

Disaster Risk Assessment and Risk Financing

A G20 / OECD METHODOLOGICAL FRAMEWORK

EXECUTIVE SUMMARY



This G20 / OECD methodological framework on disaster risk assessment and risk financing has been developed as a response to a mandate from G20 Leaders, Finance Ministers and Central Bank Governors in order to foster more effective disaster risk management strategies and financial strategies in particular.

This framework has benefited from inputs from the G20 Country Steering Group on disaster risk management, the OECD's High-Level Advisory Board on the Financial Management of Large-Scale Catastrophes, Insurance and Private Pensions Committee, Committee on Financial Markets and High Level Risk Forum, as well as from the World Bank and the United Nations. The OECD is grateful for a number of tables provided by the World Bank.

Background and main policy messages

Mandate

G20 Finance Ministers and Central Bank Governors along with G20 Leaders have recognised the importance and priority of disaster risk management (DRM) strategies and, in particular, disaster risk assessment and risk financing. They invited the OECD to develop a voluntary framework that could strengthen these two key components of DRM and complement a compilation of country experiences published by the Government of Mexico and the World Bank:

“We recognize the value of Disaster Risk Management (DRM) tools and strategies to better prevent disasters, protect populations and assets, and financially manage their economic impacts. We appreciate World Bank and OECD combined efforts, with the UN’s support, to provide inputs and broaden participation in the discussion on DRM. We welcome the World Bank’s and Mexico’s joint publication on country experiences in this area with the support of G20 members, and the OECD voluntary framework to facilitate implementation of DRM strategies, to be completed by November.” (G20 Leaders, Los Cabos, June 2012)

A voluntary methodological framework has been developed that will provide a useful tool for Finance Ministries and other relevant stakeholders involved in DRM. This framework focuses on disaster risk assessment and risk financing and their interlinkages, acknowledging that risk assessment is also essential for other components of DRM. The framework is intended to complement and build on existing international frameworks for DRM and promote more effective and sustainable DRM strategies. It is completed by a self-assessment guiding tool.

Context

It is recognised that disasters can have widespread impacts, causing not only harm and damage to lives, buildings and infrastructure, but also impairing economic activity, with potential cascading and global effects. These impacts generate losses for households, businesses and governments as damages need to be repaired, homes and businesses rebuilt, and activities resumed. These financial costs may be catastrophic in nature, aggravating economic and social impacts. **Achieving financial resilience is thus a critical component of effective DRM.**

Financial strategies for DRM are intended to ensure that individuals, businesses and governments have the resources necessary to manage the adverse financial and economic consequences of disasters, thereby enabling the critical funding of disaster response, recovery and reconstruction. These strategies depend on a comprehensive identification and accurate evaluation of natural and man-made disaster risks. The financial impacts of disasters in particular need to be understood and assessed by Finance Ministries as a basis for developing financial and fiscal management strategies. These impacts can be mitigated ex ante through financial management tools along with physical risk reduction measures. Financial tools enhance financial resilience to disasters by ensuring that resources are available for emergency response, recovery and reconstruction, thus averting financial distress.

Finance Ministries and other relevant financial authorities play a pivotal role in DRM strategies given their responsibilities for economic, financial, fiscal and budget policymaking, planning of public investment and coordinating public expenditures. These central responsibilities as confirmed by the framework include:

- Ensuring that *financial vulnerabilities within the economy* are addressed through private markets, government-backed schemes or other instruments in order to promote financial resilience, and ensuring the *availability and efficiency of compensation mechanisms*, whether private or public
- Ensuring proper *fiscal management* of disaster risks by anticipating potential budgetary impacts and planning ahead to ensure adequate financial capacity and rapid release of funds, thus enabling emergency response, reconstruction of public assets and infrastructure, and targeted financial assistance
- Ensuring that *clear rules regarding post-disaster financial compensation* are established to enable rapid compensation, demonstrate solidarity and clarify the allocation of disaster costs, thereby promoting public confidence in country financial strategies while aligning incentives and reducing moral hazard
- Ensuring the *soundness and resilience of the financial sector* with respect to disaster risks, including through proper regulation, business continuity planning, and stress testing
- Ensuring the *optimal allocation of resources for DRM*, including assessment of the *cost-effectiveness of major public financial investments in disaster risk reduction projects*

In regard to financial management strategies, these responsibilities involve key decisions regarding the development and design of schemes enabling post-disaster assistance and disaster insurance and the provision of financial guarantees within these schemes, the management of disaster-related contingent liabilities within the fiscal framework, and the role of the financial sector. These decisions become increasingly critical insofar as country disaster risks are significant and insurance markets are absent or unable to cover these risks, leaving the government with potentially large financial exposures.

Methodological framework

This methodological framework is intended to help Finance Ministries and other governmental authorities in developing more effective DRM strategies and, in particular, financial strategies, building on strengthened risk assessment and risk financing. While the framework does not specifically explore disaster risk reduction policies, it highlights the strong interconnections between disaster risk assessment, risk reduction and financial management, key building blocks for dynamic and continually evolving DRM strategies. Based on country practices and existing international DRM frameworks, the framework first addresses risk assessment as a key step for promoting risk financing strategies through a series of concrete steps:

Analyse disaster risks, based on the identification of hazards and threats and an assessment of their likelihood and impacts following a well-governed process and using relevant data

Communicate these risks to decision-makers and the public, update risk assessment following disasters and use the risk analysis as a basis for evaluating the full range of DRM strategies

Augment risk assessment for the purpose of developing financial strategies by better quantifying the scale of expected disaster costs and identifying financial vulnerabilities within the economy by assessing the distribution of risks and financial capacities to absorb them

Evaluate the availability, adequacy and efficiency of risk financing and risk transfer tools to address financial vulnerabilities facing households, businesses and governments and clarify the allocation of disaster costs so that there are incentives to reduce or financially manage risks

Assess the need for government intervention to take corrective action in risk financing and risk transfer markets and/or address financial vulnerabilities and, if a role is identified, determine the appropriate schemes or instruments

The framework balances the need for a flexible, open-ended framework that encapsulates the key issues from a broad, economy-wide perspective and recognises country differences with the need for a framework that provides substantive guidance for decision-making, in particular by financial authorities. It is intended to be non-prescriptive and applied voluntarily by any country seeking to strengthen physical and financial resilience to disasters.

Key policy messages for Finance Ministers and other relevant stakeholders

Country risk assessment is a critical foundation for disaster risk management and related financial strategies and requires clear rules and governance.

- Risk assessment needs to be comprehensive and well orchestrated both within government and with stakeholders, requiring a robust governance process and framework
- Agreed definitions and rules are needed to ensure consistent and reliable outcomes
- Risk assessment outcomes need to be communicated to decision-makers and the public
- Establishing a solid evidence base through the collection of data on hazards, exposures, vulnerabilities and losses is crucial to this effort and DRM strategies overall

Disaster risk assessment needs to consider financial vulnerabilities within the economy

- With disasters presenting potentially severe impacts, ensuring that the economy has the necessary financial resources to recover and rebuild is critical to growth and effective DRM.
- Country risk assessment therefore needs to consider financial impacts and their consequences for individuals, businesses and governments in light of their risk-bearing capacities.
- These efforts should complement the assessment of other types of vulnerabilities such as human, social, environmental and institutional and consider self-protection capabilities and coping capacities that can limit exposure, mitigate impacts and/or enable recovery.

Country risk assessment needs to be integrated into financial strategies

- Finance Ministries need to integrate risk assessment into financial strategies, leveraging the full resources of government and ensuring a comprehensive view of risks, including interlinkages among hazards and potential cascading effects which could multiply financial impacts.

A comprehensive and integrated approach is required for financial strategies

- Risk financing and risk transfer tools such as insurance along with physical risk reduction serve to reduce financial vulnerabilities. It is thus important to ensure that the financial sector is sound and resilient, capable of delivering promised payments and financing in the event of a disaster.
- The development of private risk financing and transfer markets needs to be promoted where feasible as a mechanism for financial protection; this may require the development of innovative products and other instruments in countries where private markets are less developed.
- Parallel systematic efforts by governments to address broader post-disaster financial needs can be pursued. Public and private efforts need to be well coordinated so that incentives for private protection do not diminish, which could burden governments and crowd out private markets.

Finance Ministries are uniquely placed to ensure that financial strategies for DRM are well integrated, efficient and effective, and thus play a central role in ensuring financial resilience

- They are well placed to evaluate the role of insurance markets in covering risks and may deploy policy, regulatory, fiscal and financial tools to support these markets.
- They can leverage risk assessment and their understanding of insurance markets to design more effective and complementary government compensation programmes and arrangements.
- These efforts help clarify the government's contingent liabilities for disasters, a necessary basis for efficient fiscal management, an ongoing concern for Finance Ministries.
- They can clarify the allocation of disaster costs, helping to align incentives with a shared vision of how risks are to be retained, mitigated and transferred within the economy and thus promoting a culture of risk within society

Methodological framework for disaster risk assessment and risk financing

Executive summary

Disasters present a broad range of human, social, financial economic and environmental impacts. In addition to inflicting direct damages to lives, buildings and infrastructure, they can produce indirect damages with the potential for cascading and systemic effects.

Disasters can present severe financial challenges to governments. With countries facing more frequent and severe disasters and increasingly constrained public finances, disaster risk management (DRM) strategies have become indispensable for enhancing the resilience of societies against disasters and reducing their social and economic costs.

G20 Finance Ministers and Leaders have recognised the importance and priority of adequate DRM strategies and have, in particular, highlighted the key components of disaster risk assessment and risk financing. “We recognize the value of Disaster Risk Management (DRM) tools and strategies to better prevent disasters, protect populations and assets, and financially manage their economic impacts” (Los Cabos, 19 June 2012).

Finance Ministries and other relevant financial authorities play a pivotal role in DRM strategies, and especially related financial strategies, given their responsibilities for economic, financial, fiscal and budget policymaking, planning of public investment and coordinating public expenditures. These central responsibilities include:

- Ensuring that *financial vulnerabilities within the economy* are addressed through private markets, financial schemes, subsidies, and/or other instruments and ensuring the *availability and efficiency of compensation mechanisms*
- Ensuring proper *fiscal management of disasters* by anticipating budgetary impacts and ensuring adequate financial capacity and rapid disbursement
- Ensuring that *clear rules regarding post-disaster financial compensation* are established to enable rapid compensation, demonstrate solidarity and clarify the expected allocation of disaster costs
- Ensuring the *soundness and resilience of the financial sector* with respect to disaster risks
- Ensuring the *optimal allocation of resources for DRM*, including assessment of the cost-effectiveness of major public investments in disaster risk reduction projects

In regard to financial management strategies, these responsibilities involve key decisions regarding the provision of financial guarantees, the development and design of schemes enabling post-disaster assistance and disaster insurance, the management of contingent liabilities, budget expenditures and role of the financial sector in providing protection against disaster risks. Finance Ministries can also play an instrumental role in promoting and augmenting risk assessment and supporting its coordination, enabling a comprehensive view of disaster risks and permitting the proper calibration of financial management strategies.

OECD was invited to develop a voluntary framework to facilitate disaster risk assessment and support the development of financial strategies by Finance Ministries. The framework, summarised below, highlights the need to estimate the likelihood and potential impact of disasters, and their underlying physical and societal drivers, as a basis for elaborating and assessing the full range of DRM strategies. It emphasises the role of Finance Ministries in the development of financial strategies to manage fiscal impacts, reduce financial vulnerability within the economy and enhance overall resilience.

This methodological framework is intended to be non-prescriptive and applied voluntarily by countries. Building on national, regional, and international frameworks, it ultimately seeks to strengthen physical and financial resilience to disasters.

Key components of the methodological framework



From risk assessment...

Governance	Establishing an all-hazards approach, agreed procedures and methodologies, transparency and accountability and structured interaction with stakeholders all provide the basis for a sound risk assessment.
Risk analysis	Risk analysis requires the identification of hazards and threats and an assessment of their probabilities and expected impacts, based on the vulnerability of exposed populations and assets to injury and losses.
Risk communication and awareness	The results of risk analysis need to be properly communicated to policymakers and the public to enable decision-making and enhance risk awareness.
Post-disaster impact analysis	The impacts of disasters including financial, should be evaluated and quantified. This allows the risk assessment process to be updated and refined.
Policy implications of risk assessment outcomes	Risk analysis is not a stand-alone product: it needs to be leveraged for the full range of disaster risk management actions, especially financial strategies.

to risk financing...

Risk exposure and risk-bearing capacity	Identifying risk exposures within the economy and risk-bearing capacities provides the starting point for risk financing strategies. This analysis, based on risk assessment, helps to identify financial vulnerabilities within the economy and thus the potential need for financial tools.
Risk financing and risk transfer	The availability, adequacy and efficiency of risk financing and risk transfer tools as a means to address financial vulnerabilities need to be evaluated in light of a country's fiscal strength and maturity of insurance markets.
Financial institutional arrangements	If government intervention in private markets is needed, then designing the appropriate scheme becomes paramount. For schemes involving both government and industry, this requires an understanding of private-sector capacity, recognition of the potential adverse impacts of intervention and consideration of the appropriate sharing of risks and rewards.

Risk assessment

Risk assessment provides governments with the basis for decision-making regarding all phases of DRM, including decisions on the appropriate allocation of resources, in a manner tailored to local conditions, needs and preferences. Risk assessment, which includes risk assessment from a financial perspective, is an essential pre-condition for elaborating financial strategies (see figure below). Its main elements are:

Governance – establishing agreed procedures and methodologies, transparency and accountability and structured interaction with stakeholders

Risk analysis – identifying and analysing the hazards, exposures, and vulnerabilities and then the evaluating risks

Risk communication and awareness – communicating the results of risk analysis widely to decision-makers and the general public

Post-disaster impact analysis – evaluating the impacts of disasters

Policy implications of risk assessment outcomes – leveraging the results of risk analysis for the full range of DRM actions, including financial strategies

1. Governance

Comprehensive approach and agreed objectives and methodology

Adopt an all-hazards approach, identify objectives, and agree on terms and methodology

Disaster risk assessment is best able to capture the full range of losses if it adopts a comprehensive, all-hazards approach, covering all major natural and man-made types of hazards or threats. An all-hazards approach permits an integrated assessment of disaster risks, facilitating the identification of commonalities and interlinkages between hazards, the possible sequencing of events and follow-on impacts.

As risk assessment may be conducted for different purposes, the objectives for risk assessment need to be established before it is conducted, as the intended purpose may determine the nature of data required, the most suitable methodology to use and appropriate risk communication tools to develop. Furthermore, developing a common understanding of core terminology and agreeing on a methodology promotes consistent approaches to risk assessment across sectors and facilitates comparability of outcomes.

While risk is inherently difficult to measure, the purpose of risk assessment is to obtain at least orders of magnitude of potential risks in order to facilitate prevention, preparation and mitigation efforts and consider proper financial strategies.

Transparency and accountability

Promote transparency, disclose sources of information, and establish reporting and accountability mechanisms

Risk assessment needs to be as objective and transparent as possible to ensure credibility of the output. Transparency promotes accountability and furthers rigorous results. Transparency can be supported, where appropriate, by identifying and documenting the sources of data and any limitations, as well as making them accessible. Access to data on exposures and vulnerabilities can be used to improve risk modelling, identify risk reduction measures, support the development of preparedness plans and reduce the cost of financial risk transfer tools.

Reporting and accountability mechanisms create sound incentives for high-quality risk assessment and promote the communication of risks. Accountability can be fostered by clearly assigning responsibility for the risk assessment process and is facilitated by the establishment of oversight requirements and periodic review.

Multi-level governance, multi-actor participation

Involve key groups of stakeholders, assign a lead national government authority, and provide adequate resources

The risk assessment process may involve interaction and collaboration among key groups of stakeholders, including those who use its results to develop policies, those who are responsible for managing impacts and stakeholders whose lives, assets or resources are exposed to hazards.

Designating a lead national government authority to coordinate a risk assessment across central government ministries can facilitate the development of an integrated view on the most significant risks facing the country. Its responsibilities may include co-ordinating input from ministries and developing guidelines to ensure consistent and systematic approaches to risk assessment across sub-national levels of government.

Risk assessment can benefit from close coordination with sub-national levels of government and from instituting partnerships and regular consultations with the private sector, relevant centres of scientific research and civil society. Adequate resources and expertise are required to ensure an ongoing, well-developed risk assessment process.

2. Risk analysis

Hazard identification and analysis

Identify and analyse events that could have a significant, adverse or disruptive impact

The risk assessment begins with the identification of natural phenomena, accidental or deliberate man-made events (“hazards”) that could have a significant, adverse impact on society.

The selection of significant hazards needs to be made according to a clear time horizon for the occurrence of a qualifying event, e.g., within 1 year, 5, 10, 15, 20 years or more. Hazards can be described, in terms of physical phenomenon, frequency, location, intensity, and duration. Their immediate causes and sources need to be identified, as well as any interlinkages or external drivers. Identifying risks arising from interconnections or interlinkages may present complexities, which have to be acknowledged when conducting risk assessment.

Generating hazard information may, where the occurrence and severity of hazards are quantifiable, involve modelling events according to models of physical processes such as earthquake generation. However, where data are limited, a probabilistic assessment may be difficult to perform. The use of scenarios is an alternative in which a plausible event leading to significant impacts is selected as an informative example.

Collect and report data on hazards

The collection and dissemination of data on hazard events and their characteristics is fundamental to hazard analysis. Meteorological, seismological, and hydrological agencies are, in the case of natural hazards, central to data collection. Historical archives may also provide valuable information. Collecting and reporting of data on hazards in standardised formats can promote consistency and interoperability of databases and deepen the pool of data to enrich hazard analysis.

Hazard “A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.”

Exposure “People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses.”

Vulnerability “The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.”

Source: UN ISDR

Vulnerability and impact analysis

Identify exposures, and analyse factors that create vulnerability, and estimate potential impacts

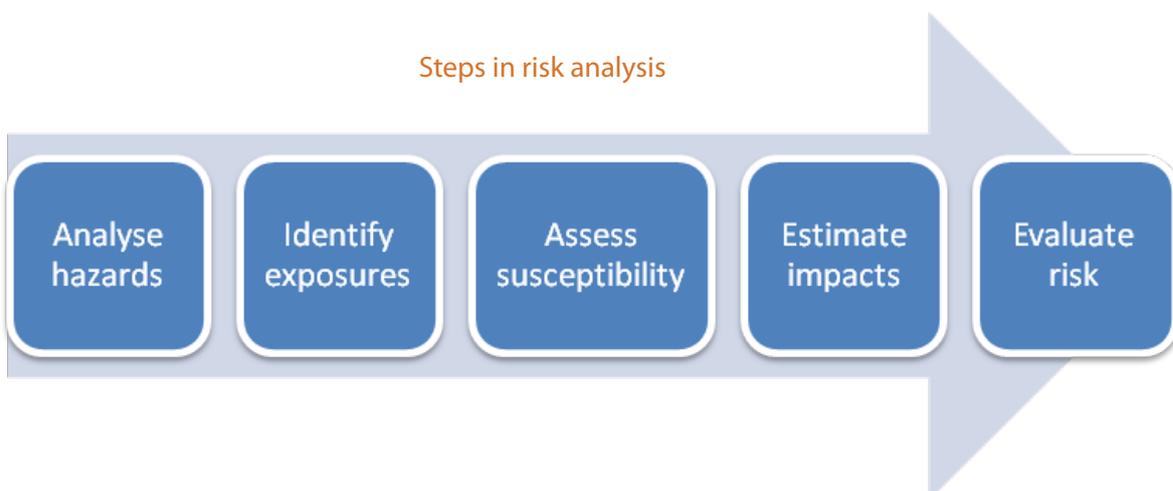
Populations, assets or environmental resources that are exposed to hazards and consequently susceptible to death, injury or damage need to be identified. The nature of these exposures, including physical, social, economic, and environmental, can be assessed and their magnitude or importance evaluated. Self-protection capabilities and coping capacities that can limit exposure at the outset, mitigate impacts and/or enable recovery, such as early warning systems, emergency response capacity and financial tools, are relevant in analysing vulnerability.

Describing the impacts of disasters pays due attention to such factors as the expected sequence or chain of events that may ensue from a hazard event or set of events, possible amplifiers that can accelerate, intensify, or spread destructive impacts, possible interdependencies and spillovers, for instance due to damaged networks or infrastructure or environmental damage, and the distribution of impacts across the population and economy, including by major segments such as government, households, the financial sector and corporate sector and their nature and scale.

Establish location-based inventories of exposures and prevention infrastructures

Data inventories are useful to catalogue elements at risk and enable an assessment of exposures and vulnerabilities. Inventories may include location-based information on the characteristics and vulnerability of assets (e.g., value, use, age, building materials) and on prevention infrastructures (e.g., flood defences). Location-based data permits the layering of information to obtain an integrated view within a defined geographical area. Other data linked to exposures and vulnerability can be collected such as data on investments for risk reduction and on insurance coverage.

Steps in risk analysis



Risk evaluation

Based on hazard, exposure and vulnerability analyses, evaluate risk and document outcomes

Risk is determined through the investigation of hazards, exposures, and vulnerability and can be expressed as a function of probability and likely impacts within a given time horizon. Where there is sufficient data, a probabilistic risk modelling framework can provide useful results. Verifying and keeping track of the risk evaluation outcomes is valuable for comparing and monitoring risks over time.

In national risk assessments, experts estimate the relative impact and likelihood of different scenarios based on common criteria and rank the risks. The results may be visualised within a matrix, in which each risk factor, determined by its “likelihood” and “impact”, is shown as a point. For disaster risk financing and transfer strategies, the relevant risk measure depends on the precise context but it is linked to anticipated losses that, absent financial tools, cannot easily be managed within existing resources.

Risk monitoring

Monitor current and emerging risks

With risks emerging and threats evolving, risk assessment requires ongoing monitoring and efforts to update of data linked to hazards, exposures, vulnerabilities, and damages. Incorporating a forward-looking element, whereby a long-term horizon is adopted, can help to identify future risks. Continuous risk assessment and periodic review of the risk assessment process itself help to ensure that it remains useful.

3. Risk communication and awareness

Communicate the results and inform key decision-makers and the broader public

The outcomes of risk analysis can be communicated to enable top-level DRM decision-making through a dedicated structure or leadership position within government. Risk matrixes, risk maps and plotted risk curves can facilitate the communication of results. Outcomes can also be communicated, in simplified fashion, to the broader public, coupled with relevant information on risk reduction actions realistic to local conditions.

Wide communication of risk assessment results can deliver benefits. Communication can for instance help build public trust, easing the acceptance of any crisis measures. Wide communication can also help in embedding risk reduction knowledge into policies, spatial planning strategies, regulations and standards, such as zoning and building codes.

4. Post-disaster impact analysis and quantification

Collect and report data on impacts and post-disaster spending

Following large-scale disaster events, an impact assessment can be conducted involving the collection of information on the event(s), responses, and impacts. This impact assessment can help to assess the strengths and weaknesses of risk assessment.

Data collected on economic and financial losses as well as other disaster impacts such as fatalities, injuries, and displaced persons can help improve understanding of disaster risks as well as promote risk awareness. The occurrence of a disaster provides an occasion to update data on hazards, exposures, and vulnerabilities, and thus refine risk assessment. Collecting data on disaster-related assistance from governments and non-profit organisations (direct and in-kind resources) involved in disaster response and recovery can help to facilitate the evaluation of DRM policies, capabilities and capacities.

5. Policy implications of risk assessment outcomes

Use the results of risk analysis to set priorities and make decisions about DRM

Risk assessment provides the basis for elaborating and assessing the full range of disaster risk management strategies, including financial strategies, aimed at enhancing disaster resilience. Risk assessment is a pre-requisite step to further policy decision-making related to DRM. By identifying hazards and analysing vulnerabilities, impacts, self-protection capabilities and coping capacities across the population and the economy, risk assessment enables cost-effective and targeted DRM strategies tailored to local risk profiles and capacities.

Risk financing

The financial impacts of disasters need to be understood and assessed by Finance Ministries as a basis for developing financial and fiscal management strategies, for which they have central responsibility. These impacts can be mitigated ex ante through financial management tools along with physical risk reduction measures. Financial tools reduce financial vulnerability by ensuring that resources are available for rapid reconstruction and recovery, thus averting financial distress and potentially devastating drops in welfare.

Risk financing strategies usefully consider:

Risk exposure and risk-bearing capacity – identifying the nature and distribution of exposures within the economy, risk-bearing capacities and, thereby, financing gaps (or financial vulnerability)

Risk financing and risk transfer – evaluating the availability, adequacy and efficiency of risk financing and risk transfer tools to address financial vulnerabilities

Institutional arrangements – assessing the need for government intervention in risk financing and risk transfer markets and, if there is a role for government, identifying appropriate schemes

1. Financial exposure and capacity

Identify risk exposures, assess risk-bearing capacities, and identify actual or potential gaps in financial capacity ('financing gap')

Effective disaster risk financing and risk transfer strategies at the country level require a good understanding of risk exposures within the economy and risk-bearing capacities, which together indicate levels of *financial vulnerability*, or the extent to which a *financing gap* might emerge as a result of a disaster.

As a first step, those who are exposed to disaster risk and thus expected to sustain losses following a disaster need to be identified and their level of financial exposure assessed. Assessing the exposures facing the major segments of the economy, namely households, the corporate sector, the financial sector, and government, helps to identify economic and social disruptions that might be caused by disasters. Specific sectors or populations can be examined in light of economic, social, environmental and other considerations. Risk assessment developed in the first part of the methodological framework can provide input into this analysis.

As a second step, the risk-bearing capacity of those exposed to disaster risks needs to be assessed. Risk-bearing capacity refers to the capacity to absorb and recover from losses, based on own resources, income, and self-financing capabilities. Similar to analysing financial exposures, assessing risk-bearing capacity can cover the major segments of the economy and those populations and sectors of the economy whose inability to absorb disaster risks might have important consequences.

Those unable or potentially unable to absorb losses given their risk exposures face a “financing gap”. Absent financial tools or further risk reduction measures, such gaps translate into financial vulnerability. Financial vulnerability provides a reference point for assessing the costs and benefits of ex ante financial tools: some may be able to cope with the financial impacts of disasters without using financial tools; however, others may clearly benefit from such tools despite their costs.

2. Risk financing and risk transfer

Evaluate how financial tools might be used to retain or transfer disaster risks, in possible combination with risk reduction

Risk financing and risk transfer instruments, in combination with risk reduction measures, reduce financial vulnerability by addressing expected financing gaps. These instruments may also reduce the economic costs of disasters by enabling the reprofiling or the transfer of risks, improving government financial planning, and the management of contingent liabilities and possibly providing incentives for risk reduction:

Risk financing involves retaining risk but adopting an explicit financing strategy to ensure that adequate funds are available to meet financial needs should a disaster occur. Such financing can be obtained internally through the accumulation of funds or externally through pre-arranged credit facilities.

Risk transfer involves shifting of risks to others who, in exchange for a premium, provide compensation when a disaster occurs, ensuring that any financing gap that might emerge is partially or fully bridged. Risk transfer may be obtained through such mechanisms as mutualisation, insurance policies or capital market instruments.

Where risk financing and risk transfer markets are domestically well-developed, those facing disaster risks need to evaluate whether, given their financial vulnerability, to retain risks and fund them solely on an ex post basis within existing financial capacities, or whether to manage risks ex ante through risk financing, risk transfer, or additional risk reduction measures, based on their benefits and costs.

If disaster risks are relatively minor in comparison with risk-bearing capacity, managing these risks solely on an ex-post basis may be a viable approach, allowing funds to be productively invested elsewhere. However, if they are material, financial tools can provide valuable protection, although they require an ex ante commitment of resources with attendant opportunity costs (see box on next page). Risk reduction measures are capable of directly substituting for, or complementing, financial tools. All of these tools may be mixed and layered to provide an optimal financial strategy.

Assess the adequacy, efficiency, and soundness of markets

In order for reliance to be placed on risk financing and risk transfer markets, their adequacy and efficiency need to be evaluated. This assessment needs to be focussed on identifying market failures, which may consider such factors as the insurability of disaster risks, the extent of asymmetric information and related adverse incentives, consumer perceptions and behaviour, and market features and structure.

The strength of risk financing and risk transfer markets depends on a solid financial sector. Banks and insurers must have adequate capital to absorb not only regularly recurring but also more remote but potentially large disasters. Insurers must also have the capacity to set aside funds for pending claims in the event of a disaster and have the operational capacity to pay these claims promptly. The capacity of the insurance sector to assume disaster risk depends critically on its insurability.

Ex ante financial tools

- Building up a dedicated pool of savings or **reserves**, a source of risk financing obtained internally that are drawn down when disaster occurs, may prove valuable for those with relatively low disaster risk exposures.
- For larger risks, accessing external sources of risk financing such as **contingent credit facilities** may be preferable, as it may be difficult to build up the necessary amount of funds to meet increased expected disaster costs. Such specialised facilities are however not available for households.
- **Insurance**, by allowing risks to be transferred, may provide appropriate protection for those facing larger disaster risks relative to risk-bearing capacity. It can provide simple and cost-effective financial protection for households and businesses. Alternative, simplified risk transfer tools such as micro-insurance and parametric insurance products may be deployed in countries where insurance markets are not well developed or broad-based.
- For very large risks, capital market instruments such as **catastrophe-linked securities** can be employed. Catastrophe-linked securities have been used as risk transfer tools by governments, insurers and other large entities.

Devise strategies to address vulnerable populations or sectors lacking financial tools

Where insurance markets are not well developed, but also in more developed markets, insurance products may be unavailable or unaffordable. In such contexts, financial vulnerabilities, which may be significant, might remain unaddressed, particularly for poorer segments of the population. Governments would need to consider ways to ensure that basic compensation or post-disaster risk financing is made available to reduce hardship, for instance through the development of innovative financial tools such as micro-insurance, and parametric insurance products, or through the establishment of government compensation programs. Absent such arrangements, the government may be called upon to provide financial aid in an ad hoc manner, potentially increasing outlays.

Evaluate the potential role of financial tools in fiscal management

For their part, governments and Finance Ministries in particular need to assess carefully the potential role of risk financing and risk transfer instruments in their fiscal management strategy. This assessment is best made within a disciplined framework that is based on a sound risk assessment process and risk financing approach that seeks to identify any financing gaps. For countries with significant populations or sectors that are financially vulnerable and, for whatever reason, uninsured, governments and their Finance Ministries especially need to factor implicit government contingent liabilities into financial planning given expected funding pressures. A similar consideration applies to any explicit contingent liabilities created by governmental involvement in an institutional scheme for risk financing or risk transfer, whose establishment will reflect a financial strategy elaborated by Finance Ministries and other relevant financial authorities. Fortunately, governments are well placed to affect their own exposures not only due to their role in risk reduction strategies, but also given their ability to foster the development of risk transfer markets, which can serve to reduce exposures.

Clarify the allocation of disaster costs to align incentives with risk reduction

Clarifying the allocation of disaster costs – among different levels of government and between the public and private sectors -- can align incentives with risk reduction and proper financial management. Such an understanding and internalisation of risk allocation may incentivise those facing risks to consider relevant mitigation actions. Among governments, clarity is required regarding responsibilities for public investments in disaster risk reduction.

Insurance markets can help to provide signals on risks, which may serve to incentivise risk reduction. Where these markets exist, pricing of coverage may provide signals regarding existing and emerging risks and their costs, which may encourage privately initiated risk reduction measures and help governments in identifying critical risk reduction measures, evaluating their costs and benefits, and measuring the extent to which disaster costs are being reduced through time.

3. Institutional arrangements

Institutional arrangements may be established to promote efficient risk financing and transfer capabilities within an economy as well as promote effective mechanisms for the provision of governmental financial assistance. These arrangements may be established by industry or government or, typically, both.

For arrangements involving the government, Finance Ministries have key decision-making responsibilities in terms of: i) assessing the need for these arrangements; ii) designing them and in this context determining the appropriate type of financial commitment to provide, for instance ex post financial assistance or a financial guarantee, given the nature and objective of these arrangements (e.g., public scheme to support the disbursement of post-disaster aid, scheme to support private risk financing and transfer); iii) ensuring clarification of responsibilities and financial commitments to ensure that incentives are aligned, policy objectives are met, and unwanted risks to the fiscal framework are minimised; and iv) ensuring that ex ante public arrangements for financial assistance and private financial mechanisms are well-coordinated and complementary.

Assess whether the government should play a role in providing risk financing or risk transfer of private losses

Institutional arrangements may serve to ensure the general availability or affordability of financial tools, provide adequate compensation for identified segments of the population or economy (which may include supporting private-sector development of products and/or developing government financial assistance arrangements and programs for targeted segments), strengthen rapidity in financial responses, and provide greater certainty regarding the allocation of disaster costs. These arrangements may be complemented by special subsidies or forms of tax relief. Institutional arrangements may bring other benefits, such as better coordination and synergies with industry and clarification of disaster-related contingent liabilities.

A critical decision is whether the government needs to play a role in private risk financing or risk transfer markets, which generally involves the creation of institutional arrangements in concert with the private sector. This decision requires Finance Ministries to conduct a careful evaluation (see text box below for key elements for consideration).

The government may also, for similar reasons, directly provide compensation and recovery financing. Such arrangements may be financed ex ante through a reserve fund or ex post based through pre-established funding rules. Well-designed schemes help to secure timely release of funds for emergency response, recovery and reconstruction, strengthen incentives for financial self-protection and avoid crowding-out effects of private markets. There is a need for a rigorous balancing of the respective roles of government and market-based or insurance-based solutions in promoting financial resilience, depending on the maturity of insurance markets and the nature of financial vulnerabilities within the country economy.

If a government role is needed, assess the appropriate extent of risk sharing, which may help to determine the appropriate role of industry and government and layering strategies

Should there be government intervention in private insurance markets, a decision needs to be made by the Finance Ministry and relevant financial authorities regarding the appropriate extent of risk sharing between the government and industry, which may help to determine the appropriate roles of industry and government and layering strategies, and thus the form of institutional arrangements.

In this respect, the government needs to consider the scale of disaster risks and the extent to which the insurance and reinsurance sectors can assume and pool these risks. Any risk-sharing arrangement with the government needs to involve a proportionate sharing of risks and benefits.

Government intervention in disaster risk financing and risk transfer: some factors for consideration

- Whether impediments to insurability might apply, thus impairing the functioning of domestic and international insurance markets
- The systemic implications of a lack of insurance availability, in particular:
 - Whether the banking sector and capital markets might be unable, following a disaster, to provide financing given possible losses
 - The impact of any lack of disaster risk financing and risk transfer on the corporate sector and its ability to secure, in normal times and following a disaster, needed financing and investment
- Whether financially vulnerable populations or sectors within the economy require protection for compelling economic, social, or other reasons
- The financial capacity of government to provide risk financing and transfer mechanisms
- The potential costs created by any scheme and the distribution of costs within the economy, which may directly impact households and businesses.

Industry may establish pooling mechanisms to spread risks more widely. Should the nature or scale of such risks exceed private sector capacity, some degree of risk-sharing with the government may be envisaged. Institutional arrangements involving the government may take various forms, involving different types of financial commitments from the government. They may involve the government providing a liquidity backstop to the industry, with the industry retaining risks.

The government may instead decide to reinsure risks, accepting some or all of the liabilities assumed by insurers in connection with disaster risks. Alternatively, the government may directly provide disaster insurance, with reliance potentially placed on the insurance sector to discharge operational functions. Where arms-length institutional arrangements exist, governments often explicitly guarantee some or all of the disaster-related liabilities.

Typically, a layering or co-insurance strategy is adopted so that the government assumes only a portion of the risk, thus limiting its exposure, with the industry bearing a level of risk that is reasonably within its financial capacity. Where disaster risks are considerable for the entire country, the government may decide to offer disaster risk coverage directly. The government needs to recognise potential adverse impacts of intervention, which include possible policyholder and insurer moral hazard and crowding out effects, which may require appropriate policy design and controls.

Current institutional arrangements cover different types of perils. Some of them have a broad scope of application, encompassing a range of disaster risks, while others focus instead on single perils or categories of perils. Institutional solutions also differ in terms of type of losses covered. While the vast majority of schemes provide coverage for property damage, the type of properties concerned may vary significantly. While institutional arrangements may differ, practice suggests that some form of partnership with the industry is needed to maximise the capacity of the insurance sector and achieve policy objectives efficiently.

Further, the nature and degree of compulsion varies across schemes. While some countries have made the purchase of disaster insurance coverage mandatory, others have required insurance companies to make disaster insurance available, by introducing a mandatory offer of coverage that can be declined by the policyholder. In a number of countries, moreover, fire or other first party insurance policies are marketed on a voluntary basis, but insurance companies are required by law to include coverage for disaster risks in such policies. Some element of compulsion is generally required to promote financial coverage and thus justify the government backstop.

Pricing mechanisms need to be addressed within any formalised risk-sharing arrangement between government and industry as they can affect the success of the scheme in meeting policy objectives and influence the balance of risks and rewards for government and industry. While some schemes apply a risk-based pricing mechanism, others adopt flat pricing.

*Review
governmental role
on a regular basis*

Pricing mechanisms need to be addressed within any formalised risk-sharing arrangement between government and industry as they can affect the success of the scheme in meeting policy objectives and influence the balance of risks and rewards for government and industry. While some schemes apply a risk-based pricing mechanism, others adopt flat pricing.

Conclusions

With disasters presenting a broad range of social and economic impacts, causing damages to lives and assets and disrupting activities, ensuring that the economy has the resources necessary to recover and rebuild, and resume productive investment and economic growth, is critical to effective disaster risk management.

Achieving financial resilience depends on the development of financial strategies that rely critically on country risk assessment and risk financing tools. Identifying and accurately evaluating natural and man-made disaster risks is necessary to comprehend the scale of expected losses and anticipate post-disaster financial needs, the starting point for identifying financial vulnerabilities within the economy and the appropriate roles of risk financing and risk transfer tools and government compensation mechanisms in addressing these vulnerabilities. Risk assessment also enables the identification of cost-effective risk reduction measures and early warning and emergency management capabilities that can directly reduce disaster costs.

Finance Ministries have a key role in ensuring an effective approach to the financial management of disaster risks – promoting the role of risk financing markets where feasible, ensuring the proper design of any market interventions, considering the development of public financial aid arrangements and programs and engaging in sound fiscal management of government contingent liabilities. Being centrally placed to affect the financial sector, budget making and the provision of financial guarantees, Finance Ministries are uniquely placed to ensure that financial strategies for DRM are well integrated, efficient and effective. Finance Ministries also have an important stake in ensuring the quality and policy relevance of country risk assessments and strengthening its own input into the risk assessment process as a means to ensure the development of cost-effective DRM strategies and financial strategies in particular.

This methodological framework provides a foundation and reference point for the elaboration of specific country approaches and methodologies intended to strengthen physical and financial resilience to natural and man-made risks.

Disaster Risk Assessment and Risk Financing

A G20 / OECD METHODOLOGICAL FRAMEWORK

EXECUTIVE SUMMARY

