



**A FRAMEWORK FOR
TRANSFORMING THE RELATIONSHIP
BETWEEN DEVELOPMENT AND DISASTER RISK**

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About the Series

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IRDR is an international scientific programme under co-sponsorship of the International Science Council (ISC) and United Nations Office for Disaster Risk Reduction (UNISDR) and with support from China Association for Science and Technology (CAST) and Chinese Academy of Sciences (CAS). Started in 2010, the Programme has been pioneering in the promoting international and interdisciplinary studies on DRR and has made its contributions through scientific publication and policy papers as well as dialogue toward shaping international agenda in the understanding disaster risks, bridging science and policy gaps and promoting knowledge for actions, all required in the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) and its top priorities. Over time, the scientific agenda of IRDR has attracted many international renowned expertise and institutions. IRDR community is now, institutionally speaking, characterized by its strong Scientific Committee and six thematic working groups, thirteen IRDR national committees (IRDR NCs) and one regional committee (IRDR RC), sixteen international centres of excellence (IRDR ICoEs), a group of some one hundred fifty Young Scientists (IRDR YS) and a broad partnership with national, regional and international institutions working for SFDRR.

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Team of IRDR-IPO

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Abstract of this Working Paper

Development is vital for reducing disaster risk, yet many current development models are unsustainable and are instead driving and creating disaster risks. At the same time, disasters can destroy development gains, and many existing disaster risk reduction (DRR) and resilience approaches are not sufficiently contributing to social equity and sustainable development. Significant and simultaneous progress towards both the Sendai Framework for DRR targets and the Sustainable Development Goals (SDGs) is a complex challenge that requires work on many fronts with a diversity of disciplines and stakeholders. We argue that transformation is a legitimate and necessary pathway for moving from development patterns that increase, create or unfairly distribute risks, towards equitable, resilient and sustainable development outcomes for all. This paper presents an analytical framework for transforming the relationship between development and disaster risk. Specifically, we discuss three interlinked opportunities for transformation: (1) exposing development-disaster risk trade-offs in decision-making and policy; (2) prioritizing equity and social justice in approaches to secure resilience; and (3) enabling transformation through adaptive governance. We then highlight key findings from an application of this framework in seeking to understand disaster recovery processes in the city of Tacloban in the Philippines following Typhoon Haiyan/Yolanda, which struck in November 2013 – with a specific focus on the extent to which relocated communities are able to access equitable, resilient and sustainable livelihood opportunities.

Keywords

Transformation, Development, Disaster risk, Trade-offs, Equitable resilience, Adaptive governance, Typhoon Haiyan

Indications of contributions to IRDR

Science Plan and UN Agendas

<i>IRDR Sub-objectives</i>	2.1, 2.2 and 2.3
<i>SFDRR targets</i>	SFDRR Priority 2 and Target E
<i>SDGs and/or Climate Goals</i>	SDG Target 1.5, 13.1, 16.6
<i>S/T Roadmap actions</i>	S&T roadmap actions under expected outcome 2

1. How does this study contribute to IRDR research objectives?

Greater understanding of the role of transformation in the context of the relationship between development and disaster risk contributes to more effective decision-making in complex and changing risk contexts (IRDR research objective 2). The framework presented here can support in identifying and understanding decision-making systems relevant to both DRR and sustainable development policy and actions, towards more equitable, resilient and sustainable outcomes for all.

2. How does this study contribute to SFDRR targets?

This study has the potential to contribute to multiple Sendai Framework targets, as greater understanding of risk and development can enhance the effectiveness of decision-making systems in reducing social, environmental and economic disaster risks and impacts (targets a-d). In particular, by supporting *Priority 2: Strengthening disaster risk governance to manage disaster risk*, we see potential for the presented framework for transforming development and disaster risk to inform greater numbers and enhanced DRR strategies that consider a broader range of risks, as well as the connections with sustainable development and climate change.

3. How does this study contribute to SDGs and the Climate Goal?

The TDDR framework discussed here has direct relevance to SDG targets 1.5, 13.1, and 16.6. Target 1.5 is to build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters by 2030. Target 13.1 is to strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries. Target 16.6 is to develop effective, accountable and transparent institutions at all levels. This study can contribute to pursuing DRR, sustainable development and climate change policy goals in greater harmony than is done so at present in most contexts.

4. How does this study contribute to Science & Technology Roadmap Actions?

This study supports the S&T expected outcome of a stronger involvement and use of science to inform policy- and decision-making within and across all sectors at all levels. Specifically, we hope the framework and approaches discussed here can facilitate greater dialogue between scientists/researchers and decision-/policy-makers in both the DRR and sustainable development spaces, around the need to transform the relationship between development and disaster risk towards more equitable, resilient and sustainable outcomes for all.

5. Main recommendations to DRR policy if not yet highlighted in the main texts

The overarching recommendation of this study to DRR and development decision-makers in policy and practice spaces is to better account for the complex relationship between development and disaster risk. Further, we encourage actors to consider pathways to transformation, including exposing development-disaster risk trade-offs; prioritizing equity and social justice in approaches to secure resilience; and enabling transformation through adaptive governance. The Interational Centre of Excellence on Transforming Development and Disaster Risk (ICoE-TDDR) stands ready to support any actors wishing to pursue pathways towards more equitable, resilient and sustainable outcomes for all.

Main Text

1. Introduction

Development is vital for reducing disaster risk, yet many current development models are unsustainable and are instead driving and creating disaster risks, for example, in the removal of natural storm-surge protection barriers in favour of beachfront property development. At the same time, disasters can destroy development gains, and many existing disaster risk reduction (DRR) and resilience approaches are not sufficiently contributing to social equity and sustainable development (IPCC, 2018; UNISDR, 2015). Significant and simultaneous progress towards both the Sendai Framework targets and the Sustainable Development Goals (SDGs) is a complex challenge that requires work on many fronts with a diversity of disciplines and stakeholders. We argue that transformation is a legitimate and necessary pathway for moving from development patterns that increase, create or unfairly distribute risks, towards equitable, resilient and sustainable development outcomes for all.

Progress on DRR is often hampered by its failure to recognise how development processes can act as the root causes of disasters (Wisner et al., 2004). Increasingly, resilience is seen as the mechanism through which development and DRR can be integrated (Matyas and Pelling, 2015). Resilience theory invites systems analysis whereby resilience is a property describing the extent to which the functioning of the current system can be maintained and renewed over time, particularly in the face of shocks or slower-onset stresses. In the DRR context, resilience has been defined as “the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management” (UNGA, 2016, p.22). The concept of resilience has a wide range of meanings from multiple fields of enquiry which is determining how resilience is conceptualized and applied in DRR policy and practice (Alexander, 2013; Kelman, 2018).

Transforming the relationship between development and disaster risk requires attending to the underlying drivers of risk, but also recognising that those risks have their foundations in the interplay between development and DRR trajectories (Thomalla et al., 2018a). Resilience by itself, however, is not enough. Questions of who benefits from resilience and under what circumstances (referred to as: resilience of what, and for whom?) bring additional complexity. Securing equitable outcomes and, in particular, ensuring that poor and/or marginalized groups benefit from development and DRR investments,

requires challenging existing structures, power relations, vested interests, and dominant narratives that persist within systems and maintain and perpetuate poverty, inequality, and vulnerability (Lebel and Lebel, 2017; Matin et al., 2018; Thomalla et al., 2018b).

Transformation here refers to challenging dominant values and goals for producing radical changes in the form and function of governance systems critical to development and DRR. This approach focuses on initiating and managing deliberate and desirable transformations toward equitable, resilient and sustainable development (O’Brien, 2012; O’Brien et al., 2012). The literature on three distinct yet overlapping framings of transformation - socio-ecological system transformation, transformational adaptation and transformative DRR - informs our analytical framework for transforming the relationship between development and disaster risk (hereafter ‘TDDR framework’) (Thomalla et al., 2018a). This framework, shown in Figure 1, identifies three interlinked opportunities for transformation, considering the role of (joined-up) bottom-up and top-down approaches:

- (1) exposing development-disaster risk trade-offs in decision-making and policy;
- (2) prioritizing equity and social justice in approaches to secure resilience; and
- (3) enabling transformation through adaptive governance.



Figure 1. Analytical framework for transforming the relationship between development and disaster risk

The role of the trade-off analysis is to identify critical choices in relation to development and/or disaster risk planning or investments. These choices are often overlooked or

undervalued in decision-making, yet are critical in the sense that they are consequential for future development and risk status (Tuhkanen et al., 2018). Trade-off dimensions that are pertinent to development and DRR decision-making are discussed in section 2. Analysing equity and social justice means understanding the settings and perspectives within which planning and investment decisions are made, and orienting decision-making around key themes that drive those decisions toward the production of more equitable resilience outcomes (Matin et al., 2018). These key themes for equitable resilience are illustrated in section 3. Finally, the complexity of the systems within which decisions are taken means that fully predictable outcomes are rare, and are often subject to change over time. This demands a governance process of monitoring and revision that encompasses multiple perspectives, generating new decisions in light of emerging situations or information (Munene et al., 2018). Adaptive governance offers such an approach, and is described in section 4.

In this working paper, we first unpack the TDDR framework and discuss the three transformation opportunities outlined above in more detail. Second, we present findings from an application of this framework in Tacloban, Philippines, following Typhoon Haiyan/Yolanda, which struck in November 2013. In seeking to understand post-disaster planning and implementation processes, our framework application focuses on analysing access to equitable, resilient and sustainable livelihood opportunities for people in relocation communities.

2. Exposing development-disaster risk trade-offs in decision-making and policy

Though trade-offs in decision-making are inherent, they are largely overlooked, particularly in terms of development and disaster risk policy and planning. Furthermore, economic development goals tend to be prioritized at the expense of reducing disaster risk. Trade-offs are typically hidden within existing systems, structures and norms, and must first be identified before they can be critically examined and addressed. To draw attention to such trade-offs and prioritizations, and in pursuit of more coherent development and DRR planning and implementation, we have developed an analytical typology framework consisting of five distinct, but related, trade-off dimensions. This typology enables an explicit consideration of both how goals and risks are perceived, weighted and prioritized, and how the processes through which development and risk trade-offs are conceptualized and negotiated (Tuhkanen et al., 2018). The five trade-off dimensions are:

- ♦ **Aggregation** - Refers to the macro-level at which we tend to consider development and DRR gains and losses, and the tendency to focus on the aggregated gains of decisions while overlooking potential losses and how impacts play-out in terms of different aspects (i.e. economic, social and environmental)

and scales (i.e. local, national, regional). The aggregation dimension recognises the competition or perceived conflict between high-level aims, such as economic gain and DRR (Sudmeier-Rieux et al., 2015). For example, a large hydropower development project may result in company profits and increased national and regional electrification rates, but at the cost of negative impacts and greater risks for downstream communities (Luu et al., 2017).

- ♦ **Participation** - Focuses on the process of governance; who is included in decision-making processes, how is participation contested and decided, and ultimately whose interests are represented and prioritized (Thomalla et al., 2018b). Participation, power relations and socio-political inclusion shape agendas and play a large role in determining development and DRR outcomes. Goals calling for inclusion and fair representation are important, but decision-makers may view effective and efficient participation as a trade-off (Badri et al., 2006), or consider broad inclusion a threat to their own vested interests. Furthermore, systems can be set up to foster competition between actors rather than collaboration, often at the expense of the marginalized and underrepresented. For example, economic structures may incentivise competition rather than collaboration between private actors who could collectively provide a more comprehensive and thus effective solution (Han and Kasperson, 2011).
- ♦ **Equity** - Exposes the uneven distribution of gains, losses and risks from development and disaster risk decision-making processes and outcomes across different scales and social groups. Different groups in society have differentiated capacities and resources to reduce risk (Chronic Poverty Research Center, 2008). Further, planning and policy decisions are likely to have differentiated impacts and create specific sets of winners and losers. For example, risk reduction investments into financially well-off areas will result in lower asset losses, while investments into more marginalized communities can mitigate poverty and wellbeing losses (Walsh and Hallegatte, 2019). For equitable resilience, planning processes and investment decisions need to address the inequities of development and risk distribution within communities and societies. However, as with the participation dimension, shifting gains and losses distribution can face high resistance from those benefiting from the current situation.
- ♦ **Time** - Relates to the balancing of short and long-term priorities, and how the distribution of gains, losses and risks can change over time. Short-term gains (which may be perceived to be more certain) are often prioritized over potential long-term losses (which may be perceived to be navigable later on) (UNISDR, 2015). For example, fossil fuel development for short-term economic growth continues despite the known future impacts of climate change. The time dimension also captures post-disaster dilemmas related to decision-making under high uncertainty and time pressure, but potentially with less transparency

and accountability. Though long-term thinking is typically constrained by political cycles, weighing costs and benefits for current and future generations is a significant trade-off challenge that must be addressed.

- ♦ **Risk** - Concerns how different threats are assessed and addressed - either in isolation or holistically - across scales. At any decision-making level (i.e. individual, community, national or global), one is likely to face multiple development and disaster risks. Mitigating one risk, however, might exacerbate another or generate entirely new risks. In consideration of finite resources, risks need to be prioritized. However, this is challenging due to multiple and changing factors of uncertainty (OECD, 2014). At the same time, a focus on one risk can come at the expense of system-level resilience (Ishtiaque et al., 2017). Differential risk prioritization at different governance levels may also lead to unintended risk consequences or the redistribution of risks across political boundaries. For example, interventions based on top-down risk assessments which do not account for local risk perceptions and prioritization may make incorrect assumptions of human behaviour and limit the potential of the intervention (Oven and Rigg, 2015).

Assessing the potential for trade-offs in these five dimensions can help identify critical issues within ongoing decision-making processes. It may illuminate how development and risk governance processes can create and embed risks, and thus open spaces for more reflective decision-making that proactively considers development and disaster risk goals, gains and losses in a holistic way (Tuhkanen et al., 2018).

3. Prioritizing equity and social justice in approaches to secure resilience

Equity places focus on the needs of those who are disadvantaged by relations of power and inequalities of opportunity, and on how these barriers to human advancement can be identified, understood and addressed. From this perspective, repeated critiques that point to the failure of resilience to address the distributive and power dimensions of environmental and development challenges limits the concept for analysis and practice. Problems arise where, for example, actions in one part of the system have unintended consequences at other temporal or spatial scales, enhancing the resilience of a particular group or community while at the same time eroding the resilience of others.

Transforming development and disaster risk therefore means driving not only towards resilience, but also towards equitable resilience. Through an extensive literature review we derived four key aspects that need to be considered if interventions are to work toward equity and social justice. Taken together, these define equitable resilience as “a form of human-environmental resilience that takes into account issues of social vulnerability and differentiated access to power, knowledge and resources. It starts from people’s own perception of their position within their human-environmental system and

accounts for their realities and their need for a change of circumstance to avoid imbalances of power into the future” (Matin et al., 2018, p. 198). The four aspects are:

- ♦ **Recognizing subjectivities** - Subjectivity relates to the lived experiences and affective states of people, and draws attention to the ways in which groups become socially differentiated due to cultural, racial, ethnic, gender or other social attributes, and how this differentiation shapes disaster risk. Subjectivities - mediated by institutions and cultural norms - shape how people interpret experiences and information, including those related to disaster risk, and whether or not people take action to reduce their risk (Biehl et al., 2007; Paton et al., 2010; Ribot, 2014).
- ♦ **Ensuring inclusion and representation** - Inclusion of diverse social groups based on different social groupings, including gender, age, ethnicity, disability and sexuality, that influence resource distribution and human-environment relationships is vital. This confronts the power and inclusion imbalances that exist between different stakeholders in decision-making processes, at multiple scales (Aldunce et al., 2016; Tschakert, 2012).
- ♦ **Working across scales and levels of governance** - Connecting scales, particularly geographical and temporal scales, is an important component of resilience and systems thinking. Scale can also contribute to exclusion. For example, those living far from the geographic, political or social centres may be marginalized (Oven et al., 2012; Vogel et al., 2007).
- ♦ **Promoting system(s) transformation** - Systems transformation is necessary when existing arrangements degrade well-being or increase risks for sections of society. Achievement of equitable resilience requires the equal understanding of subjectivities, inclusion and scale, with transformation, or the possibility for transformation, as the last stage of the four-step process (Pelling et al., 2015; Plummer and Fennell, 2009).

Equitable resilience in practice requires consideration of these four aspects through methods revealing how actors and institutions support narratives, customs or forms of regulation that subjugate or empower intended beneficiaries. Resilience indicators alone are not enough to support this form of practice as practitioners for the most part have yet to address critiques of resilience around the risk of perpetuating and reinforcing unequal access to resources and power relations. Analysis suggests that addressing resilience critiques will require systematic exploration of subjectivities, of the equity implications of inclusion and scale, and of the potential for transformation (Matin et al., 2018). The aim here is not to replace resilience interventions, but to complement them with ways of analysing for, and engaging in, resilience practice that the literature suggests increases the likelihood of equitable outcomes.

4. Enabling transformation through adaptive governance

Adaptive governance can facilitate transformative processes. It recognizes that interactions between people and systems are unpredictable and that governance must be able to adapt to evolving knowledge or context to respond to changes and promote innovation (Chaffin et al., 2014; Djalante et al., 2011). In the TDDR framework, adaptive governance has four key *enabling* components. While the presence of these components alone does not automatically mean transformations will occur, they may promote deliberate, desired transformations. The components are:

- ♦ **Participation and collaboration** - This component includes social capital, knowledge-pooling, and public participation processes. Opportunities to participate and collaborate among a range of actors and stakeholders is important for transformation to occur.
- ♦ **Polycentric and multi-layered institutions** - Participation and collaboration is only possible if power is shared across different scales and institutions. This enables cross-sectoral institutional linkages and institutional diversity.
- ♦ **Self-organization and networks** - The ability to self-organize and build networks enables multiple voices to form and create platforms for meaningful and significant change.
- ♦ **Social learning and system innovation** - Through shared, social and triple-loop learning, feedback (e.g., checks and balances) is created in the system, resulting in innovation in the governance processes, thus enabling pathways to transformation.

Adaptive governance framing and its components is relevant to implementation of the Sendai Framework (Munene et al., 2018). The Sendai Framework's approach to disaster risk governance embodies multi-stakeholder and cross-scale partnerships, broad stakeholder participation through an "all-of-society" approach, and social and institutional learning. The Sendai Framework also emphasizes the role of science and technology in supporting decision-making, with actors expected to embody the principles of learning, innovation and inclusion. Networks and self-organized entities in academia and business, in addition to grassroots initiatives, are important to the pursuit of multiple goals and targets.

The language of the Sendai Framework is important, but implementation through adaptive governance presents an altogether different set of challenges due to its broad nature, weak accountability mechanisms, and a lack of political will, in addition to the fact that its adoption is non-binding and voluntary. In enabling transformation, adaptive governance challenges established structures, institutions and processes which contribute to risk and vulnerability. However, adaptive governance framing also has limitations as it can be seen to promote stability of risk-generating systems. More

theoretical and empirical studies are needed to better establish how adaptive governance can promote and guide transformative action.

Case study: Transforming development and disaster risk in Tacloban, Philippines following Typhoon Haiyan

On 8 November 2013, super typhoon Haiyan, locally known as Yolanda, hit the Philippines. It remains one of the strongest and most destructive typhoons ever recorded, affecting over 14 million people (UNICEF, 2014). The 600 km diameter typhoon caused intense winds, heavy rainfall and powerful storm surges that left more than 6,000 people dead, at least another 1,000 missing and over 28,000 injured (NDRRMC, 2013).

The regional economic hub of the Eastern Visayas - the hardest hit region in the country - includes Tacloban, a low-lying and densely urbanized coastal city with a population of over 200,000. In the wake of typhoon Haiyan, much of Tacloban was severely destroyed. Destruction of homes was widespread, with informal settlements along the coast that are home to many poor fishing communities amongst the hardest hit. To address the typhoon's devastating impacts, the Tacloban city government and UN-Habitat spearheaded a multi-stakeholder recovery planning process that resulted in the creation of the Tacloban Recovery and Rehabilitation Plan (TRRP)— the central policy document designed to guide the city's recovery. The TRRP strives to make Tacloban a "resilient, vibrant and livable" city, and positions disaster recovery as an opportunity to "build back better" for more sustainable development (City Government of Tacloban, 2014).

One of the key components included in the TRRP is the relocation of displaced persons from hazard-prone coastal areas to permanent resettlement sites located farther inland, about 40km north of the city centre, where new livelihood opportunities were to be created. The intersection of disaster recovery and development planning in Tacloban provided an opportunity to empirically test the TDDR framework. In applying the framework, we paid particular attention to how people in resettlement sites were able to access equitable, resilient and sustainable livelihood opportunities.

The empirical data collection involved three stages. First, two rounds of semi-structured key informant interviews, designed to build evidence on the key decision-making processes that arise in a post-disaster context and to validate the trade-off typology, were conducted with more than 40 stakeholders directly involved in disaster recovery and reconstruction efforts in Tacloban. Key informants interviewed included representatives from national, regional and city-level government agencies, non-governmental organizations, and homeowners' associations. The first set of interviews focused on planning processes, while the second set focused largely on implementation, monitoring and evaluation.

Second, a household survey method for ranking subjective household resilience was used in GMA Kapuso Village, one of the resettlement sites. 150 Survey respondents recorded their perceived ability to recover from a range of context-specific development and risk disturbances, including earthquakes, floods, market instability, and a reduction in aid. The survey data produced resilience ranks of 150 households from 'most resilient' to 'least resilient'.

To further explore the different levels of resilience among community members within the same resettlement site, four focus group discussions (FGDs) were conducted with selected respondents in order to understand their differentiated experiences of the recovery and redevelopment process. Selected households belonging to both high and low resilience categories participated in the FGDs. Separate FGDs were conducted for men and women. Following an analysis of the FGD data, access to livelihoods and/or livelihood support emerged as one potential cause of the different levels of resilience for both men and women in the two groups. Twenty in-depth interviews were then conducted with men and women from the high and low resilience groups, respectively, to better understand issues of livelihood access, recovery interventions and challenges associated with the relocation.

An ongoing analysis of the data collected through the multi-stage testing of the TDDR framework has revealed key insights on post-disaster decision-making processes and how they can shape equity and resilience outcomes of disaster-affected people. The key informant interviews with stakeholders refined our understanding of trade-offs in Tacloban, for example, on the prioritization of physical safety and reduced exposure to natural hazards, and how this may have compromised the provision of equitable and sustainable livelihood support in resettlement sites. Initial analyses of the data from FGDs and interviews with resettled communities have shown that unequal access to, and the ineffective implementation of, post-disaster livelihood interventions emerge as potentially major causes of different resilience outcomes within a community. Empirical evidence highlights the critical role that pre-existing financial resources and skills, as well as and social capital, can play in determining people's varying abilities to access and capitalize on livelihood opportunities following a disaster.

5. Conclusions

Transformations are required in approaches to development and DRR in order to move towards more equitable, resilient and sustainable outcomes. In this working paper, we have presented an analytical framework for transforming the relationship between development and disaster risk that is built around three separate but intertwined strands: (1) exposing development-disaster risk trade-offs in decision-making and policy; (2) prioritizing equity and social justice in approaches to secure resilience; and (3) enabling transformation through adaptive governance. Each strand, or 'opportunity' for transformation unpacks the locked-in relationship between development and disaster

risk, in different ways. We intend for this TDDR framework and these approaches to be used to bridge development, DRR and climate change silos, and envisage that transdisciplinary and multi-stakeholder partnerships will clarify the practical relationship between global policy agendas and frameworks, i.e. the Sendai Framework, the SDGs and the Paris Agreement on climate change. By applying our framework to a post-disaster analysis - in Tacloban, Philippines - we have uncovered how the relationship between development and disaster risk plays out in context. Yet, more conceptual and applied research is needed to build a stronger foundational understanding of where and how transformations could and should occur, in theory and in practice, across scales.

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