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# National Safety & Security and Crisis Management

*Mega-crises in the 21<sup>st</sup> century*



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# Mega-crises in the 21<sup>st</sup> Century: Introduction



The threats we face today are more numerous, more substantial and more complex than ever before. Threats of large-scale violence, such as terrorism and conflicts within and between fragile states augmented by new risks and crises (affecting our communications and information technology, food production, new viruses etc.). In comparison with the kinds of disaster we experienced in the past, today's misfortunes seem to elicit an unprecedented level of uncertainty and an urgent need for government intervention. This calls for policy that is focused on managing these threats to our national security.

On 18 June 2009, an international and inter-ministerial working conference on Mega-crises was held in The Hague. It was prompted by the book of the same title, currently being written by a group of international researchers, edited by Uri Rosenthal, Ira Helsloot, Brian Jacobs (UK), Louise Comfort and Arjen Boin (US), and due to be published in 2010. Their meeting to discuss the first draft of the book was an

excellent opportunity for Dutch policymakers at various ministries to get together in a series of thematic workshops and talk about aspects of national security with experts in the field.

Henk Geveke, Director of the National Safety and Security Department, Ministry of the Interior and Kingdom Relations, emphasised in his opening remarks the

importance of gatherings such as these, which enable researchers and policymakers to share and exchange knowledge and practical experience.

This edition contains a special feature: a synopsis of the papers presented at the conference. All in all, it presents an array of mega-risks and mega-crises, and strategies for dealing with them.





# 21<sup>st</sup> Century Mega-crises: New Challenges to Crisis Management

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## Mega-crises

Natural disasters, intense and protracted conflicts, terrorism, corporate crises, threats to infrastructures and mega-events as well as related problems of governance, civil involvement and self-reliance take on new dimensions. Mega-crises confront public authorities, corporate leaders and the public at large with mega-challenges. Mega-crises involve challenges to the traditional policy assumptions of crisis management, having a wide, if not global impact, being difficult to contain in the short and long run, and generating diverging notions about appropriate solutions. Mega-crises imply not only quantum but also quality jumps in coping with the defining features of crisis: severe threat, uncertainty, urgency. Mega-crises are not just about more of the same – they are also about something else. ‘Something else’ may very well be one among the many unknown’s.

- Already at the start of the 21<sup>st</sup> century, Asian countries have collectively suffered the misery and heavy tolls inflicted by the Tsunami and the earthquakes in Kashmir (2005) and Sichuan (2008). Hurricanes Katrina (2005), Gustav and Ike (2008) have confronted the United States with huge problems in the management of increasingly large-scale *disasters*. Many countries in Europe are worried about the consequences of thorough climate change and the rise of the sea level in this century. After a long history of urbanization and economic concentration in the lowlands, they may need drastic choices to come to terms with these challenges.
- Since the last decade of the 20<sup>th</sup> century *public health crises* have been on the increase. Many countries have got their share of entirely new viral epidemics threats, including SARS, and by now pandemics, including the H1N1 Mexican flu, have gone full circle from fiction to world-wide reality.
- Protracted *conflict crises* afflict several countries in Asia, the Middle East and Africa. Failed states and ungoverned territories are fertile ground for confrontations between hardly organized and at the same time heavily armed contenders. Metropolitan regions are exposed to outbursts of violence reflecting new patterns of conflict.
- The 9/11 outrage of 2001 underlines the security threats confronted by policymakers and the public throughout the world. We have seen the transition from traditional, contained terrorism to world-wide *catastrophic terrorism*. Terrorist nuclear attacks cannot be excluded. The theory of mutual deterrence helped the nuclear superpowers through the Cold War, but it may be irrelevant to terrorists driven by absolutist aims.
- Today, *mega-events* with global scope and followed by mass audiences such as the Olympic Games, the World Soccer Championships and mass ceremonies require gigantic endeavors to counter risks in the domains of safety and security.
- Without taking risks, there would not have been the economic development and rise in life expectancy that we have enjoyed over the past centuries. However, *mega-technologies* solicit increasing concern

about safety and security risks.

- The corporate sector is taking its share in the world of contemporary crises. We have seen the *breakdown of corporate giants* like Enron. The international financial sector, if not the global economy, is facing up to threats of a size and intensity unthought of in previous times. The labelling of this huge world-wide financial crisis is still in full flux.

### Three major challenges

The world of crises is developing into a world where incidents, hazards and contained threats give way to mega-crises. Indeed this may truly be termed the era of mega-crises in which the challenges to political leadership and organisational as well as institutional capabilities increasingly force their way to the top of the political, corporate and societal agendas.

The world of crises is developing into a world where incidents, hazards and contained threats give way to mega-crises. Indeed this may truly be termed the era of mega-crises in which the challenges to political leadership and organisational as well as institutional capabilities increasingly force their way to the top of the political, corporate and societal agendas.

Political and corporate leaders as well as the academic community of crisis experts should embrace three major tasks. Firstly, they should engage into deep thinking about the causes of the increasing occurrence of mega-crises. Secondly, they should focus on the dominant trends which complicate contemporary crisis management, and the more so since in this era of mega-crises these trends take an exponential shape. Thirdly, they should up-grade their crisis management capacity.

#### 1. Deep thinking about the causes

The increase in mega-crises does not come by chance. It is hardly possible to predict the specific time and location of mega-crises – if, in the realm of mega-crises, such specifics are relevant categories at all. But we can identify a number of factors which raise mega-risk probabilities:

- 1 irrespective of the specific causes and the quantitative dimensions – *climate change*;
- 2 *urbanization* and the concentration of the world population in metropolitan agglomerations;
- 3 economies of scale, the reduction of production costs and effective logistics advancing the case for *centralization and concentration* of vulnerable sites, and for that matter growing risks of consequential, yet unclear and surprising additional hazards;
- 4 due to mass migration, globalized business traveling and mass tourism – a stunning increase in the



world-wide *mobility of goods and people*.

- 5 the growing *interdependency and tight coupling* of social and economic functions.

#### 2. Dealing with exponential trends

- Crises and crisis management are subject to *politization*. Effective political answers to mega-crises reach far beyond the limits of sovereign states.
- Crises provide fertile ground for *mass mobilization* which, in the context of mega-crises, stands for ever-growing numbers and an increasingly long timespan.
- *Mediatization* is a driving force behind political salience and mass involvement. Mass media coverage is making for an impact far beyond the local, regional or national site of the crisis. Crises may be triggered by a relatively minor event, with media-driven social viruses giving rise to copycat behavior and widespread turbulence.

#### 3. Up-grading our crisis management capacity

- There is an urgent need for balanced efforts in the *crisis management cycle* of prevention, preparation, response and recovery. Such efforts should also address the capabilities of societies and governments to bear and sustain the repeated occurrence of mega-crises within a relatively short timespan.
- The management of mega-crises will often require far-reaching *international cooperation*. This implies



reframing the usual, nation-bound ways of coping with crises, and developing more robust mechanisms for tackling them.

- The response to mega-crises will ask for *huge coordinative efforts*. Part of these efforts should aim at regulating tensions between international interventions and safeguarding national sovereignty.
- In many a mega-crisis, it will take time until the decision-makers will have a first impression of what has happened. Therefore, crisis leadership does not exclusively ask for prompt decisions. As former mayor of New York Rudolph Giuliani has it, 'Reflect before you act.'<sup>1</sup> Such *reflective moments* do not need that much time after all.
- In mega-crises, the traditional mass media play a vital role in informing the people. But these media are quickly overtaken by the new media, in particular the internet. Effective crisis management of mega-crises is in demand of an active role of *both traditional and new media*.

- More than ever, a crucial function of crisis management is to regulate and channel the extreme collective stress among the people before, during and after crises. It is a necessary condition for regaining or *earning public confidence*.
- To earn public confidence political, corporate and civic leaders should not shy away from addressing future realities involving mega-crises. They should *not give in to denial, negligence or fatalism*.
- A well-known claim has it that crises are not only threatening, but also include opportunities to restate core values, engage in drastic change or reallocate power and other scarce resources. This claim may extend to mega-crises. By their very nature, mega-crises will produce *transformational change*.

<sup>1</sup> R.W. Giuliani, *Leadership*, New York: Miramax, 2002.

# The Micro and Macro Dynamics of a Mega-disaster:

## Rethinking the Sri Lanka Tsunami Experience

### Background

The direct cause of the tsunami of 26 December 2004 was an earthquake off the coast of North Sumatra with a magnitude of 9.0 on the Richter scale. This earthquake set in motion a huge wave that hit fourteen countries around the Indian Ocean. When the tsunami landed, the waves varied from approximately 30 metres high in Banda Aceh up to ten metres in parts of Sri Lanka. The tsunami hit thirteen out of a total of 25 districts in Sri Lanka and more than two-thirds of its coastline. Loss of life was recorded at 35,322. The number of injured was 21,411 and the number of displaced 558,287. All major population groups – Sinhalese, Tamils and Muslims – were affected, though the most severely affected Districts were largely Muslim and Tamil. About 200,000 persons lost their livelihood or employment. One and a half years after the tsunami 60% of the households reported a reduction in monthly income. Damages and losses combined amounted to 7.6% of the gross domestic product. All these different figures underline that the tsunami in Sri Lanka could veritably be called a mega-crisis. A further analysis of the Sri Lanka tsunami, however, reveals a number of interesting details.



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### Analysis of the Sri Lanka tsunami

First, the impact of the Sri Lanka tsunami varied according to the level of analysis. Whereas human loss of the tsunami was only 0.18% of the population when measured at the national level, it was 15 times higher in the most affected district and well over 300 times higher in the most affected villages or neighbourhoods. The same applies to economic losses and damages. This means that the intensity of a disaster is scale-sensitive; it is a relative issue rather than a fixed value. The labelling of a disaster as a mega-crisis therefore is depending on the level of analysis. For a proper understanding of a disaster it is not sufficient to rely on macro-data at higher aggregation levels only, as those tend to hide local variations. Multi-level analysis with sufficient attention being paid especially to the local level is recommended.

Second, as corroborated by current insights in the field of disaster studies, the size of the hazard or natural trigger agent alone does not explain the impact of a disaster. Pre-existing patterns of physical, cultural, political and socio-economic vulnerabilities determined to a large degree who were hit. Vulnerability is defined here as “the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (an extreme natural event or process). It involves a combination of factors that determine the degree to which someone’s life, livelihood, property and other assets are put at risk by a discrete and identifiable event in nature and in society”. This emphasis on vulnerability has alerted academics and aid workers to the existing variability and differentiation of disaster impact among different categories and groups of the affected population. The tsunami in Sri Lanka did basically affect the poorest sections of the population, such as poor fishermen’s families living in marginal, low-lying areas along the sea or lagoons, internally displaced persons who lived in temporary shelters along the beaches, or illegal squatters along the railway line. Eighty percent of the affected households lived on less than one dollar per day per person before the tsunami struck and thirty percent was living well below the official Sri Lankan poverty line. This reconfirms the need to carry out detailed vulnerability assessments as part of a pro-active and preventative policy. In Sri Lanka this was lacking. The country had no disaster policy, institutional framework or plan in place when the tsunami hit. This probably not only worsened the impact of the disaster, it also affected the response to it.

Third, there was a notable gender-specific impact. Relatively many women and children died, as a larger proportion of men could swim, climb trees and run faster when the waves came. In the Amparai District

two times as many women died as men. In terms of recommendations this points to the need of gender-specific vulnerability assessment and disaster preparedness to mitigate the physical, cultural and socio-economic risks of women.

Fourth, in the immediate aftermath of the tsunami, rescue and life saving activities started nearly instantaneously. Medical aid was given, dead bodies buried and relief aid mobilized by a variety of local governmental and non-governmental actors as well as individuals acting spontaneously on their own initiative. In the first days into the disaster many groups were seen working jointly in the hour of need, including unexpected partnerships such as between the Liberation Tigers of Tamil Eelam (LTTE) and the government, between opposing political parties, and between army and civil society groups. Due to the conflict in the east and the north, multilateral and international NGOs had already offices, stocks and staff in place that could be mobilized without delay. The role of the central authorities at the initial rescue and relief stage was, however, minimal. There were strong indications that the central government was completely overwhelmed by the situation and lacked the resources for a quick and effective response. This was enhanced by the centralizing tendencies of the Sri Lankan government. Moreover, its tsunami response became highly influenced by party politics and political patronage. The government was accused of indifference, delay and inertia, evoking strong criticisms from the population and civil society, who assigned this sluggishness to ethnic discrimination and exclusion. Demonstrations, protests and acrimonious exchanges exacerbated divisions and ethnic tensions. This reflected tensions and struggles between the government, the LTTE, local armed militias and political factions, resulting in a power vacuum. It also reflected differences between the Sinhalese majority and the Muslim and Tamil minorities. Aid, instead of relieving the situation, became a problem of and in itself. These realities cannot be grasped when assuming a fairly monolithic, a-political and a-personal, formalised type of government. A grounded, context-specific analysis of the functioning of the state and of political patronage is needed to understand the dynamics at work in practice. This demonstrates the risk of working with western models of state or governance which may not be applicable to countries elsewhere. De-contextualized protocols of aid delivery are similarly unable to grasp the realities of aid in patrimonial or hybrid states.

Fifth, another serious omission was a nearly total lack of communication, consultation, and information vis-à-vis the local population, leading to frustrations, misapprehensions and accusations. Especially, there





There were strong indications that the central government was completely overwhelmed by the situation and lacked the resources for a quick and effective response.

was a lot of insecurity regarding the reconstruction plans in the future, as the government had been slow and indecisive on many important issues and decisions to be tackled in this connection. This underlines the need to inform and involve disaster victims as much as possible and avoid patronizing top-down approaches.

Sixth, the tsunami aid became entangled in the political and conflict dynamics at play in Sri Lanka. The political legitimacy and credibility of both conflict parties depended at least in part on how they managed the humanitarian disaster and this also affected the competing “state projects” of the government and the LTTE. The failure to set up a joint management system for the distribution of the aid to LTTE-hold areas,

conflicts around aid distribution and the overall political economy of aid contributed to an escalation of tension and ultimately violence. In sum, the tsunami and the tsunami response not only became entangled in the ethno-political dynamics of patrimonial politics, but also succumbed to the logic of the politico-military conflict. The disaster thus ended up strengthening conflict structures and dynamics and compounding attempts to resolve the conflict, while the conflict in turn affected the humanitarian response negatively.

#### Conclusion

My major conclusion is that mega-events, like in this case the Sri Lankan tsunami, can only be understood on the basis a thorough and locally grounded analysis of vulnerabilities, political economy and societal (violent) conflict. The impact of the disaster and the effectiveness of the aid response had in fact little to do with the impressive numbers attached to the natural hazard or trigger event *per se*. Analysis of the Sri Lankan tsunami showed that they remain firmly based on prior, nationally and locally determined, vulnerabilities and on the characteristics of the local patrimonial system of governance and political culture.

The example of the Sichuan Earthquake crisis in China and other mega-crises (SARS, snowstorm, etc.) underscores the need for more robust crisis management policies and practices in every country as well as the need for more empirical and theoretical work on crises and crisis management in societies under major transformations such as the case of China. While the need for – and simultaneous lack of – an adequately robust crisis management regime is often more acute in these societies, China presented a unique case in that it had a relatively strong crisis management system with some serious weaknesses.

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## The Challenge of Mega-crisis Management

# The Case of Sichuan Earthquake

The SARS in 2003 exposed these weaknesses quite dramatically and generated major momentums for changes in the system. China embarked a major effort to improve its crisis management system since 2003 by restructuring the crisis management organizations, improving the operations procedures in crisis responses, and passing a new law on emergency responses. A contingency plan system has also been developed nationwide to improve preparedness of different organizations in China.

The Sichuan Earthquake in May 2008 have presented itself as interesting case for us to evaluate the appropriateness of the new system in responding to mega-crises such as the Sichuan Earthquake.

On May 12, 2008, at 14:28 local time, Sichuan Province in China was hit by a major earthquake. The seismic event, which had its shallow epicenter in Wenchuan county, reached a moment magnitude of  $MW = 8.0$  and the highest intensity of  $XI = 11$ , and left 69,227 people dead and 17,923 missing while 374,643 being injured and 15.1 million being evacuated, meanwhile, the total number of aftershocks even exceeded 30,000 (by October 2008). The earthquake spread over 10 provinces around China, among which Sichuan, Gansu and Shaanxi suffered most severely. People abroad, in countries like Thailand, Vietnam, Philippine and Japan, could even feel the shake. The quake left a total number of areas over 500,000  $km^2$  and a total population of over 46.25 million being affected. Over 6.5 million buildings





are reported to have completely collapsed and over 23 million were damaged. Direct economic losses due to the earthquake are estimated to exceed 140 billion US\$ (RMB 845.1 billion).

Sichuan earthquake embodied all the features that a mega-crisis is considered to be – imply both quantum and quality jumps in coping with the defining features of crisis: severe threat, uncertainty, urgency. On the one hand, the huge numbers of casualties, losses, mass evacuation and resource mobilization have all proven its specialties as a mega-crisis; on the other hand, a number of factors also served as the causes to lead the earthquake into a mega-one, such as urbanization and concentration of population increased the physical and material damages; too much dependence on modern technologies vs. neglect of robustness advanced the difficulties of rescue and relief work while in face of fundamental infrastructure failures such as communication and power. Other factors also included relatively unready preparedness of different organizations, weak operational procedures in crisis responses, as well as mediaization as driving forces behind the political salience and mass involvement.

Only two hours after the earthquake, Chinese Premier Wen Jiabao took a swift action and directly flew into the quake zone in Sichuan province. Soon after, the biggest rescue and relief work in China's history was started. On the one hand, a "response plan system" (the command and control system) quickly took shape shortly after the earthquake, which included not only the headquarters of governmental organizations from the central level (China's Cabinet and its affiliated departments) to the difference local levels (totally five and half levels of government in China), but also the headquarters of military, armed forces, and professional rescue teams, as well as expert teams. On the other hand, besides reactions from China's government, the response and recovery operations presented to be a full scale across the whole nation. For instance, for the life rescue, a population of 146,000 armed forces and 91 professional rescue teams, and also a big number of volunteers and NGOs, as well as international rescue teams were put in;

at the mean time, for the resource mobilization, by the end of 2008, over 128 billion yuan of budget were allocated by both central and local governments while the social donations also accounted for a big amount.

Under such complex situations, Sichuan Earthquake not only imposed the common problems on decision-makers in crisis management, but also presented the "big jumps" as the special features of these problems when a crisis is magnified into a "mega-one" that demand non-routine/ unconventional decision-makings and solutions. These problems included:

1. the multi-layered command and control system imposed big difficulties on the coordination among different parts of public sectors;
2. decision makers were burdened with difficulties more than pressures and shortage of time and information; besides, a broken administrative system (many officials are victims themselves), a broken communication system (isolated information island), as well as many other extreme situations have amplified the threat, uncertainty, and urgency;
3. pre-determined contingency plan may not work well for mega-crisis such as Sichuan earthquake. So there is a need in the contingency plan for no-plan, or be ready to improvise;
4. government-centered system vs a system based on the partnership between the government and the society, are challenging the government's normal operations;
5. besides the hard rescue/ restructuring, the soft rescue/ restructuring (psychological impacts) has proven to be an even enduring and long term problem to be dealt with.

Through reactions to these problems, capacity building and upgrading proved to be the most important issue to be carried out for mega-crisis reaction, including:

- a. principal of people-oriented was the basic to guide the whole process of response;
- b. the powerful command and control network is the premises for the successful reaction;
- c. grassroots organizations are the crucial force to enhance the effectiveness and efficiency for crisis reaction;
- d. information transparency and in time information enclosure are the basics to lead both public and media opinions turning on the right track, as well as to prevent rumors and panic among the people;
- e. both awareness and skill enhancement for disaster prevent and reaction should be popularized. Upgrading the structure of crisis management organizations and optimization of operations procedures should also be taken into consideration.



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# A Mega-crisis Happening, H1N1 and the Need for Strengthening Communication and Community Engagement

In April 2009, a new swine influenza, later labeled as H1N1 emerged in Mexico. By July 6, 2009, the World Health Organization (WHO) reported 94,512 cases of influenza A (H1N1) infection, including 429 deaths. The worldwide spread H1N1 influenza then prompted the WHO to raise its pandemic alert level to the highest level of 6, and created concern that its spread into the southern hemisphere during its winter months will enable the virus to mutate into a much more dangerous influenza, similar to earlier pandemics in the twentieth century. Some speculate that it could resemble the 1957 pandemic or in a worst case scenario, fear the devastation of the 1918 flu pandemic. Now in September 2009 we are confronted with several hundred thousands confirmed cases and several thousands deaths. It thus might be clear that this indeed is a threatening mega-crisis.

V.l.n.r.: Sandra Crouse Quinn, Ph.D.  
en prof. dr. Ira Helsloot,



In order to cope with this mega-crisis the WHO calls for a 'whole of society' approach to pandemic planning, emphasizing that all segments of society, not simply the health sector, must be engaged in pandemic planning and response. They describe the role of central governments as coordinating preparation and response, prioritizing allocation and targeting of resources, and providing additional resources and technical assistance, including to other countries (add citation). To successfully plan, respond and thrive, our governments will need to engage our citizens and communities. We offer some guidance and strategies for such engagement (also see Table 1).

In the 1918 pandemic, the failure of government agencies to provide accurate, timely and honest communication about the pandemic fueled distrust and despair. Yet, even today, one common assumption of government, heard frequently in the media during any crisis, is that the public will either panic, be passive or start looting. However, there is little evidence in the literature of panic, and in fact, significant evidence exists that good communication, which is consistent, transparent, and honest, can strengthen trust between citizens and government, and enhance the capacity of

citizens to manage the crisis. The panic myth often leads government officials to over-reassure the public, which is exactly the wrong approach to communicating about risk in a pandemic. It is far more appropriate to talk directly with citizens, acknowledge uncertainty, and then describe how you will manage that uncertainty.

The need for transparency about pandemic planning and response means being willing to discuss changes in government planning and actions over the course of the pandemic. This pandemic will last for some undetermined period and without question, plans made today will need to be modified at some future point. It is critically important to recognize the need for flexibility and to talk with the public about how government will adapt to the evolving situation and new scientific evidence. Best practices in risk communication suggest that acknowledging uncertainty and discussing the rationale behind a changing policy will increase public understanding and reduce their anxiety about it.

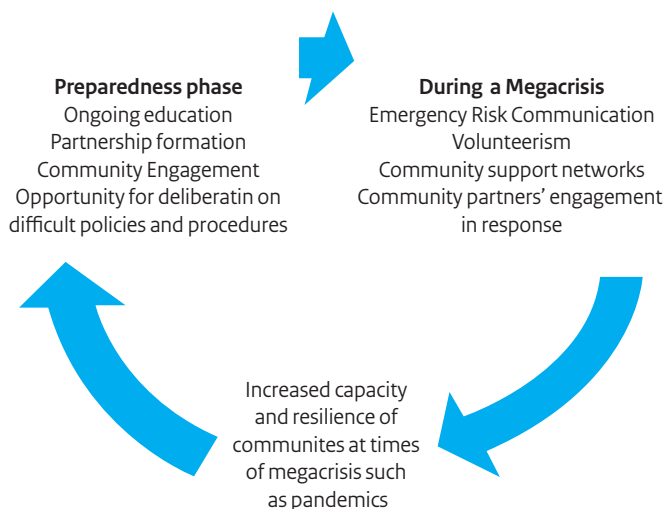
One essential role of government is to prepare the population for what could be a sustained pandemic period. Previous pandemics have come in waves of



**Table 1: Top Principles and Actions to Help Leaders Succeed at Community Engagement**

<p><b>Institutional commitment to community engagement</b></p> <p>Obtain the support of elected officials and agency heads; build top-down support for this bottom-up effort.</p> <p>Develop a common purpose through joint problem assessment by top officials, grassroots leaders, and residents at-large.</p> <p>Position an organizational champion who can effectively handle interagency concerns about the community engagement initiative.</p> <p>Grant community partners genuine opportunities to affect disaster policies; back them up with real authority and responsibility.</p>
<p><b>Investment in an enduring community engagement structure</b></p> <p>Plan for sustained community engagement, resisting shortcuts in the form of one-time or sporadic public outreach.</p> <p>Assess local civic infrastructure, identify existing networks, and enhance their capacity to take on disaster-resilience goals.</p> <p>Set aside a sufficient budget, support staff, meeting space, partner incentives, and other material necessities.</p> <p>Recruit trained professionals to facilitate face-to-face interactions, develop leadership skills in community partners, help resolve controversies, and continually improve community engagement capabilities.</p> <p>Align expectations between officials and community partners about community engagement scale, scope, process, and time-frames.</p> <p>Systematically track community engagement's impact on improved disaster policymaking; provide evidence to officials and citizens that collaborative efforts do matter.</p>
<p><b>Input from vocal and reticent communities</b></p> <p>Consciously recruit and represent groups historically absent in public affairs, including the poor, working class, less educated, and people of color; equip with leadership skills.</p> <p>Enable citizens to juggle home life and civic life better by offering convenient meeting times, travel reimbursement, child care, public recognition, stipends, etc.</p> <p>Be receptive to participants' expressive input, not just their practical advice; people become involved for different reasons: for example, to have a voice, to make a difference, to strike up new friendships.</p> <p>Acknowledge that participants' venting of anger is not an impediment to engagement but a prerequisite as a result of unresolved trauma and grief from past events.</p>

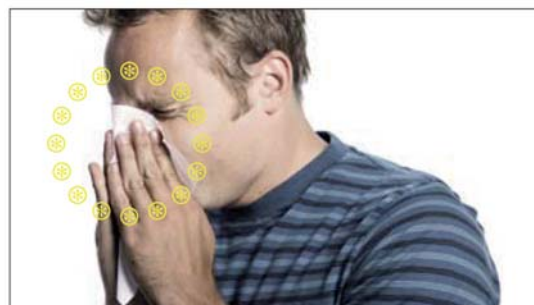
**Figure 1: Building Community Capacity for Mega-crisis such as Pandemics**



infections, and consequently the emotional and social roller coaster of these sustained events is trying and difficult. Interestingly, engaging communities in preparations, response, and policy decisions is a critical means to help them, and help government at the same time, to sustain the response.

Engaging citizens and communities in policy deliberations about allocation of scarce resources is essential. This now takes on a new sense of urgency as we must now make decisions about who will get the H1N1 vaccine first, who will receive the anti-viral medications when supplies are limited, and how will we manage the potential onslaught of people seeking care. These policy decisions are enormously challenging for two reasons: 1) there is significant uncertainty with no good estimates of incidence of disease, which also makes it very difficult to estimate case fatality rate; and 2) there is great potential for exacerbating existing inequities and disparities with policy decisions, particularly with access to care issues such as refusing care for undocumented immigrants. Some scientists explicitly link existing health disparities to increased vulnerability in a pandemic, describing disparities in exposure, susceptibility and treatment that create a synergistic effect leading to unequal levels of morbidity and mortality. For these reasons, continual communication with the public and citizen engagement in the decision-making process will help them to understand the difficult decisions to be made, and will





Hoesten, niezen en neus snuiten in papieren zakdoekje.



Zakdoekje direct weggooien.



Handen wassen met water en zeep.



help government to make good decisions with the underlying vulnerabilities, reactions and concerns of their citizens in mind.

From Facebook to Twitter, news and rumors move at an incredible speed in today's world. We must address this for several reasons. First, creating some mechanism to monitor the media, including social media, will provide an insight into public concerns and rumors. Secondly, for younger generations, text messages and social media are their means of communication, not traditional media. In the US, the CDC has adopted widgets, Facebook, Twitter and other media as part of its risk communication strategy in the H1N1 outbreak.

Finally, citizen engagement helps to ensure community resilience, which rests on critical interventions:

1. Enhance economic resources, reduce inequities in resources and risks, and address social vulnerability;
2. Engage community members in disaster mitigation activities;
3. Facilitate collaborative relationships between organizations within communities who can be responsive quickly;
4. Foster networks and strategies that mobilize social support; and
5. Engage in planning but recognize the need for flexibility and strong, trusted communication sources that can adapt to evolving situations.

As we face the potential threat of a harsher H1N1 threat in fall 2009, building capacity and resilience in our communities must begin now with education, engagement, deliberation of these ethical dilemmas and profound policy questions and planning for our civic responses. We offer this model as one way for government ministries to think about citizen engagement.

Fragile states, failing states, vulnerable states and weak states – these terms all denote states whose poor governance and weak institutions make them extremely vulnerable to mega-crises. Such countries hit the headlines because of internal conflicts, widespread human suffering caused by famine, oppression or ethnic conflict, dubious interference by neighbouring countries or intervention by international institutions such as the UN and NATO, which try to restore order and calm. This article explores the relationship between mega-crises and fragile states and discusses how far such crises can be managed.

# Mega-crises and Fragile States

The 2008 Failed States Index lists 60 countries within the failed states category.<sup>1</sup> The top five come as no surprise: Somalia, Sudan, Chad, Democratic Republic of Congo and Afghanistan. Fragile states are quintessentially different from ‘problem states’, which have functioning institutions and a functioning (although often undemocratic) form of government, but pursue a foreign policy that is experienced by the surrounding region as threatening – the most striking example being North Korea. Problem states are not discussed in this article.

A state’s fragility cannot necessarily be attributed to war. SIPRI statistics show that in 2008, major armed conflicts took place in only two of the top five fragile states



(Somalia and Afghanistan).<sup>2</sup> In the other countries, the number of battle-related fatalities did not exceed 1000 per year, the threshold criterion for ‘major armed

<sup>1</sup> [http://www.foreignpolicy.com/images/fs2008/failed\\_states\\_ranking.jpg](http://www.foreignpolicy.com/images/fs2008/failed_states_ranking.jpg)

<sup>2</sup> SIPRI Yearbook 2009, Oxford: Oxford University Press, 2009, 69.

conflict'. Furthermore, SIPRI statistics show that the number of major armed conflicts declined from 20 in 1998 to 16 in 2008. It is interesting that 'fragility' seems to feature in clusters of countries, such as those located in the region between East Africa and the Horn of Africa, the region around Afghanistan and Pakistan, and parts of the Middle East.

### Causes of fragility

To determine whether mega-crises in fragile states can be prevented or held in check, it is first necessary to pinpoint the causes of fragility. Typically, a state's *internal dynamics* are the product of many years of oppression, persecution, misrule and corruption, which result in a collapse of the state system. The dynamics of the conflict are described in the literature as 'complex emergencies' involving mass migration, famine, a collapsed economy and internal conflict. In the absence of good governance, certain areas become ungovernable or turn into 'black holes' where criminals and terrorists have free rein and can prepare their activities virtually unchecked. The most obvious example is eastern Pakistan.

The SIPRI researcher Ekaterina Stepanova says that in fragile states, the conceptual boundaries between the various forms of violence become blurred.<sup>3</sup> Conflicts are often fought out by militias, not by regular armies under state authority. This obscures the distinction between war and terror: war crimes and human rights violations are committed on a large scale. In Somalia, for example, pirates and militias are actively supported by the state, neighbouring countries or extremist groups. The country has become an anarchic, fractured territory, rife with sectarian, ethnic, religious and criminal violence, where the law of the jungle prevails and the government rules only in name.

Human displacement is one of the hallmarks of fragility. According to UNHCR, the United Nations refugee agency, climate change, conflict and human rights violations are the main causes of refugee flows today. In 2007, some 26 million people are believed to have been displaced within their home countries. Another 16 million people sought refuge abroad. Traditionally, the biggest problems have been in Africa.

Another worrying development is the exacerbating effect of climate change. Fragile states find it particularly difficult to adapt to changing climatological



circumstances. Oxfam International estimates that in a typical year, 250 million people are affected by natural disasters, 98% of which are related to climate change.<sup>4</sup> In 2015, the number of people affected by natural disasters is likely to reach 375 million. This increase is alarming. According to Oxfam International, 46 countries are at risk of violent conflict triggered by natural disasters. This particularly applies to the weakest countries in Asia, Africa and the Middle East.

Conflict dynamics are reinforced by the presence of natural resources. Paul Collier and Anke Hoeffner, researchers with the World Bank, concluded that countries that depend primarily on minerals for their income are vulnerable to conflict.<sup>5</sup> Examples include the ongoing conflict around oil in Nigeria and the struggle for control of coltan in eastern Congo.

### Prevention and management

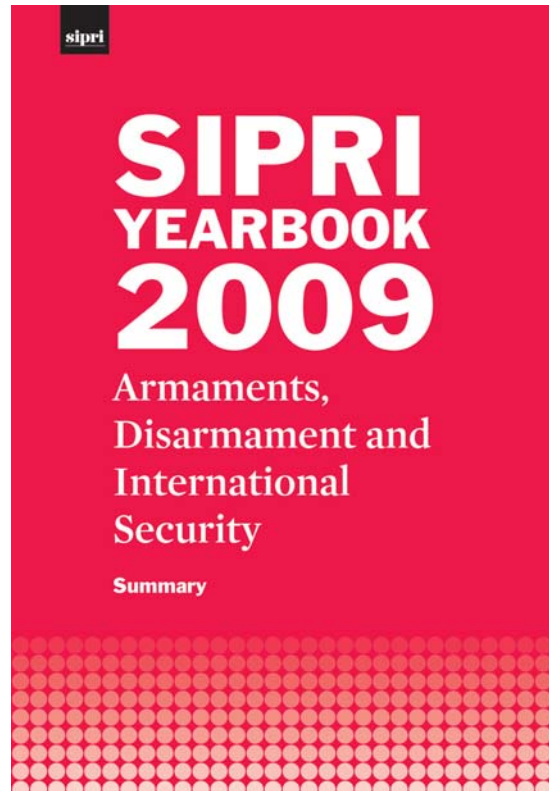
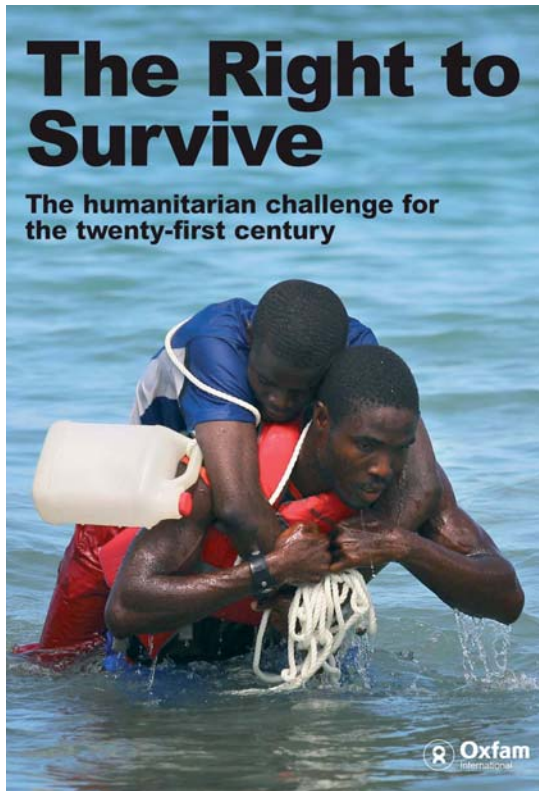
Thus, mega-crises in fragile states are not rare. It is to be expected that more mega-crises will occur as a result of the trends we have indicated. What should our response be? First of all, it should be stated that since the events of 11 September 2001, the West has been preoccupied with the war against international terrorism. This is making prevention increasingly difficult. In addition, the interventions in Iraq and Afghanistan have showed that while regime change is attainable, the ensuing task of stabilising and reconstructing these countries is almost impossible. Too few troops, inadequate resources, lack of preparation, lack of experience in managing internal conflicts involving militias, and a lack of political will to deploy troops to the most difficult areas – these are some of the reasons why there has been so little progress in stabilising Afghanistan and

<sup>3</sup> E. Stepanova, 'Trends in Armed Conflict', in: *SIPRI Yearbook 2008*, Oxford University Press, 2008, 44.

<sup>4</sup> Oxfam International, *The Right to Survive: the humanitarian challenge for the twenty-first century*, Oxford: Oxfam International, 2009, 4.

<sup>5</sup> P. Collier and A. Hoeffner, *Greed and Grievance in Civil War*. Working Papers WPS 2000-18, Washington DC: World Bank, 2000.





Iraq. However, such operations are also necessary in order to restore law and order in fragile states such as Somalia and Sudan. Patric Regan concludes that no more than 30% of military interventions have been successful.<sup>6</sup>

According to a study by Gary Hufbauer, Jeffrey Scott and Kimberly Ann Eliot, the other means of applying pressure – economic power – is just as ineffectual in practice.<sup>7</sup> The reason why economic sanctions are successful, at most only one third of the time, is that there is little correlation between putting governments under pressure to change their behaviour and actually getting them to change. Friendly governments are often willing to find ways around an oil embargo or weapons boycott. Moreover, economic sanctions constitute an external threat which enables even the most hated leaders to rally the support of their people. Because these two classic instruments of force – economic sanctions and military intervention – have little effect, political pressure also has little effect. After all, without a credible deterrent, no real pressure can be applied.

Finally, attempts are made to impose good governance and democracy by linking them to cooperation and assistance or development aid. The idea is that democratic countries are stable and peaceful. While it is true that democracies do not wage war against each

other, in practice, the likelihood of internal conflict is actually magnified by democratisation. The process of democratisation in former Yugoslavia is a good example. Serbian leader Slobodan Milošević, a political entrepreneur, came to power democratically by playing the ethnic card. The result was a civil war and the collapse of the Federation.

### Conclusion

The virtually insurmountable problems that go hand-in-hand with conflict prevention and conflict resolution call into question the ‘responsibility to protect’ assumed by the United Nations in 2005. When governments commit genocide, ethnic cleansing and crimes against humanity, third-party intervention is appropriate, in principle. However, if intervention is impracticable in real terms, ‘responsibility to protect’ becomes a meaningless phrase. The Failed States Index indicates that peace processes and the presence of stabilisation forces in Côte d’Ivoire, Liberia and Haiti have considerably improved the situation there. However, the problems in these countries were relatively straightforward, unlike those in Sudan and Somalia.

<sup>6</sup> P.M. Regan, ‘Conditions of Successful Third-Party Intervention in Intrastate Conflicts’, in: *Journal of Conflict Resolution*, 40 (1996), nr 2, 345.

<sup>7</sup> G.C. Hufbauer, J.J. Scott and K.A. Elliot, *Economic Sanctions Reconsidered*, The Peterson Institute for International Economics, 3rd edition, November 2007.

# Mega-crises and the Internet: The Rise of Botnets

The Internet has achieved a remarkable track record in terms of reliability and disaster resistance. Other assessments, however, strike quite a different tone. In fact, some predict a digital Pearl Harbor is about to strike. Recent security research suggests that 10-20 percent of all connected machines are currently attacking the Internet. These machines, many of them owned by unsuspecting home users, are infected with so-called “malware” – malicious software that brings them under the control of attackers. Malware may be distributed and used in many ways, including email, USB devices, infected websites, malicious advertising, and browser vulnerabilities.

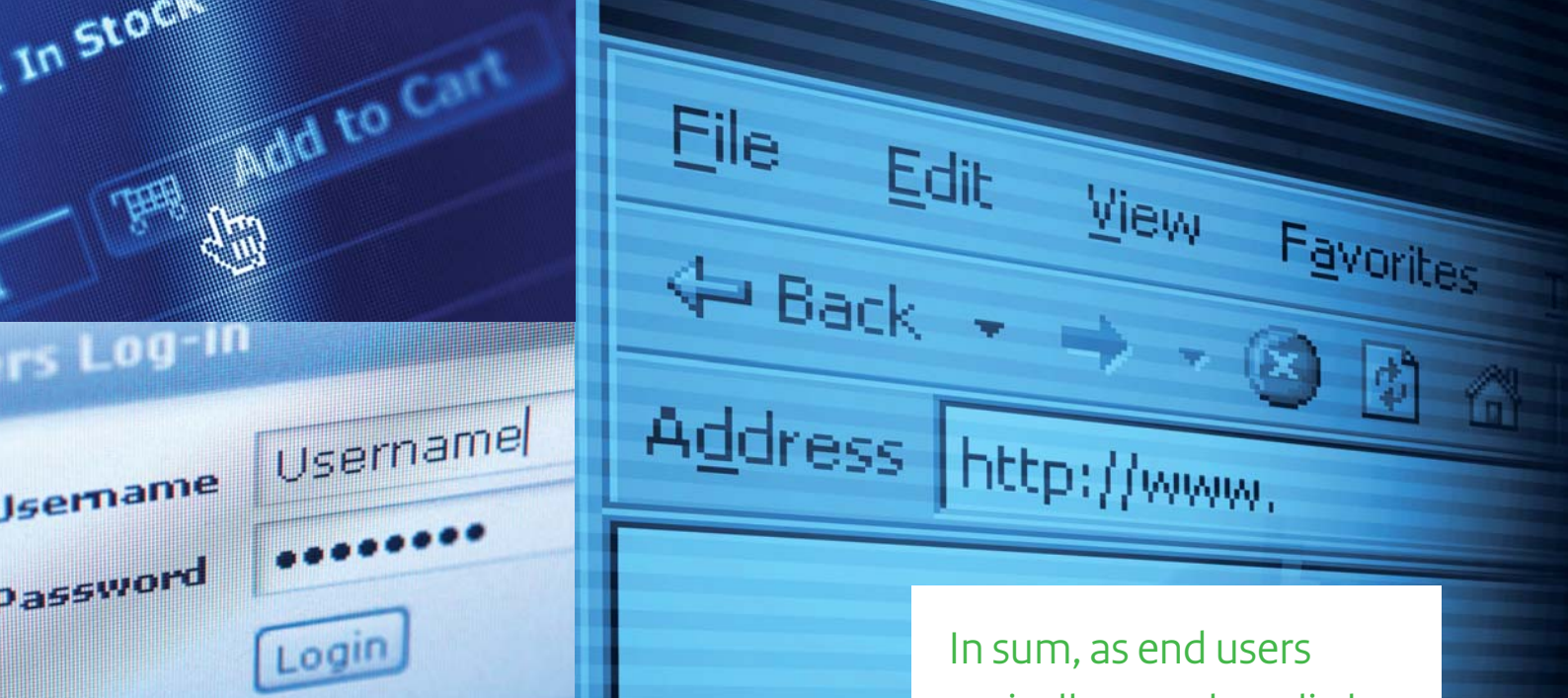
The massive number of compromised machines currently connected to the Internet has allowed the emergence of so-called “botnets” – networks of thousands or even millions of infected machines, used to launch malicious attacks. These botnets enable malicious actors to trigger large-scale attacks that might even reach disastrous proportions.

The examples of such attacks are numerous. Over the past five years, botnets have been used to attack key parts of the Domain Name System – a set of critical

Internet resources that translate domain names into the IP addresses needed for Internet communications. In September 2007, VeriSign, the company that operates

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In sum, as end users typically spend too little on security..

the .com and .net registries, reported that the attacks on their servers were growing fast and if these attacks succeeded, they would “effectively shut down the Internet”. In April and May 2007, members of a Kremlin-backed youth movement used a variety of botnets to effectively disconnect the country of Estonia from the Internet. NATO was called in for assistance. In July 2008, preceding a Russian military invasion, botnets were used to render Georgian governmental and news websites inoperable.

Botnets are predominantly used for criminal purposes rather than for terrorist or military attacks. The boundary between crime and national security is, however, increasingly blurred. These developments have given rise to a wide range of predicted mega-crises, including, but not limited to: massive crime waves that thwart the growth of the online economy and targeted attacks by terrorists or enemy states that cause large-scale disruption of power grids, communication networks and banking systems. In the U.S., as elsewhere, cybersecurity has recently moved to the top of the policy agenda.

#### The Rise of Botnets

What is causing the rise of botnets? Rather than explaining security threats as technological problems, they are increasingly understood as the outcomes of incentive structures. That is, they are outcome of rational economic decisions based on the private costs and benefits of security as perceived by the actors involved.

As security is costly, rational players will accept a certain level of security breaches. However, the incentives of the market players do not always properly reflect the social costs and benefits of security. Actors may shift the costs of insecurity on other market players. Such

‘externalities’ mean that privately rational decisions will systematically deviate from the social optimum.

The rise of botnets can also be understood this way. In the course of 2007, we conducted field research to identify the incentives of end users and Internet Service Providers (ISPs) – the former because they own most of the compromised machines that are recruited into botnets, the latter because they are a critical intermediary that connects end users to the wider network and, as such, could mitigate the security threats posed by infected machines.<sup>1</sup>

#### End users

Modern malware authors go to great lengths to minimize the impact of their code on the infected machine. Whereas the viruses and worms of several years ago would typically visibly disrupt the compromised machine itself, the current generation of malware obscures its presence and is typically used to attack third parties, rather than the infected host itself. This means that the machine’s owner often has little incentive to remediate this security problem, should s/he even be aware of it. Large business users often have the expertise and staff to deal with malware, but even here, the incentives to avoid and remedy infections is limited, because the infected machines do not visible attack or disrupt the organization itself. For other end users, such as small businesses and home users, the situation is even worse, as they often also lack the expertise and resources to manage the risks. In sum, as end users typically spend too little on security; their decisions enable the growth of botnets.

<sup>1</sup> See M. van Eeten and J. M. Bauer, *Economics of Malware: Security Decisions, Incentives and Externalities*, OECD STI Working Paper 2008/1. Available online at <http://www.oecd.org/dataoecd/53/17/40722462.pdf>.



### Internet Service Providers

What incentives do ISPs have to reduce the problem of malware? Costs of customer support and abuse management as well as the cost of additional infrastructure requirement that might be required to handle floods of spam all have an immediate effect on the bottom line and will increase the incentives to undertake security-enhancing measures. Loss of reputation and brand damage work indirectly but exert pressure in the same direction. ISPs are embedded in an interdependent system of service providers. If contacts via the abuse management desk are ineffective, other ISPs have a range of escalating options to retaliate for poor security practices with regard to outgoing malicious traffic, even if the origin are individual users.

Blacklists inventories of IP addresses reported to have sent spam and other forms of malicious code, are regularly used by ISPs to filter and block incoming traffic from other ISPs. They provide a form of peer pressure, where an ISP sending out malicious traffic is blacklisted by other ISPs, which generates problems for the offending ISP. For example, its mail traffic may be blocked, which affects the ISP's customers. This in turn triggers customer support costs.

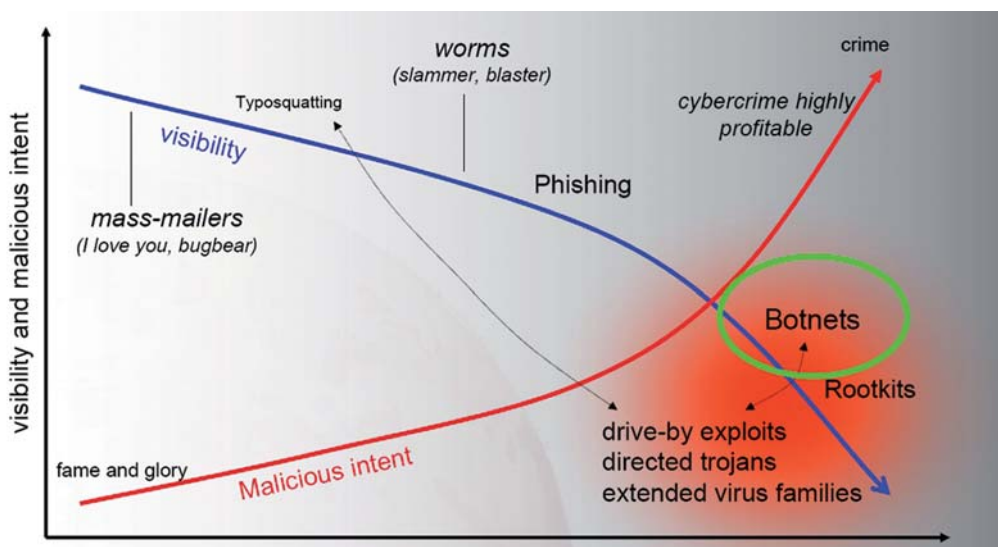
These incentives work in favor of enhanced security. On the other hand, the costs of increasing security, legal provisions that shield ISPs from legal liability, and the costs of customer acquisition all work in the opposite direction. Other things equal, they constitute incentives to adopt a lower level of information security.

The balance between incentives and disincentives will vary depending on the ISP. On the whole, it seems positive. Recent years have witnessed increased efforts by ISPs in dealing with malware, even in the absence of regulation or other forms of public oversight.

### In Sum

How, then, to explain the rise of botnets? There are two important factors that limit the extent to which ISPs mitigate the security externalities generated by their customers. First, ISPs see only a fraction of the infected machines. Only a few percent of these machines would show up in abuse notifications and customer calls and get acted upon. Second, even when they are technically able to identify and isolate most of the infected machines, the customer support costs this would generate are prohibitive. The number of customers that would be affected at any time would be in the tens of thousands. While this number might go down over time as network security improves, it was obvious that management would not accept the enormous cost impacts of such a measure.

The incentive structure of end users and ISPs combine so as to allow the emergence of large-scale botnets which generate security externalities for the rest of society that, for the most part, go unmitigated. This raises important policy questions which have to be addressed in the coming years. Carefully designed policies might be able to improve the incentives of the players to make decisions closer aligned with a societal optimum.



Source: GOVCERT.NL

# The Making of a Mega-crisis: 9/11 as a Case for the Concept

The term crisis denotes a “phase of disorder in the seemingly normal development of a system,” is characterized by threat, uncertainty and urgency, and encompasses a range of conflicts, man-made accidents, and natural disasters. The disordered system could be economic, social, cultural, or political, among others. In many ways, a crisis emphasizes the existence of a period of threat. Sometimes that threat is mitigated; other times the crisis period constitutes the preconditions of disaster where the disaster is the crisis realized<sup>1</sup>. What, then, distinguishes crises from mega-crises?

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We adopt in our work an inductive approach to this question. We consider as data for this study our own extensive research on the events related to the September 11, 2001 (or 9/11) terrorist attacks in New York, NY, Washington, DC, and Somerset County, PA. Our work focuses primarily on the responses to the New York City attacks. We also consider a large body of scholarship on the event (which is summarized in the longer version of this essay).

## Dimensions of 9/11 Event

9/11 was a high consequence event, but it was not catastrophic. While some semblance of scale is important, if 9/11 was a mega-crisis, then these kinds of crisis events do not necessarily lead to catastrophic consequences. Nor were the behaviors demonstrated during the disaster dissimilar from those exhibited in more routine disaster events. For example, there was an absence of role abandonment and widespread looting as well as a presence of significant convergence and emergence behaviors.

Collective behavior during this event seemed particularly likely to involve a high prevalence of sense-making that was both divisible amongst its participants (what Weick, 1998 calls *distributed sensemaking*) and scattered as individuals in distinct physical or social spaces made sense in similar ways (what we term *diffuse sensemaking*). Sense-making occurred between diffuse collectivities. For example, there was widespread emergence and dissemination of such ideas as hero-making, a widespread public sense that ‘everything had changed’,



and strong public consensus regarding appropriate responses to terrorism.

The broader collective was impacted with what one might refer to as a destabilized collective psyche, at least to the extent that the events were not incorporated into the collective conscience as *normal*. There was a sense that our knowledge of threats and how to navigate around them had been undone. For example, among the opening lines of the 9/11 Commission report is the phrase “...the United States became a nation transformed” and it was not uncommon to hear in the media, from public officials and responders, and amongst the general public variations of the statement “...as of Tuesday, everything has changed.”

<sup>1</sup> A. Boin a.o., *The Politics of Crisis Management: Public leadership under Pressure*. Cambridge: Cambridge University Press, 2005. A. Boin and P. Hart, ‘The Crisis Approach’, in: H. Rodriguez, E.L. Quarantelli & R.R. Dynes (eds.), *Handbook of Disaster Research*, New York: Springer, 2006, 16-41.



The idea of the “multiple” seems an important feature of this discussion. If a crisis is characterized by disorder to a system, 9/11 threatened disorder to multiple systems, including those related to potential or realized disruptions to transportation, the economy, political environment, and a cultural sense of safety. The threat and uncertainty extended beyond typical geographic boundaries, including the threat to international airspace on the 11th and the global reach of the terrorist network in the months that followed. It would seem, then, that crises are not so much questions of scale understood as size, but as involving multiple levels of government, sectors, or institutions in new relationships and interdependencies.

Potential for fundamental and far-reaching change characterized 9/11. First, exceptions became acceptable during this event, including the development of new protocols, such as the distribution of funds through the 9/11 compensation fund. Second, 9/11 brought about a sudden reassessment of the benchmarks for what constitutes a successful response. While clean-up of World Trade Center debris took months, many responders and citizens praised the effort as quick given the magnitude of the task at hand. Organizations also reassessed their management capacities. For example, when a commercial plane crashed into a residential area in Rockaway Beach less than two months after the attacks, response organizations quickly absorbed this accident. Third, technical questions of practice or policy emerged that did not have established answers. How to contend with the task of ensuring debris was safely transported out of this active and densely populated urban environment? How to make decisions on the recovery and identification of remains for victims from around the world? How to appropriately manage the

health threats to residents and response workers while moving ahead with response and recovery? In these cases, procedures and protocols were invented, with all the uncertainty of outcome implied by the idea of invention. And fourth, the event generated fundamental shifts in practice and policy. 9/11 served as a watershed for immediate and long lasting change in aviation security regulations and in legislation such as the Patriot Act. It also served as reference point for other events, including the wars in Afghanistan and Iraq. All of these events had significant implications beyond the borders of the impacted zone.

In sum, if 9/11 was an event that held a mega-crisis component, our findings study suggests that mega-crises do not necessarily lead to catastrophic events, even when they lead to negative outcomes. Outcomes of mega-crises lead to similar social behaviors as seen in other events. Key dimensions that distinguish mega-crises from crises events include more pervasive sense-making and collective behavior, a destabilized collective psyche, threats and uncertainties impacting multiple systems and jurisdictions, and potential for far reaching and fundamental change. One of the challenges of understanding mega-crises is the open-endedness of the concept. Events not yet imagined can bring unimagined threats or reveal the hidden vulnerabilities of systems. Because crises involve the loss of legitimacy, sudden shifts in the expectations of constituencies or the formation of new constituencies may yield new forms of crises. In that sense crisis – and in turn, mega-crises – has a unique protean quality; it arises from both real and perceived conditions but exists as perceptions reified by those involved. Theoretical sampling across other cases is needed to further test and refine our propositions.



# The Subprime Crisis

The global economy is now mired in a recession originating from a weak housing market that led to struggling financial institutions and sharp declines in stock prices. This housing crisis has been characterized by excessive defaults on mortgages extended to low-quality borrowers. These loans, called *subprime mortgages*, are at the root of the problem. But what is the root of the subprime crisis?

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It lies in U. S. government housing policy that originated in the 1930s with the Roosevelt (FDR) administration's efforts to use housing policy to escape the Great Depression. FDR believed that making Americans homeowners would increase employment, generate pride, and restore confidence. Believing that government should be actively involved in the recovery, the administration created the Federal National Mortgage Association or Fannie Mae in 1938 whose objective was to purchase mortgages, thereby creating a secondary market that would encourage lending. In 1970, the government created the Federal Home Loan Mortgage Corporation or Freddie Mac to provide an element of competition. Both companies were privatized but retained an implicit government guarantee of support.

Since that time the federal government has pursued a policy of encouraging broad homeownership through legislation, moral suasion, political threats and promises, and the continuing activity of Fannie and Freddie. In addition the American financial system created new and innovative tools for trading mortgages. Collateralized debt obligations (CDOs) and credit default swaps (CDSs) became standard means for repackaging mortgage loans for sale and guaranteeing them against default, respectively.



The Federal Reserve, though ostensibly independent of the federal government, played an important and cooperative role in fueling the subprime crisis. While maintaining interest rates at exceptionally low levels for many years, the Fed sanctioned low cost credit, a strategy that former Fed Chairman Alan Greenspan eventually admitted was a mistake.

For many years the housing policy seemed effective. Eventually, however, low quality loans will begin to default. Small increases in interest rates led to higher mortgage payments for many borrowers who use variable rate loans or loans requiring refinancing. As defaults increased, financial institutions started incurring losses.

Unlike weakness in say the auto industry, which is contained within a few sectors, weakness in the financial industry is more systemic. Banks are connected through an extensive series of domestic and global interbank transactions. Hence, weakness in a few major banks in one country can lead to weakness in the entire global financial system. As a result, the subprime crisis led to a massive selloff in the stock of publicly-traded banks in early fall 2008. Concerns about the stability of the financial system led to general concerns about the economy and financial system, leading to further selloffs of non-bank stocks leading to some of the largest drops ever seen in stock prices in fall 2008.

It has been said that stock markets lead recessions. While investors do look ahead to the state of the economy, investors also sell stocks when prices are falling. In the high-tech world of today, many investors are virtually glued to their portfolios. Watching the values of their retirement funds fall dramatically led many otherwise conservative long-term inactive investors to become panicky, speculative short-term investors, dumping more of their stocks, which fueled the market breakdown.

Complicating the crisis was the U. S. Presidential election, which both candidates exploited, arguing that his policies were critically needed. Senator Obama blamed the Bush administration and loose regulation even though the Bush administration had attempted to institute tighter controls over Fannie and Freddie but had been thwarted by several key Democratic legislators. Senator McCain abandoned his typically free-market philosophy in favor of greater intervention in the economy and in the mortgage markets. Both did so because American citizens, watching their retirement funds erode, in the typical fashion observed in a crisis turned to their governments for solutions. Few realized that government had largely caused the problem and that American investors had suffered mostly because they abandoned the basic rules for retirement investing in favor of speculation, which simply made things worse.

A recession need not have occurred but for the fact that as investors watched their retirement funds evaporate, they responded not only by further selling stocks but by reducing their purchases of goods and services. Whenever consumers reduce their purchases, a recession follows and businesses reduce employment. These job losses become fodder for news services that



Don M. Chance

seem to relish in warning of bad times ahead. Consumers further reduce their purchases, more layoffs occur, and the cycle continues. Government typically responds by reducing interest rates or maintaining them at low levels and by increasing spending. These efforts are typically fruitless. Low interest rates and easy credit are part of what caused the crisis. Government spending can inject small pockets of economic activity but cannot bring about recovery unless it instills consumer confidence to reduce savings and increase spending. Such is unlikely to occur. Indeed, Americans have expressed grave reservations about the massive build-up of government debt and the burden on future generations.

The subprime crisis, which led to the market crash and global recession, is a normal response to a well-intended but dangerous government policy. It is a classic case of an induced and avoidable crisis. Fortunately markets are self-correcting mechanisms and will eventually recover. Unfortunately, government and many citizens are myopic. Government borrows heavily from future generations, seizes greater control over the economy, blames financial institutions and speculators, and calls for greater regulation. Fortunately markets are strong enough to overcome the excessive greed and political power-mongering of elected officials and bureaucrats. While recovery takes longer when government gets in the way, it eventually occurs not because of government policy but in spite of it.



Financial crises do not usher in conventional threats to security. Their impacts are not typically measured in terms of body count, nor in terms of the extent to which the built environment is laid waste. Crisis preparedness is also extremely difficult in the absence of reconstructing the rationale for and the basic modus operandi of financial markets pretty much from scratch. The speculative nature of financial trading in today's highly liberalised market environment suggests that moments of systemic loss of confidence, followed by moments of significant price crashes, will always be possible. However, such moments are built into traders' models simply as statistical probabilities. Industry stress-testing criteria reduce the very likelihood of systematic price contraction to how many standard deviations away from a statistically 'normal' day's trading a

particular price fall represents. In other words financial crises become nothing more than a once-in-five years event, a once-in-ten-years event, a once-in-twenty-years event, etc., when compared with historical price data matching one day's price change with the previous day's.

# The Post-Subprime Crisis Global Credit Crunch

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Today's ongoing global credit crunch following the subprime crisis is typically described as a one-in-a-hundred-years event. The description has been popularised by the banking industry itself, because it draws attention away from individual culpability for the causes of the crisis, instead reducing it to a statistical freak. The seizing up of inter-bank credit functions is thereby not explained as an economic phenomenon with palpable causal dynamics which can be traced back to particular choices, particular decisions and particular actions. Rather, it is explained away as an historical anomaly, a wholly unpredictable alignment of events

which itself has no clearly discernible history. In this respect, the banking industry's account of its self-induced crisis mirrors accounts of natural disasters when elements in nature impact cumulatively upon one another and seemingly at random in order to produce multiplicatively disastrous results. This is the 'perfect storm' explanation, in which single factors on their own would have had very little impact but where each factor acting upon every other accentuates the overall effect in an exponential manner and brings it up to crisis proportions.



The perfect storm explanation of the ongoing global credit crunch is wholly unconvincing. For a start, it falters in its analogical reasoning. The argument is made by analogy insofar as explanations of what might happen in the natural world are transposed uncritically onto events which originate in the economic world. Yet, natural disasters often have causes which initiate at least one step removed from conscious human agency, and whilst people might develop early warning systems to make detection more rigorous, this tends to be the limit of human effects on the event in question. By contrast, outbreaks of systematic price disturbances on financial markets are entirely man-made. They usually follow previous episodes in which price rises take on bubble characteristics, and bubbles are only generated when participants in financial markets – be they ordinary people or professional financiers – attempt to capitalise on an already favourable price trajectory.

To subsequently call forth a perfect storm explanation after the bubble bursts and prices fall is merely to mask the origins of the crisis and to obscure the human dimension of its causes. It is therefore a depoliticising act designed to muddy the attribution of responsibility, and as such it is to be resisted. If for no other reason, then it is clear that financial crises do have many of the effects associated with other types of disaster. The mega-crisis dimensions of the ongoing global credit crunch have been made manifest in constrained growth dynamics and constrictions in development aid. The end result will almost certainly be the failure to upgrade the built environment in many of the world's poorest communities, consequently leading to what would otherwise have been preventable deaths.

To assess the impact of human agency on the ongoing global credit crunch it is necessary to focus on banks' profit-making strategies during the recent global house price bubble. Taking their cue from banks in the US, banks in many other countries also reconfigured their principal profit centre in the mortgage lending market away from its primary segment. They switched their attention instead to secondary markets based on the creation of increasingly exotic mortgage-backed securities. The money they made during the bubble period was not tied to the margins on individual mortgages by selling them prudently to households who were easily capable of meeting the stipulated repayment schedule. Instead, it reflected banks' ability to inflate the volume of mortgage lending by aggressively selling loans on often reckless terms, knowing that expanding loan volume by any means necessary was the major factor driving their increasingly lucrative business originating and trading mortgage-backed securities on secondary markets.

The problem with this business model is that it was entirely dependent on permanently increasing house prices. As soon as the global housing market began to unravel from the middle of 2007 onwards, many mortgage loans went bad, the tradeable value of mortgage-backed securities fell precipitously, leaving banks with large holdings of essentially worthless assets undermining their balance sheet health. Throughout 2008, hedge funds were the only private buyers left in the market for mortgage-backed securities, but they were only willing to pay around 10% of the price that was necessary to prevent banks' liabilities from overwhelming their assets.

The consequence of this was that every bank knew that every other banks' balance sheet was exposed to the sudden collapse of prices in mortgage-backed securities, but no bank knew the precise balance sheet position of any of its competitors. As a result, the banks did not have the necessary information on which to make a snap judgement about whether or not their competitors remained creditworthy. Yet, this was exactly the sort of judgement that was continuously required in order to keep short-term inter-bank lending up-and-running. Given repeated rumours about possible bank insolvencies that began to circulate from the middle of 2007, banks increasingly turned risk-averse, acting as if the rational decision was to treat every other bank as if it was already insolvent, thus refusing all but the most risk-free approaches from other banks seeking to have credit extended to them. A crisis of trust in each other's creditworthiness ensued, leading to an effective capital strike within the inter-bank lending market and paralysing global credit functions accordingly.

The massive bailout packages sourced through taxpayer money have merely been a sticking plaster operation. They substitute for the trust that has been missing from the inter-bank lending market since the collapse of the global house price bubble – in the official justification they aim to 'restore confidence' – but they can do no more than that. Bailing banks out once makes it no less likely that banks will not need to be bailed out again some time soon given the prevailing structure of financial market regulation. Indeed, if arguments about 'moral hazard' are to be believed, they might even make future restorative interventions *more* likely. The incidence of financial market crisis, even of financial market mega-crisis, is endemic to highly liberalised market environments. Successful crisis preparedness therefore entails nothing less than a paradigm shift to a very different relationship between financial markets and society.

# Mega-cities under Adversity

## Ideology, Governance and Risk

This contribution deals with mega-cities under adversity, where public managers confront major challenges arising from urbanization and mega-city growth. The United Nations Human Settlements Programme (UN-HABITAT, 2008) estimates that just over half of the inhabitants of the world now live in urban areas. UN-HABITAT list 19 mega-cities, defined as cities with 10 million or above population. Some examples illustrate the magnitude of mega-cities. Tokyo had a population of over 35 million in 2007, Mexico City over 19 million, Mumbai nearly 19 million, Shanghai just under 15 million and Istanbul over 10 million.

Going beyond the UN-HABITAT definition, Hall and Pain (2009) point to the emergence of the “polycentric metropolis” where networks of towns and cities constitute “mega-city regions” with new kinds of policy challenge to policy makers and public managers. Mega-city regions are found in Asia (the Pearl River Delta for example) and elsewhere. The southeast of England and the Dutch Randstad qualify as mega-city regions according to Hall and Pain. The sheer size of such regions and the cities within them underlines their importance within national, regional and global contexts. Such urban agglomerations are therefore at the centre of attention on the agendas of governments, international development organizations, and businesses.

According to Munich Reinsurance, the ten most economically important world cities account for nearly one-fifth of world gross domestic product, and mega-cities are inherently risky as a result of their economic and social attractiveness. Whether the risks are associated with economic change, environment, health or terrorism, mega-cities are simply more vulnerable than rural areas. Urban agglomerations offer targets and opportunities for those bent on disruption. Big cities, even those with “mature” polities such as Los Angeles, London, and Paris have experienced social tensions and are vulnerable to bouts of communal

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violence. Frequently people live under the threat of natural disasters and are vulnerable to earthquakes (Los Angeles, Osaka-Kobe and others), floods caused by sinking land levels (Delhi for example), disease (the SARs epidemic in Hong Kong and swine flu in Mexico), terror attacks (New York, London and Mumbai for instance) and potential nuclear incidents (either by terror attack or otherwise). Urbanization has increased urban risk through rapid population growth, environmental degradation, social inequalities, and urban contributions to global warming.

How can we make sense of these global trends in a policy-relevant way? There is a substantial literature on urban change and city management, but suffice it to note here that many academic writers see urban trends in terms of often sweeping generalizations about urban dynamics, global processes and ecosystem threats. Such literature abounds with references to “urban systems” often portrayed as perpetually in a state of imbalance and disequilibrium, thereby countering public policy attempts to seek “sustainable” solutions to urban problems. Cities are sometimes characterized in terms of heterogeneous flows where people are constantly on the move, communications occur within complex networks and where multiple psychologies reflect social atomisation and city segmentation with enclosed “heterotopias” where urban dwellers articulate their own distinctive aspirations, lifestyles, and obsessions.

Recent urban ecology studies claim to appreciate complex interactions between “human” (governance, social groups and etc.) and “non-human” elements (ecology, physical resources etc.) of mega-city systems.



However, despite the fact that urban ecology has become more widely accepted and held by many public managers to offer policy-relevant contributions and insights, urban ecology ultimately confronts severe limitations in attempting to blend natural and social science perspectives. Ecosystem modellers go to great lengths to depict relationships between human and ecological subsystems but they present system “actors” constrained by impersonal structural dimensions of “the system”. Modern urban ecologists claim to provide interdisciplinary insights, but their perspective limits analysis to the extent that mega-cities are regarded as part of wider, and often impersonal and uncontrollable, processes of global urbanisation. Urban ecologists therefore tend to generate ambitious yet vague claims based on the idea that urban ecosystems are products of natural and social processes that in some way should become more “resilient” and “sustainable” through policy interventions.

By contrast to urban ecology, a diverse, growing, and broadly defined urban management literature covers strategies and “networks” and reflects the widely accepted management preoccupation with effective governance. For example, Lewis and Mioch (2005) productively cover a variety of issues associated with city change providing a focus on specific policy areas concerned with crisis management and “good urban governance”.

While there is much in the above literature that is valuable, I advocate another way of thinking about the public policies affecting mega-cities and for understanding the salience of the themes evident in the literature. I argue that it is important to concentrate on the worldviews and paradigms that are important to mega-city managers, politicians and publics. Concepts such as “system”, “network”, and “resilience” are not objectively and scientifically neutral – they “come of age” at particular times and are sustained within transient and contested paradigms. The approach that I

develop recognises the embedment of ideas about mega-city management and governance in wider social settings. The focus is upon ideas about management, risk and crisis framed by public managers and others with reference to influential paradigms that embody concepts “system”, “network”, and “market” as ways of addressing problematic issues. My approach, inspired by recent ideology-focused work, recognizes the importance of groups and political elites and concentrates on the significance of the ideas and values held by them.

This approach shows that different perspectives and paradigmatic discourses are evident in world cities that produce different conceptions of factors such as the role of the state, governance, city-region boundary definitions, risk reduction, policy priorities, and allocation of resources. Different worldviews also imply diverse modes of management and political behaviour. Policies and practices are constantly tested by problems and crises, as during the recent global economic crisis. When a prevailing policy or paradigm is perceived by groups as untenable, public managers and policy makers seek new approaches and strategies. However, intentions and outcomes in policy regularly diverge, and plans are changed or abandoned as new imperatives come on to the agenda. Public managers thus adopt various coping strategies depending upon the contingencies that they confront.

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# Energy – Large-scale Blackouts

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One cannot but wonder the sheer size and complexity of today's energy systems which comprise the oil, natural gas and electricity industries. Enormous amounts of resources are invested in the extraction of energy from our planet. But how 'brittle' is this energy system and how big is the potential for mega-crises in today's energy systems?

The size and complexity of the energy system in western society is so enormous that it could well be argued that many vulnerabilities could produce their own plausible disaster scenario's. For example, one could well imagine large-scale geo-political conflicts to be fought over the increasingly scarce fossil fuels (that is if we have not witnessed some already); ecological mega-disasters could occur in the form of giant oil-spills or through more insidious long-term effects as a result of the pollutive character of the fossil fuels; a large-scale accident (attack; human error; failure of equipment or design, etc.) could produce horrible scenario's as a result of the socio-technical vulnerabilities in the energy system; and finally, a large and sustained interruption of energy provision could very well result in something akin to a societal meltdown.

The crucial question is not whether each of these vulnerabilities produces scenario's that are more or less likely to occur, but whether the scenario's would lead to *outcomes* that would indeed open up new, frightening, societal vulnerabilities. Furthermore, would these and other scenario's would produce the type of effects that would truly categorize them as mega-crises? In an effort to establish the credibility of one oft-mentioned threat,

the vulnerability of society to the long-term disruption of electricity is studied in more depth: that of large-scale blackouts.

## **Large-scale blackouts: prospect of 'the' next mega-crisis?**

In the wake of 9/11 and the occurrence of a number of blackouts over the past years, the reliability of the electricity provision has emerged as an important topic in the safety and security policy arena's in Europe and the United States. In recent years, large-scale blackouts affected well over 140 million customers in these continents. In the United States alone, an estimated 50 million households were affected by a single blackout in 2003; and a European blackout in 2006 demonstrated how a failure could rapidly cascade through the grid and result in blackouts throughout the European electricity grid, even producing interruptions in northwest-Africa (Morocco, Algeria and Tunisia).

Analysts, scientists, the media and policy makers have been quick to point out that the blackouts displayed fundamental flaws in the electricity systems. Recent large-scale power disturbances in both the US and European grids were able to cascade across the electricity system because of inadequate monitoring



and control equipment that allowed for system-wide monitoring and control and because operators had failed in the coordination of their actions and could not react fast enough to disturbances that occurred in parts of the interconnected network that were controlled and monitored by other system operators. Critics of electricity restructuring have claimed that the more decentralized, competitive environment could seriously degrade services because of coordination problems between all these organizations in the provision of services. As a result, new technologies and governance modes have been proposed to centralize the governance of the electricity industry.

Furthermore, security experts have identified the electricity industry as potential target for malicious attacks and much research has been conducted to identify vulnerabilities and single points of failure that would result in large-scale blackouts. Security critics similarly identify the institutionally fragmented nature of the electricity system as contributing to the largely insecure nature of the system.

Would these trends lead us to the conclusion that large-scale blackouts and long-term interruptions of electricity are a (mega)crisis waiting to happen? The answer might be more paradoxical than one might expect.

#### **Blackouts as 'last line of defense' against a mega-crisis**

From our past experience, the prospect of large geographical areas being subjected to prolonged

periods without electricity would indeed bring highly extensive and disruptive effects to society. So much so that this scenario might be considered well worth preparing decision makers, emergency management specialists and societies for to a certain extent. However, whether large-scale blackouts would ever produce prolonged periods where electricity would be unavailable in large geographical areas is less likely (although not wholly unthinkable).

Instead of viewing (large-scale) blackouts like the ones we witnessed in 2003 and 2006 as prospects of terror or evidence of increased vulnerability of our energy system to long periods without electricity, the opposite could be posited. (Large-scale) blackouts could well be considered as 'instruments' that *protect* society from *long-term* periods without electricity. Large-scale blackouts are the last line of defense and proceed an option that produces far less desirable consequences: the uncontrolled disintegration of the high voltage grid as high-voltage cables literally burn up. The damage that would result from such an uncontrolled failure would be far more extensive and might result in the type of long-term periods when electricity could not be provided.

The high-voltage grid that delivers electricity across long distances is a technical system that is designed and built to fail when certain operational parameters are not met. In case of an 'attack' or a disturbance in the electricity system, automatic safety devices quickly react and isolate the grid in different sections. This process is called 'islanding'. In the 2006 European blackout, the electricity system 'broke down' in three parts and the imbalances between generation and load in these systems led to customers being 'blacked out'. However, the essential aspect of 'islanding' is that this process isolates the problem area in the grid where the disturbance occurred from the rest of the high-voltage system. A blackout thus may be considered a protective measure that is meant to ensure that the high-voltage system is capable to deal with disturbances that have the capacity to result in uncontrolled shutdown.

#### **Conclusion**

Instead of viewing blackouts as a potential cause of a mega-crisis, blackouts could be considered events that actually prevent a true mega-crisis from occurring. Although they might cause inconvenience and damage to society (estimates from the blackout in 2003 range from \$6-10 billion), blackouts 'only' disrupt the transmission of electricity for a relative short period of time (usually up to 24 hours, the blackout in Europe lasted a mere 90 minutes). Blackouts may thus be considered the short-term price we pay for our ability to maintain long-term access to electric energy.

# Climate Change as Environmental Mega-crisis: Domesticated Problems, Patchwork Solutions, Inadequate Incentives

Climate change threatens a cascade of mini-crisis across a wide range of ecological and human sites and situations. Scientists predict the frequency of extreme events like floods, droughts, tropical storms, tornados, sea level rise, epidemics and other dangers to humans and ecology are increasing. While the press and many scientists spend their time and energy debating the level of certainty of mainstream climate change predictions, and most public attention is focused on abating and mitigating rather than adapting to climate impacts, societies are not doing nearly enough to reduce their vulnerability to the hydra headed monster threatening to transform the earth.

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Climate change is an environmental mega-crisis because it causes a cascade of seemingly unrelated problems that are not easily predictable and continue to worsen. Climate change manifests as multiple and overlapping issues with common roots in the systemic failures of a globalized political-economic system that produces numerous linked ecological and social vulnerabilities. However, the systemic connections between multiple climate-related problems are difficult to comprehend and frame in ways productive to problem solving. Traditional policy responses generally construct these multiple problems so narrowly that important aspects are slighted, while attempts at comprehensive policy fail to correctly identify root causes.

It is often easier for government agencies in situations of uncertainty and ambiguity to satisfy public demands to do something than take effective action. Climate change related policies in many sectors such as water resources do not reflect sufficient change. Policy makers often establish institutions and frameworks that give the appearance of coherence, coordination, and policy engagement but do not lead to comprehensive achievement. Such “domestication strategies” as described by Lach, Rayner and Ingram are often ineffectual in responding to even small crises as they inevitably occur. Instead they are domestications

intended to create the appearance of taming the problem. Setting up new institutions and organizations and engaging in modeling, forecasting, risk assessments, the development of social and ecological indicators and the like are not the same as adopting transformative policies. Domesticated policy responses are formulated within administrative, technological and economic paradigms supported by powerful elites, who favor voluntary responses that maintain existing production structures.

Political actors tend to resort to patchwork and piecemeal solutions. Both political and economic processes tend to adopt policies that externalize risks and responsibilities. Old solutions like nuclear energy and large dams get put back on the policy agenda. Solutions agreed to in one sector negatively affect problems in other sectors. The sectoral silos in which climate-change responses occur provoke prolonged debate and deadlock.

Since this environmental mega-crisis invokes multi-levels as well as multi-sectors, since domestication is not productive, and since central action in international and national arenas is difficult, policy makers resort to individualized and instrumental incentives that rely heavily on private entrepreneurship and the profit



motive. This framing further individualizes and localizes responsibilities for causing and responding to climate change to consumers and city officials. The result is to divorce policy responses to climate change as a mega-crisis from various collective attachments and symbols that effectively mobilize group action on environmental issues.

Accumulation of small failures may lead to general disenchantment with the issue of climate change. As often happens with what are perceived as insolvable problems, public interest shifts elsewhere, and the time available for mitigation and adaptation to climate change is wasted in inaction. Increases in extreme climate change-related events will not be met with the necessary robust social response. This is especially damaging to emergency managers whose jobs will become more and more difficult and they will need to respond without the needed increases in resources. Delays not only impose risks that climate-related problems will worsen, but that the political agenda for necessary social transitions will become co-opted. Such dismal prognosis is not inevitable.

A better policy strategy for climate change is to frame it as a human security human well being issue that demands broad-gauged policies of adaptation. Climate change needs to be reframed so as to incorporate adaptation as well as mitigation and production as well as consumption. The focus of problem solving needs to shift from the energy sector and carbon-based caps and trade to include the many other sectors affected by

climate change. A broader framing of ecological and human security would refocus attention upon the complex vulnerabilities to which humans are exposed.

Changing land use patterns to reduce risks of flooding on coastlines and estuaries need to be considered now. The short-term benefits of investment in infrastructure need to be evaluated in light of their long-term unsustainability as the effects of climate change involving sea level rise and more frequent and serious storms worsen. Framing climate change issues must be more compelling. Frank Ackerman suggests the following phrases for creating such a frame: "Our grandchildren's lives are important"; "We need to buy insurance for the planet"; "Climate damages are too valuable to have prices"; and, "Some costs are better than others."

People from a variety of points of view must be brought together to engage in discussions during which reflection can take place, serious political deliberation can occur, and empathy and understanding for differences can evolve. Processes for policy-making must change so that there is both more public involvement in environmental and other issues related to climate change and greater interaction between the silos of sectoral interests that tend to dominate. Collaborative processes are not magic bullets, and climate related simply changing processes for decision-making would not reduce insecurities. However, substantive change is not likely to take place without process changes.

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Helen Ingram

The Olympic Games:

# Coping with the Risks and Vulnerabilities of a Mega-event

What makes mega-events such as the Olympics vulnerable to crises and mega-crises? What sort of coping strategies exist to somewhat mitigate these vulnerabilities?

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*Massacre at the Munich 1972 Olympics*

The modern Olympic Games have become truly mega in proportion. The London 2012 Olympics is preparing to host 26 sports in 31 venues over 17 days, with around 10,500 athletes, 6,000 officials from 204 countries, 20,000 media representatives and 500,000 visitors per day. Chief Executive of London's Olympic Delivery Authority describes it as "...the world's largest peacetime event," with the logistical task equivalent to staging thirty-three synchronous world championships in the same city. These sorts of numbers indicate the complexity and scale of this event. However, consider the potential for different sorts of crisis scenarios: First, imagine detonation of a dirty bomb on the main site. Such an incident would require not only evacuation of large numbers of people, but also immediate activation of decontamination measures – in circumstances where individuals are concerned with a quick exit, unaware of potential health impact of exposure due to invisibility of radioactive material. Second, imagine the breakdown of a train during peak spectator flow for the main events, combined with a repeat of the record heatwave of August 2003. Or third, imagine a 1:200 year storm surge up the Thames Gateway, leading to flooding of the site and postponement of events. Each of these scenarios highlight the important and complex questions associated with which particular risks (some seeming innocuous) are regarded as critical, how resources should be allocated and which risks need to be tolerated.

The Olympics are therefore both highly vulnerable to interruptions and are planned and organized in a high state of alert and risk-aversion. Mega-events are therefore important cases for analysis of decision-making processes that shape operational capabilities to respond to incidents that can be escalated into crises through complex chain reactions of cause and effect, in what Charles Perrow calls "normal accidents". When operational crises acquire this complex dimension, affecting large numbers of people, and when these events threatens national and international reputations, such incidents can become mega-crises. Our analysis highlights three aspects of Olympic governance and organization that contribute to the special vulnerabilities and challenges for risk management of planning and operation of mega-events such as the Olympics. The Olympics are associated with particular decision-making styles and biases that are risky or crisis-prone.

- Each Olympics has specific features that make it unique when compared with other Games and other mega-events. This uniqueness is a result of local geographical and metropolitan features, changing global political circumstances and the limits of institutional memory. Each of these variables gives rise to a different set of risks or threats for organisers.



Martin Lodge

The location of Olympic competition and staff is changed every four years and relocated to a new political context and set of governing institutions. This venue rotation and high rate of personnel turnover creates obstacles to inter-event learning, despite initiatives such as the IOC's Olympic Games Knowledge Management programme. On the one hand, the Olympics are more operationally complex and geographically concentrated than other mega-events such as football world cups – with multiple synchronous events.

- The competitive bidding processes for the Olympics tends to accentuate optimism bias in the design of bids – and risky choices of host cities and organizing strategies. Bids are often conceived with a view to winning first and asking questions later, with the plans formulated for a fraction of the overall financial commitment and subject to high levels of uncertainty. This systematic underestimation of costs and risks in planning and construction programmes has led former IOC Vice-President Dick Point to describe bid documents as the "most beautiful fiction".
- Last, popular trends in the contemporary world of governing – towards hands-off regulation, risk management, market solutions and standardization of crisis responses – tends to give rise to risk-based and just-in-time logics of coping strategies. The coordination of such strategies is itself a heroic task in the fragmented system of public and private spheres of authority; extending from international organisations such as the IOC to national or metropolitan governments, as well as to Olympic-specific organisations such as the organizing committee (OCOG) or quasi-public infrastructure



and delivery authorities. This creates further potential for bureaucratic politics and the over- or under-lap of organisational responsibilities.

In the table hereunder, we note four different approaches ('recipes') for the mitigation of risks inherent to mega-event characteristics and organizational vulnerabilities.

<p><b>Wisdom of crowds</b> Reliance on decentralized market-type and pricing mechanisms</p>	<p><b>Central steering</b> Reliance on hierarchical oversight and the muscle of the state</p>
<p><b>Czars</b> Reliance in individual policy entrepreneurs to lead projects and bash heads together</p>	<p><b>All-in-one-room decision-making</b> Reliance on collective decision-making that incorporates different/opposite views</p>

Each one of these recipes for decision-making offers certain strengths – but at the same time are prone to particular side-effects or weaknesses. For example, a reliance on ‘czars’ gives power to high-profile executives to offer organizational leadership and a public face to the outside world, so that ‘the buck stops here’ in terms of responsibility for crisis responses. However, at the same time the importance of individuals can over-accentuate the reputational damage of small errors and mistakes, while organizational or operational czars can sometimes become at odds with their political masters. Likewise, reliance upon collective decision-making ensures representation of a wide range of views and coverage of a myriad of risk and crisis possibilities. These same structures can, however, encourage indecisiveness and unclear responsibilities. The ‘wisdom of the crowds’ refers to use of decentralized or market-based ‘discovery processes’. These lack central authority and planning powers, however. Last, ‘central steering’ provides for decisive action, but also can be inefficient due to the informational distance and

time-lag between decisions at the centre about crisis responses and implementation on the Olympics site.

It is not surprising that our analysis identifies mixed approaches through the organizational history of the Olympics. Comparing recipes for Olympics post-1945, it identifies a broad shift in emphasis from a dominance of central steering and all-in-one-room organizing recipes towards an increased influence of czars and the wisdom of crowds. Whether choice of the latter – in particular reliance upon private finance – will continue to grow in prominence in the light of the global credit crunch remains to be seen. The wider implications of this comparative analysis of organizing recipes is to advocate the importance of hybrid solutions that mix at least two of the different recipes outlined in the table. Such an approach can reduce inherent weaknesses. There is a growing consciousness of risk and crisis scenarios in Olympic planning. It is arguable that London 2012 will be the first ‘risk-based Games’ with its systematic application of risk-based approaches across the wide terrain of Olympic governance. However, the historical mixture of organizing strategies does not reflect a conscious formulation of particular recipes, but rather indicates ad hoc and reactive responses to organizational experiences.

Mega-events such as the Olympics are highly vulnerable to incidents that provoke major, if not mega-crises. The good news is that with the exception of the Munich Massacre of 1972, other incidents have been minor in comparison and contained within their particular geographical or operational jurisdiction. Thus, terror attacks or operational failures at the periphery can be insulated so they do not affect the overall integrity of the Games. The ultimate stress-test is, however, still outstanding and the challenge for analyses such as this is to learn lessons from an event where potential risks or crises consist of empirical samples of one or fewer.

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# Risks to Food Security: Contingency Planning for Agri-Mega-crises

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## **A dangerous imbalance**

The global food chain, a critical infrastructure, has become highly vulnerable. This issue is often not comprehended or seriously addressed by national governments. The enormous variety of food products in the supermarkets induces a false sense of security. There are about 105 nations, including The Netherlands, which are permanently dependent on food grain imports to have enough basic food for their citizens and for livestock production. On the other hand, there are *only* 5 countries that produce cereal grains significantly beyond their own internal requirements: USA, France, Argentina, Australia, and Canada.

Significant food reserves do not exist in the world. The global grain market is already so tight that much higher prices developed in 2007 and 2008, which pushed 115 million more people into malnutrition. Severe future droughts in China, India, or the USA, as well as other hazards, are likely to cause critical grain yield reductions at some time in the future. Then the global demand for food imports will exceed the volume of food grains available on the world market. Very steep price rises and food shortages may lead even to large-scale famine. Financial reserves do not guarantee food grain imports and cannot prevent a mega-food-crisis. All the 105 countries requiring permanent food grain imports are at risk, including The Netherlands.

## **Changes in the global food system**

How did the precarious current situation arise? All continents, including Africa, remained essentially

self-sufficient in food production until the 1930s and produced a surplus of food grains (Table 1). Only Western Europe required large food-grain imports as its agriculture had shifted away from self-sufficiency towards cash crops. This trend was followed globally. Today, a staggering total of ca 105 nations require permanent food grain imports.

The Netherlands has an annual grain production of ca 1.7 million tons while importing ca 8 million tons per year. Therefore, grain imports are a crucial link in the food chain in The Netherlands. If there would not be sufficient food-grains for sale on the world market, steep price rises and shortages could cause a severe crisis in the food infrastructure of The Netherlands.

## **The elimination of food grain reserves and national food security**

Economists in the 1970s advised governments to do away with food reserves, arguing that it is cheaper to have money reserves in the bank to purchase food than to store actual food in silos. Such economic and food policy views, presented as good for global trade and a more integrated world won the day. Hence we live today in a world without any substantial food reserves, except perhaps in China. The concept that developing countries should feed themselves was portrayed as an anachronism from a bygone era. The changes in the global food system carry a high risk for individual nations.

## **Conclusions and policy recommendations**

The global food-grain production is dangerously

**Table 1: The increasingly unbalanced global pattern of net imports and exports of food grains (in million tons) per continent or region.**

Sources: U.S. Department of Agriculture and S.H. Schneider, *The Genesis Strategy: Climate and Global Survival*, New York: Plenum Press, 1976.

Region	1934-38	1948-52	1960	1970	1976
North America	+5	+23	+39	+56	+94
Latin America	+9	+1	0	+4	-3
Western Europe	-24	-22	-25	-30	-17
Eastern Europe and USSR	+5	0	+1	+1	-25
Africa	+1	0	-2	-5	-10
Asia	+2	-6	-17	-34	-47
Australia and New Zealand	+3	+3	+6	+12	+8

Plus sign indicates net grain exports;  
minus sign indicates net grain imports.

imbalanced, as only 5 nations grow most of the volume traded on the world market, while 105 nations are permanently dependent on imports. World grain stocks are very low. Therefore, major crop failures, which are likely to occur in the future, cannot be buffered. Significant cracks in the system already appeared in 2007 and 2008, when the “cheap” imports of food grains became very expensive, due to lower yields and a very tight market. Commodity prices of basic foodstuffs rose to record levels. Food riots erupted in developing countries across the globe. In a resolution on rising food prices in the EU and in the developing countries, the European Parliament (2008) pointed out “that

current EU cereal stocks would last only 30 days, and questions whether our food stocks are at the right level, especially in view of possible crises; asks the Commission to develop strategies to set up food stocks to prevent future crises”.

A number of contingencies, i.e. negative future developments, are outlined below. Two main policy recommendations are given in terms of contingency and preparedness planning to mitigate the impact of future agri-mega-crisis.

*Contingency 1: drought in china and/or india*

Drought caused catastrophic crop yield reductions and massive famine in the past, particularly in China and India. Severe future drought in these most populous nations in the world may cause a demand for food grains that cannot be buffered by the world market.

*Contingency 2: drought in the united states*

Drought affected the United States in the 1930s, 1950s, 1970s and 1990s. If the past cyclicality would continue, severe drought in North America might recur in the period 2010-2020. Future yield reductions may cause grave shortages of food grains on the world market, because the USA supplies one third (80 million tons) of all food grains traded annually (240 million tons).

*Contingency 3: loosing too many farmers*

The unprecedented changes in the global food system during the past 40 years have caused great difficulties for local farmers. The lamentations of farmers are being heard the world over: in the USA, in Canada, in Europe,







in developing countries. The farmers are the basic players in agricultural production. The food production sector is not just another economic branch, but a *critical infrastructure*.

*Contingency 4. The current financial-economic crisis*

The financial crisis that began in the USA in 2007 may worsen. The USA has the largest debt of any nation in the world, \$ 12,300 trillion, and also a large trade deficit. If hyperinflation would strike the dollar and the USA, what will be the respective effect on large corporate agri-business and family farms? What will be the effect on the large share (30%) of food-grain production by the USA for export on the world market?

*Policy recommendation 1: the establishment of food grain reserves*

The day may come that money reserves cannot be exchanged for food in future agri-mega-crisis, as the scanty reserves become depleted. Therefore, the most robust contingency planning is undoubtedly the establishment and maintenance of food-grain reserves on a national level. The government and private sector should cooperate to establish and maintain such grain reserves, which can prevent steep price rises and lessen the intensity of conflict for available food resources.

*Policy recommendation 2: safeguarding the local farming sector*

Assessments can be made in each country or region, how many farmers and how much farming land and water are needed to produce food for the entire population in emergency situations. Sufficient reserves of arable land should be retained for use in global agri-mega-crises.

Food production not just another economic branch, but a critical infrastructure

# The Mega-crisis Unknown Territory

## In Search of Conceptual and Strategic Breakthroughs

The world of crises appears to evolve very fast. Beyond mere specific events, we have to deal with fault-line convergences and global systemic dislocations. In short: from the 1976 Seveso accident to the 2008 global economic meltdown; from the sudden meningitis outbreak in that school to a worldwide unknown pandemic. We are entering the Mega-crisis era.

This is not “something more”, but “something else”. We had the intellectual framework and the operational answers; we are now left with a blank page, in a new territory, adrift with no compass, but with the demand to find some new orientation, and decisional and managerial capacities.

We are discovering that any disturbance can stir multi-dimension phenomena, each fault-line (economic, for instance) connecting to another (social), and another (violence), etc. The contamination is not only “rapid”: it appears “instantly systemic”. The best analogy is the super-cooled liquid, which appears “normal” and can, after just a slight blow, abruptly crystallize. That kind of environment defies our basic Cartesian logic, which sustains our visions, organizational design, and even crisis philosophy. The obsession must be, as ever in crisis, to avoid “fighting the last war”.

**Patrick Lagadec**

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What are the main characteristics of “Mega-Crises”?

- **Global dislocation.** The focus is no longer the “event” (and its “domino effects”), but the potential liquefaction of our bedrocks, disintegration of links, destruction of most basic references – which open the way to “black hole” dynamics swallowing everything and every usual mode of response.
- **Multiple concomitant and interlinked scenes of crises.** Even if “all hazards” approaches are always recommended, our basic philosophy of disaster and crisis management is still event-focused and channeled. Multiple scenes and kinds of crises now confront us, at the same time, each of them feeding the others – like rogue waves that take their colossal energy from other nearby waves.
- **Systemic blackouts.** The problem is no longer the possible domino effect from one system to another but the global common freezing of all, since interdependencies are now total. A world without borders opens the way to crises without borders.
- **Instant crystallizing dynamics.** The time scale is just compressed to nothing. Our systems, especially social systems, are in “super-cooled” phase, exposed to abrupt possible crystallization.
- **From accidental failure to embedded function.** We were prepared to think of the world as stable, with some “accidents” from time to time; to see crises as difficult moments to navigate before coming back to normalcy – and even as opportunities to exploit to be stronger after the crisis. Here comes a world whose very “engine” is Mega-Crisis itself – the principle of evolution. The challenge is no longer to make sure the sea remains calm, but to be prepared to sail basically stormy, wild, uncharted oceans.

A definition to capture this new state of the world could sound like:

**Mega-Crisis:** “The embedded engine of a chaotic world that evolves and mutates through global dynamics whose texture is made up of complex, unstable webs of constant, global, major dislocations.”

Such a vista calls for reinvented landmarks and practices. We have to go much beyond Cartesian logic and be able to think a new way, and grasp chaotic dynamics. More: we have to be prepared to *be surprised*, and not prepared to have plans to avoid surprise. We are going to need leaders, able to *shape futures*, and not only managers trained to apply the “best known practices”. We have to be ready to *empower people*, and not only to “reassure” everybody that “everything is under control” before the crisis, and then to impose a decaying “Command and Control” philosophy. We must be prepared to search for “*strange*” signals, and not only “weak” signals. We have to train students to this new world that demands new answers, and not just teach them the “crisis manuals” published in the 90s. Being prepared to Terra Incognita is the vital request.

I would like to focus on one already operational and tested approach: the *Rapid Reflection Force*. Leaders must have at hand people who are familiar with engaging chaos and who are given to thinking openly in unreadable situations. The concept and practice of the *Rapid Reflection Force* – RFF – has been forged to foster and protect the ability to open questions and forge new initiatives. It has been implemented for example in EDF (Electricité de France, the premier French public utility in the energy sector, and the leading worldwide nuclear operator). Along with the more conventional crisis teams – operations, communication, logistics, and top management – such RRF teams engage in four broad lines of questioning:

- **What is the essence of the problem?** The intelligence front involves a constant battle to frame, anticipate, detect and clarify the nature of the crisis, surprises, chain reactions, escalation dynamics, and the general mutations that can be triggered. By definition, it is not possible to grasp all the essential issues at stake in a crisis that is new, unclear and chaotic.
- **What are the major pitfalls?** When the pressure of events becomes extreme, when bearings are lost, the normal tendency is to become mired in highly counter-productive ruts. It is crucial, immediately, to think about the major stumbling blocks to avoid. And the first is a wrong framing of the issue – which can mutate at any time.
- **What is the map of actors; what networks are needed?** The new issues will have to be handled with new players. New maps will be needed both for diagnosis and for



action, and they will have to be adjusted or remodeled throughout the ordeal.

- **What constructive initiatives can the RFF suggest?** The most important thing is not to pore over statistical lists or to compile all the information possible, but rather to try to discern one or a few critical initiatives that could introduce “a new ballgame”, help us escape our crisis-induced mental ruts, and launch “virtuous circles”.

Experience shows that these Rapid Reflection Forces are crucial for Executive Committees, from blowing the whistle (“there is a crisis, wake up”), to re-checking the organizational response, and above all to outline some creative initiatives to transform the global dynamics. After two years of implementation, the quintessential power of the Rapid Reflection Force innovation is coming to the fore. Fundamentally, the RRF is not just another organizational tool providing additional answers. The RRF manifests the necessity of an open-minded, questioning, creative stance, beyond the usual mere application of previous models and mindsets.

Beyond specific responses, what we vitally need is the capacity to launch initiatives to develop new ways of thinking and acting – something we have labeled the “Magellan Initiative” to link an open number of people who try, at an international level, to understand and tackle the issues related to emerging mega-crises.



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### Exercising leadership in “true crises” differs dramatically from leading in “routine emergencies.”

Emergency response organizations – whether in the civilian or defense sector – have been developed mainly to mobilize for and contend with recurring (or potentially recurring) events that can harm society: “routine emergencies.” These may be natural disasters, infectious diseases, technology failures, terrorism, or acts of war. We call such emergencies “routine” here not because they are small (they may indeed threaten very severe loss of lives, property, and quality of life), but because society can anticipate their general type, features, and consequences.

# Leading in Crises

Because society can *anticipate*, it can *prepare*. It reduces loss from these emergencies by planning for contingencies, creating specialized organizations, assembling and training people, procuring and deploying resources, practicing through discussion-based and live-action drills, operating in periodic real emergencies, and applying lessons derived from this experience to the next round of preparation. Developing the capacity and skill to deal with routine emergencies is a substantial and necessary achievement to protect what we hold dear.

More rarely but quite importantly, however, emergency response organizations must confront challenges that dramatically confound expectations and plans. These situations are differentiated by major dimensions of *novelty* – in the form of threats never before seen, response demands that vastly exceed the scale of readily available response capacity, or familiar emergencies presenting in unprecedented combinations or complexity. We term these very severe threats “true crises” to call attention to the fact that the strategies and resources we have prepared for responding to routine emergencies may prove inappropriate, grossly inadequate, or even counterproductive in managing these situations. Hence, different modes of preparation, organization, and leadership are needed to cope with these unprecedented demands.

Both modes of emergency action are essential. Robust response to routine emergencies is crucial because these threats recur more or less frequently and can produce widespread, even dire, losses. But in true crises, because of novel demands, response organizations need to *adapt* swiftly. They necessarily must depart from prepared tactics and reactions ingrained by past experience – by combining discrete capabilities in new patterns or improvising responses as the unanticipated

conditions dictate. Response organizations must thus learn to operate in *both* modes effectively: in routine emergencies reaping the benefits in effectiveness, efficiency, and safety that well-honed response can provide; while in crises being able, first, to recognize the appearance of novelty that may invalidate ordinary tactics and then flexibly moving to invent and implement innovative responses.

### What are the leadership practices that enable response organizations to function in these two modes?

Effective leadership “in the moment” of routine emergencies is importantly rooted in expertise and authority. Training and rich, professional experience inform strategic approaches and shape decisions; they also inspire followers’ confidence and trust. Such leadership is authority-based, too – at the highest levels, leaders set goals and strategies, allocate resources, though often leaving discretion in implementation to operational leaders; closer to the action, leaders tend to be more directive. They infrequently implement plans exactly as written; but plans, preparation, and practice allow the leaders of response organizations to aim for a precision of execution that increases effectiveness and protects bystanders and responders alike.

### How do the leadership demands of true crises differ?

The presence of significant novelty means that no one is truly expert in terms of comprehensive training, planning, or experience. As crises evolve, moreover, there are frequently additional negative surprises in the form of follow-on events or the surfacing of weaknesses that have been finessed in the past. This is a normal feature of crisis events – for which leaders need to be prepared.

Though the expertise of many people may be helpful, it may not be immediately obvious what skills and

knowledge are needed. As the situation slowly clarifies or continues to evolve, leaders must be prepared to reach out more broadly than usual – perhaps repeatedly and beyond the boundaries of the response organization – to draw in people with relevant perspectives and experience.

They can expect, however, that advisers with different backgrounds will sometimes provide conflicting advice. Leaders must also expect that their advisers will come with the “cognitive biases” that all human beings have: ingrained perspectives developed from past successful experiences that frequently lead them to overvalue their ability to predict the course of events, discount information that contradicts their expectations, allow issues to become personal rather than maintain perspective, and escalate commitment to poorly performing strategies rather than reconsider their choices. Effective leaders must be aware of their own and others’ biases and take steps individually or organizationally to “counter-program” – that is, to push back and question, while sifting these ideas for useful insights that will help in combating novel challenges.

A critical operational challenge of crisis response, therefore, is developing and then maintaining “situational awareness” in the face of novelty and rapidly evolving circumstances. This is often extremely difficult since, by contrast with routine emergencies, leaders may not fully understand the situation, be aware of all relevant variables, or be able to collect and assess relevant data, particularly in the early stages when confusion, communication failures, and the consequences of physical damage impede awareness.

Thus, under tumultuous conditions, effective crisis leaders must orchestrate a process of substantial strategic and operational *adaptation*. Coping with true crises is about ingenuity, improvisation, invention, and creativity under pressure and in the presence of fear – rather than a matter of triggering practiced routines, applying previously determined answers or rules, or looking for a technical fix.

This is at least as much a political and emotional process as it is a cognitive, technical, or engineering problem. Leaders must reach out and flexibly coordinate the responders’ adjustment to the new reality, some parts of which may demand painful adaptation. Inevitably crises entail real and significant losses. This reality often unleashes strong emotional reactions, including grief. The most effective leaders acknowledge these reactions and allow and help people to cope with their emotions. When sacrifices are necessary, they ask for them directly, not assuming that people will figure out what is required. But, to justify sacrifice, they also affirm and redefine core institutional values, model behaviors that focus attention on these values and priorities, and provide authentic confidence and hope that trying times will yield to better ones.

The leadership approach and skills necessary to succeed in confronting the novelty of true crises differ in significant respects from those appropriate for routine emergencies. Neither approach can dominate, however, since leaders of emergency response organizations are likely to need both sets of skills during their careers. We need them to prepare effectively for predictable forms of routine emergencies. Planning, training, practice, and experience make it possible to respond to these dangers efficiently and knowledgeably; this type of preparation will yield huge gains in dealing with the predictable events, perhaps quite severe and threatening, that responders will most frequently encounter. But we also need emergency response leaders to develop the skills necessary to cope with the unique demands of novel events, where creativity and improvisation will be crucial, and leadership must be less directive and more collaborative. This requires different approaches to training and other forms of preparation.

In selecting and grooming leaders, therefore, we need explicitly to recognize the criticality of being capable of “ambidextrous” methods and prepare our leaders and response organizations for the challenges of both routine emergencies and true crises.

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Human intervention, particularly in the interests of flood protection, is a necessary part of living in a delta. Traditionally, intervention was standard practice in the Netherlands to prevent the waters encroaching. The country's response to the disastrous flood of 1953 was 'Never again!' Although Dutch flood defences have never been better than they are now, the risk of flooding cannot be completely eliminated. In the past, floods were accepted as a fact of life, but today they are considered very unusual. So now that the obvious risk has disappeared, and with it the sense of urgency, a false sense of security could blind us to a crisis waiting to happen. In this article, we explore the dilemmas involved in maintaining a high flood defence level while focusing on the consequences of flood protection and its potential to assume mega-crisis proportions.

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# Living in the Dutch Delta: Waiting for a Mega-crisis?

## **Flood protection in the Netherlands from a historical perspective**

Land reclamation and flooding are an intrinsic part of Dutch history. Since the Middle Ages, the country has been building an infrastructure which makes it possible to live and work in the delta. Whenever flooding occurred, defence embankments were constructed or reconstructed. The continual battle against the sea shaped the Netherlands and influenced its culture and society. The great flood of 1953 was a turning point in attitudes to flood protection, and prevention in particular. For instance, the Delta Commission

developed a new approach to safety based on a system of costs and benefits. Following the high water and flooding in the 1990s, a programme was drawn up for strengthening the dikes and the concept of 'space for the river' was introduced, which laid down requirements for development in flood plains. The current flood protection levels were laid down in the 1996 Flood Defences Act.

## **Flood protection is not just about prevention: it includes spatial planning and crisis management**

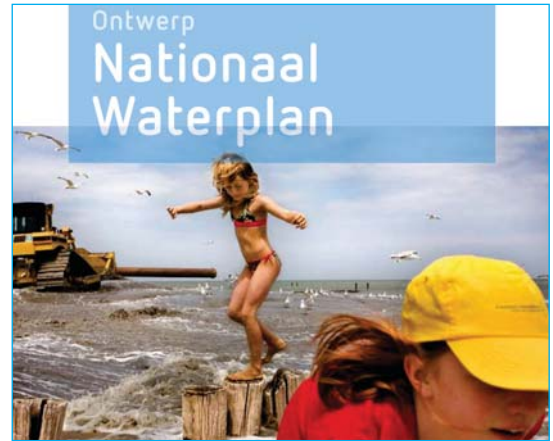
With the post-1953 flood defence measures in place,



people (including public servants) felt that the battle against the sea had been won. In retrospect, the measures appear to have influenced the Dutch sense of security. These days, floods are no longer viewed as natural phenomena and a fact of life, but are increasingly regarded as an external security risk against which we can protect ourselves with a reasonable degree of success. In the meantime, the population of the Netherlands has grown from 10 to 16 million, 9 million of whom live in areas that lie below the Amsterdam Ordinance Datum (NAP). GNP has grown to €400 billion, of which 70% is generated below NAP. The consequences of coastal or riverine flooding would be dire, possibly even 'catastrophic', as the Ministry of the Interior wrote in 2008.

From a non-Dutch viewpoint, these statistics may look rather peculiar. But is it really so strange that 60% of the country lies below NAP? The current reality is that protective measures can create excellent conditions for living and working in areas which would otherwise be extremely vulnerable. However, the risk cannot be completely eliminated and will always be present. Put into perspective, flooding is just one of a wide range of risks to which society is exposed.

Following a policy evaluation in 2004 by the National Institute of Public Health and Environmental Protection (RIVM) and in the aftermath of Hurricane Katrina (2005)

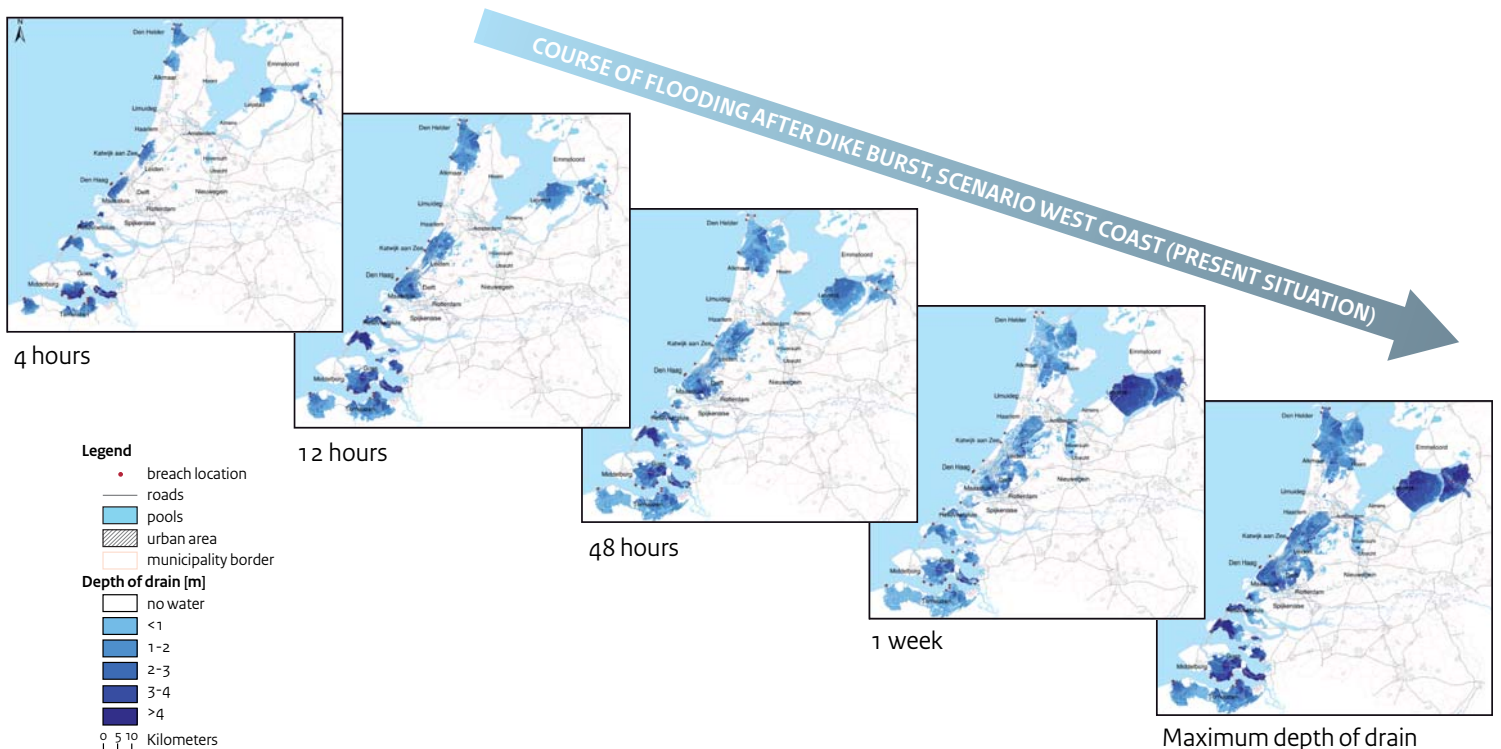


and – to a lesser degree – the tsunami in Asia (2004) and floods in Central Europe and Great Britain, the scope of flood protection in the Netherlands was extended in the draft National Water Plan. Flood defence standards have been revised and, where possible, tightened and a structural approach will be taken to the effects of flooding. In addition to prevention, there are separate pillars for crisis management and spatial planning.

### Dilemmas

#### Limited risk awareness

Dutch society is no longer confronted by the direct prospect of flooding. Indeed, in the popular mind, the likelihood of ever experiencing floods is minimal, thanks to highly effective flood defences. Floods have disappeared from the collective memory of the Dutch, propelled by the minimal probability and sense of having beaten the elements. For the authorities and



members of the general public, devising possible measures for the future is no longer part of risk awareness. So, if we attach importance to being prepared, we will need an external stimulus that is linked to measurable targets.

#### *Protection versus crisis management*

Investment in flood protection is financed from taxes, and each euro can only be spent once. An interesting question is how the investment should be assessed: is it purely a matter of economic costs and benefits, allowing for a possible death toll? Or are there other factors to be considered, such as the public's expectation that their leaders, whether democratically elected or not, will take sensible measures in times of crisis? And in that case, what would be an acceptable level at which to scale preparations and operations?

Recent interventions during the credit crisis offer interesting grounds for comparison. The sudden collapse of a bank led to a five-fold increase in the state guarantee on savings. Considerable investment has been made in order to keep the banks going and prevent the situation from worsening, but this has sharply increased the budget deficit. Actions described as sensible leadership at the time the measures were taken may later be criticised and seen as taking unacceptable risks.

We are still faced with the ultimate question about the relationship between prevention, spatial planning and crisis management in the interests of flood protection. If the dikes do burst, what choices will have to be made and what will be considered acceptable?

#### *Various scenarios*

In practice, crisis management is a flexible system that serves to organise action in virtually any situation. The question is whether this system can function efficiently in the event of a major crisis or a disaster on an extreme scale (mega-crisis). Designing flood protection in the Netherlands means preparing for events that are unlikely, but could nevertheless have catastrophic results and rapidly affect much of the country. In planning for a catastrophe, one option is to base the planning on possible scenarios. This would strengthen the responsiveness of the people involved, enable them to take their own measures and eventually make the entire system of crisis management more resilient. The expected extent of the flooding and the time available strongly influence the type of precautions that can and will be taken. A set of different scenarios generates different 'optimum' crisis management strategies. That is why it is essential to take account of various possibilities, including worst case scenarios. By the same token, the expected impact on the population must also be calculated.

#### *Decision-making means dealing with uncertainty – especially if evacuation is necessary*

If floods occur, there are usually warning signs several hours or days beforehand which give us time to take precautions before the dikes give way. By definition, warning signs are uncertain, so until the moment when the dikes actually break, the issues of *whether*, *where* and *to what extent* they may break will also remain uncertain. One of the dilemmas is how to deal with this uncertainty and choose measures whose effects are also uncertain. If evacuation is necessary, how many people will comply with the request or obligation to evacuate, and behave as directed by the government? In decision-making, the dilemma is knowing which option to choose. Should the emphasis be on controlling the entire system or should we focus on a number of crucial sub-issues such as designating relatively safe and accessible locations, and ensuring a rapid national recovery after the disaster?

#### *Conclusion*

These are some of the dilemmas inherent in the Dutch approach to large-scale flooding as a type of mega-crisis. In view of the likely impact on Dutch society and security policy, flooding constitutes a potential mega-crisis – as the floods of 1953 demonstrated. Planning for the consequences of flooding is an integral part of flood protection and should be organised as such. We hope that this will contribute to discussion and deliberation about the best ways to deal with extreme events above and beyond the standard system of resilient crisis management and a self-sufficient population.



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# Four questions to:



*Louise K. Comfort,  
Professor Public and International Affairs,  
University of Pittsburgh, Pittsburgh*

## **What was your initial involvement in (mega) crisis management research?**

“I first became involved in crisis management research when I started teaching in the Master’s Program in Public Administration at San Jose State University in San Jose, California. The MPA degree is the terminal degree for public service professionals, and in my seminars were fire captains, police lieutenants, and engineers from Public Works Departments. These students asked for assistance as they sought to develop emergency plans for their communities. I had been fascinated with the theoretical problem of decision making under uncertainty since graduate school, and I realized that managing disaster was a classic form of ‘decision making under uncertainty.’ Disaster environments then became my field study area for both research and teaching. Since 1985, I have engaged in field studies of earthquakes, hurricanes, floods, wildland fires, and the 9/11 terrorist attacks.”

## **What makes a crisis a mega-crisis?**

“The size, scope, and scale of a disaster determine whether it is a mega-crisis, a crisis, or a routine emergency. There are other criteria as well; the degree of novelty, the complexity of interactions among actors, and their interdependence with fundamental social and economic functions all increase the likely impact of a damaging event upon a geopolitical region. A full-scale mega-crisis will have a global impact and disrupt normal operations in not just one, but many nations. The impending consequences of climate change, for example, are likely to

trigger fundamental changes in exposure to hazards around the world, such as the melting of glacial ice in the Arctic, mounting sea levels, increasing frequency and severity of hurricanes that threaten coastal cities, spreading desertification in increasingly arid areas of North America, Africa, and the Middle East. The current threat of H1N1 influenza has the potential for escalating into a global pandemic, as did the Spanish flu of 1918. Interestingly, concerted efforts are now being taken globally to avert this negative outcome.”

## **What are promising ways to prevent mega-risks from materializing?**

“Three ways to prevent mega-risks from becoming mega-crises are increasingly important.

First, innovative technologies are being developed and introduced into many fields for monitoring, measuring, and modelling the changing conditions in our physical, engineered, and economic/social environments. For example, advances in medicine have led to new vaccines to reduce the risk of infectious diseases; innovative methods and materials in engineering have resulted in strengthened infrastructure in buildings, transportation systems, and energy production. Using these technologies allows managers to identify risks before they occur, and to take intervening actions before they escalate into seriously destructive events.

Second, integrating such technologies effectively into policy and practice leads to

the development of a more professional and comprehensive knowledge base for a community exposed to risk. As both managers and citizens gain access to such a knowledge base, the level of awareness and capacity for informed action to reduce risk among both professional emergency personnel and the citizenry increases.

Third, it is imperative to develop a culture of prevention in which all members of the society accept responsibility for reducing their exposure to risk and the degree to which such risk can spread. Governmental agencies have the legal responsibility for initiating such a change in culture. It will require changes in policy, to be sure, but also demonstration, practice, education, and timely feedback among the actors.”

## **What were the key aspects of mega-crisis management that were discussed during the conference?**

“Many aspects of mega-crisis management were discussed at the conference, but three key aspects included the:

1. importance of communication and design of sociotechnical systems to facilitate the search and exchange of timely, valid information among actors participating in response operations;
2. engagement of citizens as active participants in managing community response to a major event; and
3. importance of continuing inquiry into the causes of disaster from technical, organizational, and cultural/scientific perspectives.”