

Policy pointers

Donors, policymakers and researchers must address the threat of potentially catastrophic 'disruptive risks' facing cities of the global South, using fast and nimble solutions that operate at scale.

The development community should promote 'disruptive resilience' to respond to the rise in outlier and extreme events; the shift in established hazard patterns; the increase in multiple, simultaneous crises within single geographies; and the growth in transboundary risk.

Policymakers and authorities need to revise urban risk-management practices, and embrace new kinds of data, collaboration, finance, innovation models and decision making.

Researchers must explore the financial, political, social and behavioural factors that inhibit or enhance disruptive resilience, if this agenda is to succeed in transforming the lives of some of the world's most vulnerable people.

Disruptive resilience: an agenda for the new normal in cities of the global South

Urban centres across the world are unprepared for the 'disruptive risks' they now face. Highly unlikely disturbances are occurring more frequently. Established hazard patterns are shifting. Multiple crises are unfolding concurrently. A disturbance in one part of the globe is felt in another. The compound impacts of COVID-19 and climate change are important examples of disruptive risks that are rendering existing risk-management systems and practices redundant. New kinds of data, modes of collaboration, financial mechanisms, innovation models and decision-making approaches are needed to bring a vision of 'disruptive resilience' to life and meet this challenge effectively. This briefing explores the need to address disruptive risk, proposes an agenda for moving this work forward and provides inspiring examples of where approaches in building disruptive resilience are already proving fruitful.

Over time, most town and city governments (and many of their residents) have developed mechanisms for dealing with the threats they experience or anticipate from climate change and other disasters. However, the type of risks they now face differ greatly from those they have prepared for. For example, a number of extreme climate-induced events are on the rise¹ and the COVID-19 crisis is viewed by some as a harbinger of pandemics to come. The consensus is growing that we will continue to see a rise in unexpected, low-probability, high-impact events that are difficult to anticipate and, consequently, to plan for.²

Even the hazards that cities are used to facing, such as heavy rainfall, floods and high temperatures, are changing in intensity and timing; they are catching risk managers by surprise. Additionally, while national risk-management apparatuses are geared to respond to emergencies (natural or manmade) unfolding at

the same time in a few different places, most are unable to handle large concurrent crises.

For example, as COVID-19 was wreaking havoc, Cyclone Amphan battered cities on India's east coast and in southern Bangladesh. This compounded other risks, and resources were spread thin. One quarter of the cyclone shelters in areas affected by Amphan in Odisha, India were being used at the time as temporary medical centres for people quarantined for coronavirus. Also, the catastrophic explosion that rocked Beirut in August 2020 led not only to hundreds of deaths and thousands of injuries but also to a major spike in coronavirus infections. Beirut recorded its highest (at that time) single-day infection tally 48 hours after the explosion. These new risks are exposing the fundamental weaknesses of public health, disaster risk management and emergency response systems in cities worldwide.

The status quo in risk management must be disrupted to ensure towns and cities can respond effectively to outlier hazards

Given the highly interconnected nature of the global economy, events such as flash floods in one area of the globe increasingly lead to disturbances elsewhere, such as disruption in food supply chains. Due to physical distances and time lags between the occurrence of such an event and the disruptions it causes, these wider impacts are difficult to predict.³

In this way disruptive risks — unexpected, widespread, protracted, transboundary and novel — highlight the need to overhaul urban risk-management systems.

Why cities face disruptive risk

Using the lens of disruptive risk can also reveal underlying drivers that make urban centres vulnerable. Hazard impacts spread rapidly in densely populated urban centres. Risk rises where natural and engineered infrastructure that could help manage these hazards is absent, insufficient or poorly maintained. Municipal authorities in the global South lack financial and technical capacity to manage risk. Unless these are enhanced, the consequences of hazards are likely to be severe. Also, urban centres suffer from complex governance arrangements where multiple agencies, departments and ministries have overlapping mandates.

Joined-up decision-making and public accountability (particularly to the most vulnerable residents) is essential to ensure cities can cope with disasters.⁴ Well-planned and well-governed towns and cities generate many intangible resources that can help them bounce back from shocks. If managed well, multiple governance systems present within cities can open up potential solutions to challenges. Also, the density and diversity of urban societies can foster rapid problem solving and innovation.

Responding to disruptive risk with disruptive resilience

Coronavirus-related mortality rates and economic devastation have amply demonstrated the lack of resilience in urban centres worldwide and the weakness in risk-management systems in dealing with upheaval. There is near-unanimous consensus that the world will face an increase in such outlier hazards, including pandemics. The status quo in risk management must be disrupted to ensure towns and cities can respond effectively to these kinds of risks. The urgent need for transparent and accountable urban

governance is widely recognised as a pre-requisite to successfully managing risk. This apart, shifts are required in five other domains of action, which we detail here. See Table 1 for a summary of the following five points.

Informality: shift from participants to partners. Approximately 1 billion urban residents around the world live in informal settlements with poor-quality houses that lack adequate basic services and limited or no risk-reducing infrastructure.⁵ Many work in the informal economy characterised by low pay, job instability and poor working conditions. An increasing number of governments and NGOs have begun to recognise the benefits of involving these low-income residents in risk management. Frequently, though, they are not treated as genuine partners in this process.

Authorities and the development community must shift from encouraging local 'participation' to ensuring citizen 'partnership' and enabling local leadership. This long-sought change implies significant disruption. External partners must recognise the expertise of residents of informal settlements and use their knowledge as the basis for designing more resilient neighbourhoods. Financial decision making and control must genuinely devolve to properly constituted, accountable local institutions.⁶ Accountability to citizens must be as important as meeting the externally imposed standards of governments and development agencies.

In the COVID-19 pandemic, this model of partnership delivered rich dividends in Dharavi, Mumbai, the largest informal settlement in India. Unlike the top-down approach used elsewhere in India, here the government actively partnered with volunteers, civil society organisations, sanitation workers, political leaders and medical professionals. Together they have successfully contained the infection in one of the world's most densely populated places.⁷

Finance: shift from scarce to swift finance at scale. As only 11% of multilateral climate funds have gone to cities, there is a need to explore innovative mechanisms to finance urban resilience — ones that can help cities secure resources at scale, swiftly.⁸ In this context, municipal bonds are taking on a new significance. Through these, a city government/agency can raise money from capital debt markets for investment in building resilience.⁹

These are proving to be an important way for authorities to garner resources to respond to disruptive risks. For example, the US Federal Reserve has pledged to buy up to US\$500 billion in municipal bonds to finance COVID-19

Table 1. Transitioning to disruptive resilience

Area/sector	Business as usual	Disruptive resilience
Informality	Ignore residents of informal settlements or, in some cases, invite them to 'participate' superficially in decision making on urban resilience.	Treat local people and institutions as full partners to ensure that decision making on risk management devolves and draws on expertise of those living in informal settlements.
Finance	Overlook the need to finance urban resilience efforts or send funds that are too little or too late.	Ensure urban centres can augment external financing by using internal mechanisms and methods (such as resilience bonds) to raise financing swiftly, at scale.
Services and systems	Emphasise estimating probability of a hazard and basic contingency planning to ensure continued service.	Enhance the ability of those running urban services to make decisions under uncertain conditions, using approaches such as adaptive management and tactical urbanism.
Innovation	Mostly overlook novel approaches for reducing risk or use structured and expert-led models of innovation.	Enable autonomous innovation that is frugal, 'good enough' and relies on local knowledge for swift solutions to disruptive risk.
Data	Employ static, arduous, expensive approaches to gathering and analysing risk-related climate information.	Use big data and self-enumeration exercises undertaken by people in informal settlements. These provide dynamic risk data cheaply and easily.

response and recovery.¹⁰ A few cities in the global South have also employed this mechanism but there is immense scope for wider adoption. Similarly, innovative 'land-value-capture' schemes, which monetise unused government land, have also proven effective in helping cash-strapped city governments to raise money swiftly.¹¹

International climate finance must better serve local government through improved predictability, flexibility and convergence across interventions.¹²

Equity issues must be front and centre and questions as to who benefits from this finance need to be asked.

Services and systems: shift from probability to embracing uncertainty. Less than a third of cities participating in a recent survey claimed to have integrated climate adaptation and resilience planning within vital urban systems and services (such as transport, energy, water, sanitation and health). Where the resilience of these sectors is considered, it is usually in relation to engineering solutions and hard infrastructure.

To manage disruption, those in charge of running these systems should be trained in management processes that enable flexible planning and nimble decision making. Such adaptive management entails an "iterative process for continually improving management by learning from how current management affects the system".¹³

We see glimpses of this in cities trying to manage the COVID-19 crisis where access to public spaces and transport systems is permitted and denied in concert with the infection's spread or containment. Other approaches for making decisions in times of uncertainty that must be adopted include 'tactical urbanism' (planning for the short term using low-risk approaches) and 'strategic ambiguity' (planned transitions to

shorter planning horizons in times when crises are unfolding).

Innovation: shift from absent to frugal, fast, frontline innovation. Due to the uncertain nature of risk that cities will face, all partners must embrace innovative technology, building design, management practices, financing mechanisms and planning instruments. But urban governments in the global South lack the resources for this. Donors, development agencies and governments must enable new models of innovation that draw on the ingenuity and lived experiences of urban residents.

Autonomous models of developing solutions emphasise rapid cycles of experimentation and put communities in the driver's seat. These deliver frugal solutions that are good enough as opposed to the best possible. Known as 'jugaad' in India, 'gambiarra' in Brazil and 'jua kali' in Kenya, large corporations are adopting this model, which is demonstrating value for risk reduction as well.¹⁴

One illustration comes from Raipur city, India where a local innovator rigged up small solar panels to batteries from old motorcycles to develop a back-up generator. It ensures continued electricity supply through blackouts. This is essential for reducing health risks from heatwaves that are debilitating the region. Such examples abound, from alternative local electricity grids in Gaza to makeshift stoves for boiling drinking water during floods in Bangladesh.

More immediately, the COVID-19 crisis has brought these principles to the fore. New social distancing solutions for aeroplanes include using a reverse middle seat. In makeshift sanitation chambers, water pumps and showerheads are rigged to spray disinfectant on people just before they head into public areas. Also, some of these

principles are embodied in the radical changes in vaccine development protocols, with the use of rapid, parallel and adaptive development phases and abridged regulatory processes.¹⁵

Donors and governments can create an enabling environment for this model of innovation. They can periodically organise challenge funds; train staff running urban resilience initiatives to recognise and scale-up such innovations; and reward autonomous innovators and link them into networks. An example is the Honey Bee network, a volunteer effort that gathers and disseminates innovative, grassroots ideas and traditional knowledge.

Data: shift from static to dynamic, decentralised information. Data and information on risk is the bedrock of building effective resilience. But existing ways of acquiring and analysing data tend to be static, arduous and expensive. This is why decentralised data and information that emanates from those most at risk is essential for dealing with upheaval.

This could entail the use of 'big data' collected from mobile-phone use and other cost-effective, widely available information and communication devices. Although ethical concerns about privacy remain, governments have used such technologies widely in the COVID-19 crisis for contact tracing and other purposes.¹⁶

More could be done to mainstream the use of big data in responding to other hazards and crises. For instance, experiments have shown that authorities can successfully analyse information from mobile phones to determine the exposure and vulnerability of hard-to-reach populations to disasters.¹⁷ But governments and international donors have yet to use such approaches at scale to build resilience.

Apart from big data, insights from ground-up self-enumeration exercises undertaken by those living in informal settlements have had impact in countries worldwide. These rapid, structured

surveys undertaken by slum communities shed light on the physical, social and financial characteristics of areas (essential for managing risk) that government surveys frequently ignore.¹⁸

Administrations in cities such as Cape Town, Accra and Mumbai have used this data in decision making. Other cities should follow suit. Methods resembling this are proving valuable in Dharavi, Mumbai during the COVID-19 crisis. Teams of local volunteers familiar with the neighbourhood have gone house to house testing residents and gathering information. The tactic has been indispensable in containing the virus in this vast informal settlement to date.¹⁹

Fostering disruptive resilience

Implicit within the arguments made in this briefing is that to progress towards disruptive resilience, we need a keen understanding of the institutional, financial, political, social and behavioural factors inhibiting the required shifts. This effort can be supported by researchers highlighting cases where impediments in adopting this new way of thinking and acting have been overcome and the disruptive practices described here have been adopted.

The current COVID-19 crisis provides a unique opportunity for investigators to study the dynamics of disruptive risks and responses to them. This research should be increased to foster the right policies and practices that engender disruptive resilience. Building this body of knowledge will ensure that vulnerable communities in the cities of the global South will not just function but will flourish through the unanticipated shocks and stresses they will increasingly face.

Aditya V. Bahadur and David Dodman

Aditya V. Bahadur is a principal researcher in IIED's Human Settlements Group. David Dodman is director of IIED's Human Settlements Group.

The authors would like to thank Lucy Earle, David Satterthwaite, Thomas Tanner and Blane Harvey for their support and advice.



Knowledge Products

The International Institute for Environment and Development (IIED) promotes sustainable development, linking local priorities to global challenges. We support some of the world's most vulnerable people to strengthen their voice in decision making.

Contact

Aditya V. Bahadur
aditya.bahadur@iied.org

80–86 Gray's Inn Road
London, WC1X 8NH
United Kingdom

Tel: +44 (0)20 3463 7399
www.iied.org

IIED welcomes feedback
via: @IIED and
www.facebook.com/theiied

ISBN 978-1-78431-833-8

This briefing has been produced with the generous support of Irish Aid and Sida (Sweden)

 **Irish Aid**
Rialtas na hÉireann
Government of Ireland

 **Sida**

Notes

¹ IPCC (2012) Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (eds Field, CB, Barros, V, Stocker, TF, Qin, D, Dokken, DJ, Ebi, KL, Mastrandrea, MD, Mach, KJ, Plattner, G-K, Allen, SK, Tignor, M and Midgley, PM). Cambridge University Press, Cambridge, UK and New York, USA. / ² Mazzoleni, S, Turchetti, G and Ambrosino, N (2020) The COVID-19 outbreak: From "black swan" to global challenges and opportunities. *Pulmonology* 26(3) 117. / ³ Adams, K (2018) Resilience Building At Risk. *Acclimatise*. bit.ly/32bHXNA / ⁴ Dodman, D, Leck, H, Rusca, M, and Colenbrander, S (2017) African urbanisation and urbanism: Implications for risk accumulation and reduction. *International journal of disaster risk reduction* 26, 7–15. / ⁵ Satterthwaite, D, Archer, D, Colenbrander, S, Dodman, D, Hardoy, J, Mittin, D and Patel, S (2020) Building resilience to climate change in cities of the Global South. *Routledge*. bit.ly/318L2q2 / ⁶ Soanes, M (2018) Delivering climate finance at the local level: the Gungano Urban Poor Fund. IIED, London. bit.ly/327sQog / ⁷ Parasuram, S (2020) COVID-19: Involving social workers key to building on early gains in Dharavi. *The Hindu*. bit.ly/32fFjWO / ⁸ Bahadur, A and Tanner, T (forthcoming) Enhancing Urban Resilience Trap: Pivots for tackling climate change in cities of the Global South. *Routledge*. bit.ly/318L2q2 / ⁹ Climate Bonds Initiative (2020) How to issue a green city bond. / ¹⁰ Smialek, J (2020) Fed Gearing Up to Help Smaller Local Governments. *New York Times*. <https://nyti.ms/31hiYsX> / ¹¹ Global Facility for Disaster Risk Reduction (2020) Land Value Capture. World Bank. bit.ly/3hziI30 / ¹² Shakyia, C, Soanes, M and Smith, B (2019) Calling for business unusual: reforming climate finance. IIED, London. bit.ly/318L2q2 / ¹³ Bunnefeld, N, Redpath, S and Irvine, J (2015) A review of approaches to adaptive management. Scottish Natural Heritage Commissioned Report No. 795. / ¹⁴ Radjou, N, Prabhu, J and Ahuja, S (2011) Use Jugaad to Innovate Faster, Cheaper, Better. *Harvard Business Review*. bit.ly/2EsKH07 / ¹⁵ Le, TT, Andreadakis, Z, Kumar, A, Roman, RG, Tollefsen, S, Saville, M and Mayhew, S (2020) The COVID-19 vaccine development landscape. *Nature Reviews Drug Discovery* 19(5) 305–306. / ¹⁶ Servick, K (2020) Cellphone tracking could help stem the spread of coronavirus. Is privacy the price? *Science*. bit.ly/31hAhKs / ¹⁷ Letouze, E, Vinck, P, Schwarz, B, Sala, S, Sangkoyo, D and Tellman, T (2015) Big Data for Climate Resilience. Harvard Humanitarian Initiative, MIT Media Lab and Overseas Development Institute, London. / ¹⁸ Satterthwaite, D (2011) What role for low-income communities in urban areas in disaster risk reduction. United Nations Office for Disaster Risk Reduction, Geneva. / ¹⁹ Parasuram, S (2020) COVID-19: Involving social workers key to building on early gains in Dharavi. *The Hindu*. bit.ly/32h7Dbq