1 June 2010 | Draft

Enabling Collective Intelligence in Response to Emergencies

Illustrated by the case of deep oil spill containment

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Introduction

The response to the BP Deepwater Horizon Oil Spill (2010), acknowledged as the greatest recent environmental disaster, is used here to summarize and illustrate the challenge of enabling collective intelligence in response to emergencies. The focus is therefore less on the oil spill disaster and more on how intelligence is gathered of relevance to emergencies for which no immediate solution is found.

The argument follows from work over an extended period on the Global Strategies Project. This profiled strategies advocated or undertaken by international constituencies in response to world problems -- themselves profiled in a related World Problems Project.

Expertise and arrogant assumptions

In the case of technical disasters, it is typically assumed that there is a wide pool of relevant expertise which can be tapped. This has been evident in the case of the BP oil spill in which many subcontractors had obligations activated by the crisis and into which other oil industry companies were drawn -- if only to protect the industry against loss of reputation and subsequent restrictive legislation.

The crisis has however made evident that the expertise involved in deep water drilling was not adequate to the the procedures used. However a case is made that they were indeed adequate but that the operating procedures had not been appropriately followed. Also emerging are indications that the materials used were insufficiently strong in terms of requirements -- in order to reduce costs. It has also become apparent that government agencies were complicit in waiving an appropriate level of oversight -- in the interests of facilitating the drilling process.

Clearly such endeavours are undertaken in the light of a number of known risks and in the expectation that unforeseen risks can be managed appropriately. It is also clear that these assumptions were mistaken. It remains to be discovered to what extent they reflect a culture of arrogance and indifference within the oil industry.

More generally the disasters highlights that such mindsets and conditions may be associated with other uses of technology. Examples include: genetic engineering, satellites (especially in terms of the huge accumulation of dangerous space debris), pharmaceutical initiatives (as with recent controversy surrounding the flu vaccine), failures of supposedly secure information systems (release of confidential data, etc). New technologies enthusiastically proposed repeatedly appear to ignore such possibilities.

Enabling timely gathering of remedial collective intelligence

It appears to be the case that the disciplines, and the bodies through which their technologies and expertise are applied, are to be understood as dysfunctionally fragmented in practice -- at least in terms of tapping collective intelligence to offer indications of potential remedies.

A distinction needs to be made between:

- the considerable expertise available in the light of experience -- distilled into codes of best practice, possibly associated with various forms of regulation, inspection and oversight
- the expertise which may prove to be relevant in the face of unforeseen disasters, namely in the course of the disaster -- as illustrated by the BP oil spill. Other expertise may however then be relevant, as is evident from the repeated failures of best practice and the highest expertise in response to that oil spill -- with all the innovative insight that the oil industry could bring to bear, whatever the cost.

If the lines of communication for assembling expertise are adequate in the first case, the question is whether the process of gathering collective intelligence is "fit for purpose" in the second case.

The concern here is how remedial suggestions get elicited and gathered and whether this is adequate to the challenge -- especially when delays clearly aggravate the disaster. For how much time is it appropriate to rely on the arrogant promise of conventional expertise and its application when people and environments are hurting?

Mistaken intelligence gathering assumptions in a knowledge society

Much is made of the many communication facilities through which information can be gathered. The question to be asked is how fit they are in the case of emergencies, in the light of the common tendency to exaggerate their adequacy in the service of other agendas. The issue here is what is an outsider enabled to do with an insight that may be of some value. Examples of possibilities include:

- write to a conventional newspaper, journal, etc -- possibly using online comment facilities regarding articles on the issue (as with the *Guardian*, for example)
- telephone key people in such media
- post a message on a discussion list
- e-mail key individuals capable of passing on information to others who are better placed
- use of social networking sites and facilities
- contact the relevant parties (in the case BP or oil industry bodies)
- contact relevant national government departments or agencies
- contact relevant intergovernmental agencies
- contact relevant nongovernmental agencies (in this case Friends of the Earth, Greenpeace, etc)
- raise issues in face-to-face meetings, consultations and the like ("questions from the floor" etc)

Various considerations apply to one or more such possibilities inhibiting uptake of the message and its timely channelling to points where it can be appropriately considered:

- phone communications: typically this involves being placed "on hold" or receive some kind of "brush off"
- e-mail communications: typically, when unsolicited, these run the risk of being the victim of spam filtering
- list postings: typically such lists are not designed to gather and store intelligence but rather to allow people to sound off in the moment. the content is then more or less instantly forgettable, although there is always the possibility that the communication will be copied on to more relevant lists and contexts. More problematic is the extent to which such lists may compete for content and have a vested interest in ensuring that it is not passed on to be juxtaposed or melded with related insights
- key people to whom one has access typically are themselves aware of being in a similar situation of being unsure to whom information could be usefully communicated
- relevant bodies: typically, as with academic bodies, when these do take up issues it is with considerable delay (as with journal issues, agenda setting for future meetings, etc). they are not designed to respond to emergencies
- competent bodies: typically in the case of bodies much closer to the crisis (in this case oil industry bodies or BP itself), they are in a mode which is partly defensive, partly needing to assert that the relevant expertise if being applied, and partly challenging the qualifications of the communicant -- irrespective of the potential value of the suggestion

Especially problematic issues include:

- all such facilities will claim, often claim vigorously and repeatedly, that they want the public to "write in" and "express their opinions" -- that they are attentive to such communications. However, as was illustrated by the BBC Blue Peter phone-in scandal (2007), the emphasis may well be on encouraging people in this way, but without the slightest attention of considering the replies, other than drawing one or other "out of the hat" in order to be able to claim publicly that attention is being given to such feedback. The ability to cite one or two is then used as evidence that all such comments are considered.
- the logistics and cost of processing the volumes of input for which such facilities appeal. This may lead to cynical response to such feedback in terms of citing the number of replies as though this implied their content had been considered.
- non-transparent processing of feedback in support of particular agendas, and notably to suppress unwelcome arguments
- manufacturing of consensus, or presentation of information to create the appearance of consensus, as so dramatically evident in the case of the "climate change consensus" leading to significant discrediting of the scientific community (now paralleled by a discrediting of the oil industry and its claims)

There is therefore a dangerous commitment to pretence and to unsubstantiated claims of openness to ideas -- possibly to be considered as a perversion of democratic processes.

Such considerations are of much more urgent relevance in the case of emergencies. However they also apply in terms of the consideration of possible alternatives to policies under consideration, as argued in more detail previously (*Framing the Global Future by Ignoring Alternatives: unfreezing categories as a vital necessity*, 2009; *Considering All the Strategic Options -- whilst ignoring alternatives and disclaiming cognitive protectionism*, 2009; *Enabling Strategies for Viable Futures*, 2009).

It is within this context that both appreciation and caution is required in response to the creation of the Deepwater Horizon Response; the official site of the Deepawater Horizon Unified Command which notes:

> BP has established a process to receive and review submitted suggestions, on how to stop the flow of oil or contain the spill emanating from the Mississippi Canyon 252 well. Proposals are reviewed for their technical feasibility and proof of application.
>
> More than 7,800 ideas have been proposed to date. Given this quantity of technical proposals suggested by industry professionals and the public, it may take some time to technically review each one....Feasible solutions will be forwarded for additional consideration.

At the time of writing (31 May 2010) links are provided to related discussions (170 Tweets, 30 Buzz, 920 Facebook, 23 Diggs). It is not immediately clear when the site was created in relation to the start of the crisis. Of concern is the extent to which this approach has been conflated with BP's heavy investment in portraying itself via the media as preoccupied with the environment -- an approach readily framed by critics as "greenwashing". This would be a logical way of absorbing the energy of critics by taking their suggestions and effectively placing them "on hold".

Deepwater Horizon Response Agency: Department of Homeland Security Office: United States Coast Guard (USCG) Solicitation Number: HSCG32-10-R-R00019 (featured in an interview on *Fix it: Bill Nye on oil disaster suggestions*, *CNN*, **10 June 2010**; see *CNN iReport*, *Oil disaster views and solutions*)
FAQ on US Federal Business Opportunities **Where can I find the U.S. Coast Guard's announcement seeking innovative technological ideas supporting the Deepwater Horizon Response efforts for the oil spill in the Gulf of Mexico?** The United States Coast Guard Research and Development Center (USCG RDC) issued Broad Agency Announcement (BAA) HSCG32-10-R-R00019 for the purpose of organizing the collection of -- and enhancing the Deepwater Horizon Response Team assessment of -- technology assistance offers in five technology gap areas: Oil Sensing Improvements to Response and Detection, Oil Wellhead Control and Submerged Oil Response, Traditional Oil Spill Response Technologies, Alternative Oil Spill Response Technologies, Oil Spill Damage Assessment and Restoration. Follow the instructions outlined in the BAA for submitting White Papers (written description of the idea) to the USCG RDC. [Primary point of contact: RDC-BAA-DHR@uscg.mil] The attached Broad Agency Announcement (BAA) [**4 June 2010**] issued under the provisions of the Federal Acquisition Regulations (FAR), Subparts 6.102(d)(2) and 35.016, provides for the submission of White Papers (written description of the idea) in support of the Deepwater Horizon Response. All submitted White Papers meeting the requirements of this BAA will be reviewed and evaluated as they are received. Each White Paper will undergo an initial screening. The initial screening will result in a determination that either (1) the White Paper has a potential for immediate benefit to the spill response effort, (2) the White Paper submission needs more detailed investigation or evaluation and will be forwarded to the appropriate Government Agency overseeing that portion of the Deepwater Horizon Response (EPA, MMS, NOAA, or USCG), or (3) the White Paper submission does not support this incident. A Contracting Officer will provide a response to all properly submitted White papers identifying the initial screening determination.
Other oil slick crowdsourcing projects (as identified on *CNN iReport*): http://grassrootsmapping.org/ http://www.gulfcoastspill.com/ http://oilspill.labucketbrigade.org/

15 June (Addendum) : A seemingly unrelated BP Oil Spill Suggestion Box crowdsourcing initiative has been established by Michael J. Evans (*BP Oil News: Independent Reporting on the BP Deepwater Horizon Gulf Oil Spillout*). Its website notes on 31 May 2010 the establishment by BP of a telephone hotline to take oil spill suggestions from the public. On 10 June, David Teeghman (*4 Feasible Oil-spill Ideas from the Public*, *Discovery News*) reported that the Deepwater Horizon Response facility had received more than 8,000 suggestions and had been shared on Facebook more than 1,500 times. Other reports indicated that in May, BP had fielded about 60,000 calls that yielded approximately 10,000 suggestions; about 2,500 individuals submitted forms with more detailed information, and BP further scrutinized 700 of those concepts (*Oil Spill Solutions Sought Online*, *Information Week*, 4 June 2010). Over 5,000 suggestions were now being received daily. BP and the U.S. Coast Guard reportedly had a 40-member team of technical and operational personnel charged with figuring out if any of the ideas had merit. On 9 June 2010, *BBC News* (*The oil spill: Your solutions*) reported on its solicitation of solutions from the general public (Finlo Rohrer, *Can ordinary people think of a way to stop the oil? BBC News*, 3 June 2010). Other media have reported on their own efforts at soliciting suggestions, and on the crowdsourcing process in general (Robert Mackey, *Times Readers Suggest Fixes for Oil Spill*, *The New York Times*, 3 June 2010). Attention has been widely drawn to the challenges of crowdsourcing (Lance Winslow, *BP Oil Spill - Crowd Sourcing to Find the Solution - Weeding Through the Suggestions*, *EzineArticles.com*, 27 May 2010). On 3 June 2010, a technology company launched a new website WhatShouldBPDo.com aimed to leverage such crowdsourcing by capturing a pool of useful and innovative ideas from concerned citizens around the world -- designed to organize the thousands of ideas flooding the telephone lines and e-mail inboxes of government agencies and oil company offices since the original explosion.

Extreme considerations in intelligence gathering

In considering the case of the BP oil spill, in the light of the challenges and possibilities outlined above, it is also useful to note the challenge of appropriate responses to extreme instances of collective intelligence gathering:

"Crack-pot" ideas: Any effort to enable collective intelligence is highly likely to encourage a quantity of "crack-pot" ideas. Under the circumstances of an emergency however the concern is to facilitate what amounts to "brainstorming" and to be cautious about premature closure on possibilities and condemnation of ideas. The challenge is to gather ideas and to enable judgemental processes to take place thereafter. Odd-ball ideas may trigger more appropriate responses or be essential to the design of such responses. Excessively strong gate-keeper functions may also discourage the subsequent supply of any feedback. In the case of the Deepwater Horizon oil spill there is of course the issue of the deprecation of "crackpot" ideas when the problem might be said to have arisen in the first place from the "cracking of the pot". Is drilling under those conditions, with inadequate precautionary measures, to be recognized as a "crackpot" idea in its own right?

Whistleblowing challenge: The role of whistleblowers in providing warnings of possible disaster has been much debated. In the case of the historically massive Ponzi scheme managed by Bernard Madoff, the role has been highlighted through the action of Harry Markopolos, over a 10-year period, in informing the U.S. Securities an Exchange Commission (SEC) that he believed it was legally and mathematically impossible to achieve the gains Madoff claimed to deliver (*No One Would Listen: a true financial thriller*, 2010).

Political and disciplinary "turf wars": Clearly no discipline or industry sector is happy to admit to lacking ideas (or to incompetence) in the face of emergencies, however evident the disaster, as in the case of the oil spill and the failure to contain it. Professional pride is such that there is a willingness to accept a worsening of the disaster -- greater loss of life, and environmental consequences -- rather than seek help from other domains, or to accept it when offered. This has notably been the case with the BP oil spill. Of notable relevance, in the case of Hurricane Katrina, was the failure of the USA to accept any assistance from Cuba -- with recognized capacity in handling the aftermath of such disasters.

Hoping and praying: Aside from the assertions made by faith-based groups that disasters should be interpreted as divine retribution (as in the case of Hurricane Katrina), such groups also encourage a process of "hoping" and "praying" that conventional remedial initiatives will succeed. A dangerous in this modality is when it inhibits more radical consideration of otherwise neglected options.

Military competence: Given the acclaimed emergency preparedness of the military, with regard to matters of "security" it is curious to note the considerable delays in engaging the immense technology and manpower resources in response to crises. One striking example was offered by the recent widespread flooding in the UK where it was widely remarked that a major concern was ensuring freshwater facilities for stranded homeowners. Despite considerable coverage of survival skills by the BBC in past years, those with such skills were not evident at the time of the disaster, nor were water purification pills made available. Rather relief was delayed until military involvement was ensured -- to deliver bottles of commercially available water.

Unexpected sources: Society celebrates human ingenuity and invention. Much computer technology and many applications have emerged from unexpected sources -- not from recognized sources. It is therefore curious that useful ideas in response to disastrous situations should be sought primarily from the bodies that have proven to be more than complicit in creating and exacerbating such disasters. If the complexity of disaster can be fruitfully compared to an intractable mathematical problem, it is relevant to note under what circumstances, and by whom, solutions to such problems emerge. An example is provided by the case of Grigori Perelman who recently provided a solution to the Poincaré conjecture -- viewed as one of the most important and difficult open problems in mathematics until it was solved. He refused the award that had been offered for the solution. An even more extreme example is provided by the mathematician Srinivasa Ramanujan.

Illustrative examples

The concern addressed here is partly inspired by personal experience with various proposals in response to issues which may be associated with a degree of urgency:

Call for "off-the-wall" research: In response to a call for unusual knowledge-related research proposals by the European Commission's FEST Project, a proposal was submitted by a 4-partner consortium suggesting a wide range of unusual approaches to framing the cognitive challenge of organizing collective undertakings and ensuring their sustainability and coherence (*Knowledge Gardening through Music: patterns of coherence for future African management as an alternative to Project Logic*, 2000). It was rejected by evaluators primarily because the proposal could not demonstrate in advance that it could achieve the results hypothesized by the research.

Application of mathematics to territorial disputes: Given the number of ongoing (often bloody) territorial disputes around the world, it is curious that no effort is made to apply an array of mathematical tools to the possibility of discovering other ways of reframing "territory". Such possibilities are discussed separately (*And When the Bombing Stops? Territorial conflict as a challenge to mathematicians*, 2000; *Reframing Relationships as a Mathematical Challenge: Jerusalem as a Parody of Current Interfaith Dialogue*, 1997).

Shortage of housing in urban areas: Many major metropolitan areas are faced with extreme and urgent pressures on accommodation. These lead to substandard living conditions, long commute times, increasing energy costs, and erosion of green belts and parklands -- with no relief in sight. Not only is no consideration given to the option of living underground to avoid some of these issues, but no attention is given as to the effective ownership of cubic volumes at varying depth beneath major cities. The major argument by evaluators is that they themselves would not wish to live underground -- irrespective of whether others might prefer that option to the conditions to which they now have to adapt. The issue is summarized separately (*From Lateral Thinking to Voluminous Thinking: unexplored options for subterranean habitats in dense urban areas*, 2007).

Reduction of population pressure: Any discussion of the dramatic resource challenges of a planet required to support ever increasing numbers of people tends to be avoided, especially when their is any implication of the desirability of reducing the numbers of people -- typically framed disparagingly as "culling". Other challenges (food, water, land, energy, environment, climate, etc) are then used as a means of obscuring the population issues which drive them, as previously summarized (*Mapping the Global Underground: Articulating Insightful Population Constraint Consideration*, 2010). In the spirit of brainstorming, and given the degree of attention to genetic engineering in many domains, there is a case for giving consideration to a full spectrum of possibilities which avoids the issues currently held to be objectionable, as discussed separately (*Challenge of Nonviolent Population Decimation: Reducing effects of overpopulation on resources and climate change by major reduction in the height of people*, 2007).

Oil spill containment: Instead of only trying to plug the underwater gusher in the Gulf of Mexico, a **complementary approach** would be to lower from the surface a columnar "collar" or tube (from 5-20 metres in diameter) -- or deploy it from the seabed to the surface around the gusher. This could be flexible plastic tube of high tensile strength (such as Mylar), rising from the seabed to the surface in sections (with buoyancy and stiffening rings), which need not be perfectly sealed -- indeed some gaps would be vital to ensure equalization of pressure the length of the column. A degree of sealing could be ensured on the sea bed, again not necessarily perfect -- however weighted and anchored. The aim is to confine much of the emerging oil to that column -- which could increase in diameter as it reaches the surface -- creating a zone of concentration from which it could be more readily pumped into tankers. This reduces its wider dispersion. The concern is not perfection but relative concentration whilst plugging measures continue to be explored. Clearly to avoid interfering with such approaches a wider diameter tube might be required, plus a means of lowering the upper levels of the tube (or raising the lower levels) when vessels need access to the vertical column. A columnar safety tube of this kind could be envisaged as a necessary precaution in any future deep well drilling, possibly pre-installed on the seabed to be "extruded" from there to the surface as soon as required by any emergency. A possible improvement -- a suggestion made independently -- would be to use perforated hose to create a bubble curtain around the inside of the column such as to contain it for pumping on the surface. The tube could protect the integrity of the curtain.

Wiki-model for eliciting strategic responses to urgent issues

There is no lack of "best practice" databases in response to known issues. The concern in the above argument is with unforeseen issues and disasters for which there is inadequate experience and much learning must take place "on-the-fly" and with the least possible delay. The related concern is with anticipatory profiling of problems and solutions -- exemplified in part by the activities of whistleblowers and those warning of crises to come -- however this information is deprecated from a perspective of "business as usual". The challenge is one of developing databases that include information because it may prove to be relevant -- namely respectful of the Precautionary Principle.

A valuable summary is provided by Vita Lanfranchi and Neil Ireson (*User Requirements for a Collective Intelligence Emergency Response System*, ACM, 2004). This is based on the European project WeKnowIt, aimed at designing, implementing and delivering technologies and methodologies enabling both Emergency Response organization, personnel and community citizens to participate in the monitoring of an emergency incident. A subsequent study, funded within the European Community's Seventh Framework Programme FP7/2007-2013 [see project description], was undertaken by Vassilios Solachidis, Phivos Mylonas, et al. (*Collective Intelligence Generation from User Contributed Content*, 2009; *WeKnowIt: Emerging, Collective Intelligence for personal, organisational and social use*, 2009).

As noted above, this argument emerges from the development over a period of years of the online Global Strategies Project. In conjunction with the associated online World Problems Project, its later development had been funded by the European Commission with a focus on biodiversity: Ecolynx: Information Context for Biodiversity Conservation (1997-2000). Biodiversity is now the focus of the UN International Year of Biodiversity (2010). The interlinked databases of the Global Strategies Project and the World Problems Project were positively evaluated for funding by the World Bank: Interactive Conceptual Environmental Planning Tool for Developing Countries (INTERCEPT): approved for funding through the World Bank's InfoDev program (submitted 25 March 1998; approved 2 June 1999; removed from proposal pool March 2000).

More recently on the site of the State of the World Forum, a case is made at some length for a *Global Solutions for Global Challenges: a proposed International Consultation and Global Solutions Wiki*. The potential of any such initiative is discussed separately in the light of the experience with existing online initiative (*Global Solutions Wiki*, 2009).

Clearly, given the subsequent success of *Wikipedia*, and given the rapid profiling of individual crises ("problems"), like the Deepwater Horizon Oil Spill, the "missing link" is the systematic indication in such *Wikipedia* entries of collection points for remedial suggestions -- such as the Deepwater Horizon Response; the official site of the Deepwater Horizon Unified Command.

But, as the quotations above indicate, the 7,000 suggestions (and rising) are now subject to a non-transparent process totally at variance with the Wiki policy. Those submitting suggestions cannot view others made, make comment critically on their defects, improve the argument, reconcile duplicate texts, etc -- as in the well-developed, and much admired, Wiki process. There is every possibility that an additional constraint is that many of the authors, or a significant proportion, would like their suggestions regarding oil spill containment to be confidential, possibly in the hope of deriving financial benefit from them through the "intellectual property" they might be considered to represent.

Any suggestions database designed to gather insights rapidly is clearly faced with processing capacity challenges -- reducing the backlog. In addition to automatic indexing, extensive use could be made of text/concept analysis and mapping software. A notable example of this is Leximancer (see illustrative gallery), as discussed with respect to *Mapping the climate change context of Copenhagen* (*Insights for the Future from the Change of Climate in Copenhagen*, 2010). This can also be used for the automated generation of reports, presumably to the point of providing a preliminary identification of vital links between many proposals.

There is however an additional challenge to the Wiki process which is already evident in the handling of biographical entries of living persons. Many of the issues are discussed in a case study (*Abusive Wikipedia Biographical Editorial Process: a case study in problematic alternative forms of governance?* 2007). With respect to remedial suggestions, the question is whether the Wiki process can constrain the dynamics of voluntary editors potentially biased in favour or against the framing of problems and their solutions. This became dramatically evident in the lead up to the UN Climate Change Conference in Copenhagen (December 2009), given notable focus by the "climategate" e-mail hacking crisis, when it emerged that a senior *Wikipedia* editor had been manipulating the content of 5,428 climate articles such as to undermine the objectivity of entries on anthropogenic global warming and on the Climategate incident itself (Lawrence Solomon, *Wikipedia's climate doctor*, *Financial Post*, 19 December 2009; James Delingpole. *Climategate: the corruption of Wikipedia*. *The Telegraph*, 22 December 2009). The entry on Lawrence Solomon in *Wikipedia* refers to his criticism of *Wikipedia*.

The concern is therefore with how to develop a collective intelligence facility that enables people to check out ideas currently under discussion "on the table" -- as well as those that have somehow "fallen off the table", or been "designed off the table" by agenda-setting game-playing. Controversial issues subject to the latter processes are those relating to territorial disputes (most notably Jerusalem) and anything associated with constraints on population growth.

Of related interest is the ability for people to note explicit relationships between proposals still on the table, those that have been rejected, and those which have emerged as preferable or more relevant for cost or other reasons. This would offer a means of moving beyond a flat rejection and indicating why some other proposal had been preferred. People could then enrich the pattern of links or position their own preferred suggestions in relation to that network.

The Gulf of Mexico oilspill has resulted -- after significant delay -- in the creation of multiple solution suggestion schemes, from those named to many associated with other media. A key issue in terms of "collective" intelligence gathering, under conditions of emergency, is the extent to which suggestions gathered within different facilities are juxtaposed and interrelated, rather than being isolated from each other. A related concern is the assumption in each case that valuable ideas -- whether they coalesce with complementary insights or not -- will be rapidly channelled to where they can be reviewed and acted upon. This is of course a well-nourished illusion.

Unforeseen disasters and unheeded warnings

Various strong cases have been made for attention to unforeseen disasters and disruptive surprises:

- Karen A. Cerulo. *Never Saw It Coming: cultural challenges to envisioning the worst*. University of Chicago Press, 2006
- Jared M. Diamond. *Collapse: how societies choose to fail or succeed*. Penguin, 2005
- Charles Handy. *The Age of Unreason*. Harvard Business School Press, 1990
- Thomas Homer-Dixon. *The Upside of Down: catastrophe, creativity, and the renewal of civilization*. Island Press, 2006
- Paul Ormerod. *Why Most Things Fail: evolution, extinction and economics*. Wiley; 2005 [extracts].
- Joshua Cooper Ramo. *The Age of the Unthinkable: why the new world disorder constantly surprises us and what we can do about it*. Little, Brown and Company, 2009
- Nassim Nicholas Taleb. *The Black Swan: the impact of the highly improbable*. Random House, 2007 [contents]
- John Ralston Saul. *The Unconscious Civilization*. Free Press, 1995

One of these authors, has also focused on the requisite human ingenuity, in which so much hope is placed in developing remedies to disasters as they emerge (Thomas Homer-Dixon, *The Ingenuity Gap*. Knopf. 2000). The recent disastrous United Nations Climate Change Conference (Copenhagen, 2009) suggests the possibilities of many learnings of relevance to future issues -- whether biodiversity, water, energy, food, population -- as previously discussed (*Insights for the Future from the Change of Climate in Copenhagen*, 2010).

The concern here is how are collective learnings to be elicited, most notably in immediate response to emergency, and where are they to be stored for appropriate consideration and comment. As illustrated by the limited transparency of the welcome initiative of the Deepwater Horizon Unified Command, is a healthy collective response to be inhibited by hidden agendas?

Geoengineering: a disaster in waiting

The oil spill disaster also serves to focus attention on the ambitions and strategies of those favouring a geoengineering response to climate change -- now that other approaches to climate change have been discredited, notably through funding from the oil industry.

The disastrous application of technology in the case of deep drilling, and the associated inadequacies in the risk management process, are indicative of the blinkered approach to major engineering projects -- undertaken with the complicity of governments. The same may be expected of geoengineering initiatives -- on which the oil industry might well have chosen to bid, singly or as collaborators in a complex consortium. As with the drilling operation in the Gulf of Mexico, geoengineering proposals are likely to involve some of the most advanced technology available on the planet. It was so advanced that BP and other oil companies were exempted in 2008 from submitting a plan on how they would clean up a major spill. It was assumed there would be none.

The questionable mindset associated with geoengineering is fully compatible with the questionable risk management made evident by BP in the Gulf of Mexico. A striking iillustration of the manifestation of this mindset is to be found in the proposals to employ nuclear technology to plug the oil gusher (Nicholas Deleon, *Russian advice: Nuke the oil spill, that'll fix it! CrunchGear*, 5 May 2010; Tim Edwards, *Deepwater oil spill: will BP take nuclear option? FirstPost*, 5 May 2010; Adam Weinstein, *Nuke the Oil Spill? Mother Jones*, 24 May 2010; William J. Broad, *Nuclear Option on Gulf Oil Spill? No Way, U.S. Says*, *The New York Times*, 2 June 2010; *Nuking the oil spill*, Greenpeace, 2 June 2010; *Nuke US Gulf oil spill: Experts*, *Indian Express*, 3 June 2010). The proposal is based on the argument "when all else fails". One can see that argument being deployed with respect to climate change. Engendering a "nuclear winter" could then be a transformed into a credible proposal. The oil spill disaster and the evidently feeble response capacity could even be seen as a (deliberate?) preparation for the policy evaluation of geoengineering proposals -- "grooming" public opinion. Suggestions are already

being made that it is a false flag operation (*Evidence Points to BP Oil Spill False Flag*, *Congress.org*, 2010).

This makes the point that an intelligence gathering context is required for cautionary perspectives and with a view to emergency preparedness -- if such an initiative were to fail disastrously. The concern has been articulated separately (*Geo-engineering Oversight Agency for Thermal Stabilization (GOATS)*, 2008).

Technological negligence as environmental terrorism?

Will it become apparent that extreme technological risk-taking -- as with geoengineering -- should be considered in the light of emerging legislative measures against terrorism, so clearly evident in the case of financial risk-taking (*Extreme Financial Risk-taking as Extremism -- subject to anti-terrorism legislation?* 2009)? Or are technocrats to be considered simply part of a "disgraced profession" by analogy with the argument made with respect to economists in relation to financial risk-taking in a statement to the US Senate Judiciary Committee in May 2010 (James K. Galbraith, *Why the 'Experts' Failed to See How Financial Fraud Collapsed the Economy*, *AlterNet*, 15 May 2010)?

BP oil spill in Gulf of Mexico highlights the number of neglected oil spills elsewhere
• In fact, more oil is spilled from the delta's network of terminals, pipes, pumping stations and oil platforms every year than has been lost in the Gulf of Mexico, the site of a major ecological catastrophe caused by oil that has poured from a leak triggered by the explosion that wrecked BP's Deepwater Horizon rig last month (*Nigeria's Agony Dwarfs Gulf Oil Spill*, *The Root*, 9 June 2010) • The massive BP oil spill and cleanup in the Gulf of Mexico are bringing renewed attention to the many spills taking place in Nigeria's oil-rich Niger Delta region. (*BP Oil Spill Brings New Attention to Nigeria's Many Spills*, *Voice of America*, 10 June 2010) • But do we really know how bad the Deepwater Horizon oil spill is? No. And we likely won't for years, perhaps generations, to come. Not to belittle the Gulf situation at all, but here's a bit of perspective. A story that's gotten almost no media coverage is the burgeoning oil spill in the Nigerian village of Otuegwe. (*Untold Story: BP-sized Oil Spills Happen All the Time in Nigeria*, *God's Politics*, 4 June 2010) • The disastrous BP oil spill is now believed to be the worst environmental disaster in U.S. history. Even worse than Exxon Valdez. Exxon Valdez stirs up strong memories. Who can forget the images of birds covered in black oil slick? Imagine an Exxon Valdez happening every year for 50 years. Pretty unimaginable. Yet, this is what residents of Nigeria's oil-producing Niger Delta have been living with for the last 50 years. (*The Oil Spills We Don't Hear About*, *The New York Times*, 4 June 2010)