Stockholm Environment Institute

How do we prioritize when making decisions about development and disaster risk?

A look at five key dimensions of trade-offs

SEI brief
December 2018

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A persistent challenge in disaster risk reduction (DRR) is that development, crucial for reducing vulnerability to disaster risks, can exacerbate the risks because poorly thought out decisions put people and property in harm's way. Disasters, in turn, can destroy many years' worth of development investments. Furthermore, post-disaster redevelopment often rebuilds vulnerability and continues the vicious cycle. While progress in reducing the loss of life from natural hazards in some countries has been made, economic losses, particularly those related to extensive risks in low and middle-income countries, continue to increase globally.

The Stockholm Environment Institute's Initiative on Transforming Development and Disaster Risk, launched in 2015, aims to address this dilemma by focusing on the relationship between development and disaster risk. The Initiative's fundamental precept is the recognition that decision-making at all levels – from the individual up to national government – involves trade-offs. Even when we pursue desirable objectives, we may be creating new risks. While we cannot eliminate all risks, we can reduce and better manage risks by recognizing and understanding the explicit, and often implicit, trade-offs being made.

This discussion brief lays out the context for our research and outlines key dimensions of trade-offs in decision-making on Development and Disaster Risk Reduction at multiple governance levels, identifying intervention points to transform the relationship between development and DRR. We then apply the trade-off typology to the concept of 'Building Back Better', one of the key priorities of the Sendai Framework for Disaster Risk Reduction 2015-2030, and thus illustrate its potential utility for identifying opportunities for transformative change.

Five dimensions of trade-offs in development and DRR

Sustainable development inherently involves trade-offs. Actions that support one goal, such as expanding cropland to increase production, may conflict with another, such as protecting forests. The same is true with regard to development and disaster risk: making the most of coastal real estate will also expose more people and property to typhoons and other cyclones. A dam that improves water supply to some areas may exacerbate drought or flood risks further downstream. Similarly, relocating people to safer areas may have negative consequences on their livelihoods and well-being.

Based on a literature review, we developed a typology of trade-off dimensions to systematically analyse the trade-offs involved in a given decision-making process (Tuhkanen et al. 2018). Our approach considered two overarching contexts. The first is how gains, losses and risks are conceived and perceived and how they are weighed against one another and prioritized. The

Photo (above):
Aftermath of Typhoon Haiyan, Philippines © OLIVER CAM

Table 1: A typology framework for trade-offs in development and DRR

Trade-Off Dimension and Definition	Examples of Trade-Offs	Examples of Key Questions to Explore the Dimension
Aggregation: The aggregation of development and DRR gains and losses	• Competing needs: when other needs or goals compete with DRR for funding/ resources • Conflicting goals: when DRR is and other objectives, such as economic development, are perceived to conflict	• What are the goals and needs, and how are they defined? • What are the losses, and are they anticipated? • How are gains and losses measured or quantified?
Participation: The distribution of participation and power	• Role of structures: the extent to which processes and structures incentivize cooperation vs. competition • Resource limitations: how to design effective participation with limited resources (skills, time, finances, etc.) • Decision-making power: whether participation enables the ability to influence decisions and challenge the status quo	• How participatory and collaborative are key processes? • How is decision-making power distributed? • How are those who stand to directly gain and lose engaged? • What transparency, accountability, monitoring and evaluation mechanisms are in place?
Equity: The equity of decision-making processes and outcomes	• Allocation of benefits/assistance: • differing definitions and criteria used for determining distribution of benefits, including local and external definitions of equity; balancing needs-based assistance post-disaster with the incentivizing of pre-disaster risk mitigation and prevention activities. • Structural influence on risk: the impact of different development pathways, e.g. market led economic development, and its influence on the ability of different actors to deal with risks and impacts	• How equitable is the distribution of expected/desired gains and anticipated losses? • To what extent are impacts on vulnerable and/or marginalized groups in society explicitly considered? • To what extent does the economic development pathway influence equity and resilience?
Time: The balancing of near and long-term goals, costs, and benefits	• Pursuing short-term vs. long-term goals: compatibility of the impacts of goals across time • Risks related to immediate disaster interventions: the pressures, benefits and risks related to acting quickly versus acting later based on further assessment	• What time frames for goals, costs, and benefits are being considered and what takes priority? • What are the potential impacts beyond the time frame? • How compatible are short- and long-term goals, gains, and losses? • How compatible are proactive and reactive plans and goals? • Are future costs and benefits appropriately discounted?
Risk: Prioritizing reduction of multiple risks	• Prioritizing between risks, especially in uncertain situations: impacts of single risk reduction on other interrelated risks (hazard and non-hazard) • Shifting of risks: impacts of one actor's risk reduction for other actors, locations or general system resilience	• What are the known risks (hazard and non-hazard related)? • How are individual risks interrelated and linked to general system resilience? • How is managing/reducing risks prioritized? • What are the underlying assumptions of (multi-) risk assessments?

Source: Tuhkanen et al. 2018, modified by authors

second is the processes through which development and disaster risk related trade-offs are framed, deliberated and negotiated. Our trade-off typology framework includes key questions reflecting the overarching contexts, as well as a definition and examples for each trade-off dimension (Table 1).

1. The aggregation dimension

The aggregation dimension concerns the review and evaluation of overall gains and losses – how they are conceived, how they are reflected in our higher-level objectives and how we balance between potentially conflicting objectives. The objectives of economic growth and of development and DRR are often at odds – either directly conflicting with each other or competing for resources. For example, a development such as a large hydropower project that results in profits and increased access to energy might impede other sustainable development goals due to resulting social, ecological or disaster risks.

The prioritization of certain objectives in decision-making is also at times determined or influenced by external funding sources and investment, rather than actual needs. This is especially true in low and middle-income countries where there may be a greater need for funding, but weaker regulation to safeguard against the accumulation of risk. In some cases, regulations or measures to reduce disaster risk can actually be perceived as an obstacle to economic development or growth.

The key consideration is acknowledging from the outset of a process that there are multiple and sometimes competing goals, such as economic development or growth and DRR, and deciding how to measure the gains, losses and risks. Decisions also need to be made weighing their gains and losses, including their indirect and unintended, but potential, impacts. Broad monitoring of disaster losses, including those from extensive disasters, in relation to development gains can ensure that benefits are accruing faster than risks.

Predicting impacts is often not straightforward, and integrated assessments in the planning phase are needed. These processes may also identify more holistic approaches to development and disaster risk decision-making – approaches that achieve the desired benefits without exacerbating risks.

2. The participation dimension

The participation dimension focuses on the process of decision-making – 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. Understanding participatory structures is a key step in achieving transformative change. However, the people affected by interventions – and sometimes even national governments – often do not have a meaningful say in development or DRR investment decisions.

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.

However, inclusivity can come at the cost of efficiency, and additionally can face resistance from those who have a vested interest in maintaining the status quo. Furthermore, effective stakeholder involvement requires extra effort and skills, as well as established networks to identify and connect with relevant actors. Despite these obstacles, these processes can result in long-term resilience and success.

Good governance systems also need to be transparent, predictable and accountable to the people. When decision makers are protected and separated from the outcomes of their actions, they may lack incentive to minimize risks.

3. The equity dimension

The equity dimension can be distinguished from participation through its definition as the balancing of the needs of different groups, as well as the distribution of benefits, losses and risks from decisions and resulting actions. Decisions about development and disaster risk are unlikely to affect everyone equally. There may be distinct winners and losers, and the benefits or harms may be unevenly distributed based on geographical space as well as social dimensions. In low and middle-income countries, disasters tend to disproportionately affect small businesses and low-income households and communities, as well as those working in the informal sector and living in informal settlements. These populations have very limited capacity to reduce their risks through physical, political, technical or financial means.

Although there is no consensus around determining 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. This protection is also key to sustainable development and equitable resilience.

Working with a broad range of stakeholders to develop a shared goal or vision of equitable resilience that guides planning and investment can produce more equitable outcomes. Regulations that support risk prevention and 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 market. As with the participation dimension, shifting the distribution of gains and losses can face high resistance. However, this identification of the winners and losers of current policies and decision-making processes is crucial to altering the relationship between development and disaster risk.

4. The time dimension

The time dimension relates to the consequences of decision-making: how does distribution of risks, gains and losses play out over time? 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 also changes the climate, with adverse disaster related repercussions for society, the environment, and the economy. The challenge is to weigh the costs against the benefits, both for ourselves and future generations.

We know that people and businesses are often predisposed to favour short-term over long-term gains. Furthermore, the future threat is uncertain: we don't know precisely how the climate will change and how it will affect us, or what solutions will become available at a later date. At the same time, the value of potential future gains and losses might be less than their value today. As the long-term implications of decisions are often difficult to discern, and in turn less valued, they are typically outweighed by the potential for short-term gains.

Effectively addressing the time dimension of trade-offs requires three types of analysis: consideration of future disaster risks in both public and private decision-making processes; methodical assessment of potential long-term losses and benefits of alternatives, even when insurance is available; and careful selection of an appropriate time frame and of suitable discount rates on future value. 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.

5. The risk dimension

The risk dimension concerns how we prioritize among risks and how prioritization aligns across governance levels. 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, including social, environmental, political and economic risks. Climate change is further altering the risk landscape. As well, there are different types of disaster risks and more than one may be relevant to a particular location. Disaster risks, for example, may be intense and severe but relatively uncommon; extensive and frequent but not very severe; or multi-hazard, involving several risks

THE 5 TRADE-OFF DIMENSIONS APPLIED TO BUILD BACK BETTER

The concept of Build Back Better starts from the recognition that rebuilding after a disaster provides an opportunity to correct past mistakes and to lay the foundation for more resilient future development. 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 and can result in misallocation of funds, ineffective solutions and even strong resistance. The typology of dimensions can help us understand and address those trade-offs.

The **aggregation** dimension can highlight an imbalance in redevelopment response that favours some high-level objectives, such as decreased disaster risk, over an integrated perspective. For example, relocation of residents to safer areas may undermine their livelihoods and community development.

The balance between sufficient and efficient **participation** in decision-making is a significant challenge in the redevelopment phase as not everyone, including those affected, can be involved. Often, those that are affected by decisions related to relocation, land use, or regulations are simply communicated to, rather than engaged. This impedes understanding of community needs and creation of a shared vision. Top-down reconstruction processes have been shown to produce poorer results than more inclusive ones. External actors and funding sources are often involved in the redevelopment process, sometimes with their own agendas. Thus, there is a risk that key decisions are made with little input from the affected people.

Attention to the **equity** dimension can highlight disparities in how people are affected by the rebuilding process, which are often overlooked. In addition to being affected by the disaster differently, various groups in society have different starting points in terms of their capacities for coping and rebuilding after a disaster. Specific groups, such as children, women, elderly, ethnic minorities, gender minorities, informal settlers and people with disabilities may have differentiated needs and may also face challenges engaging in official participatory processes.

The **time** dimension is particularly prominent and problematic in post-disaster response situations. People want quick solutions to decrease their suffering and get back on their feet. There is high pressure on authorities to make decisions, often in cases where sufficient information or capacities are not available, and within a context of high uncertainty. At the same time, the period following a disaster is a window of opportunity to build back better in a way that addresses previous disaster risks and avoids creating new long-term risks.

In the post-disaster redevelopment phase, the **risk** dimension can manifest itself in decisions about how to account for risk in big picture processes such as urban planning, but also smaller scale community development. For example, disparities between priorities highlighted in expert risk assessments used by authorities and risks prioritized by households can lead to a situation where relocation fails to meet the needs of those relocated and they return to their former areas. Experts may not be aware of the historical, social, cultural, security and power contexts that can determine which risks are perceived as most important.

It is clear that decisions made in the post-disaster redevelopment phase must be strategic and have long-term implications. From the start, there should be recognition of the multiple policy-related goals involved in this phase. Impact assessments of potential alternatives should include direct and indirect social, economic and environmental aspects. Preparation and assessment of potential contingency plans that takes place prior to hazard events can alleviate some of the time pressure during response. Co-developing plans with stakeholders also improves communities' understanding of their risks and supports them in thinking through tough future decisions and identifying potential mitigation measures. It also helps avoid misaligned strategies.

Integrating multi-level stakeholder engagement into the early stages of planning and development processes lays a foundation for effective and efficient engagement and co-development with the stakeholders through existing networks. It can also provide a good base for understanding the local context, which helps avoid misaligned strategies among authorities, communities and external actors and can minimize unintended negative social impacts of interventions. Though it does not eliminate time pressures during response, frontloading preparation work allows for post-disaster time to be spent on the situation assessment and adaptation of pre-existing plans to the current situation on the ground.

at once that may interact with one another. Mitigating one risk might exacerbate another or generate new risks. Decision makers need to consider a broader set of risks, but at the same time acknowledge that every risk cannot be prioritised or reduced.

Another important issue to consider is the alignment of risk prioritization at various levels of decision-making, for example between local authorities and citizens. We know that in practice people perceive and prioritize risks on the basis of social norms, beliefs, values, and their own awareness levels. When policymakers do not understand how citizens prioritize disaster risk, the interventions they design will be ineffective. Thus, planners and experts need to learn how stakeholders think about and prioritize risks. 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.

Conclusions

We know development is essential for managing and reducing risks, but development can also create or exacerbate risks. Similarly, DRR decisions can thwart development. Our analysis highlights the extent to which these negative effects are the result of choices that could be managed better by addressing five key trade-off dimensions: aggregation, participation, equity, time and risk.

Recognizing trade-offs in decision-making processes may not lead to a decrease in the competition among various goals or their elimination. However, identifying them and exploring the potential consequences of different decisions gives a better understanding of how and why risk is created. Exploring trade-offs moves the focus of DRR interventions to the processes that shape development and regulation. It acknowledges that those processes create and solidify risks. It can, however, help identify spaces for policy or decision-making, resulting in a proactive, rather than reactive, approach to disaster risk management.

Our typology aims to make it easier to recognize trade-offs in development and disaster risk decision-making, even when those trade-offs are not immediately obvious. Many of the trade-offs are hidden, as parts of the existing system, structure or routine, and have to be identified before they can be critically examined and addressed. This analysis is an attempt to systematically examine the multiple dimensions of trade-offs in decision-making processes. This approach has been tested in an empirical case study on the post-disaster recovery phase after Typhoon Haiyan in Tacloban, Philippines (Tuhkanen et al. 2018). The next step in our work will focus on how to operationalize this analytical approach and use it as an instrument to transform the relationship between development and disaster risk.

Reference:

Tuhkanen, H., Boyland, M., Han, G., Patel, A., Johnson, K., Rosemarin, A., Lim Mangada, L. (2018). A typology framework for trade-offs in development and disaster risk reduction: a case study of Typhoon Haiyan recovery in Tacloban, Philippines. *Sustainability*, 10(6). DOI: https://doi.org/10.3390/su10061924

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