

Chapter 6

Designing a disaster risk financing strategy for flood risk

This chapter provides a summary of the main recommendations in the report for the purposes of designing a disaster risk financing strategy for the financial management of flood risk.

The effective financial management of flood risk is a complex public policy challenge for countries faced with significant exposures to flood risk and/or limited capacity to manage the financial impacts of that risk, particularly in the context of a changing climate. Managing flood risk requires careful consideration of the costs and benefits of different approaches, including managing the incentives created by different forms of intervention.

The OECD is preparing a draft Recommendation on the development of disaster risk financing strategies¹ which provides some overarching design principles and outlines the main components of an effective strategy, including:

- promoting comprehensive risk assessment processes that allow for the estimation of exposures and the identification of financial vulnerabilities;
- supporting the management of the financial impacts of disasters by all segments of the population and economy and encouraging the development of risk transfer markets; and
- effectively managing the financial impacts of disasters on public finances.

This chapter will outline how these can be applied in developing a strategy for the financial management of flood risk, based on the findings of this report.

6.1 Estimating exposures and identifying financial vulnerabilities

The accurate assessment of flood risk is an essential prerequisite for the effective financial management of flood risk. A comprehensive understanding of exposures to flood risk for different locations is necessary for effective land-use planning, the development of building and design standards to protect against inundation, and for assessing the relative costs and benefits of investments in risk reduction measures. It is also critical for reducing the impact of floods when they occur by providing emergency managers with the information they need to intervene (e.g. the placement of temporary emergency dams or for evacuating communities). It is also a prerequisite for the transfer of flood risk to (re)insurance and capital markets.

However, as noted in Chapter 3, the assessment of flood risk is complicated by a number of factors, including the broad range of causes of floods, the significant differential in impacts based on small changes in water level, and the uncertainty related to the nature of flood risk in a changing climate. Climate change is expected to have important implications for the nature of flood risk going forward as a result of changes to the frequency of heavy precipitation events, the range and frequency of cyclones, and the rise in sea-levels which needs to be accounted for in assessing future flood risk. A number of countries are adding climate change allowances in assessments of flood risk. For example, in Australia, the Queensland Inland Flooding Study recommends a 5% increase in rainfall intensity for each 1°C increase in global warming while in New South Wales, a 10-35% increase in extreme rainfall is recommended in sensitivity analyses of future projections (Wilby and Keenan, 2012).

Flood hazard and risk maps are becoming more broadly available (almost all surveyed countries indicated that such maps are in place and many are updated on a regular basis (usually 6 years)). However, a number of countries still face challenges in terms of the quality and consistency of flood maps which makes it difficult to construct a consistent and accurate representation of flood risk for many countries. Probabilistic flood models that provide the estimates of damage and losses necessary for underwriting

insurance coverage and for accurately assessing costs and benefits of different risk reduction measures are only available for a few countries - driven largely by the demand for such modelling capability from private insurance companies.

Where probabilistic flood models are not available, experience from past events can provide an (imperfect) source of information for understanding flood exposure. Insurance companies can be an important source of information on past impacts from flooding which can be used to support land-use planning and decisions on risk reduction. For example, in Norway, the private insurance sector has made data on past losses at the level of individual structures available to municipalities as a means of supporting their understanding of flood exposure (Ebeltoft and Nussbaum, 2016). Increasing access to satellite technology also provides an opportunity to assess the impacts of past events. A commitment to undertaking post-disaster loss assessments for significant events, as occurs in some countries, is another means of improving the availability of the data necessary for accurate risk assessment.

6.2 Supporting the effective financial management of flood risk

Countries with broad insurance coverage for disaster risks tend to face more limited economic disruption as a result of disaster events. Insurance provides a timely source of financing for reconstruction (in many cases, sourced from international reinsurance markets) and reduces the potential costs to the public sector in covering uninsured losses. However, as outlined in Chapter 3, there are a number of challenges to the insurability of flood risk, including the size of expected losses, uncertainty in the quantification of exposures and limited ability to establish a pool of diversified risks – all of which can lead to high prices for insurance coverage. At the same time, the willingness-to-pay for flood insurance is limited by low levels of risk awareness, misunderstandings about coverage and expectations of government assistance which creates a market failure that reduces the level of financial protection against flood risk and leads to a significant financial protection gap.

Governments have a critical role in supporting the insurability of flood risk through effective land-use planning, (including both restrictions on development and allowances for natural flood protection mechanisms that can enhance water absorption and protect against storm surge) and by investing in - and providing financial support for - structural (community-level) and household risk reduction measures which can be highly effective in reducing flood risk. In decentralised countries, national governments have an important role in ensuring that local governments have the right incentives (and authorities) to take flood risk into account in local planning and investment decisions. A few countries take the availability and/or affordability of flood insurance coverage directly into account when making decisions on where to target investments in risk reduction. In some countries, explicit commitments from government to implement strict land-use controls and finance risk reduction investments have been sought by the private insurance sector as a condition for offering flood insurance on a broad-basis. High-risk areas, often developed before the true level of flood risk was known, should be a particular focus for risk reduction given the difficulty of providing a viable insurance offering to households in those areas.

The form of insurance coverage can have important implications for the level of take-up. The automatic extension of general property insurance coverage to include protection against flood damage as well as approaches that include flood coverage as the default option for insurance policies have led to significantly higher levels of flood insurance

penetration. Requirements for flood coverage as a condition for mortgage financing have also been successful in encouraging take-up (when effectively enforced). Where insurance coverage for flood is an optional add-on to property policies, investments in improving public understanding of flood risk and the need for financial protection will likely be necessary for generating sufficient demand for flood insurance.

There is some evidence that forms of risk communication that focus on return probabilities within shorter time periods, build on recent flood experience and provide estimates of the potential level of flood damage may be more effective in encouraging households and businesses to seek financial protection. Minimising misunderstandings about the scope of flood coverage as well as clarifying the extent of possible public disaster assistance may also be important to increasing the demand for flood coverage.

In a number of countries, flood insurance coverage is provided by the public sector or through a public-private partnership, whether as a result of limited private insurance sector appetite for flood exposure or an explicit decision by government to intervene in order to achieve other policy objectives (e.g. broad availability and affordability of coverage or solidarity in terms of loss-sharing across regions). If administered efficiently, such schemes can support affordability by reducing the cost of providing coverage.

Whether private or public, automatic or optional, the contribution of insurance to the financial management of flood risk will be enhanced where insurance contributes to risk awareness and encourages risk reduction. Risk-based premiums, including the availability of premium discounts for risk reduction measures, can provide an important price signal on the level of exposure and a financial incentive for risk reduction. Premiums that do not reflect risk, including as a result of premium subsidies, risk encouraging development in flood-prone areas and increasing the overall level of flood exposure. The regulatory framework for insurance companies, including the framework for competition/market entry, premium pricing, reinsurance arrangements and/or asset allocation, can all have an impact on the capacity of the insurance sector to provide flood insurance coverage, meet obligations to policyholders, and support risk reduction through their investment decisions.

Public financial assistance for sub-national governments and households (and potentially businesses) affected by flood events could be essential for reducing hardship and minimising economic and social disruption. The rationale for such assistance may be particularly strong for vulnerable households living in high-risk areas where the level of flood risk may not have been known when the area was developed. However, extensive and/or poorly defined financial assistance can lead to moral hazard and reduce the incentives for sub-national governments and households, who often have the greatest ability to reducing the potential damage and loss from flood events, to invest in risk reduction and secure financial protection. Despite the existence of hazard maps, less than 40% of the respondents to the OECD survey provided an estimate of the share of the population facing flood risk, suggesting that more could be done in terms of identifying vulnerable segments of the population. Higher levels of insurance coverage among households, businesses and sub-national governments can make an important contribution to reducing the need for public financial assistance and therefore reduce the potential burden on public resources. A number of countries have aimed to address moral hazard by tying the receipt of public disaster assistance to the purchase of insurance.

6.3 Managing government exposures

The public sector is exposed to flood risk through the costs of relief and recovery, reconstruction of public assets, payments as compensation and financial assistance to individuals, business and/or sub-national levels of government as well as any costs related to public (re)insurance schemes that provide coverage for flood damages and losses. There are a variety of ways to manage these public sector exposures, including through cost-effective investments in risk reduction, efforts to minimise the cost of financial assistance and/or public insurance schemes and by securing financial protection for some part of the overall exposure. Careful management of the scope of financial assistance and public insurance arrangements as well as related operational costs can make an important contribution to minimising the overall cost of such arrangements.

In general, the most significant costs relate to the rebuilding of public infrastructure, often financed through cost-sharing arrangements between national and sub-national governments (that are often responsible for a large share of public infrastructure assets). Financial assistance to sub-national governments, taking into account the relative fiscal capacity of each level of government, can be critical for supporting the ability of sub-national governments to manage the financial impacts of flooding. However, national governments need to ensure that such assistance does not discourage investment in risk reduction or financial protection at the sub-national level. National governments could vary cost-sharing arrangements based on the level of adherence to robust land-use restrictions and building codes or could organise compensation programmes as insurance arrangements with premiums that vary based on risk, rates of co-insurance and/or coverage levels.

Where governments provide insurance coverage for flood risk, whether as a direct insurer, reinsurer or guarantor, public exposure to flood risk can be minimised by maximising the share of risk transferred to the private sector. This can be achieved by limiting the availability of public insurance to residual markets (where private insurance is not available or affordable), limiting the amount of coverage provided through a public insurance arrangement and/or requiring private insurers to retain a share of any risks transferred to a public reinsurer. However, a residual insurance arrangement will result in the government taking-on the worst risks (without the benefit of the premium income from good risks - although this can be partially mitigated by imposing cross-subsidy on the good risks [e.g. through a surcharge]).

Governments with access to international capital markets may have limited incentives to transfer fiscal risk to insurance markets although the use of insurance may still be beneficial as a means for encouraging risk reduction. The use of other risk transfer mechanisms by governments to manage the financial impacts of flood risk is limited. The transfer of flood risk to capital markets has been particularly challenging due to the complexity of flood modelling and the more limited capital market acceptance of instruments based on flood model losses. The pooling of flood risk across and within countries may offer opportunities for improving access to – and the affordability of – reinsurance coverage for public sector exposures to flood.

**Box 6.1. Key policy messages for the design
of a disaster risk financing strategy for flood risk**

- **The ability to quantify exposure to flood risk is a prerequisite to the effective financial management of flood risk and a necessary input for assessing the costs and benefits of different approaches to risk reduction and for transferring risk to (re)insurance capital markets.**
 - Assessments of flood risk need to account for the uncertainty related to the impacts of climate change on flood exposure.
 - The insurance sector is an important source of information on exposure and past losses that should be leveraged by governments for risk assessment purposes. The development of private flood insurance markets has also been a key driver for the development of flood modelling capacity.
- **Government involvement is key in supporting the insurability of flood risk.**
 - Minimising exposure to flood risk through effective land-use planning and investments (or encouraging investments) in risk reduction at the community and household level are critical for improving the insurability of flood risk. In decentralised countries, national governments need to ensure that local governments have the right incentives and authorities to take flood risk into account in local planning and investment decisions. Challenges in terms of the availability and affordability of insurance coverage in a given area are an important indicator of where risk reduction investments should be focused.
 - Insurance arrangements that make it more difficult for policyholders to exclude flood coverage in their general property insurance policies have been more successful in achieving higher levels of flood insurance penetration. Where coverage for flood is optional, investments in raising public awareness of flood risk and the need for financial protection will likely be necessary. Insurance companies, associations and brokers have a clear role to play in raising awareness among their customers.
 - Whatever the form of insurance coverage, the contribution of insurance to the financial management of flood risk will be maximised where insurance promotes risk reduction. Risk-based premiums and premium discounts for risk reduction measures can make an important contribution to maximising the benefits of insurance.
 - The regulatory framework should be designed to support the contribution of insurance to the financial management of flood risk by not establishing any (unwarranted) restrictions in areas such as asset allocation, risk transfer and premium-setting. Policies to support the development of viable insurance markets, taking into account different country circumstances, can make an important contribution to reducing the financial protection gap. International organisations should support this objective in their country programmes.
- **Effective coordination across government is critical for establishing an integrated approach to the financial management of flood risk that considers the best-use of limited public resources and takes into account the costs and benefits of different approaches (including the incentives created by different interventions).**
 - The exposure of the public sector to flood costs can be minimised by carefully managing the scope of financial assistance and public insurance arrangements and by maximising the share of risk transferred to the private sector.
 - Given the range of policy tools that need to be considered, a holistic approach to the financial management of flood risk requires effective coordination across government, including across levels of government, supported by strong leadership aimed at addressing the financial vulnerabilities created by exposure to flood risk.

Ultimately, the effective financial management of flood risk requires governments to consider the best-use of their limited resources, taking into account the cost and benefits of different approaches including the incentives created by different interventions. In particular, governments need to examine the causes of under-investment in risk reduction prevalent in most countries and the best means to correct this imbalance. Achieving this will require effective coordination across government departments and different levels of government along with strong leadership aimed at addressing the financial vulnerabilities created by flood risk.

Note

1. As the result of a review of the *Recommendation of the OECD Council on Good Practices for Mitigating and Financing Catastrophic Risks (2010)*, the OECD is developing a Recommendation on Disaster Risk Financing Strategies to replace the original. The draft text for the new Recommendation was made available for public comment until 15 April 2016 (see: www.oecd.org/pensions/public-consultation-drf.htm). At the time of writing, a draft Recommendation is being prepared for adoption by the OECD Council.

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