

How do we prioritize when making decisions about development and disaster risk? A look at five key trade-offs

A persistent challenge in disaster risk reduction is that development, which is crucial for reducing vulnerability to disaster risks, often exacerbates them instead, because poor decisions put people and property in harm's way. Disasters, in turn, can destroy many years' worth of development investments. If recovery is not handled well, disasters can leave people even more vulnerable to future hazards.

The SEI Initiative on Transforming Development and Disaster Risk, launched in 2015, aims to tackle this dilemma by focusing on the relationship between development and disaster risk reduction (DRR). The work starts by recognizing that decision-making at all levels – from individuals to national governments – involves trade-offs. Even when we pursue desirable objectives, we may create new risks. We cannot eliminate all risks, but by understanding the trade-offs being made, we can better manage and reduce the risks.

This discussion brief outlines key trade-offs in decision-making on development and DRR at various governance levels, looking for opportunities to transform the relationship between development and DRR and build resilience.

We identify five main types of trade-offs in decision-making about disaster risk and development –involving power, equity, time, risk and aggregation. The power trade-off is about who gets to be part of the decision-making process and how power is shared. The equity trade-off relates to how the development gains and the disaster losses are distributed across the population. The temporal trade-off weighs short-term versus long-term gains. The risk trade-off is about which risks we weight heavily, and which matter less. Finally, the aggregation trade-off weighs macro-economic development gains against disaster losses.

We illustrate how the trade-offs could occur in practice by applying the typology to the concept of “Building Back Better”, a widely embraced approach to post-disaster recovery, and highlight critical issues, opportunities for transformative change and relevant indicators for monitoring progress.

Refocusing the research on DRR and development

Disaster risk reduction research and practice have evolved over time. Early efforts focused on mitigating physical risks – by building flood protection walls, for instance, and ensuring safe escape routes. A second wave in DRR emphasized socio-economic factors that make some people particularly vulnerable to disaster risks. Most recently, especially in the discussions leading up to the approval of the Sendai Framework for Disaster Risk Reduction in 2015, there has been a push to look more closely at links between development and DRR, and to work proactively to resolve conflicts between the two.



A boy sits on the edge of his destroyed home after Typhoon Haima struck the northern Philippines last October.

We have long known that development entails risks. As the hazard research pioneer Robert Kates wrote many decades ago, “People encounter hazard in the search for the useful.” There is no such thing as zero-risk development, so we have to balance the benefits of development options against the hazards involved. But in practice, that balancing act often fails to prevent serious risks.

We know more than ever before about what drives disaster risks, yet we have made only slow progress in reducing the loss of life from natural hazards, and property losses continue to increase globally. Our analysis starts from the insight that although we know a great deal about how development creates vulnerabilities, we have neglected to explore why people choose to pursue those risky paths anyway. Understanding the perceived gains from risky actions is thus also essential for successful disaster risk reduction.

By examining the trade-offs made by decision-makers – explicitly or not – as they consider development and disaster risks, we hope to identify opportunities for interventions to achieve more sustainable and resilient development.

Five trade-offs in development and DRR

Sustainable development inherently involves trade-offs. Actions that support one goal (say, expanding cropland to increase production) may conflict with another (say, protecting forests). The same is true with regard to development and disaster risks: making the most of coastal real estate, for example, will also expose more people and property to hurricanes. A dam that improves water supply to some areas may exacerbate drought or flood risks further downstream. A near-term fix may cause long-term vulnerabilities.



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The Outer Banks of North Carolina, U.S., are extremely vulnerable to coastal flooding, but people continue to rebuild after storms.

We developed our trade-off typology to systematically analyse the trade-offs involved in a given decision-making process. Our approach considers both the risk rationale (i.e. how risks are conceived and perceived, and how they are weighed against one another and prioritized) and the processes through which development and risk trade-offs are framed, deliberated and negotiated. We describe each type below; Table 1 provides a summary.

The power trade-off

Who gets to be part of the decision-making process, and do some people have more sway than others? Inclusion and power relations can shape the agenda and determine whose interests are considered and prioritized. This is why understanding power structures is a key step in achieving transformative change. However, often the people affected by projects – and sometimes even national governments – do not have a say in decisions about development or DRR investments.

Governance structures can range from highly hierarchical, with top-down decision making to very inclusive and bottom-up. The appropriate level and means of involvement need to be determined in each situation. Inclusive processes will involve a wide range of stakeholders, including local governments, community-based organizations and marginalized people. Inclusivity comes at the cost of efficiency and can face resistance from those currently in power. Stakeholder involvement processes require extra effort and skills to facilitate effective participation, as well as networks to identify and connect to all the actors.

Good governance systems also need to be transparent, predictable and accountable to the people. When decision-makers are protected and separated from the impacts of their actions, they have no incentive to minimize risks. Already, there have been a few cases of authorities being held accountable for disaster risks, such as under India's National Disaster Management Act of 2005.

The equity trade-off

The equity trade-off is the balancing of the needs of different groups, as well as the distribution of benefits, losses and risks from development-related decisions and pathways. Decisions about development and disaster risk are unlikely to affect everyone equally. There may be distinct winners and losers, or the benefits (or harm) may be unevenly distributed. Although there is no consensus around the definition of equitability, it is recognized that decreasing disaster risk requires protecting the needs of those most vulnerable – the poor and marginalized, and those in high-risk areas.

In low- and middle-income countries, disasters tend to disproportionately affect small businesses, low-income households and communities, as well as those working in the informal sector and living in informal settlements. These are populations with very limited capacity to reduce their risks through physical, political, technical or financial means.

Similar to the power trade-off, shifting the distribution of gains and losses can face high resistance. However, identifying the winners and losers of current policies and decision-making processes is crucial to altering the relationship between development and disaster risk. Also, working with a broad range of stakeholders to develop a shared goal or vision of equitable resilience to guide planning and investments can support more equitable outcomes. Regulations which support risk-sharing mechanisms, such as mandatory insurance, can also help to spread the costs of disaster loss across society and make insurance accessible to a broader audience.

The temporal trade-off

Choices that maximize benefits today may impose high costs in the future. Greenhouse gas emissions are a prime example: burning fossil fuels today may boost economic output, but it contributes to climate change, with potentially devastating impacts. The tricky part is how to weigh one against the other. We know that people (and businesses) are predisposed

Table 1: Critical questions in addressing the five key trade-offs in development and disaster risk reduction decision-making

Trade-off type	Critical questions in the analysis of trade-offs
Power	<ul style="list-style-type: none"> • Who is and is not involved in the decision-making process? Which criteria are used to select actors for involvement? What is the appropriate level and extent of involvement? How are elite capture and marginalization avoided? • Who decides the agenda and goals of the process? Is it tied to funding? • How are decision-makers held accountable? • What are the costs of and resources necessary for inclusion?
Equity	<ul style="list-style-type: none"> • How is equity defined in practice? • Who benefits and who is harmed by a given decision? Are the potential losers involved in the decision-making process? • How can vulnerable and marginalized people be included in the process? • Have indirect impacts of decisions been identified and addressed in the decision-making process? • What are the resources needed to analyse impacts?
Temporal	<ul style="list-style-type: none"> • What is the appropriate time-frame for which risks, costs and benefits should be considered? • What is the appropriate case-specific discount rate, and how does the discount rate affect the outcome of the decision? • What are the long-term impacts of decisions? • How are decision-makers held accountable for the long-term impacts of their choices?
Risk	<ul style="list-style-type: none"> • What are the context, uncertainties, and known and unknown risks related to the decision? • How are risks prioritized by those needing to act in order to decrease disaster risk? • What assumptions are made in technical assessments of risks? Do they reflect how actual people assess risks in their own lives? • What level of collaborative learning with stakeholders is optimal? What resources are needed for it?
Aggregation	<ul style="list-style-type: none"> • How are the losses measured, and what are they measured in relation to? • What key indicators need to be measured alongside GDP for a balanced view of sustainable development and disaster risk reduction? • To what extent are social, environmental and economic aspects integrated? • To what extent are indirect impacts (social, environmental and economic) considered?

to favour short-term gains over long-term ones. The future is also uncertain: we don't know precisely how the climate will change, for instance, or how it will affect us – we only have model projections and probabilities.

In development and planning, disaster risk is only one of several uncertainties. Sometimes it is simply ignored, or it is “covered” by insurance. The latter may help reduce long-term risk if insurers require some risk mitigation measures, but insurance can also facilitate investments in high-risk areas; many coastal cities are prime examples. Another issue is that when future impacts are considered in cost-benefit analyses, the value of potential losses tends to be heavily discounted. As a result, the long-term implications of decisions are often hard to discern, and they are typically outweighed by short-term gains.

Effectively addressing the temporal trade-off requires explicitly considering future disaster risks in both public and private decision-making processes, assessing potential long-term losses and benefits even when insurance is available, and carefully selecting an appropriate discount rate. It is important to recognize that such an approach may not come naturally; politics and planning occur in specifically timed cycles, and decision-makers may have strong incentives to focus on the near term.

The risk trade-off

In any given decision, at any level of decision-making – individual, community, national or international – there may be more than one risk that needs to be addressed. Disaster risks, for instance, may be intensive (severe but relatively uncom-

mon), extensive (frequent but not very severe), or multi-hazard, involving several risks at once that may interact with one another. Mitigating one risk might exacerbate another, or generate new risks. And decision-makers also need to consider a broader set of risks related to social, economic and political issues. How should they prioritize among risks?

We know that in practice, risks tend to be prioritized on the basis of social norms, beliefs, values, and people's awareness levels. More immediate risks and related investments tend to be prioritized, while future and lower-probability risks



Members of the Ecuadorian Red Cross tend to a little girl after a 7.8 magnitude earthquake on Ecuador's central coast that destroyed entire buildings.

are discounted. Also, some people are used to living with uncertainty and suffering and thus have a higher tolerance for risk; they may also avoid engaging with authorities whom they distrust.

When policy-makers do not understand how citizens account for disaster risk, the interventions they design will be ineffective. Thus, planners and experts need to start by learning how stakeholders think about risks and how they prioritize. They must also “ground truth” their assumptions with the public. Policy “co-design” and collaborative learning processes are valuable tools in this context, but they require additional resources and skills, as well as a willingness to consider new perspectives.

The aggregation trade-off

Significant development gains have been made in the past few decades, globally and in individual countries. However, economic losses from disasters have continued to increase. Underlying this phenomenon is the aggregation trade-off between maximizing overall economic development and sustainable development, accounting for disaster risk exposure and vulnerability.

An analysis at the national scale might deem a development project, such as a large hydropower project, a fossil fuel-based energy plant or the construction of a road network, to be beneficial due to narrowly defined gains such as profits, access to energy or geographical access that it provides. Yet at the same time, it may create significant disaster, social and environmental risks.

A key issue here is how to measure gains and losses. GDP, the most widely used macroeconomic indicator, indicates an economy’s size, output and growth. However, it is also widely criticized as an inadequate measure of the quality of development, especially in terms of economic well-being. For instance, in low- and middle-income countries, the asset base often grows faster than standards and safeguards for risk-resilient building can be put in place.

As infrastructure has a long lifespan, inappropriate economic development can result in a long-term increase in exposure and vulnerability. The aggregation trade-off links with the temporal trade-off, in that degradation of the environmental or social base can eventually also have negative economic consequences.

One way to better address the aggregation trade-off is to monitor disaster losses in relation to the development gains being made, to ensure that benefits are accruing faster than risks. Investment decisions also need to consider indirect and unintended impacts – for example, increasing accessibility through road construction may steer investment towards newly accessible high-risk areas.

Often predicting impacts is not straightforward, and integrated assessments in the planning phase will be needed. Such processes may also identify more holistic approaches to development that achieve the desired benefits without exacerbating disaster risks.

Another factor is that many times economic development priorities are linked to the need to attract external funding

and private investment. It is then assumed that economic development will provide a basis for future social and environmental protection, but the opposite is not seen as an option. A related challenge is that there are often limited resources for extensive impact assessment beyond what little may be required by law.

The 5 trade-off types applied to ‘Building Back Better’

The concept of “Building Back Better” starts from the recognition that rebuilding after a disaster provides an opportunity to correct past mistakes and lay the foundation for more resilient future development. From that perspective, it is a prime example of integrated thinking about development and DRR.

Yet choosing to “build back better” is not as simple as it sounds. It involves real trade-offs that funders and development partners may not always recognize, some of which are quite evident to local people and can result in strong resistance. The typology can help us understand and address those trade-offs.

The **power trade-off** arises in decisions about who is involved in planning the rebuilding process. Is the process top-down or bottom up? How much of a say do stakeholders have, and is everyone included, or just men, for instance, but not women? Often key choices are made by funders, with little or no input from the affected people. Yet top-down reconstruction processes have been shown to have poorer results than more inclusive ones. One study of reconstruction processes in 10 countries found that while top-down, donor-driven reconstruction processes resulted in technically safer housing, the process resulted in housing which was “often inappropriate, difficult to maintain and too expensive to replicate”.

Attention to the **equity trade-off** can highlight disparities in how people are affected by the rebuilding process. Different groups in society have different starting points in terms of their capacities for coping and building back after a disaster. People whose livelihoods have been disrupted may have urgent needs that cannot be neglected. Understanding



A woman and her child stand in front of the house being built for them under the Building Back Better program in North Cebu, the Philippines.

those needs, the development of social networks and public services, and the provision of affordable insurance can help to lessen the impact on the most vulnerable.

The **temporal trade-off** is particularly prominent in post-disaster response situations. People are often anxious and want quick solutions to decrease their suffering and get back on their feet, but it can take time to plan and implement a strategy to ensure long-term resilience. Participatory processes also take longer than top-down decisions. However, the time following a disaster is a window of opportunity for building back better in a way that mitigates previous disaster risks and avoids creating new risks. Effective communication with affected communities can help ease their immediate concerns and engage them in the

rebuilding effort. In disaster-prone areas, alternative development strategies can also be built into contingency plans, so communities have clear ideas about how they would like to rebuild before a disaster occurs.

Risk trade-offs can manifest themselves as differences between experts' and stakeholders' assessments of risks. Experts may not be aware of the security, power, historical, social and cultural contexts which can determine which risks are perceived as most important. Understanding the context can help experts to better support residents in disaster-affected communities as they make tough choices about whether to stay in a high-risk area or take a buy-out and relocate, for example. Accounting for stakeholders' actual priorities in recovery plans can improve the alignment

Table 2: Applying the trade-off typology to 'Building Back Better'

Trade-off type	Definition	Critical issues	Indicators	Opportunities for transformation
Power	The extent to which power is distributed and stakeholders are involved.	Insufficient stakeholder participation in setting priorities for response and building back High risk of uninformed and inappropriate response	GDP HDI World governance indicators Rule of Law index EIU Democracy Index	Building good governance Strengthening rule of law Increasing democracy
Equity	The extent to which gains and losses are distributed	Inability for the vulnerable to cope and build back better due to lack of financial and material capacity Disaster impact leading to loss of livelihood, falling out from social and financial support systems, and further exclusion.	GINI index Human Poverty Index Multi-dimensional poverty index Tax base Level of subsidies and compensation	Prioritizing poverty alleviation in building back strategy Placing health equity at the centre of building back
Temporal	Short-term gains versus long-term development and resilience	Overlooking the potential long-term impacts of short-term solutions Post-disaster window of opportunity for building back better Potentially incorrect assumption that emergency response solutions will be short-term in lifespan Inappropriate levels of discounting long-term impacts	Infrastructure investment per capita Fiscal economic indicators Educational, social and health sector penetration per capita SDG indicators	SDG model in building back Use of alternative economic models with 10-15 year horizons Accounting for long-term impacts Contingency planning for disaster response and building back better
Risk	Prioritizing among risks	Overlooking how individuals and organizations in society prioritize risks within their adaptation and disaster responses	Mortality and morbidity rates Property losses Insurance sector penetration Government and international subsidy levels for response and building back	Emphasis on social and institutional learning about overlooked risks and vulnerabilities Capacity building and training in sectors requiring higher property valuation and insurance coverage Participatory stakeholder involvement in understanding societal risks in context of building back better
Aggregation	Weighing macro-economic development gains against disaster losses	Uneven focus among social, economic and environmental impacts Inadequate attention given to lowest quintile investment needs in building back	Urban / rural development Losses to GDP ratio Natural resource protection funding Sustainable Livelihoods Security index Investment levels directly benefiting the most vulnerable	Increased investment in social and environmental capital Promoting sustainable livelihoods Prioritizing food and water security



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South African President Jacob Zuma visits Alexandra Township, outside Johannesburg, after a devastating flood last November.

of stakeholder and authority goals and thus also improve the effectiveness of plans and investments.

The **aggregation trade-off** can lead to an imbalance in response that favours national-scale economic growth, for example, over other considerations. National macro-economic models tend to smooth out local variations. That means that in rebuilding after a disaster, there may be gaps in the distribution of resources regionally and within segments of society. Addressing this trade-off requires looking at a broader range of costs and benefits, including social, economic and environmental factors. The Sustainable Development Goals (SDGs) and constituent indicators may be helpful in this regard.

Table 2 summarizes our analysis and identifies potential indicators of progress as well as opportunities for transformation.

Conclusion and next steps

We know development is essential for reducing and coping with disaster risks, but development also often creates or exacerbates risks. Our analysis highlights the extent to which these negative effects are the result of conscious choices that could be managed better by recognizing and addressing key trade-offs.

Focusing on trade-offs moves disaster risk interventions upstream, to the processes that shape development and regulation. It acknowledges that those processes create and lock in risks. Focusing on the trade-offs made by decision-makers can thus help identify an “intervention space” where we can

take a proactive approach to disaster risk management, rather than only being reactive.

Our typology aims to make it easier to recognize trade-offs in decision-making about development and/or disaster risk, even when they are not immediately obvious. The analysis and questions presented here are a first attempt to systematically examine the multiple dimensions of decision-making processes. The next step in our work is to test this approach in in-depth empirical case studies. Future research should also focus on how to operationalize this analytical approach, so that it can become an instrument to transform the relationship between development and disaster risk.

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