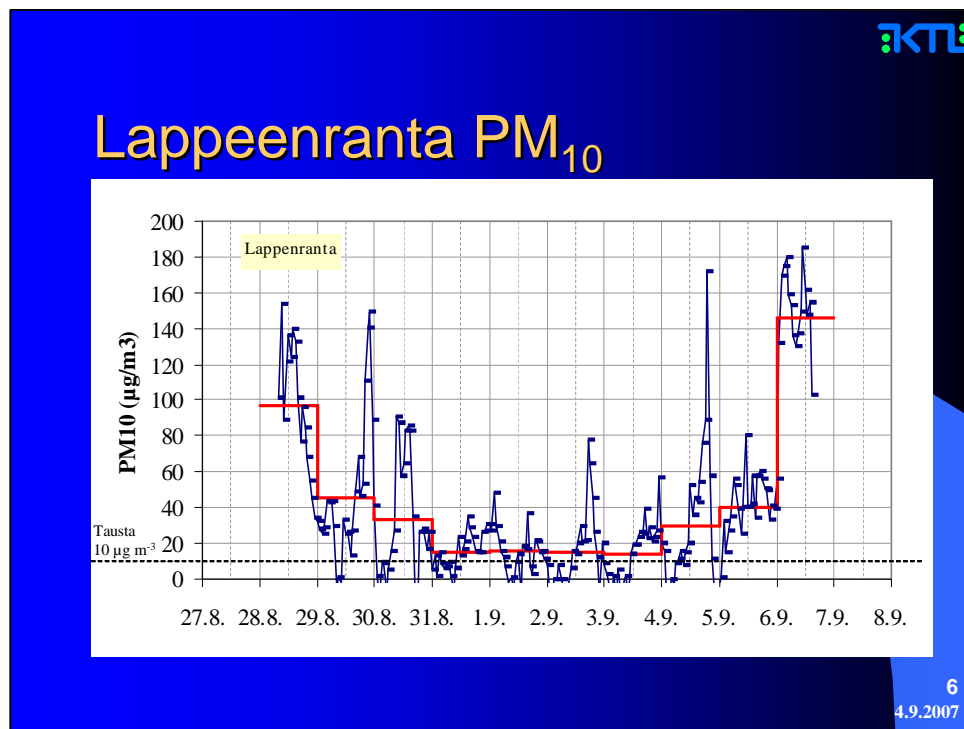
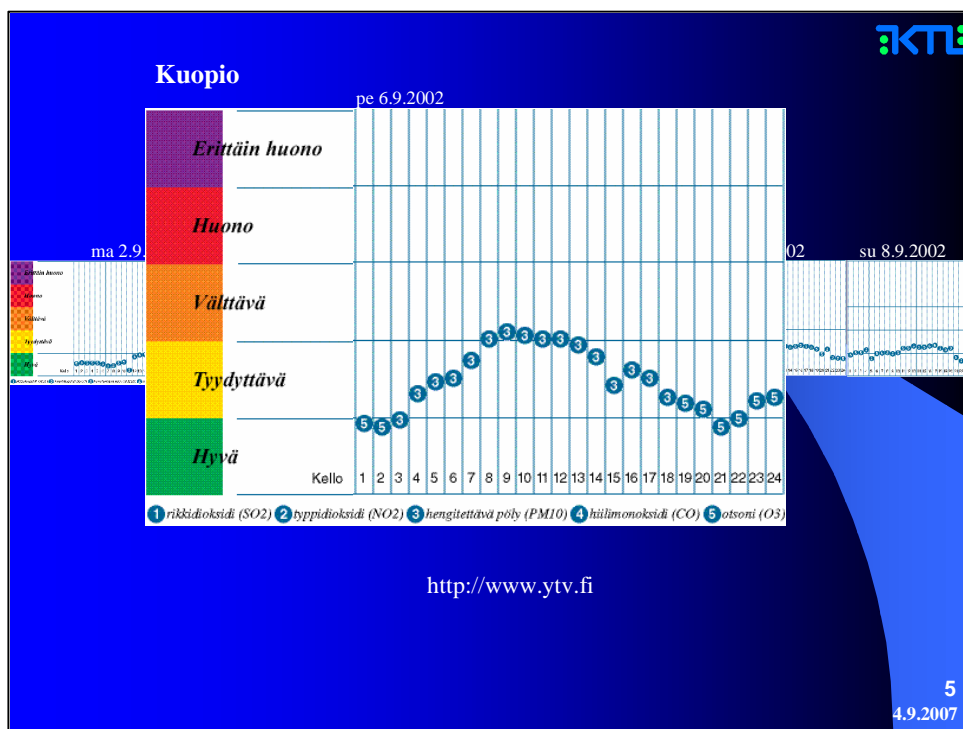
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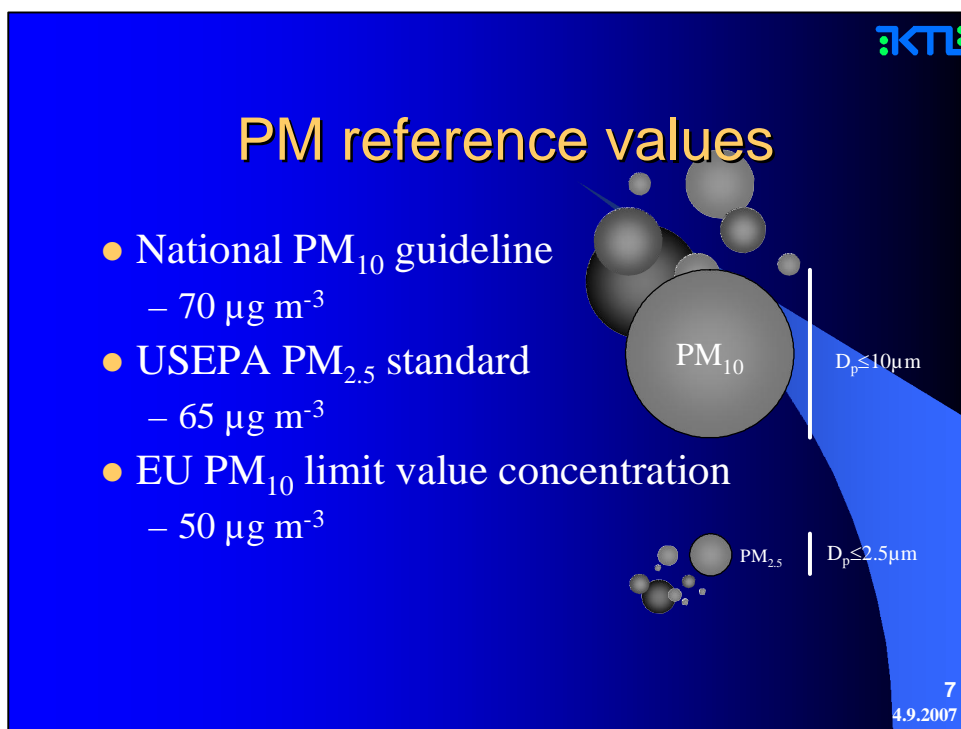
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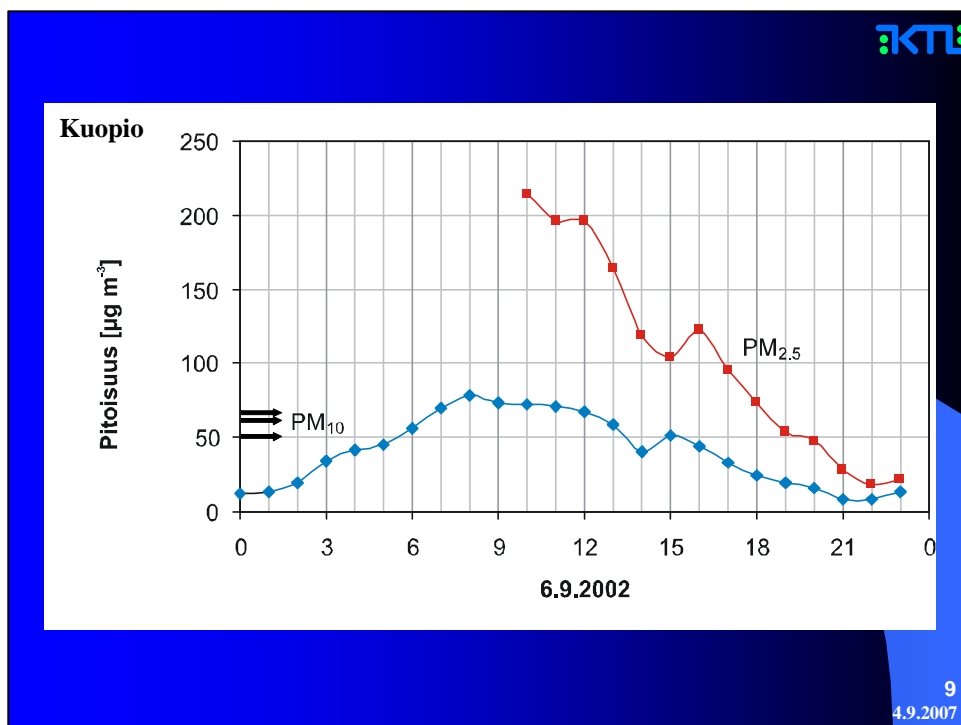
4.9.2007



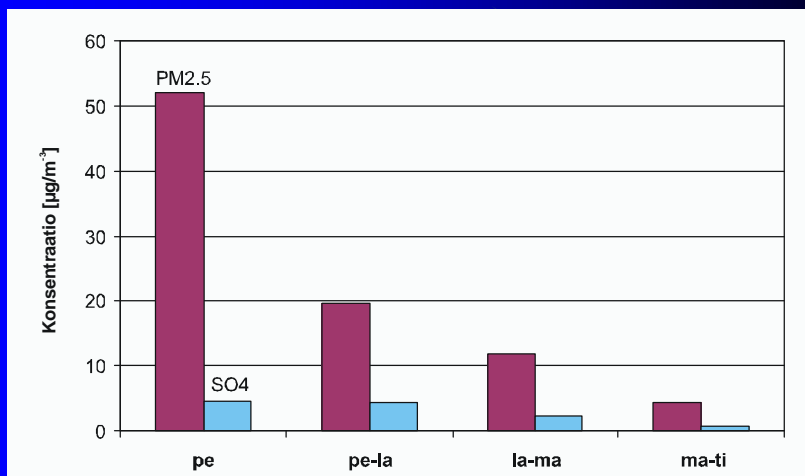




### Emergency air quality measurements in Kuopio



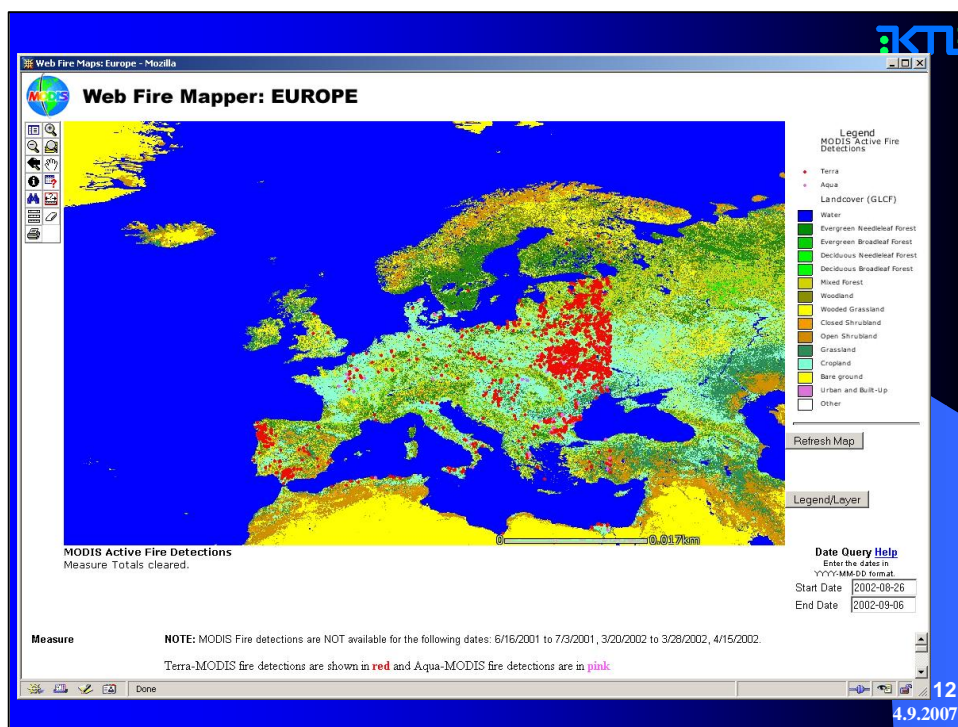
## EPA Wins sampler



10

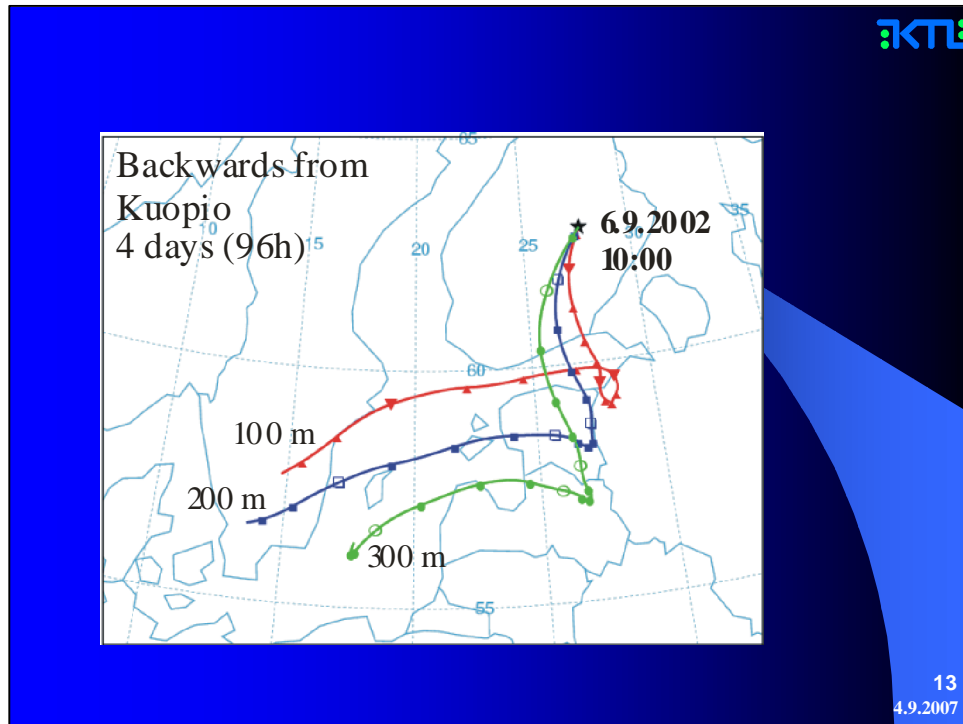
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## Movement of air masses



12

4.9.2007



## Health risk assessment

### PM measurement stations

- YTV collaboration
  - $PM_{10}$ : YTV, Turku, Vaasa, Kuopio, Lappeenranta
  - $PM_{2.5}$ : Helsinki, Vaasa
- Others:
  - $PM_{10}$ : Oulu, Pori, Rauma, Lohja, Lahti, Heinola, Hämeenlinna, Kotka, Imatra, Jyväskylä, Tampere
  - $PM_{2.5}$ : Oulu

15  
4.9.2007



## Estimation of mortality increment

- Increase in daily total mortality per estimated increase in  $PM_{2.5}$ 
  - 1.5% per  $10 \mu g m^{-3}$

WHO (2000). Air Quality Guidelines for Europe, WHO Regional publications, European series No. 91.

16  
4.9.2007



## Conclusions

- Long-range transport of accidental wildfire and man-made agricultural (Russia, Belarus, Lithuania) biomass combustion may have considerable air quality and health impacts
  - average estimated increment of  $15.4 \mu g m^{-3}$  (range  $7.2-29.2 \mu g m^{-3}$ ) in  $PM_{2.5}$  within a 2-week period in Southern and Eastern Finland
  - estimated increment in mortality of 17 persons within a 2-week period in an exposed population of about 3.3 million (cf. Chernobyl impact in Finland 100 cancers during a 50-year period)

17  
4.9.2007






## The Fires in Kuwait 1990-1991



More Than 700 Fires

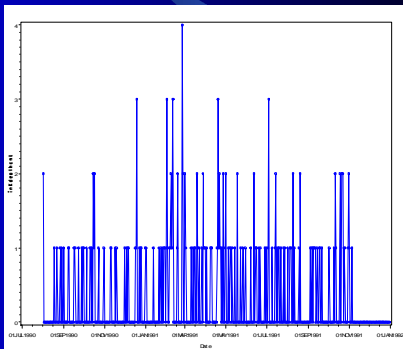
- First Fires –
  - Air War ~ 17 January 1991
  - Ground War ~ 23 Feb. 1991
  - Liberation ~ 28 February 1991
- Last Fire - 6 November 1991
- Oil Burned ~  $4 \times 10^6$  barrels per day
- PM Emissions ~  $3 \times 10^9$  kg
- Kuwaiti initial estimate 35 deaths

18  
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## Daily Deaths in Kuwait -- 2 Aug 90 to 6 Nov 91

- Daily Deaths Among Those In Kuwait (data from PACI and MOF files).
- Oil Fires Started – mid-February 1991
- Death Rate
  - Before Oil Fires -- 0.28 deaths/day
  - During Oil Fires – 0.47 deaths/day
- Correlation Between Deaths and Smoke Concentration ~ 0.6 (Weekly Averages)
  - Not statistically significant
  - However, only 200,000 exposed people and a relatively short period of 248 days.



19  
4.9.2007





## Expert elicitation

- Six air pollution experts
- Intercalibrated by utilising known cases
- Significant overlap of central estimates but ranges differed widely
- General conclusion: true mortality may be several times higher than the estimated 35 deaths

20

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## Smoke Exposure elsewhere

1000 - 1300 premature deaths calculated in Saudi Arabia

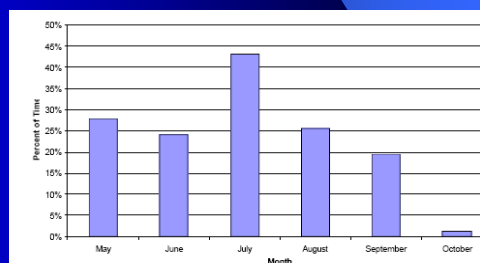
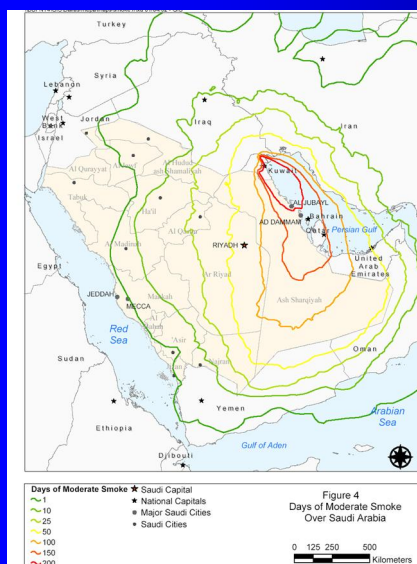


Figure 2-5 Occurrence of Smoke at Dhahran During 1991

17.10.2007

## Recommendations

- Health problems of smoke, including burning of biomass, are clearly undervalued as compared with risks of “chemicals” and radioactivity: not exciting, familiar
- EU and UN organisations should take a lead in improving the awareness and abatement: does not show presently e.g. in limit values (i.e.  $PM_{10}$  limit value concentration high compared with e.g. carcinogenic metals)

# Climate Change and Regional Crises

*Tapani Vaahtoranta*

There is a general agreement that the linkage between the environment (population growth, environmental degradation and competition over natural resources) and crises exists. Those responsible for civilian crisis management need more specific knowledge: How exactly does the environment cause crises? I look at the issue from the political science point of view. And my focus is on the potential linkage between climate change (CC) and violent conflict.

What do we know? What do we not know? We know that human-induced climate change is already taking place and that it may be difficult to prevent the “dangerous” warming (two-degree increase compared to the pre-industrial period). Thanks to the reports by the Intergovernmental Panel on Climate Change (IPCC) we know a lot about the physical consequences of CC and the Stern report tell us something about economic implications.

What about security consequences? Does CC cause violent conflict? Many believe that this is the case. A report prepared for Pentagon in 2003 concluded that CC will cause, among other things, major wars. In July, Chinese researchers reported that cool periods in China, and the resulting scarcity of resources, are closely linked with a higher frequency of wars over the past 1000 years. And now we see CC behind the Darfur crisis.

In general, there are two types on environmental issues that can cause violent conflict:

- First, the cause may be the abundance of natural resources and the human greed. The *honey pot explanation* is applied to resources such as diamonds and oil. There is also the resource curse explanation of which Russia may be an example.
- Second, the cause of conflict may be the scarcity of natural resources and the grievance caused by it. This is the *deprivation explanation*. CC as a potential cause of violent conflict belongs to this latter category. CC is expected to cause scarcity of renewable resources, such as water and food.

It has been suggested that the scarcity caused by CC may result in violent conflict in two ways:

- either those affected by the increasing scarcity start fighting over the remaining resources
- or people are forced to leave the area. When the migrants encroach the territory of other people, the potential for violence rises.

However, clean water and fisheries have become increasingly scarce in the Baltic Sea, but nobody expects a violent conflict because of it. And, in Sweden, e.g., there is a large number of migrants but nor armed conflicts.

Clearly, there are also other factors involved: social and political factors that exacerbate or mitigate the potential for violent conflict. Colin Kahl (2006) suggests in his recent book that

- there are two causal ways whereby the environment causes violence: state failure and state exploitation
- and that two factors – groupness and institutional inclusiveness – determine which countries are most prone to state failure and state exploitation.

The point is that we do not yet know enough of these intervening social and political factors. We are only now starting to do serious research on the issue.

- First, the current understanding is that CC could make armed conflict more likely.
- And cause civil strife rather than interstate war.
- Second, it is evident that CC will hit hardest poor countries and the poor in poor countries. Thus we should focus on the developing world.
- Third, to anticipate violent conflicts caused by CC, we should look at
  1. asymmetrical consequences of CC: positive and negative consequences, geographical differences
  2. different capacities to adapt
  3. the strength of state and political institutions.

## *CMC Finland Working Papers*

"Barents Rescue 2007 Seminar Publication", edited by Petteri Taitto. *CMC Finland Working Papers, Vol. 1: No. 1/2007*. ISSN 1797-1616 (printed) & ISSN 1797-1667 (PDF).

"CMC Finland Round Table Discussion on Crises and Environment", edited by Kirsi Henriksson. *CMC Finland Working Papers, Vol. 1: No. 2/2007*. ISSN 1797-1667 (PDF).

"Siviili-sotilasyhteistoiminta kansainvälisessä kriisinhallinnassa (Civil-Military Cooperation in International Crisis Management)", toimittanut Jari Mustonen. *CMC Finland Working Papers, Vol. 1: No. 3/2007*. ISSN 1797-1667 (PDF).

Publisher  
Crisis Management Centre Finland  
Hulkontie 83  
PO Box 1325  
FIN-70821 Kuopio  
Finland

Editing and Layout  
Kirsi Henriksson  
CMC Finland

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N.B.

All texts included in this publication have not passed through  
a language revision.

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Crisis Management Centre

ISSN 1797-1667 (PDF)