

Dodging the disaster bullet



How can we avoid disasters? **Gareth Byatt, Ilan Kelman, and Ana Prados** offer an answer...

In *CRJ* 18:2, we wrote about the need to avoid disasters and catastrophes and how no such event should be a shock or Black Swan. Past experiences teach us about the hazards and threats we face, and our last piece highlighted examples of people around the world who are mitigating disasters. This article will describe how innovation can be applied in various ways to avoid disasters; it examines innovation in economics before moving onto aspects relating to finance, data and technology, and businesses, including their liaison with local authorities. The piece concludes with a mindset example of how to avoid disasters, such as through counterfactual thinking.

Innovation is not only concerned with new approaches; it also includes working out meaningful uses for old, sometimes forgotten, ideas and ensuring good ideas are put into action.

In the pursuit of uncovering ideas, innovation, and global insights, which includes conducting case studies funded by NASA and engaging with various experts, six recurring factors become evident when disasters are successfully averted: the right mindset so that disasters are avoided; the right investment or funding is provided and

used; good governance, which includes accountability for actions; good data to inform decisions and actions; meaningful inclusion, for objectives serving everyone; meaningful targets, to track the benefits.

■ **Economics innovation:** A rethink of economics can help prevent more disasters from occurring. A rethink can start with a mindset to apply economic principles in a way that balances societal, environmental, and financial needs and benefits. Consider the way land is usually valued, divided, and subdivided for economic development. For various reasons, people keep finding themselves living on land that puts them at risk from disaster threats. Sometimes, it is the prospect of financial gain that drives decisions to build properties in urban flood-prone areas, next to vegetated spaces that are vulnerable to wildfire, or perilously close to or on seismic fault lines. For the less fortunate, it is because there is nowhere else to go.

The authority of local governments to control what can be built varies in effectiveness around the world. The predominant driving force behind it is how our current economic systems value short-term financial gain for



generations, rather than short-term political cycles forcing future generations to deal with problems created today.

Negative discount rates are not new, and discussion around the world is taking place about their application to help stop human-caused climate change. Would their use in the cost-benefit analysis of initiatives to reduce disaster risk lead to more action, more resources being made available, and meaningful targets being agreed to, monitored, and achieved?

■ **Finance innovation:** Along with economics and economic policies, finance is key, yet only a tiny fraction of the world's finances are allocated to avoiding disasters. Can innovative financial thinking alter the *status quo*? With a mindset to achieve the right investment or funding, always aligned with good governance and meaningful inclusion, can we be innovative with how we allocate

disaster finance and demonstrate compelling financial benefits?

Good examples, from global to local, of purposeful and life-changing funding exist, which we review in our case studies.

Farmers in Bangladesh harvesting crops

Photo: Shithil Rahaman

The international climate

change negotiations held every year are supposed to focus on the growing cost of inaction on climate change and related disaster risks. Consider those who struggle the most to obtain funds to address hazards and threats. The long-term debt and corruption in many countries are used to excuse their inadequate funding for action to avoid disasters. Innovative global initiatives on debt, financial transparency, and equitable resource distribution could help tackle structural issues implicated as reasons for not funding action to avoid disasters.

One example is national subsidy allocations. Ample finance to avoid disasters could be obtained by redirecting large government subsidies currently handed out to the fossil fuel industries towards decreasing disaster vulnerabilities and stopping climate change through better energy alternatives.

Innovation in domestic and international development financing can be accomplished with the right mindset, good governance, and meaningful inclusion, so that everyone benefits and works together to resolve conflicts or tensions as they arise. New approaches are needed to speed up funding for projects to avoid disasters and reduce disaster risk. Too often, bureaucracy and other factors prevent large organisations from releasing funding to those in need quickly enough. An alternative approach could be for international development organisations to work with those that provide capital in the private sector and to spur innovation with a timelier release of funds.

The speedy release of funds might also allow more consultation time to include everyone in designing solutions that work, perhaps running pilots before a full roll-out. The 'first mile' approach of discussing ideas and needs with communities is the first step, with an iterative feedback loop. Development funders should specify 'first-mile' meaningful inclusion as a requirement of funding to be released, with verifiable targets that are linked to funding allocation.

Innovation in insurance can play a valuable role in avoiding disasters. People's livelihoods are supported in the face of disasters when good insurance solutions are in place. The insurance market benefits from innovation

a select few over long-term financial, societal, and/or environmental benefits for all.

As another example of how we choose to value land, economics drives forest clearing because of the value of timber and agricultural land to grow resources cheaply so that consumers can purchase cheap products and corporations can make money for themselves and shareholders.

We need to adopt a different economic mindset to minimise disaster threats and value natural habitats, with innovative policies that achieve a trinity of societal, environmental, and financial value for the long term. Otherwise, destructive practices of land clearance and land use will continue, and more natural habitats will be lost. Furthermore, poor air quality will continue to cause problems (for example, from intentional wildfires), hazards such as landslides and storm surges will have higher impacts, wildfire threats to urban areas will increase, and more disasters will happen.

What innovation can be applied to macro- and microeconomic policy? Consider negative discount rates. This economic valuation approach places the present value of a future liability higher today than at a future date when the liability will need to be paid. In essence, it makes us think about acting sooner because it imposes higher immediate costs as a result of not acting now. By changing lifecycle costs, those of us alive today have a reason to help future

in the provision and use of services and products. Claims levels can be minimised, and the costs to insurers of their reinsurance can be reduced.

The amount of capital and liquidity in the world's finance markets is huge, but it is hardly used to manage disaster risk. Could innovative thinking unlock more of the very large private finance pie to fund work to avoid disasters? Examples exist, such as the good use of capital raised through bonds. Good governance must always exist to ensure private finance delivers compelling economic, financial, societal, and environmental outcomes.

■ **Data and technology innovation:** The collation and use of good data is one of our six factors. Data comes in many forms for society and the environment. People can directly observe the Earth or use ground-based or remote instruments (like satellites or drones) to do so. Socioeconomic data helps us assess vulnerabilities and prioritise disaster avoidance and response where it is most needed. Data is collated and analysed to provide information that supports on-the-ground decision-making.

The potential and reality of artificial intelligence's (AI) ability to change significant aspects of the economy and people's daily lives are long-standing and hold potential for how we can avoid disasters. While the private sector is spending heavily on language-based systems like ChatGPT, less discussed forms of AI and model-based machine learning (ML) are well suited to scientific data analysis of disaster threats.

For example, much has been written about the use of AI and ML algorithms to spot and anticipate patterns that can lead to various types of disasters and then inform actions to avoid them. How AI and ML solutions are applied could perhaps leverage our six factors to use these technologies for assigning and spending funds wisely.

■ **Design innovation:** Disaster risk specialists should ensure enough thought is given to design innovation, for which there are many opportunities to exchange knowledge and share lessons learned on different approaches to what has worked and what has not worked.

Design can take many forms. From the design of effective and efficient personal equipment to the design of nature-based and human-made infrastructure, innovation can be crucial to helping us think about new and different ways to solve a problem. Consider the teardrop plinth village design adopted in Bangladesh to help inhabitants address flooding – this is a design rooted in observing how nature works.

■ **Business and local authority innovation:** Businesses that are in step with local authorities can innovate to help the communities where they operate avoid disasters and, in doing so, improve their own resilience. Consider Japan's innovation, an aspect we continue to research in our Disasters Avoided initiative.

Businesses everywhere produce business continuity plans (BCPs) to help them deal with disruption. In Japan, many businesses build into their BCPs a way to contribute towards societal action when a major event (for example, a typhoon or an earthquake) is threatening to occur or occurs. While businesses will probably experience downtime and disruption, a purposeful BCP helps mitigate this loss by helping communities during their downtime.

Consider a hotel operators: They can quickly make rooms available in safe and unaffected properties as


shelter and offer hygiene and shower facilities, liaising with local authorities to ensure they are part of a co-ordinated, fast response. In Japan, this type of thinking between businesses and local authorities results in known lists of places where people can go for respite, shelter, and washing when their homes are rendered unsafe, or worse, destroyed. Businesses are reimbursed for costs incurred in a pre-agreed arrangement.

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This is an example of businesses having the right mindset. It is not a profit-making venture, but rather an agreement that base costs will be covered while allowing the business to continue to operate (in line with a purposeful BCP). This type of action by businesses and local authorities doesn't stop an event from occurring. Together with other actions that can be quickly triggered, it can help minimise the impacts of an event and play a part in avoiding a post-event disaster.

■ **Innovation and our mindset:** For the examples listed in this article and elsewhere, we have continually stressed how innovation requires the right mindset to succeed. Counterfactual analysis is a technique that can help us innovate by forcing us to think about how different situations, events, and near misses could have unfolded differently. It helps us maintain the right mindset.

Perhaps counterfactual thinking could be a reference technique for policymakers, funders, urban planners, and those who control and oversee codes and regulations to support the enforcement of good governance. When we think about how an event might have been worse (a downward counterfactual) or near misses that could have turned into events, we can unlock new forms of innovation to test approaches to possible outcomes and circumstances and to improve our awareness of situations such as near misses.

As the Head of the United Nations Office for Disaster Risk Reduction (UNDRR), Mami Mizutori, has stated: disasters can be prevented, but only if countries invest the time and resources to understand and reduce their risks. 

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