
Regional Report for Asia-Pacific

Advanced unedited copy
Acknowledgement

UNDRR would like to acknowledge its donors for their support.

Disclaimer

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country or territory or of its authorities or concerning the delimitations of its frontiers or boundaries. The designations of country groups in the text and the tables are intended solely for statistical or analytical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of the names of firms and commercial products does not imply the endorsement of the United Nations.

Note: The designations employed and the presentation of maps in this report do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities or concerning the delimitation of its frontiers or boundaries.

Some rights reserved. This work is made available under the Creative Commons Attribution-NonCommercial 3.0 IGO licence (CC BY-NC IGO); https://creativecommons.org/licenses/by-nc/3.0/igo/legalcode

Under the terms of this licence, this work may be copied, redistributed and adapted for non-commercial purposes, provided that the work is appropriately cited. In any use of this work, there should be no suggestion that UNDRR endorses any specific organization, products or services.

The use of the UNDRR logo is not permitted. If a translation of this work is created, it must include the following disclaimer along with the required citation below: “This translation was not created by the United Nations Office for Disaster Risk Reduction (UNDRR). UNDRR is not responsible for the content or accuracy of this translation. The original English edition shall be the authoritative edition.”

Users wishing to reuse material from this work that is attributed to a third party, such as tables, figures or images, are responsible for determining whether permission is needed for that reuse and for obtaining permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user. Sales, rights and licensing.

UNDRR information products are available for non-commercial use. Requests for commercial use, rights and licensing should be submitted via: https://www.undrr.org/contact-us

This publication may be freely quoted but acknowledgement of the source is requested.


© 2023 UNITED NATIONS OFFICE FOR DISASTER RISK REDUCTION

For additional information, please contact:
United Nations Office for Disaster Risk Reduction (UNDRR)
7bis Avenue de la Paix, CH1211 Geneva 2, Switzerland, Tel: +41 22 917 89 08
Table of Contents
Acronyms and abbreviations ............................................................................................................. 4
I. Methodology and process ................................................................................................................ 5
II. Introduction ...................................................................................................................................... 6
III. Retrospective review ....................................................................................................................... 7
   A. Priority 1: Understanding disaster risk ........................................................................................ 8
   B. Priority 2: Strengthening disaster risk governance to manage disaster risk .............................. 10
   C. Priority 3: Investing in disaster risk reduction for resilience ...................................................... 12
   D. Priority 4: Enhancing disaster preparedness for effective response and to "Build Back
      Better" in recovery, rehabilitation and reconstruction ............................................................... 17
IV. Contextual shifts, new and emerging issues and challenges ....................................................... 19
V. Prospective review and recommendations .................................................................................... 20
   A. Priority 1: Understanding disaster risk ........................................................................................ 20
   B. Priority 2: Strengthening disaster risk governance to manage disaster risk .............................. 23
   C. Priority 3: Investing in disaster risk reduction for resilience ...................................................... 28
   D. Priority 4: Enhancing disaster preparedness for effective response and to “Build Back
      Better” in recovery, rehabilitation and reconstruction ............................................................... 31
VI. Conclusions and Recommendations for the further implementation of the Sendai Framework
.......................................................................................................................................................... 33
VII. Annex .......................................................................................................................................... 40
References ......................................................................................................................................... 41
<table>
<thead>
<tr>
<th>Acronyms and abbreviations</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AADMER</td>
<td>ASEAN Agreement on Disaster Management and Emergency Response</td>
</tr>
<tr>
<td>ACDM</td>
<td>ASEAN Committee on Disaster Management</td>
</tr>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
</tr>
<tr>
<td>APMCDRR</td>
<td>Asia-Pacific Ministerial Conference for Disaster Risk Reduction</td>
</tr>
<tr>
<td>ASEAN</td>
<td>Association of Southeast Asian Nations</td>
</tr>
<tr>
<td>CCA</td>
<td>Climate change adaptation</td>
</tr>
<tr>
<td>CDRI</td>
<td>Coalition for Disaster Resilient Infrastructure</td>
</tr>
<tr>
<td>COP</td>
<td>Conference of the Parties</td>
</tr>
<tr>
<td>COVID</td>
<td>Coronavirus disease</td>
</tr>
<tr>
<td>CREWS</td>
<td>Climate Risk and Early Warning Systems</td>
</tr>
<tr>
<td>CSO</td>
<td>Civil society organization</td>
</tr>
<tr>
<td>DRM</td>
<td>Disaster risk management</td>
</tr>
<tr>
<td>DRR</td>
<td>Disaster risk reduction</td>
</tr>
<tr>
<td>EOC</td>
<td>Emergency operation centre</td>
</tr>
<tr>
<td>ESCAP</td>
<td>Economic and Social Commission for Asia and the Pacific</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross domestic product</td>
</tr>
<tr>
<td>GESI</td>
<td>Gender equality and social inclusion</td>
</tr>
<tr>
<td>IOM</td>
<td>International Organization for Migration</td>
</tr>
<tr>
<td>IRIS</td>
<td>Infrastructure for Resilient Island States</td>
</tr>
<tr>
<td>LDC</td>
<td>Least developed countries</td>
</tr>
<tr>
<td>LGBTQIA+</td>
<td>Lesbian, gay, bisexual, transgender, queer, intersex and asexual</td>
</tr>
<tr>
<td>LITK</td>
<td>Local, indigenous and traditional knowledge</td>
</tr>
<tr>
<td>MHEWS</td>
<td>Multi-hazard early warning system</td>
</tr>
<tr>
<td>MSME</td>
<td>Micro, small and medium enterprise</td>
</tr>
<tr>
<td>MTR</td>
<td>Midterm review</td>
</tr>
<tr>
<td>NBS</td>
<td>Nature-based solutions</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
</tr>
<tr>
<td>PRP</td>
<td>Pacific Resilience Partnership</td>
</tr>
<tr>
<td>REAP</td>
<td>Risk-informed Early Action Partnership</td>
</tr>
<tr>
<td>RIMES</td>
<td>Regional integrated multi-hazard early warning system</td>
</tr>
<tr>
<td>SAARC</td>
<td>South Asian Association for Regional Cooperation</td>
</tr>
<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
</tr>
<tr>
<td>SFM</td>
<td>Sendai Framework Monitor</td>
</tr>
<tr>
<td>SIDS</td>
<td>Small Island Developing States</td>
</tr>
<tr>
<td>SOGIESC</td>
<td>Sexual orientation, gender identity, expression and sex characteristics</td>
</tr>
<tr>
<td>UNDRR</td>
<td>United Nations Office for Disaster Risk Reduction</td>
</tr>
</tbody>
</table>
I. Methodology and process

Coordinated by the United Nations Office for Disaster Risk Reduction (UNDRR), the midterm review (MTR) of the Sendai Framework for Disaster Risk Reduction 2015-2030 (hereafter Sendai Framework) was a multi-stakeholder process. Regional reports contribute to the global MTR Sendai Framework. This report for the Asia-Pacific region is based on voluntary national MTR reports, a literature review, informant interviews, a specific Sendai Framework MTR report on the Pacific region (UNDRR, 2022a), as well as the following thematic reports:

- Local, Indigenous and Traditional Knowledge for Disaster Risk Reduction in the Pacific (UNDRR, 2022b)
- The Status of Science and Technology in Disaster Risk Reduction in Asia-Pacific (UNDRR & APSTAG, 2022)
- Disaster risk reduction and climate change adaptation: Coherence pathways in Asia and the Pacific (UND, 2022)
- Strengthening the connection between Disaster Risk Reduction and the Convention on the Rights of Persons with Disabilities to ensure the protection of persons with disabilities (UNDRR, 2022d)
- DRR Financing in Asia and Pacific (UNDRR, forthcoming a)
- The Role of Human Rights in Disaster Risk Reduction: Mid-Term Review. Strengthening a human rights-based approach to implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 (UNDRR, forthcoming b)
- Study on General Recommendation No. 37 (2018) of CEDAW \(^1\) on the gender-related dimensions of disaster risk reduction in the context of changing climate (UNDRR, forthcoming c)
- Thematic Review of Climate and Disaster-Resilient Infrastructure in the Pacific (UNDRR et al., 2022)
- Career Barriers and Motivations for Women and Men Working in Disaster Risk Reduction in the Asia-Pacific Region (UNDRR et al., forthcoming d)

Elements from the thematic reports are summarized as cross-cutting issues in boxes within this report.

\(^1\) The Convention on the Elimination of All Forms of Discrimination against Women
II. Introduction

Asia and the Pacific are the world’s most disaster-prone regions with urbanisation, population growth, persistent rates of poverty and inequalities increasing vulnerability as well as climate change impact. Moreover, Pacific Small Island Developing States (SIDS) are particularly vulnerable due to their fragile terrestrial and marine ecosystems, as well as the limited economic diversification, which makes them largely dependent on imports.

From 1970 to 2021, 57 per cent of all disaster fatalities and 87 per cent of all people affected by natural hazards worldwide were recorded in Asia and the Pacific (ESCAP, 2021). In 2022, two disasters had a particularly severe impact in the region: the monsoon floods in Pakistan affected over 33 million people and submerged around one third of the country. In terms of the proportion of the population affected, Pacific countries are often more affected: the Hunga Tonga - Hunga Ha'apai volcanic eruption in Tonga in 2022 affected over 84,000 people, which is approximately 78 per cent of the population.


In September 2022, the Asia-Pacific Ministerial Conference for Disaster Risk Reduction (APMCDRR) was held in Brisbane, Australia, and formally included for the first time the Pacific countries. All participants re-affirmed their commitment to the Sendai Framework. It was stressed that the Sendai Framework lies at the intersection of sustainable development, climate and humanitarian agendas, thus, acting as an enabler for the 2030 Agenda for Sustainable Development, the Paris Agreement on Climate Change, the Agenda for Humanity, as well as the New Urban Agenda. Participants also highlighted that improving the implementation of integrated and comprehensive disaster and climate risk management at both national and local levels in an inclusive, gender responsive and people-centred manner is critical to achieve the seven targets of the Sendai Framework. Furthermore, considering the impacts of the ongoing COVID-19 pandemic, participants called on governments and stakeholders to apply the “Bangkok Principles for the implementation of the health aspects of the Sendai Framework” and share lessons (Australian Government & UNDRR, 2022a). Participants also echoed a call from the 66th Session of the Commission on the Status of Women for a gender action plan for the Sendai Framework and called on governments and stakeholders to uphold the guiding principles of the Sendai Framework. The APMCDRR was preceded by the inaugural meeting of the Pacific Disaster Risk Management Ministers in Nadi, Fiji. The Ministers endorsed a declaration committing, among others, “to the full implementation of the Framework for Resilient Development in the

2 https://sdgs.un.org/2030agenda
3 https://unfccc.int/sites/default/files/english_paris_agreement.pdf
4 https://agendaforhumanity.org/
6 https://www.preventionweb.net/files/47606_bangkokprinciplesforthimplementati.pdf
Pacific 2017 - 2030, the 2018 Boe Declaration on Regional Security, the 2050 Strategy for the Blue Pacific Continent, the Sendai Framework for Disaster Risk Reduction 2015 - 2030 and related national policies” (Pacific Ministers for Disaster Risk Reduction, 2022).

This report echoes the urgent call to implement the Sendai Framework as an integral part of the 2030 Agenda for Sustainable Development and the centrality of the DRR agenda to the achievement of the Sustainable Development Goals (SDG). The most disruptive global disaster in the first half of the Sendai Framework’s term was the COVID-19 pandemic. The world was not only unprepared for the pandemic, but the pandemic also increased gender inequality, exacerbated risks for persons with disabilities and other at-risk groups, widened the gap between rich and poor within and between countries and compounded further global systemic risks and the impacts related to climate change and other risk drivers. The pandemic and climate change have exacerbated development challenges and as a result, the Asia-Pacific region is not on track to achieve any of the 17 SDGs, and projections indicate achievement in 2065 rather than in 2030 (ESCAP, 2022). This has a negative impact on improving people’s capacities and reducing their vulnerabilities and exposure to hazards, which in turn leads to an increase in disaster risk. Of particular concern is the significant regression from the 2015 baseline for Goal 13 “Climate Action”. Therefore, strengthening the implementation of the Sendai Framework will also strengthen progress towards the 2030 Agenda and the Paris Agreement.

III. Retrospective review

A Snapshot from the Sendai Framework Monitor

While some progress has been made in reducing disaster impact, national reporting through the Sendai Framework monitor shows that more work is needed in the Asia Pacific region to realize the Framework expected outcome and goal by 2030.

As at March 2022, 36 Asia-Pacific countries were using the Sendai Framework monitor – up from 20 countries in 2018.

(a) Target A: Substantially reduce global disaster mortality by 2030

The average annual mortality during 2015–2021 is 13,344 people. A decrease per 100,000 people from 1.87 in 2005–2014 to 0.47 in 2012–2021, this represents an improvement in the average annual number of deaths and missing persons in the event of a disaster. However, the COVID-19 pandemic offset this improvement, causing 53,824 deaths in 2020 and 110,421 deaths in 2021, as reported by 9 countries in the Sendai Framework monitor. These figures are likely a significant underestimation.

(b) Target B: Substantially reduce the number of affected people globally.

The number of persons affected by disasters per 100,000 people has increased from 1,184 in 2005–2014 to 2,796 in 2012–2021. The average annual number of disaster-affected people

---

7 https://www.preventionweb.net/publication/framework-resilient-development-pacific-integrated-approach-address-climate-change-and (Footnote not in original text of declaration)
8 https://www.forumsec.org/2018/09/05/boe-declaration-on-regional-security/ (Footnote not in original text of declaration)
during the period 2015–2021 was 127 million people per year.

(c) **Target C: Reduce direct disaster economic losses in relation to global gross domestic product (GDP).**

The average direct economic losses per year from 2005 to 2021 is about $16.8 billion – approximately 0.25 per cent of total GDP of reporting countries.

(d) **Target D: Reduce disaster damage to critical infrastructure and basic services disruptions.**

The number of critical infrastructure units and facilities destroyed or damaged by disasters averaged 55,964 per year from 2015 to 2021. Disasters, including COVID-19, also disrupted more than 348,491 basic services in 2020 and 2021 including health and educational services.

(e) **Target E: Increase national and local disaster risk reduction strategies.**

The number of countries with national disaster risk reduction strategies increased from 15 in 2015 to 33 in 2021. A total of 26 countries have reported having local governments with disaster risk reduction strategies.

(f) **Target F: Enhance international cooperation for disaster risk reduction.**

In the past decade, 17 countries reported receiving official development assistance (ODA) for national disaster risk reduction actions, and 7 countries have reported providing ODA support.

(g) **Target G: Increase availability and access to early warning systems and risk information.**

26 Asia-Pacific countries have reported the existence of multi-hazard early warning systems in their respective countries.

In case of least-developed countries, landlocked developing countries and small island developing states in the Asia Pacific region, from 2012 to 2021, these countries account for approximately 24 per cent of deaths and missing persons despite representing only 8 per cent of the total population of reporting countries in the region. Disaster mortality rates averaged 1.17 and 7.74 deaths annually per 100,000 population in reporting least-developed countries and landlocked developing countries, and 2.33 deaths per 100,000 population annually in small island developing States, compared with an Asia-Pacific average of 0.47 deaths per 100,000 population.

**A. Priority 1: Understanding disaster risk**

In terms of understanding disaster risk, progress has been reported in awareness and knowledge among government officials at all levels, civil society and communities and the availability of information on disaster risk, owing also to new technologies, the involvement of the media and the mainstreaming of DRR in education. But shortcomings related to data quantity and quality and capacities remain.

Since 2015, several successful initiatives to increase risk knowledge and understanding have been launched in Asia and the Pacific. Stronger links between risk assessments, decision-making and disaster prevention investments have been reported. The role of science was also highlighted to connect research across different hazards, including hydrological, geological and biological hazards. Such multi-disciplinary and multi-hazard approaches allow for better understanding of
cascading hazards and potential impacts of concurrent hazard events. However, the current practices of DRR in the public and private sectors and in civil society are not yet sufficiently modeled on such multi-hazard and multi-disciplinary approaches.

In general, progress has been made in identifying, monitoring and modelling hazards, assessing vulnerabilities and exposure through increasingly comprehensive and advanced risk assessment tools. One example is the strengthened Pacific Risk Information System, which is one of the largest collections of geospatial information for the region or the Multidimensional Vulnerability Index, expected to be finalised in July 2023. However, significant work remains to be done to tackle the limited understanding of systemic risk, including compounding and cascading risk and impact and potential tipping points, and the significant potential distortion it inflicts on proper definition and prioritization of DRR measures. This could be achieved, inter alia, through increased stakeholder awareness and research on systemic risk, defining approaches to assessing and managing systemic risk, further developing indices that support this understanding, and improved data collection for compound, cascading and systemic events and impacts. In the Pacific, the World Bank’s Pacific Catastrophic Risk Assessment and Financing Initiative aims to provide information on disaster and climate risk and related tools for improved risk management to support development planning and financing decisions.

While the quality and availability of data on hazard exposure and of hazard models have significantly improved, more work is needed to define and apply methodologies to better integrate vulnerabilities, including socio-economic vulnerabilities, into risk assessments and collect disaggregated data on sex, age, disability and income. More should be done to collect and use relevant data to better understand the drivers of creation of risk and vulnerabilities, including aspects related to the specific needs of different groups, such as women, children, persons with disabilities, persons of diverse sexual orientation, gender identity, expression and sex characteristics (SOGIESC), refugees, migrants and internally displaced persons.

Technological advances and emerging technologies have improved the availability of data, the quality and diversity of sources of risk information. Remote sensing and geographic information systems have increasingly improved and are of great benefit for DRR and climate change adaptation. ESCAP (2019) highlights the role of big data innovations, including the use of large data sets from mobile phone tracking to satellite platforms, to delineate patterns, trends and linkages of the complex disaster risks.

Nevertheless, issues regarding fragmentation and limitations of data and challenges in terms of access to technology and capacity have also been highlighted. The state of play of disaggregated data called for in the Sendai Framework varies: while some progress in the collection and use of disaggregated data has been reported, risk data is not systematically disaggregated by hazard, sex, age, disability, income and geography, which can contribute to people being left behind and inadequate DRR measures being taken. Moreover, it was pointed out that historical disaggregated data is often missing, while at the same time a considerable number of databases, knowledge hubs, portals and platforms exist for a variety of data related to disaster risk management. Harmonising data collection methods and setting up data repositories, including data collection by different organisations beyond the disaster management agency, was seen as a challenge. The absence of common methodologies for studying and assessing risks hampers a comprehensive understanding of risk and its cascading and compounded nature. Duplications
and inconsistencies were also reported. In this context, the private sector, which plays an important role in investments and thus in increasing or reducing disaster risk, also has considerable relevant data. Therefore, there is a need for significantly increased collaboration between the public and private sectors in sharing and analysing data and producing risk analyses.

The issues related to data and understanding of risk can often be related to limited capacities, as reported by countries; therefore, continuous work on building capacity for better understanding of risk and producing risk analyses is needed. This is all the more important at the local level as the Sendai Framework states that risk is local. Therefore, local governments and communities should be empowered to collect, validate and consolidate risk information using disability-inclusive and gender-responsive risk assessment tools. Good practices on gender and social inclusion exist in the region, as identified in some national voluntary reviews.

Despite some challenges, the public’s knowledge and awareness of risk, including impacts of disasters and climate change, seems to have increased and there is increasing support and demand for DRR actions to be taken. However, this is not the case everywhere and in some areas there is still a misconception that disasters are natural and inevitable. Sharing risk information with the population in simple language and through disability-inclusive, gender- and age-specific safety education is still of great importance, and this is even more true for early warning and early action.

The involvement of the media and its critical role in raising public awareness and understanding of disaster risk was also highlighted. Recent disasters have led to increased media coverage of these issues, particularly climate change.

Mainstream DRR into education was critical to better understand disaster risk. To achieve the goal of a disaster-resilient society, curricula and textbooks were developed and teachers were trained on disaster education. Topics included natural hazard safety, transport safety, infrastructure safety and health safety. Customized safety education was provided to administrative officials and local leaders, as well as to citizens of certain age groups. Significant pioneering work was done across the Pacific in the area of vocational training for resilient development, which needs to be built upon in the future and which can be seen as global best practice.

B. Priority 2: Strengthening disaster risk governance to manage disaster risk

In the Asia-Pacific region, progress was reported on risk governance. This included better coherence between DRR and climate change adaptation (CCA), multi stakeholder coordination, mainstreaming of DRR into local development plans, inclusion and localization.

National DRR policies and normative and planning frameworks were established, especially to achieve Target E of the Sendai Framework (national and local DRR strategies by 2020). At the same time, further progress is needed in the adoption of local DRR strategies. One challenge remains that the lead agencies for implementing the Sendai Framework are usually the national disaster management agencies, which are already stretched in preparing for and responding to disasters and may not be fully empowered to direct other government agencies, whose policies, actions and investments have a significant impact on prevention and effective disaster risk.
management. Moreover, national legal frameworks need to be further improved by enshrining a clear legal obligation to reduce disaster risk and defining corresponding responsibilities. Lessons from the COVID-19 pandemic show that policy and regulatory frameworks need to be expanded to include both biohazards and technological hazards to ensure a multi-hazard approach to DRR. Furthermore, the guiding principles of the Sendai Framework clearly underscore the importance of human rights, including the right to development. This underlines the importance of a human rights-based approach to DRR, which can also benefit from close collaboration between organizations working in DRR and national human rights institutions. Human rights treaty bodies can also provide very useful guidance for the design of DRR measures to effectively address vulnerabilities related to economic, social, cultural, political and other conditions. Overall, human rights help to reinforce the importance of equality, freedom from discrimination and participation in public life. This often requires affirmative action to increase opportunities for women's participation and leadership in DRR institutions and to ensure that processes and actions are disability-inclusive and gender-responsive.

DRR and CCA are converging at both conceptual and practical levels and there is progress integrating DRR and CCA into regional and national strategies and plans (see also box 3). A coherent approach at the policy level offers more opportunities and benefits. This includes an improved knowledge base, more efficient use of financial and human resources and better planning tools and streamlined processes for more effective preparedness, response and recovery to climate change and disaster risk.

Multi stakeholder coordination remains essential, especially to ensure diversity in decision-making and action, including a wide range of ministries and institutions, the private sector, science and academia, youth groups, civil society organizations such as organisations of persons with disabilities and women’s organisations and community-based organizations. Engagements tend to be ad hoc or in the form of advisory groups and is not necessarily institutionalised as recommended in the Sendai Framework. Inclusive and participatory disaster risk governance mechanisms would be essential to pool all the necessary competencies to develop effective DRR measures and make governance more adaptive and thus more effective in addressing existing and foreseeable challenges. Furthermore, given the strong interdependence and interrelationship between disaster risk governance and investments in DRR and resilience, national audit institutions, which have already played an important role in guiding the implementation of the SDGs, should also be involved.

Volunteers remain vital in DRR and in strengthening communities’ resilience. Even though they are often invisible, their actions need to be supported through capacity building and resources, while ensuring that they have a say in defining policies and implementing them in the light of their experiences.

Urban resilience should be improved and the localization of DRR should be enhanced, including strengthening the capacities of and empowering local governments and communities. There has been progress in mainstreaming DRR into sub-national development planning. However, some countries reported that sometimes there are no clear responsibilities between national and local levels, which makes implementation difficult. In some places, the extent and adequacy of implementation of policies and plans, especially at the local level, remains a challenge due to the
capacity limitations of local governments, including the availability of sufficient financial resources.

There has been some progress regarding various aspects of inclusion and localization in accordance with the principle of “leave no one behind”. Women, persons with disabilities, youth, older persons, displaced people, indigenous people and people of diverse SOGIESC are essential stakeholders for DRR planning, design and implementation. Education at all levels and the necessary adjustments in governance remain critical to ensure that current and future generations have the knowledge and means to demand and lead more DRR action – and this must be achieved equally in urban and rural areas alike. Persons with disabilities, while estimated to make up at least 1.3 billion people or 16 per cent of the global population, are not routinely included in DRR decision-making, so their participation in defining DRR policies and their implementation needs to be significantly improved.

Women and youth are playing a more active role in DRR decision-making and are receiving recognition for the essential responsibilities they have at national, sub-national and local levels, although many disaster management institutions are still male-led. In most countries in the Asia-Pacific region, there is scope for better participation and more leadership of women in risk governance institutions at the national and local levels and for more recognition of women’s key role in reducing risk and responding to disasters. Good regional practices are emerging that could be further built upon.

A survey on career barriers and motivations for women and men working in disaster risk reduction in the Asia-Pacific region (UNDRR et al., forthcoming) found that work-life balance issues and a limited overlap between their personal and professional networks were common career barriers for women, while key enablers for both women and men included higher diversity of leaders and role models, opportunities to become role models, and work environments that encourage a sense of belonging and a better work-life balance.

A study was undertaken on how countries report under the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) on the CEDAW Committee “General recommendation No. 37 (2018) on gender-related dimensions of disaster risk reduction in a changing climate” (UNDRR, forthcoming). It shows that, while there is great potential for mutual reinforcement of gender equality in disaster risk reduction between country reporting under CEDAW and implementation of the Sendai Framework, this is not yet evident in national reports. The study recommends increased interaction at country level between the national women’s machinery and the national disaster risk management agencies during preparation of national reports to CEDAW, to fully capture good practices on gender and DRR, as well as greater use of General recommendation No. 37 to guide gender-responsive DRR at national and local levels.

C. Priority 3: Investing in disaster risk reduction for resilience

Although there has been a considerable mobilization of resources and instruments for DRR financing since 2015, these are not sufficient to meet the challenges ahead. There is growing interest among governments in the Asia-Pacific region in developing national DRR financing strategies, frameworks and policies. But data on government spending for DRR is limited
(UNDRR&ADB, forthcoming a), as is the understanding of the indirect impact of disasters and the implications for investments in sustainable development, including the achievements of the SDGs. Moreover, there is a strong gender dimension concerning DRR financing, including but not limited to access, that needs to be considered, further explored and addressed – this is a significant gap and inherent bias in current financing instruments and practices.

The recognition of the need to develop DRR financing strategies has considerably increased following the adoption of the Sendai Framework and is also explicitly recommended in several United Nations General Assembly resolutions on DRR and the implementation of the Sendai Framework, as well as in the deliberations of the United Nations Financing for Development Forum (2020). Yet we are still in early days and more work is needed to support their development. Such strategies are different, yet complementary, from disaster risk financing strategies which commonly aim at transferring economic and financial risks. DRR financing strategies encompass but are not limited to disaster risk financing. Their scope mainly covers the financing of preventive measures to prevent the creation of new risk and reduce existing risk and are ideally linked to integrated financing framework for sustainable development and the achievement of the SDGs.

DRR financing strategies can show whether planned DRR investments are cost-efficient and how these investments can be financed at lower cost. They inform policymakers about which DRR investments should be prioritised in terms of financing perspective, once it has been politically determined which DRR measures should be taken. In this context, the DRR financing strategy can be an important tool in creating political leadership in increasing DRR financing.

To support the development of DRR financing strategies, it is important to undertake risk-sensitive budget reviews and implement budget tagging and tracking systems as these would help clearly understand what DRR investments have been financed, to what extent and how. Also, a probabilistic cost-benefit analysis of DRR investments could be prepared and integrated into the DRR financing strategies to render visible the rationale and cost-effectiveness of investment. DRR financing strategies would need to be part of the Integrated National Financial Framework (INFF) to support countries in ensuring the resilience of the SDGs investments. (UNDRR&ADB, forthcoming a).

There is growing focus in a number of countries on annual expenditure reviews and tagging as their result can inform disaster risk financing strategies, set pre-disaster spending targets for DRR and play an important role in making the case for DRR investments. Budget tagging is a critical mechanism to inform DRR at the country level, including climate change adaptation. While some countries in the region are embarking on more multi-hazard DRR budget tagging approaches, there currently is no commonly accepted global framework or methodology for comprehensive disaster and climate budget tagging and tracking. To address this gap, UNDRR and IIED are developing a methodology for disaster and climate budget tagging and tracking expected to be finalized in the second half of 2023. In this connection, also ongoing efforts to develop taxonomies to guide DRR investment as well as facilitate budget tagging and tracking are an important development.
The climate emergency has accelerated the need for and work on the development of disaster risk financing strategies and mechanism. Such strategies generally focus on estimating how to finance the necessary urgent liquidity needs and the cost of the damages and reconstruction after disasters, and in recent years, increasingly also to enable anticipatory action to minimise disasters impact. Risk layering approaches used in disaster risk financing documents help the definition of more tailored-to-needs strategies.

There is growing progress in investing in DRR and resilience. The financing instruments of governments in the Asia-Pacific region include domestic resource mobilization, e.g., through public taxes, tariffs, land-value capture and crowdfunding, grants and transfers, debt as well as equity financing. DRR financing by the private sector is growing but still only a fraction of its total potential. Globally, private sector financing directed at climate change adaptation totalled $1 billion in 2019-20, or about 2 per cent of adaptation financing from all sources (Climate Policy Initiative, 2021). Private financing instruments include foreign direct investment, debt and equity financing, insurance protection and DRR incentives via insurance products and services, as well as philanthropic giving (UNDRR, forthcoming a).

The potential to increase the use of Islamic finance instruments in DRR investments is very high. The Asia Development Bank emphasizes that Islamic finance “represents an important source of development capital, which could assist in achieving sustainable development and funding the region’s expanding infrastructure needs”. Islamic finance has been described as one of the fastest growing elements of global finance with total assets growing at a rate of 11 per cent year-on-year as of 2021 and worth USD 3.06 trillion (IFSI, 2022). Its main sectors comprise Islamic Banking, Sukuk (Islamic bond), Islamic funds assets, and Islamic insurance (Takafuk) (IFSI, 2022).

In this context, international development organizations should be encouraged to continue exploring the potential of Islamic finance instruments to support DRR, including climate change adaptation. Among the barriers that need to be addressed to realize the potential of Islamic finance are: (i) tax and regulatory regimes which treat Sukuk unfavourably; (ii) managing liquidity risks brought about by, among other factors, limited availability of a Shari’ah compatible money market and intra bank market; and (iii) harmonizing Shari’ah rulings to enhance predictability and enforcement of legal transactions (ADB, n.d.(f)).

Asia’s stock market and state pension funds with total assets exceeding $6 trillion, could create a leverage point to finance DRR. Pension funds could play a significant role in increasing Environmental, Social and Governance (ESG) investment, support the widening of the criteria to include “Resilience” as well encourage the development of resilience and disaster risk reduction bonds.

Limited understanding of systemic risks, lack of appropriate incentives as well as burdensome requirements and fiduciary standards have been mentioned As barriers to domestic private financing. There is an under-leveraged potential of private sector finance for DRR and climate change. ADB identified the following five barriers for the Asia-Pacific region: much of the adaptation benefits are considered public goods and are difficult to monetize; short-term time horizons linked to capital investment and/or loan timelines are incompatible with the often lengthy time frame within which risks manifest or return on investment materializes; current
economic and financial modelling of investments do not reflect the cost of disaster impacts nor account the benefits of enhanced climate resilience; businesses are currently not encouraged to invest with conducive financial incentives. However, the provision of certain financial incentives can lead to maladaptation or disaster risk or simply discourage resilient development (ADB, 2022b).

Official development assistance in the Asia-Pacific region is another important source of disaster risk financing and has been steady since 2012, averaging approximately USD1.4 billion per year but with only 16 per cent of spending being directed at ex-ante disaster prevention and preparedness (UNDRR, forthcoming a). Some barriers to accessing international disaster risk financing have been identified, such as complex and lengthy application processes and stringent requirements which render difficult for civil society organizations (CSOs) to qualify for funding, thus limiting the possibility to leverage their capacity to localise DRR action. It has also been highlighted that substantial allocations of DRR investments are mainly targeted to post-disaster phases yet significant portions remain unutilized. Reasons cited for the non-utilization are unclear fiscal guidelines, including for local government units, limited capacity and limited prioritization of DRR.

Strengthened public-private partnerships are increasingly needed to reduce risks. The private sector, both independently and in partnership with government, creates important pathways for investment. Investment in DRR is often not sufficient to cover the resilience and risk reduction needs vis-à-vis potential medium- to large-scale disasters impacting communities more frequently and with higher intensity due to the changing climate. Prevention, adaptation and recovery costs are anticipated to grow in the future due to the increasing frequency and intensity of disasters, combined with a growing population and the associated increase in assets and infrastructure exposed to natural hazards. In this regard, climate change and disaster risk will have operational impacts on critical infrastructure. This may affect road and rail supply chain resilience, but also buildings, for which the compliance with building codes is critical. Widespread investments in resilient infrastructure systems included retrofitting infrastructure to a more resilient standard, which may incur higher costs in the short-term, but over the long-term generates savings by reducing the likelihood of assets being re-damaged in a subsequent disaster. Further investments targeted roads and bridges; slopes, dams, including saltwater dams, irrigation systems, reservoirs, water treatment plants and automated water level detecting systems; as well as coastal protection on several islands. However, significant funding is lacking for the strengthening, retrofitting and upgrading key infrastructure.

Encouraging micro, small and medium-sized enterprises (MSMEs) to invest in DRR is important for economic stability. Disaster-related disruptions to business continuity are felt most acutely by MSMEs whose financial reserves are limited. MSMEs comprise more than 80 per cent of businesses in the Asia-Pacific region and are critical in creating livelihoods, supporting well-being and building social cohesion and value chains. UNDRR surveyed MSMEs in the Asia-Pacific region to better understand what prevents them from investing in DRR measures. The main barriers described were the perception that disasters are just not considered an immediate priority.

---

10 Average from 2012-20, based on data from the Creditor Reporting System of the Organization for Economic Cooperation and Development (OECD).
compared to other challenges, the difficulty in identifying effective measures for risk reduction as well as a lack of capacity and resources for investing in DRR, exacerbated by a general lack of awareness of risks and the potential impacts on their business (UNDRR, 2020).

Moreover, insights from the World Bank’s 2010-2020 evaluation of its support for reducing disaster risks from natural hazards illustrates further challenges, such as the limited evidence on positive impacts of DRR investments, limited reporting on DRR benefits for groups other than the most vulnerable groups disproportionately affected by disasters, insufficient attention to operation and maintenance aspects of infrastructure for long-term resilience, insufficient variation of types of risk prevention activities as well as a significant insurance protection gap (World Bank IEG, 2022).

Challenges to DRR investments should also be evaluated in terms of local governments. For example, significant challenges remain to enable local governments to devise, fund and implement local DRR strategies, plans and other preventative measures. Whereas some progress has been noted, the focus remains on preparedness and response. Also, reconstruction funds are limited and oft depended on central mechanisms. In addition to financial governance reasons, also limited local capacities contribute to the slow pace in this yet critical area.

The effective use of the financial resources invested into DRR deserves special attention, considering governments’ limited resources and the compounded effects of various crises, such as financial crises, food crises, effects of wars such as the one in Ukraine. This points out the importance of strengthening the public accountability and transparency related to DRR investment and expenditures. In this connection, supreme audit institutions have an important role in enhancing public accountability in government and their capacity may need to be strengthened accordingly. Interesting and encouraging progress has achieved through the International Organisation of Supreme Audit Institutions (INTOSAI) and the issuance of guidance (GUID 5330) to facilitate the audit of disaster management.

The increasing understanding of systemic risk and its disruptive multidimensional impacts has supported the development of more comprehensive and inclusive approaches to social protection systems with a view to enhance not only their responsiveness but also their anticipatory nature pre-impact and adaptivity to a changing risk-scape. Various approaches to social protection have been applied in the last years, linking social protection with climate change and DRR. However, the stark reality is that in the Asia-Pacific region 56 per cent of the population still do not have access to any form of social protection, and if China is excluded, it is 69 per cent11 (ILO 2021). Social protection mechanisms, in addition to their human and social value, have also an important potential to be explored as part of DRR investment and financing strategies, and as investments that by reducing vulnerability would reduce disaster risk, and as a consequence the economic and social costs and impact of disasters.

The focus on nature-based solutions (NBS) and ecosystem services (ESS) has increased in recent years. The paradigm shift of economic development that includes social well-being and ecological health, as reflected by SDGs, explains this growing interest (ADB, 2022c). The intensification of hazards due to climate change, advancement in science and the increasing

---

realisation that grey infrastructure alone may not be a cost effective and sustainable solution has increasingly brought to the fore the untapped DRR potential of NBS and ESS. In particular, low cost, effective and scalable NBS can play an important role in preventing the negative effects of various disasters. When properly implemented, NBS can provide not only ecological but also important social co-benefits in terms of community empowerment. For example, the role of ecosystems in poverty reduction has been recognized, along with the long-term costs and risks associated with losses in ecosystems. In addition, the need of more investments in greener and blue infrastructure, ecosystems protection and NBS is broadly acknowledged in the Asia Pacific region and needs to become an integral aspect of analyses in DRR financing strategies and measures. In this context, it is necessary to develop new sustainable finance systems that will enable investments in NBS and examine whether investments risk leading to maladaptive developments.

D. Priority 4: Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction

There has been progress in disaster preparedness, response and ‘Build Back Better’ in the Asia-Pacific region, such as developing and implementing contingency plans, setting up emergency operation centres, building local capacities, enhancing civil-military cooperation, establishing early warning systems as well as early action and safe evacuation. At the same time, significant challenges remain. The Early Warning for All Initiative (EW4all) launched by the UN Secretary General can generate the necessary momentum to advance in these areas.

Contingency plans have been increasingly developed, including for the local level. The establishment and reinforcement of emergency operation centres (EOC) has increased in the region, even if more resources are needed to optimize their functioning. Also, the conduct of simulation exercises and drills is a common practice in the Asia-Pacific region at different levels (national, sub-national and community-based).

Logistical capacities have been strengthened, including the availability of warehouses with stocks of relief supplies, including mobile ones, and means of transport by land and water, as well as trained staff. But unequal access to these facilities has also been pointed out. Civil-military cooperation has been enhanced, which harnesses the capacities and resources of military forces for humanitarian assistance, as well as search and rescue operations.

One of the most effective ways to reduce disaster impact is to have an effective multi-hazard early warning system (MHEWS) in place which allows people to engage in risk reduction actions. Evidence suggests that countries reporting good coverage of MHEWS have lower mortality rates compared to countries that have little or no early warning systems (UNDRR, 2022e). Closely related to MHEWS is early action, also known as anticipatory action or forecast-based action. Early action defines actions and financing based on forecasts and predefined triggers. Advances in science have led to the possibility of more precise forecasts that facilitate anticipatory action.

In Asia-Pacific, several initiatives reinforce early warning and early action, including reinforcement of hydro-met services, dissemination, public awareness and communication. Different partners work with governments and civil society to enhance early warnings and early action for different
purposes including evacuation needs, disease outbreaks in humans and animals, agriculture and others. The Climate Risk and Early Warning Systems (CREWS) initiatives aim to address gaps in timeliness and last mile connectivity in the dissemination of warnings from issuers to end-users and to ensure that early warnings take into account the different risks and needs of sub-groups, including different vulnerabilities (urban and rural, women and men, elderly and youth, people with disabilities, etc.). countries reported increasing good practices than can be scaled up. However, such remains to be done, including in ensuring that infrastructure like shelters and evacuation centres have women and child-friendly spaces and adequate water and sanitation facilities.

Regional frameworks and working groups have been established to further advance the operationalization of early warning and early action. For example, the Association of Southeast Asian Nations (ASEAN) Framework on Anticipatory Action in Disaster Management provides guidance for defining and contextualising anticipatory action at the regional level with some considerations for its implementation by members of ASEAN. The Regional Technical Working Group on Anticipatory Action Asia-Pacific support the development of guidance and frameworks on early warning early action in the region. CREWS, Risk-informed Early Action Partnership (REAP) and Regional Integrated Multi-Hazard Early Warning System (RIMES) support governments and communities to strengthen early warning early action.

For a number of hazards, mostly related to hydrometeorological events, including glacial lake outburst floods, there are numerous initiatives and technological solutions that reach all populations in a timely manner and through various channels. As a result, significant progress in improving multi-hazard forecasting, monitoring and dissemination has been reported. A specific aspect is the upgrading of cell broadcast emergency alert systems to enable sending alerts to connected mobile phones, including voice recordings, which also involves dedicated mobile phone applications. Also, toll-free numbers to receive weather forecast and warning messages have been reported. To reach foreigners, e.g., migrant workers or tourists, messages are translated in relevant languages. Other means to notify provincial authorities and the public are social media, websites, TV, radio, loudspeakers and even handmade instruments; the latter four to cater for people without mobile phone or Internet. In some places, the private and citizens also share relevant early warning information via social media to complement information provided by governmental sources. Inhibiting factors for early warning systems are lack of funding and capacity, as well as limited access to satellite communication.

Countries also stressed that effective early action, which includes safe evacuation of potentially affected people based on easy-to-understand instructions, needs to be tailored. Special attention and engagement need to be ensured for older persons and those with disabilities. The needs of women and LGBTQIA+ need to be taken into account in the measures to be taken. It is also critical that the public is informed in advance about the importance and meaning of warning signals and the measures to be taken, including through evacuation drills. Community-level structures that involve volunteers to improve risk knowledge are good practise in this regard.

‘Build Back Better’ is often not implemented, since investments in the immediate phases of response and short-term recovery are often limited to a return to a sense of normalcy. countries reported that recovery often means a return to business as usual and in doing so, neither new technologies nor innovations are used, for example experimenting with a different crop or applying updated building codes. Moreover, indicators and guidance would be useful to define or
characterize whether an area and its sectors have bounced back from disasters and have applied ‘Build Back Better’ in their rehabilitation and recovery efforts. Another challenge is preparing for building back better by strengthening risk information and applying this information to set up plans and regulations for rehabilitation and reconstruction before a disaster strikes. This is undoubtedly an area that requires special attention in the remaining years of the Sendai Framework.

Overall, there is ample margin to integrate DRR into relief and humanitarian plans to strengthen preparedness and response.

IV. Contextual shifts, new and emerging issues and challenges

Since 2015, the disaster risk landscape globally has changed and is becoming increasingly complex, including in the Asia-Pacific region. These developments must be taken into account for further implementation of the Sendai Framework until 2030, and certainly after as well. Natural hazards in the Asia-Pacific region have become more frequent and intense and the disaster impacts more long-term, complex and costly. While increased risks due to the effects of climate change had been forecasted, preparation for the highly disruptive COVID-19 pandemic was insufficient, although epidemics and pandemics had occurred and lessons had been drawn from them. Both climate change and the COVID-19 pandemic are examples for the systemic, cascading and compounding nature of disaster risk. As the frequency, intensity and duration of hazards like droughts, floods and bushfires increase, so does the likelihood of multiple disasters with cascading and compounding impact. Systemic risks increase because essential services are interconnected and interdependent. Against this backdrop, disaster risk management must deal with uncertainties. In addition, other hazards are expected to increase, including zoonoses and cyber security threats, particularly in relation to critical infrastructure.

Socio-economic aspects in the region contribute to increased vulnerability of people and thus increased disaster risk. It is therefore important to continue to address these drivers of vulnerability and disaster risk. The socio-economic impacts of COVID-19 in the Asia-Pacific region was unprecedented and its effects will continue to be felt in the years to come. The impacts of COVID-19 on societies and economies have significantly affected the progress towards achieving the SDGs (ESCAP, 2022). Many workers in Asia-Pacific do not have access to social protection and health coverage. In the future, digitalization and changes in the nature of work may also lead to loss of jobs and increased inequalities between high- and low-skilled workers (OECD, 2022). Only one in three persons of retirement age in the region are covered by a pension scheme (OECD, 2019). This means that in the future, more older persons will need to rely on family support to meet their needs and other informal social safety nets. This is also linked to ageing societies in some parts of Asia and the Pacific due to demographic trends, in which the special needs of older persons need to be taken into account. In addition, societal challenges regarding gender equality, reducing inequalities and ensuring social inclusion will be exacerbated if risk drivers are not addressed.

The economic and social drivers of vulnerability require a significant shift from systems that emphasize economic growth to system that prioritizes resilience, safety, sustainable production and consumption, food security, inclusion and reduced inequalities.
Population growth and rapid urbanization continue to shape the risk landscape, with more people and assets exposed to hazards and amplified by the systemic nature of disaster risk. While this has been a consistent trend for decades, the scale of the challenge requires a much greater focus on urban and community resilience, especially plans and investment. In the Asia-Pacific region, 51 per cent of the population lives in urban areas and it is estimated that this will grow to 66 per cent by 2050 (UN-Habitat, 2022). Urbanization in Asia is driven mainly by rural-urban migration and, especially in South-East Asia, is strongly linked to economic transition and greater integration into the global economy. This is explained by the fact that many cities receive foreign direct investment, mainly in the form of outsourcing of manufacturing by parent companies in developed countries (UN-Habitat, 2022). The need to improve local resilience requires the development of resilient infrastructure and increased attention to natural hazards triggering technological accidents (Natech).

While there has been overall progress in the adoption of policies, implementation seems to be advancing at a slower pace as investment in DRR and prevention are not commensurate to the measures that need to be adopted. The expected costs of DRR and adaptation measures in the SIDS far exceed most Pacific countries’ financial capacities. External finance and enhanced cooperation is thus critical if not vital to the Pacific island countries.

V. Prospective review and recommendations

A. Priority 1: Understanding disaster risk

There are multiple areas to focus on to progress on Priority 1 of the Sendai Framework by 2030, which include the quantity, quality and sharing of data, data governance protocols or guidance, multi-hazard risk assessments, integration of indigenous knowledge, as well as required capacities. Overall, countries and stakeholders recognise that data disaggregation remains a major priority where further progress is necessary, in particular the collection and analysis of sex-, age-, disability- and income-disaggregated data and to build greater national and local capacities to this aim, in order to better understand risk and better assess needs when disasters materialise.

Open data sharing among government institutions and all stakeholders is critical, as well as improvement of the types, the amount and the quality of collected data and the information products developed from them. The latter issue requires thorough analysis of the collected and shared data, for which capacities are limited. It has also been recommended to further harmonize systems and to integrate datasets, especially on exposure and vulnerability, to existing platforms. Moreover, it has been emphasized that communication channels must be in place so that the population has access to key information, as equal and easy access to hazard and risk information is a crucial factor in empowering the population to make risk-based decisions and act individually.

However, whereas there is an essential need to enhance data collection, especially disaggregated by sex, age, disability and income, this should not prevent a better use of the existing data in the development of targeted and actionable risk analytics, policies setting, investment decisions and the definition and implementation of DRR measures. At the same time, it is clear that an
enhancement of capacity understand systemic risk and development of related analytics is key as indeed expertise, capacity and resources are often limited. Similarly, and as a consequence, information collected and its potential is not fully leveraged for prevention purposes and enhancement of disaster risk management and better preparedness for response.

The formulation of comprehensive data governance protocols and guidance with priority areas for sectors, such as infrastructure, agriculture and housing, and the involvement of local governments is key. This would also have positive implications for enhanced multi-hazard risk assessment and monitoring, as well as financial tracking tools. Disaster loss databases and risk information platforms should shed light on the needs of the most at-risk groups, including information of key socio-economic aspects that determine vulnerability to disasters, and how such groups are effectively and meaningfully engaged in the definition of DRR measures and investment and their implementation. In addition, DRR knowledge management strategies and plan would be important to support the dissemination and use of knowledge products and services as well as to raise awareness of disaster risks, enable action accordingly, including for more effective early warning systems.

To understand disaster risk, local, indigenous and traditional knowledge (LITK) is essential (see also box 1). However, while LITK is partly mentioned in polices and plans, its use in combination with science and technology or for innovation purposes is still limited in the implementation of DRR measures. Targeted efforts are necessary to leverage the expertise, capabilities and knowledge held by local communities and Indigenous people.

Accessible training and education on DRR across sectors and levels has also been cited as a most needed intervention to improve the implementation of the Sendai Framework and comprises the further inclusion of DRR in curricula and vocational training. In general, it is critical to have an adaptable and tailored approach since there are communities, which are more difficult to reach by standard mechanisms and narratives, thus require alternative awareness campaigns. Considering that children and youth are nearly half of the world population, DRR education at all levels of education including tertiary education is an obvious priority to ensure that there is more awareness, understanding, skills and competences directed toward preventing the creation of new risk and reducing existing risk – in the face of increasing systemic risk and potential for system failures one could argue that is a relatively low-cost investment toward a vital outcome.

The UNDRR & AP-STAG (2022) report highlights the importance of citizen science and advancing inter- and transdisciplinary approaches to strengthen the science-policy interface, including applying a multi-disciplinary approach to data collection and development of risk information and analytics, considering compound, cascading and systemic risk. This includes the interplay of natural and social and behavioural sciences, given the significance that perception of risk has in the determination of DRR and measures. Also, there is still a lack of commensuration between the production of knowledge and its dissemination in way that support wider understanding and application. In this respect, the work of the U-INSPIRE, a network of young scientists and innovators, is of significance and its expansion auspicious. The Manila Declaration of the Asia-Pacific Science and Technology Conference for Disaster Risk Reduction 2022, convened on 7-8 April 2022 by the Government of the Philippines, APSTAG and UNDRR, echoed these points and also stressed the need to significantly enhance the evidence base and understanding of systemic, compounding and cascading risk and consequence, and invest in science-based adaptive
governance, localization of STI solutions, enhancement of capacities and trans-disciplinary education and research and youth leadership and participation.

Accessibility of simple and actionable risk analytics is also key to support the work of the private sector and ensure the resilience of business, especially MSMEs which are an essential element for the resilience of local communities. This would be essential to maximise the resiliency of their capital investment, thus moving beyond business continuity measures. The experience matured by the UNDRR's Private Sector Alliance for Disaster Resilient Societies (ARISE) and especially the networks in the Philippines, Japan and India offer practices of interest, including risk assessment tools, planning, sharing of lessons, and awareness raising. The private sector through its supply chains that go across countries borders represent a significant vehicle of cooperation to be further leveraged upon.

Overall, there is a need for more data sharing between the public and the private sector and a continued collaboration, including in risk disclosure in public and private transactions, risk pricing based on effective risk levels, and the development of incentives, including of a fiscal nature, for investment which also contribute to the reduction of disaster risk.

**Box 1: Cross-cutting - Local, Indigenous and Traditional Knowledge for DRR in the Pacific**

This section highlights some of the points made in the study on *Local, Indigenous and Traditional Knowledge for DRR in the Pacific* (UNDRR, 2022b). There is significant yet underutilised local, indigenous and traditional knowledge (LITK) in the Pacific in relation to housing and infrastructure, food security, water, energy, health, and sanitation, other natural resources, ecosystem services and sustainability.

In the Pacific, LITK has been relatively extensively incorporated into regional, national and local policies and plans associated with DRR and CCA, such as the regional Framework for Resilient Development in the Pacific and the complementary Pacific Resilience Standards. The use of LITK and practices for DRR in the Pacific is mostly through existing local community practices, supported by NGOs and donors, rather than through national governments initiatives and with almost no support from the private sector. Localization is crucial in the Pacific for the implementation of DRR work. At the same time, it is important to recognize that terminologies, concepts and initiatives, such as DRR, climate action, SDGs and SFDRR may need to be adapted and tailored to effectively support local action.

Weaving LITK and practices and science together remains a challenge due to different methodological approaches. For instance, LITK is often based on observations and oral traditions that are passed down from generation to generation as cultural knowledge, rather than formally documented and validated. It is also difficult to standardize LITK as the specifics of the traditional methods differ from one locality to another. Language barriers further complicate the transfer and use of LITK: those with LITK and techniques often only speak their native language and DRR and CCA terminologies often do not exist in these languages. Moreover, some communities consider LITK to be culturally sacred and convey it only to the younger generation of the same tribe and/or family. Yet, those often migrate to urban settings or abroad where livelihoods do not require LITK methods, which are then lost.
Overall, additional efforts and investments could make much better use of the potential of combined LITK and science. For this, the Pacific needs more resources and funding for capacity development and community-based projects to better preserve, integrate and use LITK and practices for DRR. More work needs to be done on standard (as much as this is possible), capacity development and tools to translate LITK policies into action plans that align with local community needs and traditional governing systems. These approaches should be socially inclusive, since the type of LITK that can be obtained from women, men and the elders is different. Special attention should be paid to LITK programmes which are associated with early warning systems.

B. Priority 2: Strengthening disaster risk governance to manage disaster risk

Disaster risk governance impacts many aspects of the implementation of the four priorities of the Sendai Framework, from data governance and management to production of joint analytics through an all-state-institutions approach, as well as e-governance; from managing hazards to managing risk; from inclusive approaches to disaster risk management to financing mechanisms, legislation, as well as localization of DRR action and adaptive governance; from enhancement of public and private partnerships to resilient infrastructure and other non-structural measures; from enhanced preparedness and response to the development of pre-disaster arrangements to be prepared to build back better. Just to mention a few.

National normative frameworks require further strengthening to be adequate and fit for purpose to tackle the challenges posed by systemic risk and determine the necessary measures and related duties and accountabilities across institutions and stakeholders. Whereas there has been positive strengthening of normative frameworks for disaster management and response, the preventative aspects more connected to preventing the creation of new risk and reducing existing risk, in accordance with paras 17 and 27(a) of the Sendai Framework need further normative work. It would be very important to have a clear legal obligation to reduce disaster risk enshrined into national legislation. This would be a significant step forward to counter the disaster risk and disasters increase, and projected increase for year 2030 – an increase of up to 40 per cent compared to 2015. An equally fundamental corollary norm would be the definition of disaster risk disclosure obligations in both public and private transactions. The advancement of science will also have a significant bearing on due diligence assessments.

International human rights instruments and mechanisms provide a useful and pragmatic, yet normative, guidance for the development of national DRR measures. At the same time, DRR measures, which aims at protecting, lives and livelihoods and reducing vulnerabilities, can be an equally pragmatic way to fulfil the related obligations emerging from the ratification of those international treaties. Addressing participation, discrimination, ensuring access to health and education are just but a very few examples of the potential existing in leveraging DRR for the protection and promotion of human rights and vice versa.

Whereas updating normative frameworks with an adequate budget attached is necessary, significant efforts are nevertheless required to ensure the implementation of existing laws, regulations, policies building codes and the like. The challenges remain those of availability of human and financial capital, hence the imperative of political decisions that give attention to investment in DRR across the spectrum defined by the Sendai Framework.
A significant obstacle to the effective development and implementation of DRR measures and the broader implementation of the Sendai Framework is the limitations to inclusive DRR. An inclusive approach to DRR ensures that the competencies, skills, resources, and knowledge as well as specific needs of stakeholders are brought in and contribute. Significant more remains to be done to eliminate the barriers and ensure women leadership and full participation in DRR, the effective participation of LGBTQIA+ persons, persons with disability, the meaningful engagement of children and youth, older persons, Indigenous people, displaced persons and other persons of concern. Grassroots and CSOs organisations are key to give voice to communities and ensure that their knowledge is actually built upon and utilised in the determination of DRR measures. Overall, more efforts are needed to institutionalize multistakeholder mechanisms envisaged as a priority in the Sendai Framework.

Moreover, prioritization of outcomes, projects and activities, which is based on both scientific findings and longer-term planning, rather than planning by season and/or election cycles. This requires an appropriate, clear and identified funding source for each of the priority outcomes, projects and activities. It is also considered critical to mainstream DRR into the day-to-day operations of all levels of government with a clear delineation of roles, responsibilities, decision-making processes, activities and achievements among mandated agencies and local governments for transparency and accountability. Also, further involvement of private sector, not-for-profit organizations and academia would be beneficial.

Finally, governance arrangements often do not foster an integrated disaster and climate risk management. More efforts are necessary to overcome existing challenges and enhance and scale up integrated definition of measures, programming and investment at national and local levels.

Box 2: Cross-cutting - Risk-informed sustainable development

The implementation of the SFDRR is an integral part of the 2030 Agenda for Sustainable Development since sustainable development cannot be accomplished as long as disasters continue to undermine economic growth and social progress (UNDRR, 2016). In other words, the achievement of the SFDRR targets will drive the achievement of the SDGs, while failing to achieve the SFDRR targets would inhibit the achievement of the SDGs. DRR must be at the core of sustainable development. Reducing disaster risk protects lives and livelihoods. Achieving the SDGs would mitigate the root causes of disaster risk, such as vulnerability, discrimination, inequality, as well as exposure and climate change, while increasing the capacity of people, communities and countries to manage disaster risk would increasing their resilience. This fundamental interconnectedness is reaffirmed in the Asia-Pacific Action Plan 2021-2024 for the Implementation of the SFDRR, which states that, following the setback of the 2030 Agenda due to the COVID-19 pandemic, scaling up the implementation of the Sendai Framework in the region has the potential to reverse – and ultimately reduce – these worrying trends and that it will, in turn, bolster progress towards the SDGs and the Paris Agreement UNDRR (2021a).

Participants at the APMCDRR also reiterated the nexus between the SFDRR and the sustainable development, climate and humanitarian agendas (Australian Government & UNDRR, 2022a).

The SFDRR was the first agreement of the post-2015 development agenda and set out the case for development to be risk-informed in order to be sustainable. It has been demonstrated that the
SFDRR contributes to each of the 17 SDGs (UNDRR, 2016). Whereas there is a direct connection between the Sendai Framework’s targets and the SDGs’ targets for SDG1, SDG11 and SDG13, some other examples on social protection, resilient urban infrastructure and pandemic risk prevention can help further.

Social protection is addressed by SDG 10 "Reduce inequality within and among countries", especially through the targets 10.2 “Promote universal social, economic and political inclusion” and 10.4 "Adopt fiscal and social policies that promotes equality", while also the SFDRR promotes and supports the development of social safety nets as DRR measures to ensure resilience to shocks at the household and community levels. Adaptive social protection systems can address the root causes and systemic drivers of vulnerability and inequality in a sustainable manner, thus preparing people to cope with disasters and supporting with recovery and resilience building. In contrast, non-inclusive DRR interventions may lead to new sources of vulnerability.

At the APMCDRR, panellists and participants stressed that resilient infrastructure in the Asia-Pacific region is the foundation for both the accomplishment of the SFDRR targets as well as the SDGs. This applies to cities where an estimated 2.3 billion people were living in 2019 in Asia-Pacific, and the number is projected to rise to 3.5 billion by 2050. The APMCDRR report states: “As countries have urbanised, so too have disasters. […] As such, the success of the SDGs and the Sendai Framework will depend increasingly on what is being done to manage risks and build resilience in urban areas.” Australian Government & UNDRR (2022b).

Commitment to achieving the SDGs needs to be strengthened to prevent future pandemics. This does not only apply to SDG Target 3.3 about communicable diseases, but also to further SDGs related to vulnerability and exposure, such as lower social vulnerability (e.g., SDG 1, 2, 3, 5 or 11), healthier ecosystems (e.g., SDG 13, 14 and 15) and more resilient economies (e.g., SDG 8, 9 and 12). UNDRR & UNU-EHS (2022) outline that the 2030 Agenda is a critical mechanism to address risk from a systemic perspective since it targets holistically the interconnected pre-existing vulnerabilities and aims for societies to become resilient to the impacts of potential systemic shocks. The adoption in 2016 of the Bangkok Principles for the Implementation of the Health Aspects of the Sendai Framework was instrumental to such integrated and preventive measures, however, regrettably, their implementation has been overlooked. Based on the hard learning from the COVID-19 pandemic, it is critical to ensure their implementation.

In the Pacific, the need for risk-informed sustainable development has been recognised, as, for example, described in the first voluntary national review report related to the SDGs by Tuvalu (Government of Tuvalu, 2022). Tuvalu has developed a "National Strategy for Sustainable Development for 2021 – 2030", which is called “Te Kete” and is aligned with the SDGs. At the same time, the report states “upscale the implementation of ‘Te Kete’, mainly on Disaster Risk Reduction at the national level, will have potential and ultimate influence to reduce and reverse the trend and likewise to enhance the progress towards the Sendai Framework and Sustainable Development Goals” (Government of Tuvalu, 2022, p.37). Therefore, “Te Kete” outlines the development of effective frameworks for disaster risk and resilience management. Specific actions include building the physical infrastructure required that contributes to the resilience of the people from the impacts of climate change and natural disasters, such as land reclamation as a protective measure against sea level rise.
Box 3: Cross-cutting - DRR-CCA coherence

This section highlights some of the points made in the UNDRR & SEI study (2022) on coherence between DRR and CCA in countries and territories in the Asia-Pacific region. The study identified five types of coherence between DRR and CCA: strategic, conceptual, institutional, operational and financial coherence.

Climate change has been recognised as a significant driver of disaster risk. At the same time, disaster risk reduction can also significantly accelerate adaptation to climate change. It is therefore critical to recognise the potential of a synergy between climate action and disaster risk reduction as it can prevent creating new risk and exacerbating existing risks. Such coherence also contributes to protecting development gains from the impact of disasters and climate change and to the necessary preventative and course-correction measures to be applied to current development pathways and investments. It can also contribute to a more efficient and effective use of resources.

The analysis found that the importance of integrating DRR and CCA has also been recognised and efforts have been initiated in the Asia-Pacific region. Yet, in many countries, progress is hampered by significant conceptual, operational and financial challenges. While some countries have developed pertinent policies and institutions, institutional silos persist and conflicting mandates, roles and responsibilities, and competing interests hamper cross-sectoral cooperation. Moreover, while the importance of coherence at the local level is often acknowledged, it is often not articulated and specified. Most importantly, specific financing frameworks, budgets and mechanisms to integrate DRR and CCA are lacking in most places.

Existing regional and sub-regional cooperation mechanisms and frameworks represent significant potential that can be further exploited. Such potential would also enhance transboundary cooperation.

ASEAN and its mechanisms are an important vehicle to enhance regional cooperation and support Member States in this area. The AADMER Work Program 2021-2025 (ASEAN, 2020) can support the further strengthening of the ASEAN mechanism and policy framework on DRR and CCA integration, as well as the promotion of an ASEAN Declaration on Coherence. Moreover, DRR and CCA coherence should be promoted between the ACDM and other mechanisms, for instance on financing or urban resilience.

For the SAARC, there is untapped potential to be leveraged in the SAARC Secretariat and the SAARC Disaster Management Centre; similarly, for ICIMOD and its Member States. Moreover, it is critical to increase the sharing of data and regional multi-hazard early warning systems through the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES) and other relevant regional mechanisms, e.g., the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning System.

For the Pacific region, regional collaboration through the PIF and the CROP agencies and the Pacific Resilience Partnership (PRP) and other pertinent regional platforms must be supported and strengthened further. This includes regional exchange of information, data, methods, tools and good practices.
Box 4: Cross cutting – Combined potential of DRR and human rights

This section is based on (UNDRR, forthcoming b), Institute for Sustainable Futures (2022) and UNDRR (2022d).

The Sendai Framework Guiding Principle 19(C) enshrines the existing interconnection between disaster risk reduction and human rights, including the right to development. Disaster risk reduction and human rights share the same objective of protecting and enhancing lives and livelihood of people and communities. Overall, the combined potential of DRR and human rights remains largely untapped. All DRR-related activities across the four Priorities of Action of the Sendai Framework from planning to implementation should be guided by an inclusive and human rights-based approach. A human rights-based approach to DRR can help better frame and identify those drivers of vulnerability that increase disaster risk, hence guiding and supporting a focused formulation of the DRR measures needed to reduce disaster risk. For example, it can guide the creation and implementation of DRR laws, policies and practices; ensure people-centred approaches to DRR, with a focus on those at-risk, hence more likely to be affected by hazardous events; establish fair, transparent and participatory processes in decision-making; make funding DRR more gender-responsive and disability-inclusive; provide a regulatory framework for responsible and preventative business practices in the context of DRR, beyond business continuity and corporate social responsibility. At the same time, DRR measures can provide practical ways to protect human rights.

There are several countries in the Asia-Pacific region which include explicit reference to human rights in national DRR plans or strategies such as Fiji, India, Kiribati, Lao PDR, New Zealand, Papua New Guinea, Samoa, Tuvalu and Vanuatu.

The combined potential of DRR measures and human rights can bring significant practical advances for Gender Equality and Social Inclusion (GESI), as well as persons with disabilities.

Four pathways that promote GESI for community resilience as part of DRR activities have been identified. The first one is women-led partnerships and coalitions. This includes that women-led partnerships and coalitions build momentum and amplify diverse experiences for a collective and stronger voice for advocacy on climate and disaster resilience. The second pathway is women’s economic empowerment for DRR. This comprises economic empowerment of women for effective preventative measures, disaster preparedness, response as well as recovery, supports women’s agency and enables women and their communities to build back better and be more resilient to multiple risks. The third pathway is about diverse and long-term partnerships. This involves long-term partnerships between local women leaders, national agencies and regional organisations support two-way dialogue for ongoing gender responsive approaches in DRR. And the fourth pathway is about directly supporting individuals, policy and the environment. This encompasses investments and actions that directly empower individuals, organisations and the environment, such as funding for upskilling women leaders as change agents and policy change through incentives, and upgrading local infrastructure, like markets.

There are some challenges along these pathways, but they are not insurmountable and can be addressed in the remaining seven years of the Sendai Framework. These include structural barriers that limit women’s participation and leadership in DRR, from regional to community level; gender biases in DRR financing and supporting financing for women-led organisations and for
gender-responsive DRR measures; enhancing assessments and updating policies to ensure their gender responsive and inclusive nature and capacity.

Persons with disabilities suffer disproportionately in the event of disasters. Whereas there has been some progress after the adoption of the Sendai Framework through the Dhaka Declarations in 2015 and 2018 concerning disability and disaster risk management, much more remains to be done to ensure that DRR is disability-inclusive and that persons with disabilities and their organisations are fully engaged in the design and implementation of DRR policies and measures and their financing. The Convention on the Rights of Persons with Disabilities, in particular art 11 on situations of risk and humanitarian emergencies, provides a solid legal basis and thus makes an important contribution to the Committee’s advice to States Parties on the implementation of the Convention. In this respect, the decision by the Committee in September 2022 to adopt a General Comment on art 11 is commendable and will help address the gaps existing in policies and current practices.

C. Priority 3: Investing in disaster risk reduction for resilience

DRR is not receiving the level of funding required to implement the measures identified in international, national and local policy frameworks. There is agreement that several barriers need to be overcome to enable more strategic and innovative investments in risk reduction. These barriers include the limited use of predictive approaches and methodologies, such as stress testing, to reduce risks and build resilience; the neglect of integrating disaster risk into the financial sector’s risk management framework; the difficulties in accessing some financial instruments and mechanisms; and the limited involvement of the private sector.

Further development and use of predictive approaches and methodologies to analyze the costs and benefits of ex-ante investments is important. The development of DRR financing strategies would contribute to drive the estimate the cost of damages in different disaster scenarios and how much these estimated costs could be reduced through DRR investments. This would also help policy makers to assess whether DRR investment are cost-effective. In addition, predictive analytical tools such as stress tests that forecast the impact of disasters on public revenues and expenditures will inform in advance on how spending and fiscal policies should be implemented in the event of disasters. While such approaches and methodologies would show what needs to be done in terms of DRR investments, budget tagging and tracking would show what is being done in terms of DRR investments. Any difference would allow policy makers to take the necessary corrective measures.

Public resources alone are not enough to manage disaster risk. It is therefore important to mobilize private sector resources to invest in DRR. An important policy option to reduce disaster risk for economic and financial stability is to provide financial incentives to the private sector, including institutional investors, to accelerate the mobilization of resources for long-term DRR investments. Financial institutions too should integrate disaster risks into financial risks, as failure to do so may also render some financial stability measures insufficient and thus jeopardize financial stability.
Several private financing instruments in the Asia-Pacific region support DRR and climate adaptation. However, the overall potential is still largely untapped, including foreign direct investment (FDI), equity financing, debt financing (i.e., private bonds, sustainable funds, exchange-traded funds), insurance protection and DRR incentives via insurance products and services, as well as philanthropic giving. For example, the region's sustainable bond market (all issuers) and private sustainable funds markets could potentially contribute up to US$5.2 billion and US$35 billion per year, respectively. And the yet untapped equity market in the region has a potential to deliver investment ranging from US$23 to US$230 billion annually (UNDRR&ADB, forthcoming a).

Insurance can play a crucial role in creating direct and indirect incentives for more investments in DRR. Such incentives may be classified in three categories: 1- As the insurance industry has significant expertise in modelling the financial consequences of natural and man-made disaster risks and disasters, there is a need to explore how governments can use this capacity to provide information, for instance for land-use planning and building codes. 2- Pricing (re)insurance coverage in accordance with effective levels of risk could encourage policyholders (or insurers) to invest in risk reduction to reduce the cost of that coverage. Further development of risk-based pricing should therefore be encouraged. 3- Some insurance programs could include specific risk reduction requirements to incentivise the adoption of DRR measures. (From protection to prevention: The role of cooperative and mutual insurance in disaster risk reduction, UNDRR and icmif, 2021).

Given the potential and growing market for ESG-informed investments, it is important to support the expansion of the criteria to include “resilience”. Businesses, including investors, would benefit from having an explicit parameter to assess and disclose the ability to avoid and reduce disaster risk, and to recover from disasters and other stressors.

FDI is an important type of private capital financing for developing countries. There is significant potential to be explored to leverage FDI for DRR investments. FDI flows to developing countries in Asia increased by 19 per cent from 2020 to 2021 to a record high of US$619 billion (UNCTAD 2022a). Importantly, FDI flows into sectors which are important for achieving the SDGs rose by 74 per cent to US$121 billion, owing to investments in renewable energy (UNCTAD, 2022b). UNCTAD’s World Investment Report also tracks FDI flows to climate change mitigation and adaptation12. At the global level for the period 2011 through 2021, mitigation projects accounted for the vast majority of investment – more than 95 per cent of international climate investments, with the remainder in adaptation (UNCTAD 2022c).

Access to international financing mechanisms remains highly challenging and costly especially for countries with limited capacities, such as SIDS and LDCs, thus making it very difficult to act with the urgency that the climate crisis and increasing systemic risk require. Access

---

12 Climate change adaptation flows are represented by two categories: (i) Water management, including investments in water pipelines, water supply, district cooling, desalination, water storage, disposal and treatment; and (ii) Other adaptation, including investments to improve the climate resilience of existing infrastructure, and coastal protection and climate resilient agriculture, such as flood/drought resistant crops. (Source: UNCTAD 2022c)
simplification is necessary, including the flexibility to support the work of, and thus benefitting from the skills and expertise of, civil society organisations, communities and local governments.

The Asia-Pacific Ministerial Conference for Disaster Risk Reduction also discussed pathways for greater DRR investment, such as increased and risk-informed public investments, adaptive social protection systems, investments and support to MSMEs and, most notably, making access to financing instruments and funds easier. Governments play a crucial role in ensuring DRR is prioritised in public and private investments and that these investments are informed by a multi-hazard risk analysis, which draws on historical and prospective risks. The creation and promotion of a range of responsive disaster financing products is recommended, including incentivised and innovative insurance options (Australian Government & UNDRR, 2022b).

Box 5: Cross cutting - Climate and Disaster-resilient Infrastructure in the Pacific

Climate and disaster resilience of infrastructure is critical. This has been recognised in many policy frameworks and agreements such the SDGs, particularly SDG 9, the Sendai Framework Target D, the Paris Agreement and the Principles for Quality Infrastructure Investment of the G20, the Coalition for Disaster Resilient Infrastructure (CDRI) and its Infrastructure for Resilient Island States initiatives (IRIS), and most recently, the Principles for Resilient Infrastructure launched at the Global Platform for Disaster Risk Reduction in May 2022. Infrastructure is one of the sectors most affected by disasters. According to an analysis of post-disaster needs assessments in the Pacific between 2011 and 2020, damages and losses to infrastructure accounted for about US$1.45 billion or 37 per cent of the total damage and losses of the major disasters in this period. And it is expected that climate change will exacerbate this trend due to sea-level rises, storm surges and swells. This is also reflected in the increasing adaptation costs for coastal protection, which, for example, amount to US$329 million per year in Fiji (3 per cent of the GDP) and to US$58 million per year in the Republic of Marshall Islands (13 per cent of the GDP) (World Bank, 2017). Overall, the infrastructure deficit in the Pacific, as well as in Timor-Leste is estimated at US$46 billion from 2017 to 2030 by the Australian Government (Pacific Regional Infrastructure Facility, 2022).

Most of the infrastructure systems needed in the future are still to be built and this represent an opportunity to build them better from the start in order to withstand hazards through proper design and construction, including the use of the principles of universal design. There is significant scope to leverage the potential of public and private partnerships to finance the development of resilient infrastructure systems, to prioritise infrastructure investments in low-risk locations and to consider the concept of ‘net resilience gain’, similar to net zero, whereby resilience to systemic risk is increased for all infrastructure (UNDRR, 2022c). Climate and disaster-resilient infrastructure is also critical to support SIDS in achieving up to 92 per cent of all SDG targets.

Recent studies have provided further guidance on the development of infrastructure systems, such as “Disaster Resilient Infrastructure – Unlocking opportunities for Asia and the Pacific” by ADB (2022a), which outlines 16 opportunities to build infrastructure resilience, as well as “Enhancing Procurement Practice and Local Content in Pacific Infrastructure” by the Pacific Regional Infrastructure Facility (2022), which explores the opportunities for enhancing local
D. Priority 4: Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction

It is understandable that countries continue to pay particular attention to and make progress in strengthening response preparedness and response mechanisms, given the current and projected increase in disasters. While this strengthening needs to continue, it is important to improve and pay more attention to the longer-term provisions of Priority 4.

Important progress has been made in enhancing contingency planning, establishment and reinforcing of emergency operations centres, logistical capacities and civil-military coordination. Regional cooperation has been and continue to be strengthened. However, the needs are still significant, particularly when disasters become more frequent and hazards more intense. The role of communities and volunteers as well as local, Indigenous and traditional knowledge is vital and national and international mechanisms need to increase support for enhanced local preparedness and response capacity.

The strengthening of early warning systems remain a key priority. Significant work remains to be done to ensure that they are multi-hazard, end to end and people-centered. What used to be called “the last mile” of early warning systems is now increasingly understood as “the first mile”, i.e., the point of departure to understand how a community, all its members with their specific needs and without leaving anyone behind, is ready to act on warnings and relevant infrastructures are in place. Despite significant progress, gaps remain for instance in timeliness and last mile connectivity in warning dissemination from warning issuers to end-user communities and to ensure early warnings consider the different risks and needs of the population, including differential vulnerabilities (urban and rural, women and men, older persons and youth, persons with disabilities, etc.) and are also disseminated in local languages. Financial mechanisms to support early action are the focus of continued strengthening and further enhancements are necessary. It is expected that the Early Warnings for All initiative of the UN Secretary General to be achieved by 2027 will provide the necessary focused stakeholders’ collaboration and investment.

A key element of Priority 4 is to ensure the necessary preparedness to Build Back Better before disasters, however, limited progress has been made. Whereas there has been an increased focus on shock responsive social protection mechanisms, it has been recognised that more efforts are needed to use recovery and reconstruction as an opportunity to harness greener, more inclusive and resilient solutions, including for infrastructure, which can accelerate progress toward climate change mitigation and adaptation, and invest in human capacities, tools, and baseline data collection. The development of standards or indicators to determine whether an area has fully...
recovered may contribute to measure and assess progress in the longer term, especially on social and environmental dimensions. To achieve this, significant changes need to take place from a governance perspective to ensure that the necessary normative frameworks and financing mechanisms be in place and all key stakeholders be engaged meaningfully.

Most of the infrastructure development envisaged in the Addis Ababa Action Agenda remains to be imagined, in line with future needs and a changing climate, and built with resilience as a key feature. Considering the systemic nature of risk, the focus needs to be not just on infrastructure per se, rather on infrastructure systems. The Principles for Resilient Infrastructure, launched at the Global Platform for Disaster Risk Reduction held in Indonesia in 2022, represent a significant practical guidance for the development of new infrastructure systems in accordance with the Sendai Framework’s “building back better from the start” as well as the upgrading of existing infrastructure. Standards need to be upgraded\(^\text{13}\) and stress testing for systemic risk needs to be enhanced and applied. The Coalition for Disaster Resilient Infrastructure launched in the wake of the Sendai Framework, and more recently its Initiative for Resilient Island States initiative, are a clear indication of the increasing commitment across partners to ensure the resilience and inclusiveness of infrastructure systems, develop practical guidance and invest accordingly.

With the increasing understanding of systemic risk and its consequences, the update, development of and compliance with building codes remains essential. Building codes ensure that cities be inclusive, safe as well as resilient and contribute to the achievement of SDG11 “Sustainable cities and communities”. There is an increasing number of initiatives aimed at it which include also sharing of good practices and lessons learned.

Disaster displacement in the Asia-Pacific region is the highest in the world. According to IDMC (2022), “there were over 225 million internal displacements – or movements – in Asia and the Pacific during 2010–2021, which was over three-quarters of the global total for this period, and “East Asia and Southeast Asia had the highest number of disaster displacements—nearly two-thirds of the total – closely followed by South Asia. All three subregions are densely populated and highly exposed to various hazards. Pacific island states bear the greatest displacement risk relative to their population size”. Durable solutions, addressing also preventative measures and built on a sound understanding of systemic risk and leading to resilience, require further and stronger commitment and investment across stakeholders and regional cooperation mechanism as well as normative reforms and other measures and an inclusive and meaningful engagement of local communities and displaced persons, as enshrined in the Sendai Framework. There are positive and fruitful initiatives across the region that can be built upon and expanded.

The increasing understanding of the systemic nature of risk with its cascading and compounding effects as well as fluid and evolving characteristics requires ongoing investment in capacity building. It needs to concern professionals in public and private sectors and civil society organisations, including volunteer organisations, in all areas and sectors whose work can contribute to reduce vulnerability and exposure. It also concerns education at all levels. At the same time, there are other numerous limits to stakeholders’ capacity and opportunities to express

\(^{13}\) See also UNDRR (2022c) as well as above box 5.
such capacity, beyond knowledge which, having to do with economic, social, cultural political dimensions, need to be addressed and removed.

VI. Conclusions and Recommendations for the further implementation of the Sendai Framework

The findings of the MTR for the Asia-Pacific region suggest that the scope and focus of the Sendai Framework’s provisions remain relevant. At the same time, the political commitment to take prevention at heart and...budget(!) does not seem to have materialised sufficiently. The scale of action is not commensurate to the challenges at hand, and whereas there is good progress in specific aspects of DRR and the Sendai Framework implementation, risk and disasters continue to increase worryingly and steadily. The capacity of humans to increase disaster risk is still greater than the capacity to reduce it.

Questions on governance and DRR investment, i.e., Priority 2 and 3 of the Sendai Framework, seem to have a strong bearing on the implementation of the other Priorities as well as other sections of the Sendai Framework, including Role of Stakeholders and International Cooperation and Global Partnership. Also, more focus is needed to implement the priorities in light of the Guiding Principle, especially those concerning various aspects of inclusion (19b, 19d, 19e), synergies between DRR and human rights (19c) and coherence across and integration of climate, development and DRR (19h), and international cooperation and support (19l, 19m).

Although the social, economic, environmental and political consequences of disasters are increasingly well understood in their complexity and longevity, DRR and prevention have not yet become a clear, articulated and popularly demanded and supported political priority and agenda.

**Overall**

**Recommendation 1: Raise more awareness that the Sendai Framework for DRR is an integral part and enabler of the 2030 Agenda for Sustainable Development and the Paris Agreement and essential to their achievement.**

The implementation of the Sendai Framework is an integral part of the achievement of the SDGs. DRR, climate action and sustainable development, as well as the enjoyment of human rights are interdependent and mutually supportive. This means that the Sendai Framework, if successfully implemented, would be an instrumental enabler for the SDGs, while a failure would render difficult the achievement of the SDGs. There is a variety of interlinkages that demonstrate that resilience is co-dependent with achieving the SDGs. Awareness and leveraging of these synergies are not prevalent in national and international systems, including on the donor side. As also stated in the APMCDRR Co-chairs’ Statement, the priorities identified in the MTR Sendai Framework, such as the interlinkages between the Sendai Framework and the 2030 Agenda for Sustainable Development, but also the Paris Agreement on Climate Change, the New Urban Agenda and the Addis Ababa Action Agenda on Financing for Development, constitute critical points of strengths for their integrated implementation and achievement of objectives. DRR cannot be applied to development as an added element – rather, it needs to be one of the key objectives in the design
and implementation of such policies. While understandably and rightfully, significant attention is given to better preparedness and response, a much high share of political attention and resources must be given to preventive measures. At international level, the synchrony of the midterm review of the Sendai Framework and the SDG Summit in 2023, as well as the global stocktaking of the Paris Agreement, represent a key opportunity to reflect and capitalise on synergies between development, climate action, DRR and resilience.

**Recommendation 2: Increase integrated and comprehensive disaster and climate risk management.**

The systemic, cascading and compounding nature of risk, including multi-hazard risk analyses and climate projections and ecosystem services and biodiversity loss, must guide risk-informed approaches to sustainable development and investment. This must include biohazards management and the current negotiations of a Framework Convention for Pandemic Preparedness and Response is a key opportunity for system integration not to be missed, building on the guidance of the 2016 Bangkok Principles for the Implementation of the Health Aspects of the Sendai Framework. It must also be based on disability-inclusive and gender-responsive risk and needs assessment and approaches to DRR. The focus on achieving economic growth under current development models has turned out to be unsustainable as it has increased systemic risk, as evidenced for instance by climate change and biodiversity loss. Viewing growth as the main indicator of well-being has been myopic and has led to a failure to invest the necessary percentage of global GDP to prevent the existential risk of climate change. Governments and the private sector need to fully recognize the exponential growth of potential crises, as seen during the COVID-19 pandemic, and adapt governance arrangements and invest in DRR accordingly.

**Sendai Framework Priority 1: Understanding disaster risk**

**Recommendation 3: Strengthen the capacities of stakeholders.**

While staff in National Disaster Management Offices and similar institutions have knowledge and capacities, it is critical to widen the scope and provide systematic and comprehensive capacity building to non-traditional DRR stakeholders. This includes stakeholders who make important decisions related to DRR, but have often not been involved much, as well as potentially affected groups. The former comprises, e.g., line ministries and staff in public administration, including national audit institutions, that require awareness availability of risk information, as well as capacities to contribute to the management of systemic and emerging risks and mainstream DRR. The latter comprises local communities and Indigenous people, as well as at-risk groups, including women and persons with disabilities, displaced persons, migrants and marginalized minorities. Especially, girls and boys and youth need to be encouraged and supported to develop the knowledge and skills they need in an ever-changing climate and growing systemic risk, which includes leadership, developing innovative ideas and problem-solving skills.
Recommendation 4: Collect more disaggregated data, ensure open source and access and develop risk analytics.

The understanding of systemic risk needs to be significantly stepped up through additional disaggregated data, better use of existing data, appropriate methodologies, protocols for data sharing, and leveraging artificial intelligence, big data, as well as enhanced data governance. Much data relevant to DRR is neither available, nor disaggregated in quantitative and qualitative terms, nor is it fully shared and analysed. Data should be shared openly and made accessible and interoperable. This would be particularly important for data concerning economic, social, environmental and political dimensions of vulnerability, infrastructure system vulnerability and exposure, loss and damage, and hazards in accordance with recent taxonomies\textsuperscript{14}. Data governance needs to be significantly enhanced from collection to the integration of datasets, especially on risk, hazards, vulnerability and exposure, to Institutional and other stakeholder capacities to process, analyse and utilize the data for the development of risk analytics.

Overall, data disaggregation by sex, age disability and income is lagging behind and requires significant efforts to be stepped up. It is critical that data concerning at-risk groups within communities be better and more explicitly considered, collected and analysed across sectors; only when risk data as well as data on disaster impact, including loss and damage, are disaggregated, it is possible to really understand differential and intersectional risk. Indeed, everyone in a given area/community is not affected by disasters in the same, and existing disadvantage and inequality are exacerbated by disasters, so that the "left-behind" tend to be further left behind – aggregated data does not tell the full and proper picture, hence not conducive to guide development of adequate DRR measures.

Recommendation 5: Develop scientific and technological solutions integrated with local, indigenous and traditional knowledge.

DRR-related activities should be based on scientific research and evidence, as well as gender-responsive and disability-inclusive data. Disaster risk scientists across all sciences (natural, physical, economic, social, political, etc.) are critical stakeholders to generate knowledge on systemic risk across hazards, vulnerability and exposure. LITK is underestimated and underutilised, while the localization of science, technology and innovation need to be further expanded, including through a mutually supportive approach to strengthen the capacities of local communities and local governments to manage disaster risk. LITK has been deemed important also in the development of infrastructure systems and the integration of grey, blue and greed infrastructure.

\textsuperscript{14} the UNDRR-ISC Hazard Definition and Classification Review - Technical report (2020) and its Supplement on Hazard Information Profiles (2021)
Sendai Framework Priority 2: Strengthening disaster risk governance to manage disaster risk

Recommendation 6: Leave no one behind and ensure a human rights-based approach for all DRR-related activities with inclusive processes and implementation, as well as a diverse leadership.

All DRR-related activities from risk analysis to planning and implementation should be guided by a human rights and gender-transformative approaches. The inclusive participation and leadership of women, children and youth, displaced persons, migrants, persons with disabilities, persons of diverse SOGIESC, Indigenous people and older persons is key to ensure the presence of all necessary competencies and skills to manage systemic risk. This comprises the promotion of an intersectional approach to DRR activities, where all aspects of a person are considered in reducing the risks of disasters, including extensive capabilities and unique means of resilience. Of particular relevance is gender equality, i.e., the involvement of women in leadership and decision-making throughout the process from preparedness and early warning to recovery, which requires ensuring women’s participation at planning, implementation and decision-making processes. To this aim, the development and implementation of a Gender Action Plan for the Implementation of the Sendai Framework, as recommended by the UN Commission on the Status of Women in 2022, will be critical to ensure a gender-responsive implementation of the Sendai Framework and to guide further integration of gender considerations into DRR. Also of concern are refugees, migrants and displaced persons. Disaster vulnerability and exposure can be connected to limited or lack of enjoyment of human rights. The national and international legal foundations of DRR require strengthening and this include the definition of clear legal obligations to reduce disaster risk. In this connection, human rights treaties and their bodies offer significant guidance at disposal of the national Sendai Framework focal points. Moreover, the draft articles on the Protection of Persons in the Event of Disasters under consideration by the United Nations General Assembly’s Legal Committee represent a solid foundation for the further development of international law and a stronger DRR action internationally and domestically.

Recommendation 7: Empowerment of communities and local governments.

Decentralization and localisation of DRR- and resilience-related activities, including urban resilience, remain critical and in need of further development. Given the essential local nature of risk and unless local level disability inclusive and gender-responsive action is strengthened, reducing disaster risk will remain a very hard objective to reach. This calls for stronger local communities and institutions with the disposal of the necessary means and partnerships to reduce disaster risk. The importance of volunteers, local NGOs and CSOs, including women-led organizations and organizations of persons with disabilities, cannot be overestimated. Advancement in technology and innovation need to be leveraged to ensure inclusion and participation of and support to local actors, including decision-making with central government institutions.
**Sendai Framework Priority 3: Investing in disaster risk reduction for resilience**

**Recommendation 8: Accelerate and increase overall DRR financing.**

All recommendations considered in this report require financial resources to implement the necessary measures and ultimately achieve the goal, outcome and targets of the Sendai Framework. Investing in DRR is necessary for the sustainability of development. This requires a major shift in mindset and regulation throughout the economic and financial system, constituting a move from a short-term outlook and under-prioritisation of disaster risks to mandatory risk disclosure. More risk-informed investments for DRR and resilience ought to come from the public and the private sectors. The private sector can contribute effective innovations and should therefore become a more active player. This requires overcoming existing barriers and increase DRR uptake by the private sector beyond business continuity and CSR.

Several countries in the Asia-Pacific region are in the process of graduating from the LDC status and this represents a key opportunity to integrate disaster risk considerations in the development of smooth transition strategies, policies and investments, adopt DRR financing strategies aligned with the SDGs Integrated National Financing Frameworks and conduct public budget disaster risk stress testing.

It is essential to develop forward-looking methodologies such as DRR financing strategies and budget stress testing to assess potential financial losses due to disasters and develop strategies on how to finance them with a mix of financing instruments under a risk-layering approach. In addition, integrating the DRR financing strategies and the budget stress testing into the Integrated National Financing Framework would be instrumental to countries’ efforts towards achieving the SDGs.

Stronger political leadership for DRR financing is crucial. Evidence is critical to support political leaders. In this respect, risk-sensitive budget reviews and implementation of budget tagging and tracking systems are instrumental to indicate what measures have been invested in and spent on and what measure require more investments. Such information, together with probabilistic cost-benefit analysis, is also key for the development of DRR financing strategies.

The private sector bond market could be further explored and leveraged upon to invest in risk reduction. Elaboration on specific principles for DRR and resilience bonds needs to be encouraged.

Given the potential of the growing market for ESG-informed investments, it is important to consider and develop methodologies for the criteria expansion to include “resilience.”

Overall, financing accountability for DRR needs to be enhanced, capacity built and guidance developed accordingly. In this respect, supreme audit institutions (SAIs) play a critical role in promoting accountability and transparency within the government and their work needs to be encouraged and supported in the implementation of INTOSAI guidelines and the development of more specific national guidelines.

DRR financing and investments, including risk transfer mechanisms like insurance, need to be made more disability-inclusive and gender-responsive. In this regard, gender budget tagging can support better understanding and decision-making on investments in gender-responsive DRR.
**Recommendation 9: Increase investments in resilient infrastructure and integration with nature-based solutions and ecosystem services.**

Investments in the resilience of infrastructure system is a key strategic objective for governments, communities and the private sector. The application of the Principles for Resilient Infrastructure in infrastructure development is key to guiding investment decisions. The integration of disaster risks into the lending process of financial institutions and risk disclosure is important. Infrastructure resilience stress testing needs to be scaled up. At the same time, the recognized potential and cost effectiveness of nature-based solutions and ecosystem services to reduce disaster risk, as well as integrated solutions of green, blue and grey infrastructure systems need to be further leveraged and invested in. In this context and to this aim, the LITK of local communities is a critical resource to be tapped in more systematically.

Insurance can provide indirect and direct incentives to increase investments in DRR. It is important that the insurance sector develops modelling further to offer effective risk-based pricing for insurance policies and incentives for policyholders who take action to reduce risk.

**Sendai Framework Priority 4: Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction**

**Recommendation 10: Integrate risk information in better preparedness and response.**

Continue strengthening of preparedness and response is necessary due to the current and increasing levels of disaster risk. Climate change projections and projected temperature increases and consequences will pose increasingly heavier pressure on response systems to be ready for increasingly unprecedented events and wide and long-lasting consequences which, by eroding increasingly the coping capacity of persons and communities, require ever stronger response systems capable to address the differential needs of groups at higher risk. A stronger integration of risk information, including potential for cascading and compounded impacts due to the systemic nature of risk, is critical to determine the necessary preparedness and response measures, capacities and the network of partners and mechanisms necessary for effective responses – the COVID 19 pandemic has clearly indicated the need to support the interoperability of response mechanisms across sectors. Moreover, as disaster risk builds up also in fragile and conflict contexts, there is a need to further integrate the use of risk information in humanitarian emergency planning cycles.

**Recommendation 11: Strengthen early warning systems and anticipatory action.**

More commitment, investments and action is needed to strengthen early warning systems to ensure coverage for all by 2027, in line with the United Nations Secretary General’s Early Warning for All (EW4all) initiative. Significant investments in early warning systems have been made, yet significant gaps remain, notably in terms of early warning systems covering multi-hazards and being end-to-end, people-centered, disability-inclusive and gender-responsive. Early warning systems need to be built taking into account the differentiated risks within and between communities. It is necessary to support countries to clearly identify the gaps and mobilise capacities and resources accordingly. Effective early warning systems imply that people,
communities and institutions can act on the warnings and also take the necessary preventative measures. This requires the further strengthening of adequate financing mechanisms to enable capillary action at the local level.

**Recommendation 12: Durable solutions for people displaced by disasters.**

The heavy burden that disasters place on people and current trends in disasters and systemic risk require a renewed focus and commitment to address the challenges of displacement both from a preventative perspective and the identification of solutions for existing displacement. National and local DRR strategies and measures need to anticipate potential displacement and identify the necessary measures and national and local capacities need to be supported, including through international cooperation. Existing guidance related to the Sendai Framework implementation, namely the Words into Action on Disaster Displacement, offers useful suggestions and elements by practitioners that can support efforts to identify durable solutions to displacement.

**Recommendation 14: Prepare to ‘Build Back Better’**.

Preparations to ‘Build Back Better’ do not appear to be advancing as other areas under Priority 4. It remains critical to prepare to ‘Build Back Better’ before a disaster strikes and link these preparations to lessons learnt from past disaster response and reconstruction, especially from the perspective of disability inclusion and gender mainstreaming and how the needs of various at-risk groups have been taken into account. Such preparation should be built in and be part of initiatives to ‘Build Back Better’. Giving the scale and frequency of disasters, it is not uncommon for disasters to occur while reconstruction is ongoing, which presents an additional challenge that needs to be considered in the planning of reconstruction. Developing specific guidelines on how to prepare for better reconstruction would contribute to addressing these challenges.
VII. Annex

Key informants consulted in the preparation of the report:

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mareike Bentfeld</td>
<td>GIZ</td>
</tr>
<tr>
<td>Kriszia Lorrain Enriquez</td>
<td>UNDP, Philippines</td>
</tr>
<tr>
<td>Jonathan Gilman</td>
<td>UNEP</td>
</tr>
<tr>
<td>Hemang Karelia</td>
<td>World Bank</td>
</tr>
<tr>
<td>Kamal Kishore</td>
<td>National Disaster Management Authority, India</td>
</tr>
<tr>
<td>Bradley Mellicker and Chris Richter</td>
<td>IOM Regional Office for Asia and the Pacific</td>
</tr>
<tr>
<td>Prof. Tae Hoon Moon</td>
<td>Chung-ang University, Republic of Korea</td>
</tr>
<tr>
<td>Mohamed Shahudh and Ahmed Fizan</td>
<td>UNDP, Maldives</td>
</tr>
</tbody>
</table>

List of voluntary national MTR reports:

<table>
<thead>
<tr>
<th>Country</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Government (2022)</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Government of the People’s Republic of Bangladesh, Ministry of Disaster Management and Relief (2022)</td>
</tr>
<tr>
<td>Bhutan</td>
<td>Royal Government of Bhutan (2023)</td>
</tr>
<tr>
<td>Cambodia</td>
<td>NCDM Cambodia (2022)</td>
</tr>
<tr>
<td>Democratic People’s Republic of Korea</td>
<td>DPR Korea, State Committee for Emergency and Disaster Management (2022)</td>
</tr>
<tr>
<td>Japan</td>
<td>Government of Japan (2022)</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>Government of Lao PDR, Ministry of Labour and Social Welfare &amp; UNDRR (2023)</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Government (2022)</td>
</tr>
<tr>
<td>Pacific</td>
<td>UNDRR (2022a)</td>
</tr>
<tr>
<td>Philippines</td>
<td>Office of Civil Defense, National Disaster Risk Reduction and Management Council, Philippines (2022)</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>Government of Republic of Korea, Ministry of the Interior and Safety (2022)</td>
</tr>
<tr>
<td>Thailand</td>
<td>Government of Thailand, Department of Disaster Prevention and Mitigation (2022)</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>VNDMA &amp; United Nations in Viet Nam (2022)</td>
</tr>
</tbody>
</table>
References


Pacific Regional Infrastructure Facility (2022). Enhancing Procurement Practice and Local Content in Pacific Infrastructure. 


UNDRR (2016), Implementing the Sendai Framework to achieve the Sustainable Development Goals. 

UNDRR (2020). Reducing risk & building resilience of SMEs to disasters. 
https://www.undrr.org/publication/resilience-smes


https://www.undrr.org/publication/principles-resilient-infrastructure

UNDRR (2022d). Strengthening the connection between Disaster Risk Reduction (DRR) and the Convention on the Rights of Persons with Disabilities (CRPD) to ensure the protection of persons with disabilities. Scoping report.

UNDRR (2022e). Global status of multi-hazard early warning systems: Target G. 


UNDRR (forthcoming b). The Role of Human Rights in Disaster Risk Reduction: Mid-Term Review

Study on General Recommendation No. 37 (2018) of CEDAW on the gender-related dimensions of disaster risk reduction in the context of changing climate (UNDRR, forthcoming c)

https://www.undrr.org/media/79225/download

UNDRR & SEI (2022). Disaster risk reduction (DRR) and climate change adaptation (CCA): Coherence pathways in Asia and the Pacific.

http://collections.unu.edu/eserv/UNU:8756/UNDRR_UNU-EHS_cascading_and_systemic_risks_META.pdf


https://www.unicef.org/eap/media/12996/file/230127_Disaster%20Risk%20Financing%20(1).pdf

https://www.ohchr.org/sites/default/files/Ch_IV_15.pdf


https://openknowledge.worldbank.org/handle/10986/37921