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4th June 2016 | Draft

Disastrous Floods as Indicators of Systemic Risk Neglect implications for authoritative response to future surprises

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Previously published on 7 February 2011; amended in the light of media coverage of the disastrous flooding in Europe in 2016

Introduction

This is an exploration of the level of neglected risk visibly and dramatically highlighted by a number of recent widely publicized floods which have been framed as unforeseeable surprises. At the time of writing the earlier version of this document in 2011, the prime examples were in Australia with the [Queensland flood of 2010](#), which was followed by flooding in [Victoria in 2011](#). Other examples noted included flooding on the [French Atlantic coast in 2010](#), as a result of cyclone Xynthia, and in the [UK and Ireland in 2009](#). Disasters involving flooding have included those related to the Asian tsunami of 2004 and [Hurricane Katrina](#). (*Wikipedia* offers a checklist of [floods by country](#)).

The issues raised are highlighted to a far greater degree by the unusual [flooding in Europe in 2016](#), and most dramatically in Paris where the Seine rose over 6 metres -- the occasion for extensive media exposure (*Paris underwater as Seine River flooding approaches worst in 60 years*, *Accurweather*, 4 June 2016; *Paris floods: River Seine reaches highest level in decades as Louvre museum closed 'for precautionary reasons'*, *The Independent*, 4 June 2016). The extent of negligent unpreparedness was indicated by the fact that significant proportions of the French cultural heritage (and that of the world) are stored underground in zones vulnerable to flooding (*Flooding in Paris threatens the Louvre's most iconic artwork*, *The Washington Post*, 3 June 2016).

In the midst of the disaster in Paris, a summit was held to relaunch peace negotiations (*Paris foreign minister summit aims to revive Middle East peace talks*, *Euronews*, 3 June 2016; *France felt 'compelled to act' on Middle East peace talks*, *The Guardian*, 3 June 2016). The coincidence raises the question as to whether the quality of thinking brought to bear on disaster preparedness within France is equivalent to that applied to engendering disaster in the Middle East, especially given the complicity of France in exacerbating disaster through massive sale of arms to parties to the conflicts there (*Arms Sales to Saudi Arabia Boost French Economy, but at What Cost?* *World Politics Review*, 9 October 2015; *France fills the American arms void*, *Politico*, 25 June 2015).

The nature of the disaster, and the content of the media coverage, justifies a slight revision of this document (previously published in 2011). A week of exposure to coverage on French media indicated no sense in which either government authorities or the public could in any way be considered negligent in anticipating such disaster. As previously, France framed itself as a victim of the forces of nature -- understood as an Act of God by the insurance industry. This is despite having previously authorized a remarkable degree of construction in areas vulnerable to flooding, and having failed to discourage modifications to the watershed which exacerbated risks of flooding. No questions were raised regarding any failure to learn lessons from past exposure to disastrous flooding.

The question raised here is the level of risk to which "normal" activity prior to the flood is assumed to be exposed in relation to the level of risk which is made apparent by the disaster -- even though it is assumed that "normal" activity can be resumed thereafter.

Since "flood" is frequently used as a metaphor to describe other phenomena which may be experienced as disastrous, a further question is whether these imply inappropriate assumptions about risk levels and avoidance of recognition of risk. The same may be asked of phenomena based on a "dearth" of resources rather than the excess associated with "flood". The remedial focus on return to "normality" is then to be equated with the attitude of "business as usual". This is now widely deprecated as inadequate to systemic challenges of governance -- despite its uncritical celebration by the World Economic Forum (Davos, 2011), following the financial crisis of 2008-2009 in which the markets were "flooded" with "toxic assets".

These questions highlight the manner in which risks are framed by authorities, with the complicity of specialists and vested interests, and promoted as acceptable to the population, possibly to be enshrined in policies, legislation or other regulatory measures. In the case of flooding, this is evident in the enthusiastic development and marketing of riverside and coastal properties, with little attention to their vulnerability.

In the discussion of flooding in *Wikipedia*, a valuable distinction is made between [upslope factors](#) and [downslope factors](#), and the exacerbation of disaster as a result of their [coincidence](#). With respect to disaster as a consequence of negligence, more generally understood in the light of flooding as a metaphor, these can be explored in terms of the dangerous inadequacy of "derivative thinking" (*Vigorous Application of Derivative Thinking to Derivative Problems: transcending bewailing, hand-wringing and emotional blackmail*, 2013). In the midst of any disaster, unfortunately the focus is on emergency relief with no opportunity taken to highlight the lessons to be learned for the future, in the light of complicity in the negligence of the past. The point can be argued with respect to the response of the tragedy of widespread starvation (*Starvation Imagery as Humanitarian Trump Card? Counterproductive emotional blackmail engendering worldwide indifference*, 2016).

Such issues relating to surprises of the present are highly relevant to assumptions made about risks of the decades to come. Associated arguments have been developed by [Karen A. Cerulo](#) (*Never Saw It Coming: cultural challenges to envisioning the worst*, 2006) and [Nassim Nicholas Taleb](#) (*The Black Swan: the impact of the highly improbable*, 2007).

As a source of indications of relevance to navigating other flow systems characterized by a degree of risk, the set of signs by which road traffic "self-organizes" and "self-governs" is explored in an Annex (*Being in the Flow on Strategic Highways and Byways: enabling sustainable self-governance through traffic signage*, 2011). Such a perspective, from the theory of signage systems, raises the question as to how it might be applied more generally to elicit the signs and symbols of requisite scope for sustainable governance of the global environment.

The systemic arguments made are complemented by those with respect to the [disaster in Japan](#) (*Anticipating Future Strategic Triple Whammies: in the light of earthquake-tsunami-nuclear misconceptions*, 2011). Why has the "flood" of refugees into Europe proven to be such a surprise (*Massive EU Weapons Sales to Saudi Arabia Contribute to Fuelling International Aggression and Terrorism in the Middle East, Global Research*, 5 April 2015)? The absence of systemic thinking regarding cause-and-effect suggests the need for new kinds of indicator (*Evaluating the Grossness of Gross Domestic Product: Refugees Per Kiloton (RPK) as a missing indicator?* 2016).

Systemic analogues to "flooding"

The term "flood" used with reference to unforeseen water-related disasters has been extensively used as a metaphor in commentary on other disasters:

- **commodities:** "flooding the market". This is typically associated with the pricing policy termed ["dumping"](#) whereby a manufacturer in one country exports a product to another country at a price which is either below the price it charges in its home market or is below its costs of production.
- **labour:** "flooding the labour market", notably with foreign workers. Understood as "social dumping", this describes the process of ensuring the temporary movement of labour from one area to another where the cost of labour is usually more expensive. The preoccupation is a particular focus of controversies associated with (unchecked) immigration.
- **financial market:** examples cited include:
 - flooding the financial market with personal loans
 - flooding the financial market with forex (as with flooding the financial market with large amounts of sold dollars, so the dollar drops even more)
 - flooding the financial market with cash derived from export revenue
 - flooding the financial market with billions of dollars in hot money derived from foreign portfolio investors
 - flooding the financial market with liquidity ("cheap money", "cheap credit"), namely a "flood of liquidity", as a central bank policy to counteract deflation (perceived by seen by banks and major investors as a consequence of interest rate cuts)
 - flooding the financial market with valueless bills and cheques
- **housing market:** a form of flooding is associated with easy access to subprime mortgages:
 - namely [subprime lending](#) effectively flooding the market with mortgages that borrowers had difficulty paying back, notably resulting in the [subprime mortgage crisis](#)
 - flooding the property market with distressed properties (namely "toxic assets")
- **information:**
 - media may be described as:
 - flooded with advertising as a characteristic promotional strategy
 - flooding with propaganda in support of an ideological strategy
 - knowledge (and wisdom) may be variously understood as "flooded":

- "flood of online information" (*Is knowledge drowning in a flood of information?* Lippard Blog, 22 February 2010)
 - "flood of expertise"
 - "flood of innovation"
- classified information, as with respect to the "flood" of [US diplomatic cables leaked by WikiLeaks](#)
- **internet:**
 - flooding the internet with unsolicited communications ([spam](#))
 - [denial of service attacks](#) may be described in terms of flooding a server to overload its capacity to respond to requests
- **environment:** examples of "flooding" the natural environment with potentially problematic substances include:
 - flooding the oceans with wastes, notably non-biodegradable plastics ([marine debris](#), [ocean floor waste disposal](#))
 - flooding the atmosphere with particulate matter through [stratospheric aerosol geoengineering](#) programmes
- **conditioning:** a form of behaviour therapy and conditioning termed "[flooding](#)" involving prolonged exposure to a stimulus.
- **"people"** may be variously understood as constituting a "flood", as in the case of:
 - foreigners, immigrants and refugees (noted above with respect to the labour market) -- especially deprecated in Australia as "boat people".
 - people of some other ethnicity
 - class-related: flood of young people, and increasingly of the elderly
 - increase in absolute numbers, namely concern with overpopulation

Whether simply a metaphor or not, **perceptions of "flooding" may well reflect insight of systemic relevance, especially a sense of systemic imbalance.**

Any form of "flooding" may, to some degree, derive from a "flood" of people -- whether as a consequence of immigration, labour opportunities, or unconstrained increase in population. The latter is of particular interest when it increases pressures on the environment and on more sustainable practices.

Impact of flooding understood generically

Any text description of a disaster resulting from "flooding", as more generally understood in its literal sense, can be usefully explored by replacing "water" with any of the above terms in media coverage of flooding by water. This offers a sense of possible articulations of popular experience -- as reported in the coverage of other disasters, past and future. It also offers a sense of how authorities variously frame and respond to such a disaster.

The same approach may be used with respect to the "dearth" of resources, including water, and the manner in which these are experienced and elicit collective response. Such an exercise has previously been explored with respect to the generic formulation of problems and responses (*Towards a Generic Global Issue Statement: evoking an instructive pattern of unquestionable responses*, 2009).

Of particular interest is the use of "peak" in relation to water flooding, since this term is also used more generally in the case of both excess and dearth, most notably in the case of commodities as with "[peak oil](#)" (*Peak Experiences Challenging Humanity*, 2008). The latter document offers a checklist of some 25 "[peaks](#)" and considers possibilities of *Reframing engagement with "peaks" through metaphor*

Response by authorities to "flooding" or "dearth"

The response of Australian authorities to the flooding in Queensland (and later Victoria) provides a valuable illustration of how authorities respond to disaster:

- for the leader of the opposition, the floods exemplified the "worst of nature"
- for the prime minister, in various declarations the focus was on a "return to normality"
- for the treasurer, in justifying tax levies, the focus was on remedying the damage associated with the current flooding -- any consideration of possible future flooding (predicted by some) was "pure speculation" (Queensland was hit by [Cyclone Yasi](#) in the following days)
- for the government as whole, the cost of the remedial responses provided a justification for renegeing on electoral commitments to environmental programmes (which had persuaded some to vote for them in a tight election)
- appointment of a commission of inquiry to report on the efficacy of emergency services (rather than on decisions ensuring vulnerability to flooding)

Especially noteworthy was the manner in which the government sought to identify itself with popular support for those affected by disaster through loss of homes and possessions, etc. In referring to the disaster as exemplifying the "worst of nature", a photo opportunity enabled the leader of the opposition to highlight the extent to which it elicited the "best of people". The latter point has been well made by [Germaine Greer](#) (*Australian floods: Why were we so surprised by floods?* *The Guardian*, 15 January 2011)

The official view is that Australians in flood areas are being wonderful. They are pulling together, helping each other, staying cheerful, not complaining. When given the opportunity they make inspiring statements, that they'll rebuild their communities, stronger and better than ever. That they are Queenslanders, who don't give up. (And so forth.) What nobody is talking about yet, is whether the flood risk can be reduced.

In presenting a case for additional taxation, it might be said that there was a degree of skillful exploitation of public goodwill:

- using community solidarity as an exercise in [CYA](#):
- celebrating pulling together at the community level to compensate for evident fragmentation of authority at a higher level
- hiding "behind God" as the perpetrator of such acts, in a manner reminiscent of the issues raised by the Australian movie *The Man Who Sued God* (2001).

Such responses might be summarized as:

- focusing on the present and ignoring both exacerbating causative effects from the past and potential future disasters
- opportunism in seeking to gain and sustain political advantage
- avoidance of learning
- exploiting community solidarity in support of those affected by the disaster
- using a form of emotional blackmail, exploiting the need for remedial investment as a justification for further taxation -- effectively a form of "emotional taxation", taxing goodwill
- using disaster as a justification for failure to deliver on electoral promises and to elicit further funds for remedial programmes for those complicit in avoiding recognition of risk

More generally this may be understood as:

- an asystemic focus offering explanations based on proximate causes. This approach is equivalent to empty statements to airline passengers such as: *We apologize for the departure delay -- this was due to a delay in the incoming flight*
- blaming nature for failing to conform to the best of scientific predictive expertise and enlightened urban planning ("*Naughty rain, naughty rivers, naughty tides*") -- thereby exonerating any authorities, public or otherwise, from any responsibility in the matter
- failures of previously assertive authorities, needing in each case to be remedied by "bailouts" from the public -- called upon emotively (even exploitatively) to exhibit solidarity towards those whose risk-taking had been implicitly encouraged.

Most significant, in illustrating the lack of collective learning capacity, was the complete lack of reference to the causes of the vulnerability to risk from disaster, which might have included:

- according building permission on land subject to flooding, whether for private homes or for public infrastructure
- inadequacy of the scientific expertise and models applied to determining the risk of flooding (exemplified by those governing the release of water from dams at risk failure, exacerbating the flooding)
- questionable nature and origin of the pressures brought to bear upon decision-making with regarding to either building permission or formulation (and acceptance) of modelling criteria

Such evident behaviour is presumably implicit in the response to less tangible forms of "flooding".

Assessment of risk

One widely-cited excuse by authorities for the damage in Queensland was the exceptional nature of the event -- a "200-year" event, necessarily beyond any reasonable government mandate. Whether or not this figure is statistically accurate or the consequence of faulty modelling, a more correct understanding is that there is then a probability that such an event will occur once in ever 200 years. But, as noted by a citizen in one community at risk, it is then just as likely (statistically) to be repeated in a few years time -- since the "200 years" is but **a statistical average over a much more extended period**.

A month later, at the time of writing, the impact of a new storm is anticipated with trepidation, as reported by Graham Lloyd and Andrew Fraser (*Queensland's cycles of havoc*, *The Australian*, 2 February 2011). Their report notes

According to a paper by [BOM Queensland](#) weather forecaster Jeff Callaghan, the frequency of severe land-falling tropical cyclones had declined to low levels in recent decades in line with the [El Niño](#) weather patterns. Callaghan's analysis shows that landfalls occurred almost twice as often in [La Niña](#) years as they did in El Nino years and that more than one cyclone only ever hit land during La Niña years. Callaghan says it would be imprudent to suppose the low number of tropical cyclones crossing the coast in recent decades would continue and planning should reflect the possibility of a rapid return to higher landfall rates. Callaghan's research confirms [\[Jonathan\] Nott's](#) analysis that tropical Australia is overdue for a dramatic intensification of cyclonic activity, regardless of whether there is a climate change signal in what is happening now or not....

What the longer term records show, however, is that the frequency of extreme cyclones follow a predictable long-scale pattern. "What the record shows is we go through extended periods, hundreds of years, of high activity and extended periods of little activity," Nott says. "The past 100 to 150 years has been very quiet in Queensland in terms of what happened in the past. The couple of hundred years prior to that were very active." According to shorter term decadal scale-that uses a 10-year cycle-Queensland can also expect a big increase in the number of severe cyclones. The [Interdecadal Pacific Oscillation](#) indicates the tropical north is due to emerge from a three-decade period of low cyclonic activity and return to the conditions of the 50s, 60s and 70s.

It is questionable whether such potentially embarrassing issues will fall within the remit of the official commission of inquiry into the efficacy of the emergency response services -- which may well terminate its report in the midst of the next "200-year flood".

The appropriate approach to collective learning as a consequence of disasters past, or in anticipation of those to come, is more fruitfully illustrated by:

- Karen A. Cerulo (*Never Saw It Coming: cultural challenges to envisioning the worst*, 2006)

- Nassim Nicholas Taleb (*The Black Swan: the impact of the highly improbable*, 2007).
- A healthier approach is that exemplified by the concern with collective learning capacity arising from the 9/11 intelligence disaster by the Lessons Learned Center of the Office of the US Director of National Intelligence (Josh Kerbel, *Lost for Words: the Intelligence Community's struggle to find its voice*, US Army War College Quarterly: *Parameters*, Summer 2008)
- John Gall (*Systemantics; how systems work... and especially how they fail*, 1978) -- reviewed as *Why Systems Fail and Problems Sprout Anew* (1981), highlighting Gall's recognition, of relevance to risk management, that "a fail safe system fails by failing to fail safe"

Especially striking, in the case of the toxic asset "flood" that triggered the financial crisis, was the dependence in risk analysis on the [Gaussian copula](#), as separately discussed ([Uncritical Strategic Dependence on Little-known Metrics: the Gaussian Copula, the Kaya Identity, and what else?](#), 2009). This dependence is admirably described by Felix Salmon ([Recipe for Disaster: the formula that killed Wall Street](#), *Wired*, 17.03, March 2009) -- or on the title page of the issue as *The Secret Formula that Destroyed Wall Street*. As David Li had indicated by the discoverer of the innovative formula, [David X. Li](#) in 2005: *Very few people understand the essence of the model* (Mark Whitehouse, *Slices of Risk*, *The Wall Street Journal*, 12 September 2005). A second description is offered by Kevin Drum ([The Gaussian Copula](#), *Mother Jones*, 24 February 2009).

As noted by Salmon:

The damage was foreseeable and, in fact, foreseen. In 1998, before Li had even invented his copula function, Paul Wilmott wrote that "the correlations between financial quantities are notoriously unstable."... During the boom years, everybody could reel off reasons why the Gaussian copula function wasn't perfect. Li's approach made no allowance for unpredictability: It assumed that correlation was a constant rather than something mercurial. ... In hindsight, ignoring those warnings looks foolhardy. But at the time, it was easy. Banks dismissed them, partly because the managers empowered to apply the brakes didn't understand the arguments between various arms of the quant universe. Besides, they were making too much money to stop. In finance, you can never reduce risk outright; you can only try to set up a market in which people who don't want risk sell it to those who do. But in the CDO market, **people used the Gaussian copula model to convince themselves they didn't have any risk at all, when in fact they just didn't have any risk 99 percent of the time. The other 1 percent of the time they blew up. Those explosions may have been rare, but they could destroy all previous gains, and then some.** [*emphasis added*]

In the case of flooding rivers, it is precisely this kind of thinking which drives the false confidence in the "normality", to which authorities and vested interests aspire. This is valid "99 percent of the time", but is proven to be false "1 percent of the time" (by "200-year floods") when such predictions fall apart.

An earlier example was provided by the [2004 Indian Ocean earthquake and tsunami](#) about which [warnings had previously been provided](#) by the head of the Thai meteorological office -- then forced to retire, accused of scaremongering and jeopardising the tourist industry.

Another example is provided by severe flooding occurred in March 2010 as a result of the [Xynthia storm](#) on the Atlantic in the Vendée region. French President Nicolas Sarkozy, declared: *We have to find out how families in France in the 21st-century can be surprised in their sleep and drowned in their own houses.* Mr. Sarkozy added, *We have to shed light as urgently as possible on this unacceptable and incomprehensible drama.*

As noted in response by Claire Le Guern Lytle ([The Memory of Risks](#), *Coastal Care*, April 2010)

As much as this drama is utterly unacceptable, it is all too comprehensible and sadly, previously announced by warnings from many scientists, locals, and even more relevantly by an official 2008 report from the Vendée Equipment Department, DDE. The risks of marine submersion were known to the Vendée DDE, which strongly addressed and questioned coastal safety, citing in particular the fragile sea walls in L'Aiguillon-sur-Mer and La Faute-sur-Mer, as well as their existing location and development in flood-prone areas

Ironically, with respect to the "200-year" figure in Queensland, one interviewed respondent in France (regarding the flooding there in 2010) noted that it was unfortunate that the dikes constructed 200 years ago in the Vendée area by Napoleon had not been maintained since then.

Systemic risk level

With respect to the financial crisis, one blogger fruitfully draws attention ([Why fixing what failed before always led to the next](#), 27 January 2011) to an article introducing the notion of "systemic risk" by Andrew G. Haldane and Robert M. May ([Systemic risk in banking ecosystems](#), *Nature*, 469, pp. 351-355). Those authors argue:

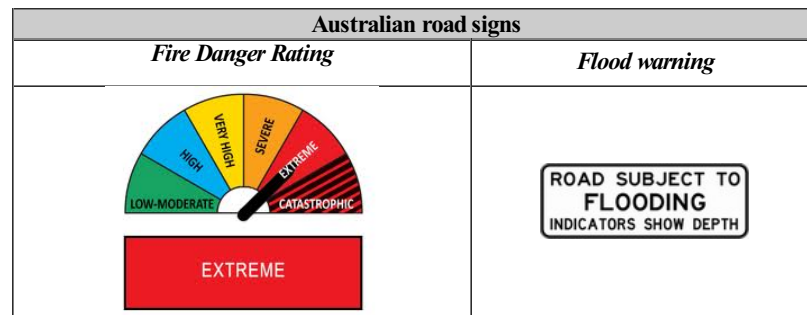
In the run-up to the recent financial crisis, an increasingly elaborate set of financial instruments emerged, intended to optimize returns to individual institutions with seemingly minimal risk. Essentially no attention was given to their possible effects on the stability of the system as a whole. Drawing analogies with the dynamics of ecological food webs and with networks within which infectious diseases spread, we explore the interplay between complexity and stability in deliberately simplified models of financial networks. We suggest some policy lessons that can be drawn from such models, with the explicit aim of minimizing systemic risk.

The article was accompanied by a forum response on [Financial systems: ecology and economics](#) and an editorial response ([Natural](#)

Wealth: ecological models can be used to guide economic policy -- but should they?, *Nature*, 469, 266, 19 January 2011). [It is ironically appropriate that such insights into global systemic risks should only be fully accessible to those who subscribe to *Nature*.]

With respect to aspirations to "normality" in unpredictably dynamic systems, it is appropriate to ask at what risk level do people, communities, businesses, infrastructure facilities, and countries believe themselves to be operating. For some, risk levels have already been irrecoverably exceeded (James Lovelock, *The Vanishing Face of Gaia: a final warning: Enjoy It While You Can*, 2009). Governments readily ignore warnings on which the insurance industry focuses most assiduously, if only "in the small print". In the case of the Queensland floods, the government has cordially invited the insurance industry -- in a spirit of solidarity with the people so disastrously affected -- to set aside considerations of risk which would otherwise allow them to avoid making compensation. The escape clauses would naturally relating to **Acts of God** (if not Gaia). Arguably governments also avoid taking account of information relevant to their normal operations when it only appears "in the small print".

Australia is a country much exposed to forest fires, understood as natural to forest ecosystems. For that reason, it is common to see [roadside panels indicating the risk of fire](#) on any particular day, according to weather conditions. Indicator posts may also be positioned on roads crossing rivers showing the levels to which waters may rise during the wet season. However they do not indicate the risk of water rising to any given level.



In that spirit it may be asked to what extent citizens and institutions are appropriately and explicitly informed (other than implicitly through their insurance premiums) regarding the risk of the following in particular areas:

- fire
- theft
- flood
- hurricane
- violence / muggings
- industrial accident (Bhopal, Chernobyl, French)
- volcano
- earthquake
- landslide / avalanche / rock falls
- nuclear explosion
- wildlife hazards
- health hazards
 - radio frequency
 - unhealthy foodstuffs
 - genetically modified foods
- lightning strike
- asteroid strike

Decision-making within misleading periods of risk

Many strategic decisions are taken with respect to periods **within** which the risk associated with the decision is less likely to become evident. If deprecated, this is termed short-termism. [Short-termism in democracies](#) is typically associated with frequent elections arising from the instability of coalition governments. The notorious [short-termism](#) of the stock market is recognized as potentially antithetical to appropriate spending on maintenance and investment in industries with long time horizons, where the failure to do so may only have effects a decade or more hence (*No bonuses for 'short-termism' financial planning*, The Climate Institute, 17 October 2008; *Myopia: Short - termism, a barrier to corporate sustainability?* Green Capital: advancing corporate sustainability, 26 June 2006)

This is partially illustrated in the financial case by the use of the Gaussian copula. It is also partially illustrated by assumptions regarding the vulnerability of buildings and infrastructure to "200-year floods". Clearly the life of the building, or of its owners, may well be less than manifestation of such a flood. In which case: no problem. Financial transactions can readily be taken with such assumptions -- "before the statistical chickens come home to roost".

A valuable example is provided by problematic health effects from new drugs testing favourably over a particular period -- and then marketed -- although the problematic effects only become evident over a longer period. A number of drugs have been withdrawn or banned after such effects become manifest ([lindane](#), [DDT](#), ; see [List of banned drugs](#); [Internationally banned drugs](#); [List of drugs banned from the Olympics](#)). This example can be extended to include food products (additives, flavours, dyes and sweetening agents) and agricultural products (see banned fertilizers, [banned pesticides](#), additives, and [banned growth hormones](#)). Genetic modification of

organisms is vigorously defended on the basis of evident provided **within** a limited test period. Problematic effects that emerge over a longer period may well do so long after the inventors and manufacturers have themselves disappeared -- or are well able to deny responsibility.

Another example is provided in the construction industry where understrength materials may be used -- however well they may test in the short term -- with effects becoming manifest at a later stage in the form of collapsing buildings and bridges. More generally this applies to the durability of many products.

A useful example is provided by government decision-making. Initiatives can be taken -- to widespread favourable acclaim -- whose problematic effects only become evident within the mandate of a subsequent government. The latter is then able to claim no responsibility for the poor decision-making of its predecessors -- especially if the initiative was launched several mandates previously.

In the light of such examples, questions might then be asked as to the risk levels to which people are exposed, knowingly or unknowingly -- with or without adequate "testing" of relevance to the period in question, but especially to any longer period in which consequences are more likely to manifest:

- within a one-hour period
- within a one-day period
- within a one-month period
- within a one-year period
- within a 5-year period
- within a 10-year period
- within a 20-year period
- within a 200-year period -- future generations
- within a 500-year period

Surreptitious juggling of periods of testing, responsibility and liability in relation to risk

The above argument highlights the importance of timing in relation to risk management:

- **time scale:** the longer the time scale, the greater the probability of occurrence of a disastrous outcome from taking a risk (as with the "200-year flood" and the Gaussian copula). Namely the probability of experiencing the disastrous outcome of taking a risk increases by extending the time over which the risk is taken.
- **period of testing:** the shorter the period of testing for hazardous outcomes, the lower the probability of detecting any risk from an initiative (such as use of a new product). Namely detection of the risks associated with products whose problematic effects only become apparent over a longer time period can be avoided by conducting tests over a shorter period. Legislative and other provisions, including research methodologies, may well specify periods of testing (to obtain approval to market) that are too short to detect the risk of longer-term hazards.
- **responsibility of decision-maker:** the shorter the period of mandate of any government (or other authority), the less likely that it will have to deal with any problematic outcome of a risky initiative for which it is responsible. Short-termism minimizes exposure to risk. Namely there is an increasing probability of reducing responsibility for any disastrous outcome of a risk taken -- by reducing the duration of the period of responsibility. Mandates of governing bodies are typically from 2 to 5 years, ensuring that responsibility for problems arising from their decisions can be avoided if they manifest after that period. Those subsequently elected can attribute responsibility for problems with which they are confronted to their predecessors -- all being typically protected by some form of impunity provisions.
- **period of liability:** whereas responsibility for hazardous outcomes may be clear in the shorter term, attribution of responsibility and engaging in legal proceedings may be impossible in the case of longer-term hazards -- in terms of the constraints of any [statute of limitations](#). This is an enactment in a common law legal system that sets forth the maximum time after an event that legal proceedings based on that event may be initiated. In civil law countries, almost all lawsuits must be started within a legally determined period. If they are presented after that time, a provision called [prescription](#) applies, which prevents them from filing the case -- as with a statute of limitations. It may be unclear whether the party originally responsible for the product remains responsible for damage beyond that period, if the product continues to be marketed. Of potential relevance is the case for the responsibility of the owner of the associated intellectual property and the period over which that is recognized (*From Patent Rights to Patent Responsibilities: Obligations incumbent on owners and licensors of intellectual property*, 2007).
- **period of existence:** whether undertaken by a well-identified party or not, it may be impossible to associate hazardous outcomes arising over a longer period from the origin of the initiative if such parties have ceased to exist. This is as evident in the case of dynastic families as with corporations whose ownership is transferred or with countries which have acquired independence from former colonial powers.

The interplay of these factors makes it evident that there are "windows of opportunity" through which high-risk initiatives can be taken without those undertaking them being effectively held responsible for disastrous outcomes. Expressed otherwise, it is possible to function within a risk-free "cocoon", (willfully) ignorant of vulnerability to those risks having a significant probability of manifestation on a longer time scale. This is exemplified by many homeowners disastrously affected by the subprime mortgage crisis.

Useful examples are offered by the deliberate or inadvertent [introduction of species to ecosystems](#). Australia, for example has become highly sensitive to the consequences of the "innocent" introduction of the rabbit, the [cane toad](#) and [red fox](#). -- subsequently recognized as pests damaging to the environment. These are readily described metaphorically as a "flood". Curiously little has been learnt from such initiatives -- as currently illustrated by some of the geo-engineering proposals in response to global warming ([Geo-engineering Oversight Agency for Thermal Stabilization \(GOATS\)](#), 2008). As noted above, they include stratospheric aerosol geoengineering, namely intentionally flooding the stratosphere with toxic materials in particulate form. As with other forms of flooding, it might well be asked at what point such initiatives are to be recognized as crimes against humanity and acts of terrorism.

It is of course also the case that those knowingly taking such risks may factor into their costs the possibility of any subsequent punitive legal action against them (as is typically the case with the pharmaceutical industry). It might well be argued that government authorities do just that in anticipating the possibility of ensuring that taxpayers bail them out for incompetent decision-making -- as in the case of the financial crisis and with the proposed "flood levy" in the Australian case.

Flood control: the reality

In the light of the above argument, the question is the nature of the provisions made for the control of whatever systemic imbalances are typically described metaphorically as a "flood". [Flood control](#) itself is a continuing concern but may well be poorly conceived and managed.

This point is well made by Germaine Greer ([Australian floods: Why were we so surprised by floods?](#) *The Guardian*, 15 January 2011), arguing that meteorologists had warned Australians six months earlier to prepare for a soaking: *And nobody did a thing... After 10 years of drought, we are having the inevitable flooding rains. The pattern is repeated regularly and yet Australians are still taken by surprise.* As a resident of Queensland, she notes:

The meteorologists will tell you that the current deluge is a product of La Niña. At fairly regular intervals, atmospheric pressure on the western side of the Pacific falls; the trade winds blow from the cooler east side towards the trough, pushing warm surface water westwards towards the bordering land masses. As the water-laden air is driven over the land it cools and drops its load. In June last year the bureau of meteorology issued a warning that La Niña was about "to dump buckets" on Australia... Dr Andrew Watkins, manager of the bureau's climate prediction services, told the assembled media: "*Computer model forecasts show a significant likelihood of a La Niña in 2010.*" ... Six months ago the meteorologists thought it was worthwhile to warn people to "*get ready for a wet, late winter and a soaked spring and summer*". So what did the people do? Nothing. They said, "*She'll be right, mate*". She wasn't.

With respect to flood control, Greer specifically notes:

The [Wivenhoe Dam](#) on the Brisbane river was built to protect the city of Brisbane from another flood like the one of 1974. For years it has been at 10% of capacity, so when it filled this year nobody wanted to let any of the precious water out. It eventually became clear that the dam had filled to 190% of its capacity, and the authorities realised with sinking hearts not only that the floodgates would have to be opened, but that the opening would coincide with a king tide in Moreton Bay. The question nobody has been heard to ask is whether or not the level of water in the dam should have been reduced gradually, beginning weeks ago. The mayor of Brisbane, aware that a disaster was about to occur on his watch, made a hysterical attack on the opponents of dam building, but what the succeeding events prove is that dams are no substitute for a coherent water strategy.

Whilst heavy responsibility for the flooding can be attributed to La Niña -- as an insensitive Act of God -- almost no mention has been made of those whose inadequate modelling and/or decision-making ensured that the damage was maximized. In a helpful summary of the insouciance of residents of the area, Greer asks:

The world is aware of what has been happening in Australia because so much of Queensland's capital city, Brisbane, the "most livable city in Australia", is now submerged in dirty brown water. Smaller towns in Australia have been flooded for months; some have been flooded five times since the beginning of December. What the rest of the world must be asking is why Australians don't take steps to minimise the destruction?

Greer also highlights a neglected feature of such flooding by "brown water", namely the continuing loss of topsoil from the highlands and its pollution of marine ecosystems. She concludes: *Australia owes it to the rest of the world to get a handle on its regular floods. Or she won't be right, mate.*

"Flood control": exemplified by "governance" of road traffic

Many systemic imbalances are described metaphorically as "floods" because floods offer the most graphic imagery through which to indicate the chaotic nature of more abstract forms of "flooding" -- as well as the implication, as "Acts of God", that no human can be held responsible. Extensive use of related meteorological metaphors ("hurricane", "storm", etc) was made in the case of the recent financial crisis to avoid any responsibility for systemic strategic and management failures, as separately reviewed ([Credibility Crunch engendered by Hope-mongering: "credit crunch" focus as symptom of a dangerous mindset](#), 2008).

Rather than consider metaphors based on the control of flooding by water -- even though this requires very concrete measures -- of potentially greater relevance is the understanding to be derived from the control of a "flood" of traffic. This involves forms of

"governance" with which many are personally familiar on a daily basis -- and which they consider credible and appropriate. It also implies a higher degree of self-organization and self-governance. The degree of personal responsibility and engagement in the face of risk "on the ground" is strikingly contrasted with that articulated from an abstract perspective through representation in complex systems diagrams -- notably with respect to issues of sustainability.

As discussed separately (*System Dynamics, Hypercycles and Psychosocial Self-organization*, 2010), the more complex the map of a system, the less likely it is to be widely comprehended and used, and the greater the potential for unremarked errors. This is relevant to mapping the current strategic issues in Afghanistan (Dion Nissenbaum, *Graphic Shows Complexity of US Counterinsurgency in Afghanistan*, *The Huffington Post*, 22 December 2009; Dion Nissenbaum, *The Great Afghan Spaghetti Monster*, *Checkpoint Kabul*, 20 December 2009). Such mapping offers possibilities in reframing the systemic challenge of climate change, as discussed separately (*Insights for the Future from the Change of Climate in Copenhagen*, 2010).

It is understandable that people find it difficult to identify with the dynamics indicated by such systemic representations. These can be usefully recognized as offering a "false" sense of perspective dissociated from those which are required to navigate within a flood of traffic. Such concerns were raised with respect to commentary on the follow-up [United Nations Climate Change Conference](#) in Cancun (*From Changing the Strategic Game to Changing the Strategic Frame: Missing cognitive possibility in changing the system not the planet*, 2011).

[Road and traffic signs](#) are widely accepted as a necessary and valuable indication of risk, whether or not neglect of their information is subject to legal process. The emergence and standardization of such signs has been a response to the increasing "flood" of traffic worldwide and to the need for a succinct (often pictorial) indication of risk. Curiously there is as yet little acceptance of the need for equivalent indication for many other forms of risk.

Sets of [road signs](#) can therefore be creatively "mined" for indications as to the kinds of comprehensible signs that might be of value with respect to navigating various other classes of risk. Such "mining" -- effectively a form of "research" -- follows from the argument of Susantha Goonatilake (*Toward a Global Science: mining civilizational knowledge*, 1999).

The emphasis on flow, and "being in the flow", recalls the arguments on learnings to be derived from water (*Enabling Governance through the Dynamics of Nature: exemplified by cognitive implication of vortices and helicoidal flow*, 2010). This certainly holds the "freedom" which people value in being empowered to explore highway and freeways. Does framing the collective challenge in this individualistic way offer a vital key in the elusive quest for sustainable governance?

Insights into "flood navigation" from road signs?

In the case of Australia, the road signs also typically include warnings regarding the current level of fire danger or the potential dangers in the event of flooding (as noted above).

An extensive summary of road traffic signs, variously clustered, is provided in *Wikipedia* entries. In the entry on [traffic signs](#), *Wikipedia* notes that Annex 1 of the [Vienna Convention on Road Signs and Signals](#) (1968) defines eight categories of signs. As an exercise, a selection of road traffic signs is presented in an Annex (*Being in the Flow on Strategic Highways and Byways: enabling sustainable self-governance through traffic signage*, 2011). These are loosely clustered to distinguish between:

- purely advisory information,
- warnings relevant to prudent driving,
- rules which must be followed to avoid collisions.

The commentary in the Annex endeavours to highlight the systemic relevance of the signs with respect to the "self-governance" of:

- flows in opposite directions
- intersecting and cross-cutting flows
- hazards calling for prudence
- speed

Whilst suggesting systemic parallels in navigating risky flow situations -- "floods" -- the Annex raises the questions:

- which traffic signs are of no systemic relevance to which situations, namely which are of no relevance in some way?
- what is the minimum number of signs to enable viable navigation of "floods" -- the optimum number, an excessive number?
- whether a general theory of "traffic signs" could be developed, from a more systemic perspective, to facilitate navigation in a variety of flow situations?

Given the number of road traffic signs people are called upon to recognize within the flow of traffic, how many "signs" might be required to enable navigation of the dynamics of other systems and their associated forms of flood?

A variant of this question is a feature of the [theory of signage systems](#), namely the design of a comprehensive set of signs for a facility or for an environment. This is illustrated by the study of [Ravi Poovaiah](#) (*Graphic Symbols for Environmental Signage: a Design Perspective*, 1995) who argues:

'Symbols' conceived in the context of environmental directional signage, and one that is specifically intended as a public service facility, is being seen here as having the potentials for constructing an effective graphical interface between the user and the intended facility; the objective is to facilitate the activities of locating, identifying, informing and directing the user through the various gamut of activities of a given service facility.

Such a perspective raises the question as to how it might be applied more generally to elicit the signs and symbols of requisite scope for sustainable governance of the global environment -- as a "public service facility". Appropriately an international review of this approach uses a descriptor of strategic significance (Philipp Meuser and Daniela Pogade, *Wayfinding and Signage: Construction and Design Manual*, 2010).

Psychoactive hazards in recognizing and engaging with risk

There is a considerable body of experience regarding the engagement with risk of drivers of vehicles on roads, notably including that of Tasmania (*Road Risk Reduction*, 2009). This focuses on:

- concentration and coordination, as it is affected by:
 - tiredness
 - influence of alcohol or other substances
 - distracting influences (mobile phone use, etc)
- speed
- misjudgement, notably with regard to safe driving in relation to road conditions and to other vehicles
- driving skills
- knowledge/ignorance relative to that of other drivers

Studies (and remedial campaigns) have notably focused on the appreciation or denial of risk by drivers, typically through misplaced overconfidence. These issues come to a focus in the heightened risk associated with the enthusiasm for speeding. There is a natural thrill in taking risks in many driving situations -- typically associated with a degree of denial regarding the level of risk. It is in this sense that the engagement with risk may be described as "psychoactive".

The situation is relatively clear in the case of road traffic, despite such patterns of denial. It is far less clear in many of the other forms of "flooding" described above. Clearly risks are taken in those situation -- exemplified by the high risks taken in the financial speculation leading to the recent global financial crisis.

Of particular interest is the engagement with risk relating to population increase. The implications with regard to constrained resources are evident to a degree at the collective level (shortages of food, water, energy, etc). They are also evident to a degree at the individual level within families. In these cases however, the dangers of speeding in the case of road traffic are replaced by the thrills and dangers of "growth" -- whether of the family or of an economy.

As with speeding, the response of the "drivers" involves a mix of denial, thrill, righteousness and self-fulfillment. Beyond the recognized difficulties of engaging with drivers regarding unconstrained speeding (through road safety campaigns and the like), in the case of unconstrained population increase the "right to speed" is typically framed as a fundamental right which is not readily amenable to debate. It is a "hot topic" of as deep a concern to Abrahamic religions as is the right to speed defended by motoring organizations on behalf of drivers.

With respect to the psychoactive nature of constraining population increase, the challenge of dealing with such a "hot topic" has been compared separately to that of handling radioactive materials (*Overpopulation Debate as a Psychosocial Hazard: development of safety guidelines from handling other hazardous materials*, 2009). This includes a section on *Psychoactive hazard warnings: symbols relevant to overpopulation debate*. The "symbols" are psychosocial adaptations of those conventionally used with respect to hazardous materials. They therefore correspond to the road traffic signs to which drivers are exposed.

Conclusion

The tragic incompetence in the management of flooding by water, as exemplified by developed countries such as the USA, the UK, France or Australia, serves to illustrate the less evident incompetence in the management of other forms of "flooding" -- whether in the financial markets, the commodity markets, or otherwise (*Emergence of a Global Misleadership Council: misleading as vital to governance of the future?* 2007). The challenge for developing countries is necessarily all the greater.

Overpopulation: Implicit in the above argument is the challenge for individual countries, and for the planet as a whole, of "flooding" by people -- namely the implications of overpopulation on a resource-constrained planet. The point has recently been succinctly expressed with respect to the classic "IPAT" formula by Richard Black (*H for 'human': The missing climate link?* BBC News, 21 January 2011). I=PAT is the lettering of the formula put forward to describe the impact of human activity on the environment: **Impact = Population x Affluence x Technology**. As noted by Black:

In fact, virtually no government intends to restrict the P in the equation, and certainly none wants to curb the A.

With respect to "P", this conclusion has been noted in relation to the *Kaya Identity* as separately discussed (*Uncritical Strategic Dependence on Little-known Metrics: the Gaussian Copula, the Kaya Identity, and what else?* 2009) with respect to a conclusion of the Intergovernmental Panel on Climate Change report:

The challenge - an absolute reduction of global GHG emissions - is daunting. It presupposes a reduction of energy and carbon intensities at a faster rate than income and population growth taken together. Admittedly, there are many possible combinations of the four Kaya identity components, but **with the scope and legitimacy of population control subject to ongoing debate, the remaining two technology-oriented factors, energy and carbon intensities, have to bear the main burden....** [*emphasis added*]

The inability of governments to come to grips with any form of "flooding" is therefore well-exemplified by the inability to come to grips with "P". Hence the merit of reframing the challenge in terms of psychoactive parameters. Expressed otherwise, if the intelligence community has been encouraged to think differently following 9/11, as noted above with respect to the work of Josh Kerbel (2008). "Rethinking thinking" is now appropriate with respect to China (Josh Kerbel, *Thinking Straight: cognitive bias in the US Debate about China -- Rethinking Thinking. Studies in Intelligence* (CIA), 48, 2007, 3). It would then seem to be appropriate to "rethink" risks associated with engagement with issues of increasing population. Ironically it is now China that is perceived as "flooding the market" with a variety of goods, as previously done by the USA with both goods and cultural products.

Acts of God: There is a curious irony to the manner in which humanity continues to attribute responsibility for many forms of disastrous flooding to a deity regarding whose existence there is far from universal consensus. This "deity" is however embodied in the provisions of the insurance industry for "Acts of God", as separately explored (*Acts of God vs Acts of al-Qaida: Hurricane Katrina as a message to Bible Belt America?* 2005). It is of course the case that "flooding" in many cultures is associated with tales of **mythical flooding** as a form of divine retribution for humanity's failures. The disastrous nature of flooding of whatever kind may well play into unconscious anticipation of further retribution (*Spontaneous Initiation of Armageddon -- a heartfelt response to systemic negligence*, 2004).

This semi-conscious neglectful tendency can be fruitfully framed as an effort to design comprehensive global strategies whilst "inadvertently" neglecting core issues, as discussed separately (*Lipoproblems: Developing a Strategy Omitting a Key Problem*, 2009).

Given recognition of a **collective unconscious** -- consistent with the global implications of the argument of John Ralston Saul (*The Unconscious Civilization*, 1999) -- a global knowledge society may even be subject to the climatic "chaos" induced by a systemic analogue to the **El Niño Southern Oscillation**. The psychocultural implications of any form of widespread "flooding" may well be reflected in those myths regarding great floods. This might even be understood as a form of **psychological flooding**, now recognized in a context of remedial behaviour therapy.

Terrorism: The global preoccupation with terrorism, and the management of its associated risks, has been variously associated with preoccupation with other forms of extremism (*Norms in the Global Struggle against Extremism: rooting for normalization vs. rooting out extremism?* 2005; *Varieties of Terrorism: extended to the experience of the terrorized*, 2004). Mismanagement resulting in any form of disastrous flooding can, in such terms, be understood as perpetuating a form of terrorism. Such mismanagement of risk can therefore be seen as a form of terrorism, subject to legal provisions where extremism is recognized as endangering the population. The case has been made with respect to the extremes of speculation which triggered the disastrous financial crisis affecting the livelihoods of thousands, if not millions (*Extreme Financial Risk-taking as Extremism: subject to anti-terrorism legislation?*, 2009).

With respect to flooding by water, and specifically the example of Australia, it may be asked whether the forms of risks taken with the lives and livelihoods of the population should be considered as a form of terrorism. Does this merit testing in the courts through a class action suit against those responsible for that systemic negligence -- and currently attempting to attribute their risk management failures to Acts of God?

WikiLeaks: In this context there is a curious irony to the position of the Federal Attorney-General of Australia, **Robert McClelland**, with regard to the release of the "flood" of documents by **WikiLeaks**, founded by Australian citizen **Julian Assange** (Joseph Krauss, *Wikileaks unleashes flood of confidential US cables*, *TimesLive*, 28 November 2010) -- a metaphor widely used in the media. But, as stated by McClelland in an interview on *ABC Local Radio* on that occasion (Queensland, 30 November 2010; and [reproduced on the website of the Attorney-General](#)):

All I can say is that the publication of this material is very, very serious. It has the possibility of literally affecting the safety, prejudicing the safety of people referred to in the documentation, and most certainly it has the potential to effect the national security interests of the United States and its allies including Australia. So the action is grossly irresponsible and can't be justified in any way shape or form, so you would like a dose of reality, common-sense, if not the absence of recklessness to come into this fellow's mind.

One might then appropriately ask what is the position of the Attorney-General with regard to actions markedly increasing the vulnerability to flooding in Australia and the extent to which these might themselves be understood as "grossly irresponsible" -- given their demonstrably disastrous impacts on lives and livelihoods. This is surely to be seen as undermining "national security" (if not **homeland security** as understood by Australia's principal ally). The irony is all the greater in that the river waters might be said to have transgressed the conventional boundaries established for them by planning arrangements -- much as WikiLeaks flooded (leaked) over the boundaries of diplomatic convention. The mindset which enabled such planning decisions surely "can't be justified in any way shape or form". Australians would surely "like a dose of reality, common-sense, if not the absence of recklessness" to come into the minds of those responsible.

Give the ambiguous statements made by Australian authorities regarding their intended treatment of Julian Assange, extending to the possibility of legal proceedings, there is a further irony regarding use of the term "bail" in his case and with respect to flood damage in Australia. Whilst Australian authorities made no effort to assist in enabling bail for Assange in the UK (despite the legal costs to which he is exposed), every effort has been made to "bail out" those affected by the floods -- presumably including those whose corporate initiatives so irresponsibly facilitated them (as in the clearing of forest areas which would otherwise have partially contained the unusual rainfall). This can readily be seen as another surreptitious diversion of taxpayer resources to those implicated in the origin of the problem -- whether or not, "too big to fail".

The Attorney-General also argues that a degree of confidentiality is essential to the functioning of relations **between** countries -- thereby

highlighting the mindset which considers it essential to the functioning of the network of authorities **within** countries. At what point, however, does the argument against transparency -- in favour of withholding information -- reinforce complicity in the "gross irresponsibility" in relations **between** countries rendered apparent by WikiLeaks? Similarly at what point does the case made for nontransparency **within** a country reinforce gross irresponsibility, as was demonstrated *post facto* by flooding the financial market with toxic assets -- and potentially to be demonstrated in the case of river flooding in Australia, should the Attorney-General choose to focus on the matter?

Collective learning: There is however every indication that very little will be collectively learnt from disastrous flooding of any kind. As previously explored, there is very little ability to focus on remedial capacity beyond the political pledges -- which might appropriately be said to be "written on water" (*Remedial Capacity Indicators versus Performance Indicators*, 1981). It might even be said that it is in terms of the "boundaries" to action that any "flooding" takes place (*Recognizing the Psychosocial Boundaries of Remedial Action*, 2009).

The dramatic [Gulf of Mexico oil spill](#) of 2010 illustrates the challenges to eliciting collective intelligence in a timely manner (*Enabling Collective Intelligence in Response to Emergencies*, 2010). The continuing emergence of "surprises" of global significance -- as documented by Taleb (2007) and Cerulo (2006) -- suggests that the modelling predictions for the mid-21st century regarding population and resources are dangerously naive in their failure to allow for the unexpected, including new forms of "flooding". At the time of writing, research suggests that the Amazon forest may no longer be able to mitigate rising greenhouse gas emissions of which it may itself become a source (Damian Carrington, *Mass tree deaths prompt fears of Amazon 'climate tipping point'*, *The Guardian*, 3 February 2011). The risks for future food production resulting from the [colony collapse disorder of bees](#) offer another current example.

Future surprises: The extreme certainty with which the problematic consequences of overpopulation (as predicted by some) are declared to be ill-informed (by others) bodes ill for the future. Despite the unpredicted global financial crisis of 2008-2009, the mindset is exemplified at the time of writing by the extreme surprise and horror at the disastrous flooding in Queensland. If flooding in Queensland constitutes a surprise, the modelling of population stabilization, in which so much confidence is notably invested by economists, may be undermined by other unforeseen events. Given that the insurance industry is faced with mitigating such levels of risk, potentially associated with "Acts of God", perhaps greater attention should be given to the role of the [reinsurance industry](#) as a means of appropriately reassuring the population.

As noted above, James Lovelock (*The Vanishing Face of Gaia: a final warning: Enjoy It While You Can*, 2009) makes the point that it is already too late. However his fruitful systemic reference to Gaia focuses primarily on her "cosmetic" appearance to humanity. The "Acts of God", with which disaster is so intimately associated, point to the continuing remedial capacity of Gaia -- effectively a "governor of last resort", once the credibility of humanity's global management capacity finally evaporates. The many biblical references to [weeping, wailing and gnashing of teeth](#) will then indeed be appropriate.

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