OECD Reviews of Risk Management Policies

Risk Governance Scan of Colombia

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Please cite this publication as:
OECD (2019), *Risk Governance Scan of Colombia*, OECD Reviews of Risk Management Policies, OECD Publishing, Paris, *https://doi.org/10.1787/eeb81954-en*.

ISBN 978-92-64-62948-6 (print)
ISBN 978-92-64-71591-2 (pdf)

OECD Reviews of Risk Management Policies
ISSN 1993-4092 (print)
ISSN 1993-4106 (online)

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Foreword

Colombia is one of the countries most exposed to natural disasters. Regularly recurring disasters such as floods and landslides cause an estimated USD 200 million in damages on an annual basis. During the 2010/11 'La Niña' phenomenon, damages were as high as USD 6.3 billion. As much as 80 percent of the population is exposed to two or more types of natural hazards, including many of the poorest in society. Decades of armed conflict, unplanned urbanisation, the rise of natural hazards that trigger technological accidents, and a recent flood of migrants all contribute to increasing social vulnerability and a changing risk landscape.

In 2012, Colombia launched ambitious reforms to improve its disaster risk management framework and ultimately strengthen the country's resilience to disasters and interconnected risks. Colombia recognised the need to establish a comprehensive, multi-hazard risk management structure. It aims to mainstream disaster risk management across critical sectors at national and subnational level, and its objectives align well to the principles set out in the *OECD Recommendation on the Governance of Critical Risks*.

This OECD Risk Governance Scan provides the first assessment of progress, identifying gaps and recommendations to further strengthen Colombia's disaster risk management system. It is part of a series of OECD Reviews of Risk Management Policies, including similar studies on France, Italy, Japan, Kazakhstan, Morocco and Mexico. It was prepared under the auspices of the OECD's High Level Risk Forum, which promotes an integrated, whole-of-government approach to disaster risk management and governance. The Forum brings together policy makers from governments, practitioners from the private sector and civil society, and experts from think tanks and academia, to identify and share good risk governance and management practices. The work of the Forum is underpinned by the *OECD Recommendation of the Council on the Governance of Critical Risks*, which forms the analytical framework for the present report.

Colombia's National Unit for Disaster Risk Management provides strategic guidance and coordination of disaster risk management actions across government ministries. Under its stewardship, stakeholders have shown strong commitment to the reform agenda and made substantial progress in setting disaster risk management objectives.

The Scan finds that, while Colombia has gained much ground in understanding the risks faced by its communities and economic activities, more granular knowledge and risk assessments could be developed at sub-national levels and leveraged in the risk management decisions of municipalities. To prevent risk exposure from increasing, the country also needs to address land-use issues in disaster prone areas. There are untapped opportunities for Colombia to use the disaster recovery and reconstruction phases to incorporate resilience measures and change path dependencies that perpetuate disaster risk exposures.

Acknowledgements

This *Disaster Risk Governance Scan of Colombia* was prepared under the auspices of the OECD High Level Risk Forum by the OECD Directorate for Public Governance, led by Marcos Bonturi, and with support from Colombia's National Unit for Disaster Risk Management (UNGRD), under the leadership of Eduardo José González Angulo and previously Carlos Iván Márquez Pérez.

The project was managed by Catherine Gamper, who co-authored the report with Teresa Maria Deubelli, under the supervision of Stéphane Jacobzone, Deputy Head, Reform of the Public Sector, and Jack Radisch, Senior Project Manager. The Secretariat is grateful for comments and suggestions received from OECD colleagues, including Charles Baubion (Directorate for Public Governance), Leigh Wolfrom (Directorate for Financial and Enterprise Affairs) and Mamiko Yokoi-Arai (Directorate for Financial and Enterprise Affairs). Andres Aponte provided valuable research assistance. The authors benefitted from expertise and insights from Nestor Alfonzo.

The Secretariat would like to thank the team within Colombia's National Unit for Disaster Risk Management that helped engaged the stakeholders in the National System for Disaster Risk Management and facilitated the information-gathering and fact-checking process. We would like to thank in particular Lina Paola Martínez Fajardo, Maria Jimena Pantoja Castrillon and Antonio Lopez. The OECD Secretariat would like to thank all stakeholders in Colombia's National System for Disaster Risk Management for their availability and engagement throughout the project (see Chapter 7. Annex A and Chapter 7. Annex B). Their participation in the launch event on 3 May 2018 in Bogota, their input through a series of interviews held in June 2018, as well as their responses to the questionnaire, were essential for this report.

Jennifer Allain edited and prepared the report for publication. Assistance was also provided by Liv Gaunt and Raquel Paramo. The team is very grateful for assistance provided by Elisabeth Huggard and Javier Gonzalez throughout the project.

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Acronyms and abbreviations

ANI	National Infrastructure Agency *Agencia Nacional de Infraestructura*
CAR	Regional autonomous corporation *Corporación autónoma regional*
CNGRD	National Council for Disaster Risk Management *Consejo Nacional para la Gestión del Riesgo de Desastres*
CNMD	National Committee for Disaster Management *Comité Nacional para el Manejo de Desastres*
CNRCR	National Committee for Risk Knowledge *Comité Nacional de Conocimiento del Riesgo*
CNRR	National Committee for Risk Reduction *Comité Nacional para la Reducción del Riesgo*
DAPRE	Administrative Department of the Presidency of the Republic *Departamento Administrativo de la Presidencia de la República*
DFAA	Disaster financial assistance arrangement
DIMAR	Directorate General of Maritime Affairs *Dirección General Marítima*
DNP	Department of National Planning *Departamento Nacional de Planeación*
ELN	National Liberation Army
FARC	Revolutionary Armed Forces of Colombia

FNGRD	National Fund for Disaster Risk Management *Fondo Nacional de Gestión del Riesgo de Desastres*
IDEAM	Institute of Hydrology, Meteorology, and Environmental Studies *Instituto de Hidrología, Meteorología y Estudios Ambientales*
INVEMAR	Institute for Marine and Coastal Research "Jose Benito Vives de Andreis"
NATECH	Natural hazard triggering technological disasters
NRA	National Risk Assessment (United Kingdom)
PND	National Development Plan *Plan Nacional de Desarrollo*
PNGRD	National Plan for Disaster Risk Management *Plan Nacional de Gestión del Riesgo de Desastres*
PNPAD	Plan for Disaster Prevention and Attention *Plan Nacional de Prevención y Atención de Desastres*
SGC	Colombian Geological Service *Servicio Geológico Colombiano*
SNGRD	National System for Disaster Risk Management *Sistema Nacional de Gestión del Riesgo de Desastres*
SNPAD	National System for Disaster Prevention and Response *Sistema Nacional para la Prevención y Atención de Desastres*
UNGRD	National Unit for Disaster Risk Management *Unidad Nacional para la Gestión del Riesgo de Desastres*

Executive Summary

Colombia is exposed to major disaster risks. Its topography and climate make it prone to geological hazards, such as earthquakes and landslides, as well as significant hydro-meteorological risks, including floods and droughts. A majority of the country's population is prone to one or more natural hazards.

Several socio-economic factors contribute to the growing complexity of disaster risks. First, forced displacements caused by decades of armed conflict and the recent influx of migrants from the bordering Bolivarian Republic of Venezuela have contributed to the trend of rapid urbanisation. The pressure to expand urban areas to accommodate citizens has forced construction to take place in unsuitable areas. Especially vulnerable people, such as the poor, end up living in informal, hazard-prone housing. Second, changes in Colombia's climate in the long run and in climate variability in the short run add to the uncertainty of future disaster events. Finally, the exploration of unconventional oil and gas resources and the significant expansion of hydropower plants could increase the occurrence of natural hazard triggering technological disasters (so-called natech risks).

With Law 1523/2012 Colombia initiated an ambitious reform process to establish an effective disaster risk governance framework that anchors resilience in the national policy agenda. This OECD Risk Governance Scan evaluates the progress made in implementing major parts of Law 1523/2012 and provides recommendations to strengthen Colombia's efforts in the future.

Key findings

The strategic value of Colombia's disaster risk governance framework: Law1523/2012 paved the way to establish a comprehensive, multi-hazard approach embedded across national sectors and levels of government. The National Unit for Disaster Risk Management (UNGRD) steers and co-ordinates stakeholder engagement, through inter-institutional platforms, towards a shared culture of risk. Several channels for whole-of-society participation in policy-making and a commitment to transparency strengthen inclusiveness and accountability in Colombia's disaster risk governance.

Disaster risk identification and assessment: Hazard assessments are available for almost all types of natural hazards at a broad geographic scale, but the level of granularity needed to inform local-level decision making is still missing. The need for more information on actual risks has been recognised as a policy priority. There is scope to improve the sharing of hazard and risk knowledge between public and private stakeholders, to increase the understanding of interconnected and systemic risks.

Disaster risk reduction: Colombia embraces a two-pronged approach consisting in avoidance of the creation of new risks and the reduction of existing risks. Many efforts are made to reduce disaster risks, but informal housing in disaster-prone areas remains a major challenge that has not been addressed yet in a comprehensive strategy. Current disaster risk reduction policies also fall short when it comes to avoiding the creation of new risks to

households and businesses. UNGRD has not yet made full use of central funding mechanisms, such as the National Disaster Risk Management Fund or the National Adaptation Fund, to support national government agencies and subnational governments in implementing priority measures for disaster risk reduction.

Disaster preparedness and response: The National Strategy for Disaster Response sets forth clear roles and responsibilities in emergency preparedness and response and identifies policy priorities. Regular crisis management exercises and drills are organised by the UNGRD together with stakeholders and a National Crisis Room, which enables effective co-operation in case of a disaster.

Disaster recovery and reconstruction: Risk avoidance is a policy priority in the reconstruction process, but financial assistance in the aftermath of a disaster is not yet designed accordingly. There are few systematic mechanisms for learning lessons in place to foster the improvement of disaster response over time.

Key recommendations

- *Reinforce the strategic governance framework of disaster risk management.* The role of stakeholders in inter-institutional coordination platforms could be more clearly formulated and information-exchange mechanisms scaled up. To strengthen stakeholder engagement, establishing a two-way communication process is needed.
- *Strengthen the disaster risk management capacities of relevant government sectors*. The resilience of sectors, such as agriculture, housing or tourism, make a crucial contribution to Colombia's overall resilience to disasters. Sectoral risk management strategies could orientate disaster risk management responsibilities across sectors. They should include the assessment of disaster risks to sectoral activities, the reinforcement of capacities in preparing for and managing the response to disasters.
- *Focus on learning:* systematic lessons learning processes and the annual monitoring of the National Plan for Disaster Risk Management's implementation present an opportunity to identify changes in the course of action to improve performance over time.
- *Reinforce framework conditions for ensuring business continuity*: the contribution of households and businesses could be increased through formulating clear responsibilities. The responsibility of owners and operators of critical infrastructure could be defined through a dedicated strategy, regulations, and through technical advice to support their role. Public private partnerships should be developed as a useful vehicle for engaging the private sector in disaster risk management.
- *Promote the use of hazard and disaster risk information in policy making and implementation.* Available hazard and disaster risk information could be more fully harnessed in prioritising disaster risk management decisions, as well as in land-use planning and building code development and application.
- *Conduct a national risk assessment.* A national risk assessment brings a broad range of government stakeholders together to assess risks in an integrated way. This helps build consensus across government concerning strategic investments and policy priorities throughout the disaster risk management cycle.
- *Take targeted action to reduce disaster risks.* Financial incentives, such as central funding mechanisms to co-finance disaster risk reduction, could be further

leveraged to scale up risk reduction investments. Strengthening enforcement capacities for land-use regulations and application of building codes could further reduce disaster risks. To that end, it would be useful to focus on continuously communicating building codes and the way they should be implemented in housing constructions. Addressing the specific vulnerabilities of low-income households with tailored disaster risk communication or by building resilience into affordable housing programs will be important going forward.

- *Reinforce disaster management capacities at all levels of government for effective disaster response at appropriate level*. Early warning systems could be systematically updated to provide real-time warnings that activate disaster response at the appropriate scale. Ensuring national coverage with crisis rooms and standardised training modules and civil protection exercises could contribute to further strengthening response capacities.
- *Maximise the potential for disaster risk reduction with the funding available for recovery and reconstruction.* Post-disaster assistance should be provided in a way that clearly incentivises investments in resilience measures as part of the reconstruction efforts. Clear cost-sharing mechanisms for disaster recovery and reconstruction across levels of government can help reduce the level of unplanned expenses and encourage disaster risk reduction investments.
- *Evaluate options for disaster risk insurance to boost the financial resilience of households and businesses.* Disaster risk insurance can be an effective mechanism to encourage investments in disaster risk reduction and nurturing a culture of risk among households and businesses. Such insurance mechanisms also reduce the eventual liability for the central government in case of a disaster.

Chapter 1. Assessment and recommendations

This chapter provides an overview of the key findings of the disaster risk governance of Colombia. It identifies good practices and success factors, as well as persisting bottlenecks towards a disaster risk governance system that supports policy outcomes for sustainable and inclusive development across the country. In addition, this chapter features a list of recommendations to further improve disaster risk governance in Colombia in the future from disaster risk identification and assessment to disaster risk reduction, disaster preparedness and response and disaster recovery. The chapter also gives recommendations to further strengthen strategic leadership capacities and whole-of-society engagement in disaster risk governance.

Colombia's exposure to natural hazards and its growing number of interconnected risks require strong disaster risk management capacities anchored in an effective risk governance framework. Colombia's topography and climate have shaped the country's exposure to a wide range of natural hazards, including earthquakes and volcanic eruptions, as well significant hydro-meteorological risks. Rapid urbanisation, climate change and years of armed conflict are some of the factors that have influenced the frequency, scale and complexity of disaster events. An increase in natural resource extraction, including hydropower and hydraulic fracturing, has brought about interconnected Natech (natural hazard triggering technological) risks. To manage this increasingly complex landscape of risks, Colombia needs an effective risk governance framework that revolves around a strong central leadership that steers and coordinates governmental and non-governmental stakeholders to contribute to a shared risk reduction agenda.

This OECD disaster risk governance scan evaluates Colombia's progress in implementing the risk governance framework established through Law 1523/2012, which aimed at providing an overarching risk governance framework that anchors the country's disaster risk management in the national policy agenda, embracing a culture of disaster risk reduction in addition to a strong disaster preparedness and response capacity. This chapter summarises the OECD's assessment of Colombia's risk governance framework and provides a set of policy recommendations that seek to inform Colombia's disaster risk management work going forward.

Assessment

The strategic value of Colombia's national risk governance framework

The introduction of Law 1523/2012 established a comprehensive multi-hazard framework that is strongly anchored in the national policy agenda. The law considers natural hazards as well as Natech risks, and unintentional man-made hazards. Intentional man-made hazards, such as terrorism, do not fall under its provisions. Since the introduction of the law, disaster risk management has also been included in the National Development Plan as a cross-cutting priority to be embedded in national sectoral as well as territorial planning, to ensure sustainable development in Colombia.

Colombia has recognised the need for mainstreaming disaster risk management across government agencies at central and subnational level, as well as among non-governmental actors. Law 1523/2012 formally recognises the importance of a whole-of-government and a whole-of-society approach to disaster risk management. While detailed responsibilities for governmental actors can be found in the law, the national disaster risk management plan and the annual monitoring reports, the contributions expected from households and businesses have not been clearly spelled out. Nonetheless, there are a number of good practices in disaster risk management emerging from businesses, including critical infrastructure.

The National Unit for Disaster Risk Management (Unidad Nacional para la Gestión del Riesgo de Desastres, UNGRD) holds the central government leadership function for disaster risk management in Colombia. Law 1523/2012 established the agency as part of the centre of government through the Administrative Department of the Presidency of the Republic. The UNGRD has carried out its leadership function through the formulation of the National Strategy for Disaster Risk Management, the provision of technical assistance and an oversight function, as well as facilitating the collaboration of all key stakeholders to work together in the implementation of national priorities. Although technical assistance

has helped to foster the implementation of the disaster risk management agenda, there remains a significant untapped potential for the UNGRD to mobilise central disaster risk funding instruments to encourage disaster risk management investments across government departments and levels of government.

Colombia has established inter-institutional platforms to foster cross-sectoral and cross-governmental coordination in implementing the disaster risk management agenda. The UNGRD organises the inter-agency coordination through a national Disaster Risk Management Council and three technical committees that convene all the relevant governmental and non-governmental stakeholders. Although the roles for each committee are clearly defined, actual activities have overlapped. In addition, linkages between the committees that could inform their work respectively have not yet been fully leveraged.

Colombia has established a number of channels for non-governmental stakeholders to participate in policy-making. Online consultation processes, town hall meetings and public hearings are used to give those stakeholders the opportunity to participate in the policy-making process. Some disaster risk management policies, such as land-use planning and building code development, are open to public consultation. In other areas, such as hazard assessments and decisions on structural disaster risk management measures, there is room to better engage non-governmental actors in the policy-making process.

The Colombian disaster risk management framework recognises the importance of transparency and accountability, and several practices show progress in implementation. For example, the results of the annual monitoring of the implementation of the National Disaster Risk Management Plan are published online. Financial support for disaster recovery and reconstruction, as well as investments in disaster risk reduction are subject to the provisions of the Anticorruption Plan, which promotes transparency in the use of public resources.

Disaster risk identification and assessment

Significant progress has been made to identify and assess natural hazards in Colombia, while risk assessments are increasingly prioritised. While at the national level hazard assessments have become available for almost all types natural hazards, more granulated information that can inform local-level decision making is still missing. Tying in hazard information with data on exposures in order to obtain risk information has been recognised as a priority in national policies, but risk information is still scarce. There is scope to improve the sharing of hazard and risk knowledge between public and private stakeholders to improve, in particular, the understanding of interconnected and systemic risks. The National Disaster Risk Management Plan does not foresee a national risk assessment, an important tool to guide priority setting in disaster risk management.

Disaster risk reduction

Disaster risk reduction have become a core priority embraced in Colombia's current disaster risk management legislation and national policy framework. Colombia has embraced a two-pronged approach to disaster risk reduction, which consists of avoiding the creation of new risks on the one hand, and the reduction of existing risks on the other. While a significant number of efforts have been put into the avoidance of the creation of new risks, a major issue, which is informal housing in disaster-prone areas, has not been addressed yet in a comprehensive strategy. Current disaster risk reduction policies also fall short of designing a role for households in avoiding the creation of new risks. To foster implementation of policy priorities in disaster risk reduction, the UNGRD has not yet made

full use of the potential of using central funding mechanisms, such as the National Disaster Risk Management Fund or the National Adaptation Fund, to support national government agencies or subnational governments in implementing disaster risk reduction measures.

Disaster preparedness and response

A solid disaster preparedness and response management system has been established in Colombia, with clear roles and responsibilities for all relevant stakeholders. The National Disaster Risk Management Plan formulates concrete disaster preparedness objectives for public stakeholders in the National Disaster Risk Management System. With the National Strategy for Disaster Response, an emergency management plan accompanied by response protocols is in place at the national level, requiring service providers to have their own emergency management plans in place. Regular crisis management exercises and drills are organised by the UNGRD together with stakeholders and a National Crisis Room enables effective co-operation in case of a disaster.

Disaster recovery and reconstruction

Colombia's national policies have focused on the avoidance of recreating existing risks in the rehabilitation and reconstruction process. However, it is not clear how post-disaster financial assistance in Colombia is designed to foster a risk-avoidance approach. Colombia has not established mechanisms that allow it to systematically draw lessons in the aftermath of a disaster to improve the response mechanisms over time.

Recommendations

Strategic governance framework of disaster risk management

- *Reinforce the effectiveness of cross-governmental co-ordination and co-operation.* The role of inter-institutional platforms could be more clearly defined to avoid redundancies, while linkages and information exchanges between the different platforms could be reinforced to improve effectiveness.
- *Design sector-specific disaster risk management strategies, for those sectors most affected by disasters*. The strategies should aim at fostering a risk culture, strengthening institutions, including regulatory frameworks, to carry out disaster risk management activities. Finally, sectoral strategies should establish clear plans to fund disaster risk management activities.
- *Make room for learning.* The results of the annual monitoring report of the implementation of the National Plan for Disaster Risk Management provide an excellent opportunity to suggest changes in the course of action. Similarly, systematically assessing the lessons learnt in the aftermath of a disaster can help improve the performance of Colombia's disaster risk management system over time. This function could be incorporated in the National Committee for Disaster Management.
- *Make stakeholder engagement tools meaningful in the policy-setting process.* To make policy processes truly open and inclusive, a two-way communication process should be fostered that ensures that contributions of stakeholders are taken into account in the actions taken by disaster risk managers.

Whole-of-society engagement in disaster risk management

- *Determine clear roles and responsibilities for households and businesses in disaster risk management.* Responsibilities for households and businesses could be more clearly formulated. This could include the introduction of specific resilience requirements, such as business continuity plans or structural reinforcement measures that go beyond the existing requirement to develop emergency management plans. Technical support by government agencies can help reinforce capacities.
- *Strengthen the engagement of critical infrastructure owners and operators in resilience management.* This can include a requirement to conduct regular risk assessments on an infrastructure asset or operator level. Government agencies can support this by sharing the results of public risk identification and assessment exercises. Supporting the development of insurance markets for critical infrastructure could increase the uptake of risk transfer measures.
- *Explore public private partnerships in the process of strengthening resilience of non-governmental actors.* Public-private partnerships could be useful vehicles to strengthen resilience of all actors, for example for working together on conducting and sharing information on the results of risk assessments, or for exploring the options for developing risk transfer markets.

Disaster risk identification and assessment

- *Encourage an all-hazards approach to disaster risk identification and assessment.* This involves closing gaps in covering all areas of socio-economic activity with all-hazard maps. Based on an identification of prevalent hazards, interconnected risks, including Natech risks, should be evaluated to improve the effectiveness of resilience measures.
- *Consider conducting a national risk assessment.* A national risk assessment brings all stakeholders together to assess risks in an integrated way to build consensus across government concerning strategic investments and policy priorities throughout the disaster risk management cycle.
- *Scale-up disaster risk assessment efforts.* To prioritise disaster risk management measures, hazard assessments should increasingly be complemented by risk assessments that take account of the exposure and vulnerability of people and economic assets to prevailing hazards. To that end, an assessment of the capacities to generate and use risk knowledge by the different responsible entities might be useful, to devise areas that need technical reinforcement.
- *Promote the use hazard and disaster risk information in policy making and implementation.* Consistently use hazard and disaster risk information in determining and prioritising disaster risk management measures. Harness hazard and disaster risk information in land-use planning as well as in building code development and application.

Disaster risk reduction

- *Strengthen disaster risk reduction efforts by technical units and key sectoral institutions* through capacity building activities and training programs.

- *Set incentives for all government agencies to encourage disaster risk reduction investments*. This could include using central funding mechanisms, such as the National Disaster Risk Management Fund, to co-finance disaster risk reduction actions by all government agencies, as well as by subnational governments.
- *Take targeted action to avoid the creation of new risks through unplanned urbanisation.* Such action could include strengthening enforcement capacities for land-use regulations and building codes or the use of financial incentives to discourage informal settlements in hazard-prone areas.
- *Address the specific vulnerabilities of the poor to disaster risks.* This could include disaster risk communication tailored to low-income households and specifically designed training in emergency preparedness and response. Furthermore, technical assistance could be made available for building resilience into affordable housing programs. Finally, social protection mechanisms could be used more systematically to integrate support for low-income households affected by disasters.

Emergency preparedness and response

- *Continue to strengthen early warning systems throughout the country*. Available warning systems, such as seismic warning systems, should be upgraded to real-time early warning systems that converge in a national response coordination centre to activate disaster response at the appropriate scale.
- *Ensure consistent emergency management capacities at all levels of government for effective disaster response at appropriate level*. This includes ensuring national coverage with crisis rooms, co-ordinated by the National Crisis Room. Standardised training modules and civil protection exercises could contribute to further strengthening disaster management capacities.

Disaster recovery and reconstruction

- *Maximise the disaster risk reduction potential with the available funding for recovery and reconstruction.* Post-disaster assistance should be provided in a way that clearly incentivises betterment (i.e. build back better), by requiring resilience measures as part of the supported reconstruction efforts or by aligning the size of assistance with the implementation of disaster risk reduction measures.
- *Ensure transparency in the use of disaster recovery and reconstruction funding to increase efficiency in resource use*. This could include publishing how the funds for public disaster recovery and reconstruction were allocated to recipients.
- *Establish clear cost-sharing mechanisms for disaster recovery and reconstruction across levels of government.* Predetermined cost-sharing mechanisms help reduce the level of unplanned expenses in the aftermath of disasters and encourage disaster risk reduction investments by subnational levels of government.
- *Evaluating options for disaster risk insurance to boost the financial resilience of households and businesses.* Disaster risk insurance can be an effective mechanism to encourage investments in disaster risk reduction and nurturing a culture of risk among households and businesses. Such insurance mechanisms also reduce the eventual liability for the central government in case of a disaster.

Chapter 2. National context for disaster risk management in Colombia

Colombia is exposed to a continuously changing risk landscape. Natural hazards, such as earthquakes, volcanic eruptions, as well as floods, droughts and storms threaten most of the country. In addition, new emerging risks, such as natech risks, put Colombia's disaster risk management system to test. A large-scale influx of migrants from the bordering Bolivarian Republic of Venezuela presents new challenges to managing crises and their longer term implications. Other socio- economic factors have contributed to the continuous increase in disaster risk across the country. Years of armed conflict have resulted in internal displacement and contributed to often unplanned urbanisation in hazard-prone areas. Changes in Colombia's climate are expected to drive disaster risk in the future.

Colombia's exposure to natural hazards is significant

Located in the north-western part of South America, Colombia is characterised by its diverse topography and climate, making it prevalent to a range of natural hazards, both geophysical, such as earthquakes and volcanic eruptions, as well as hydro-meteorological, such as floods, droughts and storms (Table 2.1). An estimated 90% of Colombia's population and assets are exposed to at least one source of hazard, with over 80% exposed to two or more (OECD/UN ECLAC, 2014; OECD, 2014; GFDRR, 2017; DNP, 2018). Hydrometeorological phenomena have been the most recurrent cause of disasters, making up 85% of all recorded disaster events since 1998 (UNGRD, 2018). Major disasters can produce significant death tolls ((EM-DAT, 2017); see Table 2.2), with single events, such as the volcanic eruption in Nevado del Ruiz in 1985, which caused over 20 000 deaths (Figure 2.2). More recently, in 2017, a landslide in the Andean city of Mocoa cost 329 lives (EM-DAT, 2017; BBC, 2017; Reliefweb, 2017; Aon Benfield, 2017).

Table 2.1. Types of natural hazards prevalent in Colombia

Natural hazard category	Type of natural hazards
Geophysical	Earthquakes, volcanic activity, tsunamis
Hydro-meteorological	Floods, landslides, storms, droughts

Source: (EM-DAT, 2017)

Table 2.2. Major disasters in Colombia (since 1980)

Disaster event/location	Year	Fatalities	Estimated damage (in USD)
Earthquake/Popayán	1983	250	410 million
Volcanic eruption/Nevado del Ruiz	1985	21 800	1 billion
Landslides Villatina/Medellin	1987	650	*not available*
Earthquake/Armenia	1999	1 200	1.8 billion
Flood (La Niña)/Salgar, Gramalote)	2010/11	1 374	6.3 billion
Landslide/Mocoa	2017	329	*not available*

Sources: (EM-DAT, 2017; Aon Benfield, 2017)

In terms of economic costs, estimates suggest that disasters in Colombia cause average annual losses between USD 177 million (Campos Garcia et al., 2011)and USD 381 million (PreventionWeb, 2017), with specific events, such as the 2010/11 La Niña disaster (Box 2.1), producing cumulated damages of around USD 6.3 billion (Figure 2.3), equivalent to about 2% of Colombia's gross domestic product (GDP) (OECD/UN ECLAC, 2014; CEPAL, 2012).

With most of the resources to finance the response to disasters coming from the government, the fiscal impact of major disaster events can be significant. Annual average disaster-related contingent liabilities for the government have been estimated at USD 490 million, equal to 0.7% of the 2010 government budget and 0.2% of 2010 GDP. Taking the 2010/11 La Niña events as example, only an estimated 7% of damages were insured (OECD, 2014). This makes disasters the second largest fiscal risk to the government of Colombia, after legal claims against the government (OECD/ World Bank, Forthcoming; GFDRR, 2012).

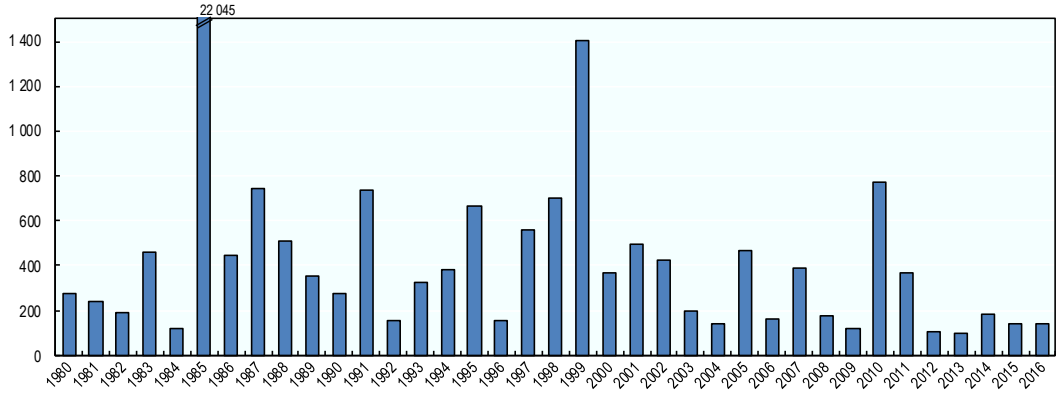
Box 2.1. The 2010/11 La Niña rainy season

The 2010/11 La Niña rainy season was marked by intense rainfall across Colombia, causing numerous floods and landslides throughout the country. In the north and Pacific regions, precipitation rates exceeded twice the average of previous years. More than 2 000 emergencies were declared, of which over half were due to floods. Over USD 6 billion in damages were registered, predominantly affecting housing (44%) and infrastructure (38%). The rainy season also affected economic activity, causing 2% of GDP in economic losses and a 2.8% decrease in the share of the working population.

Aggravated by the environmental degradation associated with deforestation and unplanned changes in land use, La Niña illustrated the significant underlying drivers of risks. It also demonstrated the need for Colombia to fully embrace disaster risk reduction, and specifically disaster risk communication, and to take the future drivers of disaster risk, including changes in climate, into account.

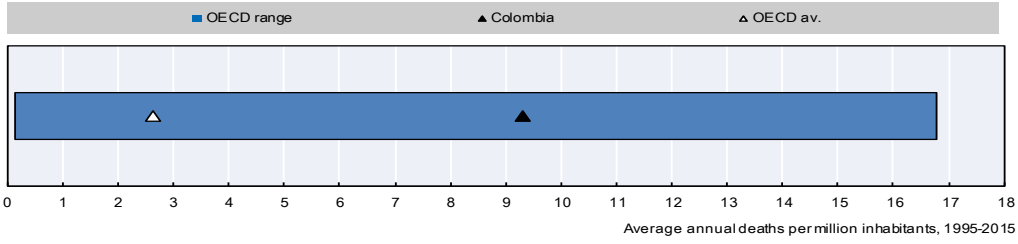
Source: CEPAL (2012), IDB-ECLAC (2012).

Figure 2.1. Disaster-related deaths in Colombia



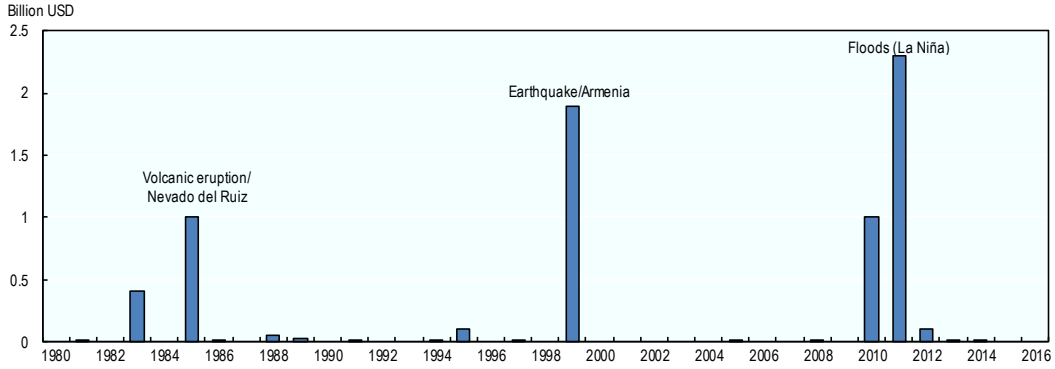
Sources: (GTD, 2016; EM-DAT, 2017)

Figure 2.2. Average annual deaths per million inhabitants in Colombia and across the OECD, 1995-2015



Note: Due to methodological differences in the attribution of deaths to heatwaves, the figure comparing average deaths per million inhabitants against the OECD average excludes these deaths. In line with the all-hazards approach taken by OECD (2014b), deaths due to intentional man-made hazards are included.
Sources: (GTD, 2016; EM-DAT, 2017)

Figure 2.3. Total annual damage from disasters in Colombia



Note: Data are based on the EM-DAT database of the Catholic University of Louvain. The total annual damage represents the sum of the damage caused by all types of disaster events in a given year. Figures are true to the year of the event. "0"values could mean that no disasters occurred, or that disasters that occurred had no damage recorded.
Source: (EM-DAT, 2017)

A number of factors have been driving Colombia's disaster risk exposure

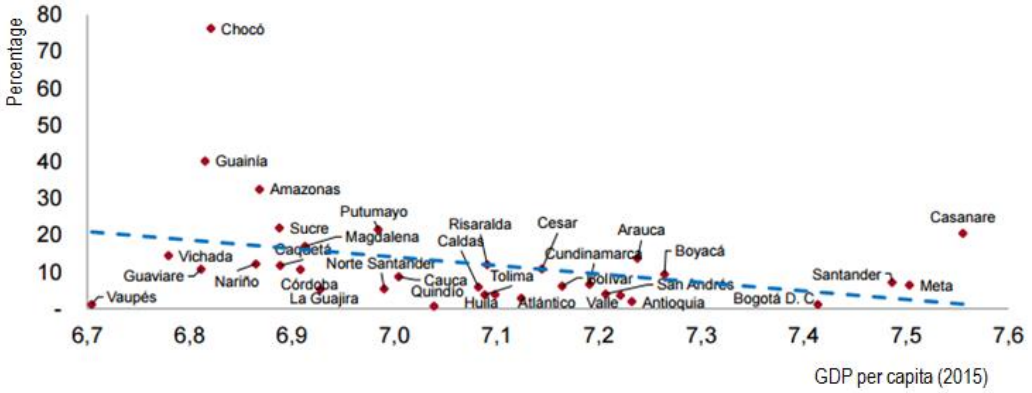
Disaster risk in Colombia has been influenced by a number of socio-economic and environmental factors.

Fast-paced and often unplanned urbanisation in hazard-prone areas has contributed to an increase in disaster risks, with a significant impact on the urban poor. The capacity of the state to provide public services and housing has not grown at the same speed to meet the needs of this rapidly growing population. An estimated 77% of Colombia's population lives in large metropolitan areas, up from around 45% in 1960 (World Bank, 2012). Urban areas are concentrated along the Andean mountains as well as along the Caribbean and Pacific coastal areas. With over 20 000 citizens per square kilometre, the three biggest cities – Bogota, Medellin and Cali – have among the highest population densities in South America.

Forced displacements caused by decades of armed conflict (Box 2.2) and the recent influx of migrants from the bordering Bolivarian Republic of Venezuela (Box 2.3) have contributed to the trend of rapid urbanisation. The pressure to expand urban areas to accommodate citizens has forced construction to take place in unsuitable areas, such as on steep slopes and terrains at the foothills of the Andean mountains (Parés-Ramos, Álvarez-Berríos and Aide, 2013).

Vulnerable people in particular, such as the poor, end up living in informal, hazard-prone housing, with lower-income households often overrepresented in hazard-prone areas. In Bogota, for instance, more than 200 000 people are estimated to live in high-risk areas, many of them living below the poverty level. As a result, the impact of disasters is comparably higher where per capita income is lower, calling for targeted policy action (Baker, Anderson and Ochoa, 2012; Winsemius et al., 2015).

Figure 2.4. Population affected by hydro-meteorological hazards 2010-2015 vs. GDP per capita



Source: DNP, 2018.

Changes in Colombia's climate in the long run and in climate variability in the short run are expected to add to the uncertainty of future disaster events. The expected influence of climate change differs by geographic region. The Caribbean and Andes regions are projected to change from a semi-humid to a semi-arid climate. As a consequence, the Andean glaciers are expected to shrink, which in turn increases the risk of landslides, as slope stability is reduced. Similarly, the risk of flooding may increase as glacial water is set free at faster rates. Deglaciation along Colombia's several glacier-clad volcanoes is expected to drive volcanic activity and associated hazards. Climate change-related sea-level rise is expected to increase coastal flood risk. In the Amazon region, increases in precipitation are expected to drive flood risk, while rainfall levels in the eastern savannah are expected to drop, increasing drought risk (OECD, 2013; Schaub et al., 2013; Huggel et al., 2007; OECD, 2014).

Another man-made hazard that is expected to drive Colombia's future exposure to risk is the exploration of new sources of energy, such as hydraulic fracturing – or fracking – and hydropower. Among other factors, the rising exploration of oil and gas through fracking and the significant expansion of hydropower through major hydropower plants are expected to create major interconnected, Natech risks. The recent Ituango hydropower (Hidroituango) project illustrates the potential threat these interconnected risks may pose (Box 2.4) (Villamizar, 2018; National University of Colombia, 2018; Bogota Post, 2017; Bogota Post, 2018).

Box 2.2. Managing conflict and post-conflict challenges in disaster risk management

After decades of internal armed conflict, the 2016 peace agreement between the Revolutionary Armed Forces of Colombia (FARC) and the Colombian government is being implemented, while another peace agreement is being negotiated with the National Liberation Army (ELN).

Colombia's 2016-18 Strategic Plan for the Defence and Security Sector seeks to reduce the principal criminal phenomena associated with organised armed groups and organised criminal groups. This places the country in a transitory state, where some areas are still suffering from the

effects of the armed conflict whilst others are transitioning towards a post-conflict scenario.

In this hybrid context, the worst affected communities continue to be the poorest ones, including the communities of Afro-Colombian descent and indigenous people. These communities tend to be those that are harder to reach in terms of public service. As a consequence, victims of the conflict are therefore also more vulnerable as they have limited capacity to cope. Effectively linking victim support and other aspects of the peace process with disaster risk management is an important challenge.

Source: Colombian Ministry of Defence (2016).

Box 2.3. The novelty of Venezuela's migrant crisis for Colombia's disaster risk management

Since 2013, and in particular since 2015, tens of thousands of migrants from Venezuela have arrived in Colombia in search of protection and economic alternatives. Between July 2017 and January 2018, the number of Venezuelans in Colombia doubled, from 300 000 to nearly 600 000.

The International Federation of the Red Cross estimates that the number of people crossing the border between Colombia and Venezuela has been growing since mid-2017 and has recently increased significantly. Between 2 000 and 10 000 people are estimated to move every day across the border and within Colombia. This sudden increase in migrants has placed the National Disaster Risk Management System under pressure to understand the extent of the situation and its effects, and to co-ordinate the protection requirements of this vulnerable population. The National Unit for Disaster Risk Management (Unidad Nacional para la Gestión del Riesgo de Desastres, UNGRD) has engaged in efforts to understand the scale of the situation by conducting a census of those who have entered the country recently and is working with international humanitarian agencies to address the most critical needs. A key challenge remains to move beyond the immediate humanitarian response towards a process that enables the receiving communities to cope with further population movements, while at the same time continuing to assess the situation to identify longer term strategies.

Sources: IFRC (2018), Humanitarian Response (2018).

Box 2.4. The risk of inter-connected natural and man-made risks: The case of the Hidroituango hydropower dam

Located along the Cauca River in Antioquia, the Ituango hydropower (Hidroituango) dam was initially conceived in the 1980s, but construction did not begin until 2011. The dam is one of the most ambitious and biggest hydropower projects in Latin America. Once completed, it is expected to supply 17% of Colombia's electricity demand.

In 2018, shortly before the expected start of the operation of the dam, heavy rains and landslides blocked the only diversion tunnel that was still in use at the time. This caused the reservoir to fill up and threatened the dam to break, potentially flooding downstream communities. When the other two diversion tunnels eventually opened, the sudden increase in water flow required the evacuation of approximately 25 000 inhabitants in Córdoba, Sucre, Bolívar, Antioquia and Puerto Valdivia. The dam operator, Empresas Públicas de Medellín (EPM), provided temporary shelter for the affected population.

The Hidroituango incidence illustrates the critical importance of assessing and managing risks that large infrastructure investments may generate. Effective disaster risk management requires the sharing of information on prevailing risks and their interconnected nature, adherence to resilience standards, as well as emergency plans in case a risk materialises.

Sources: Villamizar, E. (2018), National University of Colombia (2018), Bogota Post (2018).

Although rare in occurrence, the damage potential of earthquakes and volcanic eruptions is significant

Due to its location on the Pacific Ring of Fire, where the Nazca, Cocos and Pacific plates converge, Colombia is prone to strong earthquakes. The areas most at risk are the densely populated Andean mountains ranging from the south-western part to the north-eastern part of the country, as well as the coastal areas in the north-west, where the majority of the Colombian population and important economic centres are concentrated. An estimated 86% of Colombia's population is exposed to medium to high earthquake risk (GFDRR, 2017; World Bank, 2012).

The most recent devastating earthquake occurred in 1999 in Armenia, the central coffee-growing region. It killed an estimated 1 200 people, and caused economic losses of around USD 1.8 billion, making it one of the most impactful disasters in Colombia's recent history (Box 2.5). The experience of the 5.5 magnitude earthquake that struck Popayán in 1983, causing 300 deaths and around USD 410 million in damages, resulted in the adoption of Colombia's first code for seismic-resistant building in 1984 (EM-DAT, 2017).

In addition to earthquake risks, the Pacific Ring of Fire exposes the country to the risk of volcanic eruptions. Fifteen active volcanoes are spread throughout the Northern Volcanic Zone of the Andean Volcanic Belt, where much of the Colombian population and economic activity is concentrated. The glacier-clad Nevado del Ruiz volcano is one of Colombia's most active volcanoes, and has erupted several times in the past 40 years. One of the most

forceful eruptions occurred in 1985, resulting in 23 000 fatalities and an estimated USD 1 billion in damages. The Galeras volcano in the west of Colombia has also shown activity in recent years. In 2009 and 2010, a series of small eruptions caused repeated evacuations of surrounding towns (Klemetti, 2012; VolcanoDiscovery, 2018; Carreño et al., 2009).

Box 2.5. The 1999 Armenia earthquake

The Armenia earthquake occurred on 25 January 1999 and affected Colombia's central coffee-growing region (Quindío, Risaralda, Caldas, Valle del Cauca and Tolima). Even though the earthquake had a relatively moderate magnitude of 6.2, its occurrence on volcanic soil and anthropogenic landfills coupled with limited preparedness capacity brought about significant losses.

The earthquake caused an estimated 1 200 casualties and USD 1.8 billion in losses, with housing losses alone making up a third and many historic churches destroyed. Over 60% of buildings were destroyed due to the disregard for building codes. The collapse of several hospitals further undermined the capacity for dealing with such a large-scale disaster, hindering the emergency assistance available for injured people. The disruption of critical infrastructure, such as transport and communications, further complicated disaster response efforts.

Sources: CEPAL (1999), OSSO Corporation, N.D., Restrepo (2000).

Colombia's extensive coastlines generate significant risks

The Caribbean coast in the north-east and the Pacific coast in the west generate significant risk of coastal flooding due to tsunamis. Tsunami risk is most pronounced along the Pacific coast, where Colombia borders the Pacific Ring of Fire, and to a lesser extent along the Caribbean coast, where the Caribbean and the South American plates converge (DIMAR, 2013). The 1979 Tumaco tsunami was one of the most destructive and followed an earthquake that occurred in this subduction zone. The tsunami killed an estimated 450 people (DIMAR, 2013; Otero, Restrepo and Gonzalez, 2014)

Hydro-meteorological risks make for the most damaging and frequently recurring disasters

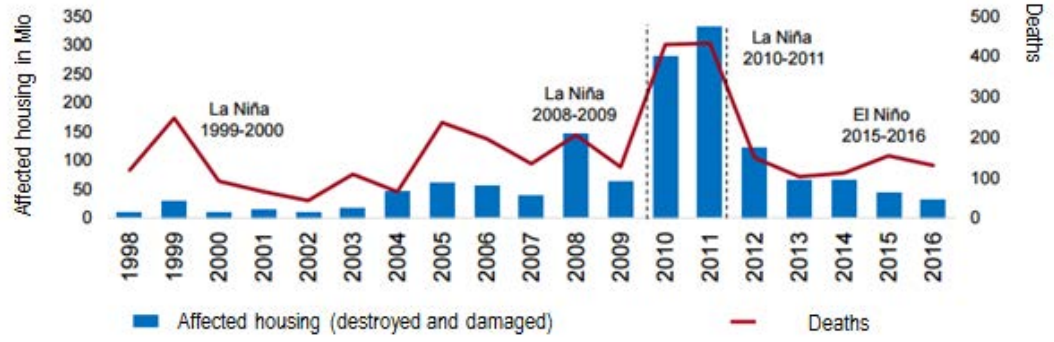
Hydro-meteorological disasters have been Colombia's most costly source of hazards due to its high recurrence. With a tropical climate causing frequent and heavy rains, and a high number of rivers and streams, flood risk throughout Colombia is high. During the rainy seasons in April and November the Caribbean north, the Magdalena and Cauca rivers, and the eastern savannahs are particularly prone to flooding. Many of Colombia's main economic centres are located along rivers and coasts in areas particularly exposed to flooding. High urbanisation rates coupled with the construction of housing and infrastructure in vulnerable areas have increased exposure to flood risk. Deforestation along basins and streams is also increasing flood risk, as soil absorption rates are reduced and areas for runoff limited (GFDRR, 2017; DNP, 2018). The La Niña weather phenomena have aggravated the frequency and intensity of precipitation, leading to devastating

disasters such as the 2010/11 events that caused damages equivalent to 2% of Colombia's gross domestic product (GDP) (Box 2.1) (CEPAL, 2012; GFDRR, 2017; Reliefweb, 2017).

Landslides are an interlinked risk with high precipitation and floods. They pose a particular threat to Colombia's densely populated Andes region, as well as to parts of Putumayo, the Amazon region and Arauca. Some 66% of all disaster-related deaths are caused by landslides. A series of landslides occurred in early 2017, with the Mocoa landslide alone killing 329 people (DNP, 2018; EM-DAT, 2017).

Storms are another hydro-meteorological risk prevalent in Colombia. Areas along the Caribbean coast are particularly vulnerable to the impact of tropical storms and hurricanes. The 1988 hurricane Joan was one of the most impactful tropical storms, causing landslides and floods that left USD 50 million in damages in its wake. More recently, hurricanes Matthew in 2016 and Maria and Harvey in 2017 caused extreme rainfall and flooding along the Caribbean coast (EM-DAT, 2017; Ortizo Royero, 2012; Adriaan, 2017).

Figure **2.5**. **Deaths and damaged houses due to hydrometeorological hazards, 1998-2016**



Source: (DNP, 2018)

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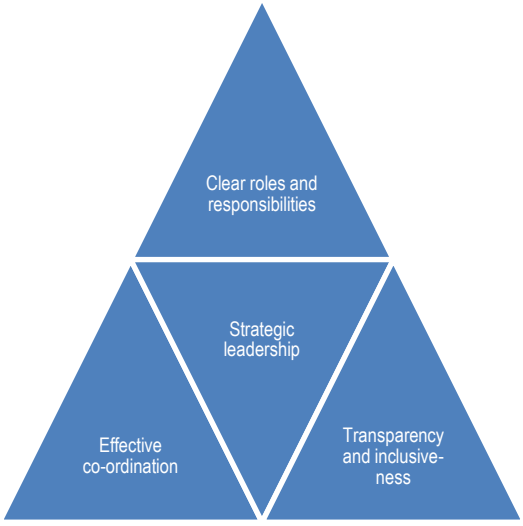
Chapter 3. Colombia's strategic framework for disaster risk governance

This chapter assesses the ability of Colombia's risk governance system, anchored in Law 1523/2010, to support policy outcomes for sustainable and inclusive development across the country. Law 1523/2012 is evaluated against its capacity to provide strategic guidance and to anchor disaster risk management in the national policy agenda. It also reviews the framework's ability to devise clear roles and responsibilities and to convene all relevant actors to co-ordinate national disaster risk management policies and measures under the strategic leadership of a central lead institution. The chapter also assesses transparency and inclusiveness in the policy formulation and implementation process as key elements of good disaster risk governance.

This risk governance scan seeks to assess Colombia's Law 1523/2012, which provides a disaster risk governance framework for Colombia, in its ability to support policy outcomes for sustainable and inclusive development across the country. For a disaster risk governance system to effectively support the fulfilment of these objectives, it has to be strongly anchored and tied into the national policy agenda, so that all stakeholders integrate disaster risk as a priority action in their policies and implementation processes. To this end, the *OECD Recommendation of the Council on the Governance of Critical Risks* (OECD, 2014) suggests designating a lead institution at national level to provide comprehensive and strategic leadership and guide the actions of all other governmental and non-governmental stakeholders towards the fulfilment of these shared objectives.

This chapter assesses the ability of Colombia's risk governance system to fulfil these objectives (Figure 3.1). It evaluates its leadership role against its capacity to provide strategic guidance, but also in its ability to devise clear roles and responsibilities and to convene actors to co-ordinate national policies and risk priority actions. Furthermore, this chapter will evaluate transparency and inclusiveness in the policy formulation and implementation process. The degree of inclusiveness influences the ability of the government to establish ownership of risks and engage stakeholders in disaster risk management actions. Along with transparency, inclusiveness is an important factor in establishing trust among societal actors that the government manages risks appropriately and that it renders itself accountable for its actions.

Figure 3.1. Elements of good disaster risk governance



Source: Based on (OECD, 2014)

Historical development of Colombia's disaster risk management institutions

Given the prevalence of natural hazards in Colombia, the first formal institutions were established in 1948,[1] giving the Colombian Red Cross, a civil society organisation, the responsibility for preparing for and responding to disasters. Subsequent laws expanded the set of stakeholders involved in managing disasters, eventually making it a core government responsibility, with the National Civil Defense Bureau (Dirección Nacional de la Defensa Civil) as lead institution.[2] To co-ordinate the growing number of stakeholders that manage disaster response, the National Sanitation Code of 1979 created the National Emergency

Committee (Comité Nacional de Emergencias) with its subnational equivalents, the local and regional emergency committees (*comités regionales y locales de emergencias*). In 1984, the National Calamities Fund (Fondo Nacional de Calamidades) was established to finance the response to disasters (World Bank, 2012).

In Colombia, as in many other OECD countries, policy development in this area has often evolved as a response to major events. The creation of the National System for Disaster Prevention and Response (Sistema Nacional para la Prevención y Atención de Desastres, SNPAD)[3] in 1989 marked an important shift from a focus on disaster response to the consideration of disaster risk reduction measures. Drawing the lessons from the Nevado del Ruiz volcanic disaster in 1985 and the earthquake in Popayan in 1983, Law 46 introduced legal responsibilities for disaster risk reduction. In 1998, the Ministry of Interior issued the Plan for Disaster Prevention and Attention (Plan Nacional de Prevención y Atención de Desastres, PNPAD), which sought to strengthen disaster risk reduction in all phases of the disaster risk management cycle. It aimed at improving capacities to conduct risk identification, assessment and communication; at integrating risk in public investment projects at national and subnational level as well as in land-use planning; at establishing risk-informed building codes and infrastructure protection mechanisms; and at integrating resilience measures in the recovery and rehabilitation phase (Colombian Ministry of the Interior, 1998). Decree 919 established subnational governments to mainstream disaster risk management into local and regional development plans and public policies and required vulnerability analyses for large public works. Subsequent legislation further anchored disaster risk reduction in the law by prescribing risk-informed land-use planning and by limiting construction in hazard-prone areas (World Bank, 2012).[4]

Strategic value of the new national legal and policy framework

Disaster risk management at the heart of the national development agenda

With the adoption of Law 1523/2012[5], Colombia established a comprehensive legal framework that guides all national and subnational government stakeholders in the implementation of an integrated approach to disaster risk management, from disaster risk identification to recovery and rehabilitation.

As noted in the *OECD Council Recommendation of the Council on the Governance of Critical Risks* (OECD, 2014), for a disaster risk governance framework to be effective, it should be strongly embedded in the national policy agenda.

Disaster risk management is anchored in the government's national development agenda. In Colombia, the national policy priorities are laid out in the National Development Plan (Plan Nacional de Desarollo, PND); the most recent version of the PND covers the period 2014-18. The PND sets out policy priorities of the government for a four-year period, formulating key policy objectives and priorities for public investment spending as well as planned budget allocations. The current PND contains five overall policy objectives and a transversal priority on green growth. Disaster risk management is prominently placed in this transversal component of the PND, which demonstrates the government's recognition of the cross-cutting nature of disaster risk management and the need for embedding it in national sectoral as well as territorial development plans (DNP, 2014).

The management of disaster risks is recognised as a key factor for Colombia's sustained and inclusive development. The National Development Plan describes disaster risk and the interconnected risk of climate change as potentially undermining factors for the country's economic competitiveness, affecting the sustainability of key infrastructure investments

and threatening the quality of life for its population, especially the poorest segment. To reduce disaster risks, the PND recommends strengthening the National System for Disaster Risk Management (Sistema Nacional de Gestión del Riesgo de Desastres, SNGRD), to carry out the activities set out in Law 1523/2012, recognising the National Unit for Disaster Risk Management (Unidad Nacional para la Gestión del Riesgo de Desastres, UNGRD) as the national lead organisation. The PND acknowledges the importance of mobilising all national stakeholders to contribute to the SNGRD as well as to improve the technical capacity for managing disaster risks (DNP, 2014).

This section will evaluate the SNGRD against the four key quality aspects that characterise an effective disaster risk governance framework (Figure 3.1), based on the criteria spelled out in the OECD Recommendation (OECD, 2014):

1. the quality of its central government leadership
2. the clarity of roles and responsibilities attributed to different national and subnational as well as non-governmental stakeholders
3. the effectiveness of mechanisms for cross-sectoral and cross-governmental co-ordination
4. the openness and inclusiveness of its national policy and strategy formulation processes.

Box 3.1. Disaster risk management in Colombia's National Development Plan

The National Development Plan recognises Colombia as one of the most disaster-prone countries in Latin America. It highlights the devastating impact of recent disasters on public infrastructure and the vulnerable population, and the deteriorating impact disasters can have on the competitiveness of economic sectors. It also recognises the potential fiscal impact disasters may entail, particularly in light of changes in climate and in case of low probability high-loss events.

To reduce disaster risks in Colombia, the National Development Plan suggests strengthening the National Disaster Risk Management System, as defined by Law 1523/2012. In particular it aims at: strengthening the co-ordination of disaster risk management, ensuring the participation of all national sectoral stakeholders in the national committees; strengthening the technical assistance provided to assist subnational and sectoral entities in integrating disaster risk management in their activities; and monitoring the implementation of the National Plan for Disaster Risk Management. To achieve these objectives, the National Development Plan proposes to improve the use of funding available through the National Disaster Risk Management Fund to ensure allocations are made in line with Law 1523/2012 and with the objective to co-finance activities that foster the integration of disaster risk management across sectors and territorial development activities.

Table 3.1. Disaster risk management objectives in the National Development Plan 2014-18

Objective	Baseline (2013)	Target 2018
Co-financing of subnational and sectoral disaster risk management investments by the National Fund for Disaster Risk Management	5%	10%
Number of disaster risk management projects that receive technical guidance from the National Unit for Disaster Risk Management	0	100
Number of strategic sectors that integrate disaster risk management in their planning processes	0	3
Number of sectoral agendas that implement and monitor the National Plan for Disaster Risk Management	0	3
Number of national entities that report information to the National Unit for Disaster Risk Management to be integrated in the national information system on disaster risk management (SNIGRD)	0	8
Number of municipalities with guidelines on incorporating disaster risk management in the revision and adjustment of territorial land-use planning, articulated in the local investment plans	0	68

Source: (DNP, 2014)

The National Development Plan includes concrete objectives to be attained in the area of disaster risk management through 2018 (some exemplary indicators are presented in Table 3.1), including sectoral activities that are to be carried out to reduce existing risks as well as avoid creating new ones. Concrete roles are given to the Ministries of Housing and Territorial Development, Transport, Agriculture, Justice and Security, Finance and Public Credit as well as Mining and Energy. Each of the ministries should work to understand the exposure of sectoral infrastructure to disaster risks; to estimate potential losses and damages; to define risk reduction and protection strategies, including disaster risk insurance; and to mainstream disaster risk considerations in new public investment projects.

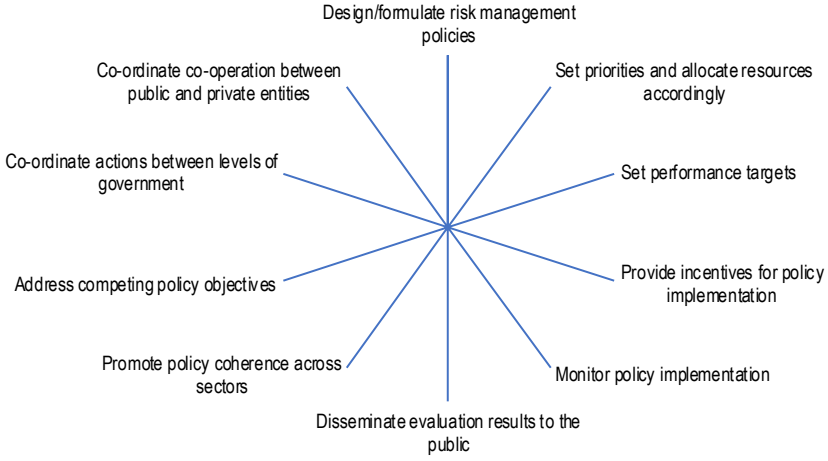
Source: DNP (2014).

Central government leadership

As noted in the OECD Recommendation, strong leadership at national level lies at the core of an effective disaster risk governance framework. The Recommendation calls for the designation of a national lead agency for the governance of critical risks, equipped with co-ordination and incentive-setting power for the entire disaster risk management cycle (OECD, 2014). Results from the 2016 OECD Survey on the Governance of Critical Risks show that most OECD countries designate such a lead institution at central government level, although the roles that are assigned to these institutions vary considerably across countries (OECD, 2018).

In Colombia, the UNGRD is the designated national lead agency for disaster risk management. The director of the UNGRD is a representative of the President of Colombia, whose responsibility includes the maintenance of security and health of the country's population. Established in 2011,[6] the UNGRD replaced the previous Directorate for Risk Management, which was part of the Ministry of the Interior and Justice. As an autonomous agency attached to the centre of government through the Administrative Department of the Presidency of the Republic (Departamento Administrativo de la Presidencia de la República, DAPRE), it has its own technical expert staff that is not subject to staff rotation rules applied to other civil servants that are part of the central government. Figure 3.2 illustrates the comprehensive leadership roles of the UNGRD. The only function that it does not cover is policy evaluation, which is the responsibility of the Department of National Planning (Departamento Nacional de Planeación, DNP).

Figure 3.2. Leadership roles of the National Unit for Disaster Risk Management



Note: The question asked: "Which of the following disaster risk governance functions does the UNGRD carry out?".
Source: 2018 OECD Colombia Risk Governance Survey.

The core leadership functions carried out by the UNGRD are:

1. the formulation of the national and strategic vision of the country's disaster risk management system and the design of national disaster risk management policies;
2. the provision of technical assistance for, as well as an oversight function of, the mainstreaming of disaster risk management policies into national sectoral and subnational development policies;
3. the facilitation of the co-ordination of all key stakeholders to work together on the implementation of national priorities;
4. the support and monitoring of the implementation of national policies.

Colombia's strategic vision is laid out in the National Plan for Disaster Risk Management (Plan Nacional de Gestión del Riesgo de Desastres, PNGRD), which currently covers the period 2015-25. The current PNGRD sets out goals and activities for each phase of the disaster risk management cycle and designates the stakeholder(s) responsible for their short-, medium- or long-term implementation. The current plan sets out priorities for actions largely on the basis of what stakeholders have already been doing, rather than orientating more ambitious ones to be reached by 2025 (UNGRD, 2016).

The UNGRD uses different instruments to mainstream disaster risk management into national and subnational policies. It organises technical workshops with different stakeholders from line ministries and subnational governments as well as with academia and civil society. The UNGRD works directly with line ministries responsible for critical infrastructure (transport, housing, agriculture) to mainstream disaster risk management objectives into their sectoral policies. At the subnational level, the UNGRD supports the implementation of disaster risk management actions through the intra-institutional committees, as well as through the territorial councils at state and municipal level (UNGRD, 2018).

The UNGRD leads and facilitates the co-ordination and co-operation among disaster risk management stakeholders. It brings all responsible stakeholders together to co-ordinate the implementation of the national policy priorities for disaster risk management. It carries out this function as the secretary of the intra-sectorial committees (see below), which are platforms to promote policy coherence, facilitate collaboration and address competing objectives, organised around different functions in the disaster risk management cycle (Lacambra et al., 2014).

The UNGRD fosters policy implementation through non-financial and financial incentive mechanisms. It provides non-financial incentives, such as the provision of technical guidelines and toolkits as well as training sessions on specific disaster risk management issues, and continued work refining the regulatory framework for disaster risk management. Further to this, the UNGRD carries out disaster risk communication campaigns (UNGRD, 2018). The UNGRD is also in charge of monitoring the implementation of projects as defined by the PNGRD and publishes monitoring results on its website[7] (Box 3.3).

Based on Law 1523/2012, the UNGRD can tap into the National Fund for Disaster Risk Management (Fondo Nacional de Gestión del Riesgo de Desastres, FNGRD) (Box 3.2) to provide financial incentives by means of co-financing to national sectoral units or subnational governments investing in disaster risk reduction measures. Although the concrete expenditures of the fund would have to be evaluated in more detail, it appears that it has been used to a limited extent to this end. It is mostly used to provide financial assistance in the event of a disaster, which leaves only limited room to co-finance disaster risk reduction projects. The unspecified requirement for allocating funding from sectoral budgets to the fund creates a second challenge, as it prevents forward-looking financial planning, and may result in underfunding (UNGRD, 2018).

To support the UNGRD in its steering function, Law 1523/2012 requires the UNGRD to establish a national information system (the SNGRD). To date some, but not all, available hazard maps can be found on the UNGRD's website, but there is little systematic information on other risk management functions. To be a useful tool, the national information system should also contain guidance on effective disaster prevention, preparation, response and recovery tailored to levels of government, as well as households and businesses (see Chapter 4) (UNGRD, 2018).

Box 3.2. The National Fund for Disaster Risk Management in Colombia

The National Fund for Disaster Risk Management (FNGRD) was initially set up as the National Calamity Fund, to provide financial assistance in the response to disasters. In 2012, with the introduction of Law 1523, the fund's purpose was expanded to leverage the implementation of the national risk management objectives spelled out in Law 1523/2012.

Law 1523/2012 divides the FNGRD into five sub-accounts, namely risk knowledge, risk reduction, disaster management, recovery and financial protection. The fund is administered by the Fiduciaria La Previsora and executed by the National Unit for Disaster Risk Management (UNGRD) and, in addition to providing emergency financial assistance, is supposed to co-finance risk reduction projects implemented by national sectoral agencies or subnational governments.

The FNGRD is operated as a special account with asset, administrative, accounting and statistical independence. In 2013, for example, the available resources were mostly used for risk reduction projects, followed by disaster management/response projects and, to a lesser extent, to finance risk knowledge activities. The annual allocation for the FNGRD is only able to provide limited initial response to an emergency and very little funding is dedicated to risk reduction measures (World Bank, 2012).

Sources: UNGRD (2016), Congress of Colombia (2012), World Bank (2012).

Stakeholder roles and responsibilities in the National System for Disaster Risk Management

In complement to the central government leadership function, an effective disaster risk governance framework establishes clear roles and responsibilities for all stakeholders. This includes roles for the whole of government, i.e. at national and subnational level, as well as for the whole of society, including non-governmental stakeholders.

In Colombia, the roles and responsibilities for disaster risk management are articulated through the SNGRD, created by Law 1523/2012. The SNGRD, whose structure is depicted in Figure 3.3, includes public entities (sectoral, territorial and institutional), private entities (for profit and non-profit) as well as individuals and households, and describes how their interaction is organised in the form of different councils and committees. The National Plan for Disaster Risk Management, as aforementioned, turns the provisions of Law 1523/2012 down into concrete actions and designates the stakeholder(s) responsible for their short-, medium- or long-term implementation (UNGRD, 2017).

Box 3.3. The biannual monitoring of Colombia's National Disaster Risk Management Plan

Regular monitoring of progress made in project implementation is important to keep track of project performance and task duration, and to identify potential bottlenecks and problems that could derail a project from its planned timeline.

In Colombia, the National Unit for Disaster Risk Management (UNGRD), in co-operation with the technical committees in the National System for Disaster Risk Management (SNGRD) and with input from the territorial councils, monitors the implementation of projects agreed as part of the National Plan for Disaster Risk Management (PNGRD). In line with the provisions of Decree 1081/2015 and Law 1523/2012, monitoring takes place twice a year, and is presented in a report published on the UNGRD's website. As part of the monitoring, progress in completing objectives within the timelines (short term: 2015-18; medium term: 2019-21; long term: 2022-25) and resources spent are reviewed. The idea behind the monitoring exercise is to ensure transparency to enable continuous improvement and to build trust in the government's capacity to implement disaster risk management objectives.

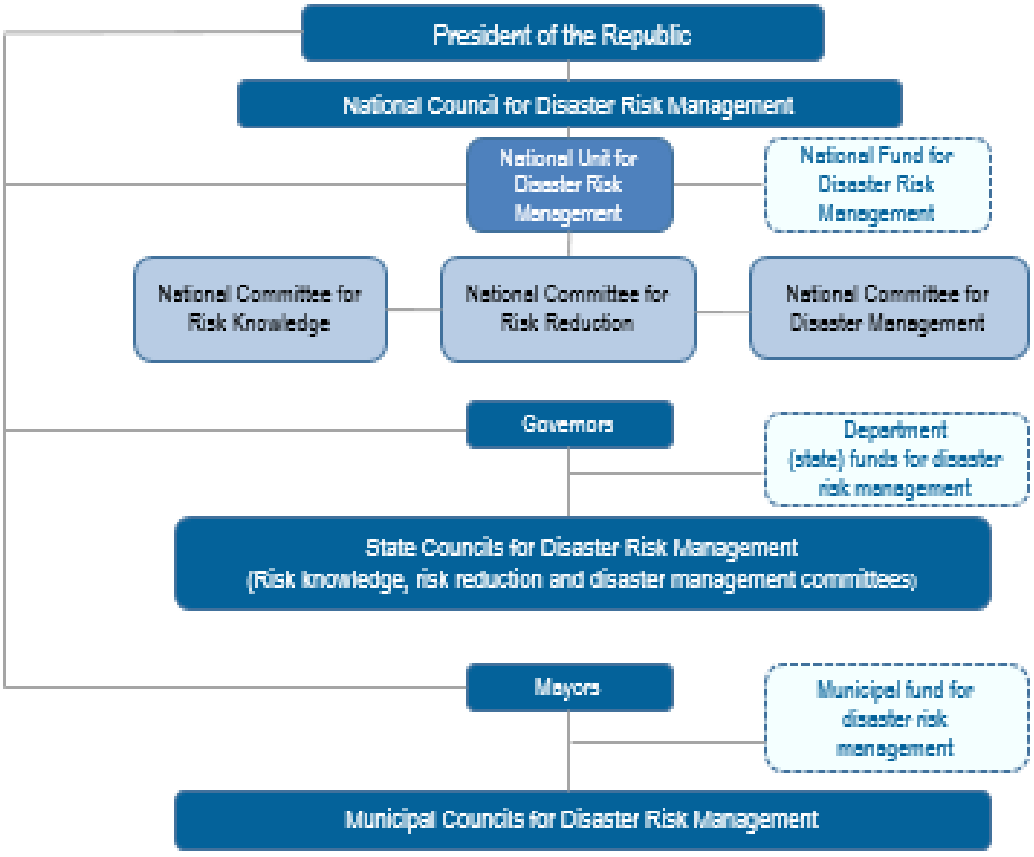
However, so far, the available four progress reports suggest that while many projects are already under implementation, few have been completed (including those set to end by 2018), suggesting that there is further scope to using monitoring to drive policy implementation. One way the monitoring report could add value would be to identify bottlenecks for implementation, and propose ways to overcome them, along with determining clear subgoals. It would also be useful to specify the links between project progress and overall implementation of the national disaster risk management objectives.

Source: UNGRD (2018), UNGRD (2016).

Whole-of-government approach to disaster risk management

Effective disaster risk management hinges on the engagement of all government actors at central and subnational levels (OECD, 2014). In Colombia, Law 1523/2012 requires all central and subnational public entities to mainstream disaster risk management into their respective policy fields, and carry out disaster risk management actions within the framework of their competence. All government entities are required to ensure that public investments take hazard information into account in their planning process so as to avoid the creation of new risks. The law also requires territorial and land-use planning to take account of prevailing hazards. Entities in charge of critical service provision have the additional responsibility to develop emergency response strategies and contingency plans (Congress of Colombia, 2012).

Figure 3.3. National System for Disaster Risk Management



Source: Adapted from (UNGRD, 2018)

Some ministries build on the requirements of Law 1523/2012 with their own decrees. For instance, the Ministry of Housing, City and Territory issued Decree 1807 to ensure risk-informed land-use planning. This requirement applies to both land-use planning for new areas, and to the review of existing documents, and is the result of a co-ordination and advisory process with the UNGRD and other stakeholders in the SNGRD (Colombian Ministry of Housing, City and Territory, 2014).

Law 1523/2012 clearly recognises the importance of a whole-of-government engagement in disaster risk management and the UNGRD has assumed the role in mobilising all actors towards this end. While a review at subnational level goes beyond the current review and is thus subject to further investigation, at national level the PNGRD implementation review suggests that stakeholders have started to engage in contributing to the implementation of the national disaster risk management objectives. However, to fully evaluate the contribution of each actor towards the national disaster risk management objectives, a more detailed review of each actor's engagements, especially at the subnational level, would be necessary.

Whole-of-society approach to disaster risk management

Public stakeholders have a lead role in creating a resilient society, but they cannot do so if households, civil society and businesses do not do their part. A "whole-of-society" approach, as outlined in the OECD Recommendation, is needed to encourage non-governmental actors to carry out self-protection and resilience measures (OECD, 2014).

Law 1523/2012 introduced a whole-of-society responsibility for disaster risk management in Colombia. As per Article 8, businesses and all individuals living in Colombia should be risk informed and carry out disaster risk management measures. Introducing a legal disaster risk management obligation that extends to private actors is an important step forward from previous legislation and planning instruments that prioritised government engagement. Although the 2012 law renders disaster risk management a shared task, it does not specify legal obligations beyond the requirement for developing emergency management plans from public service providers (for which Decree 2157/2017 provides additional guidance). Other OECD countries have made further advancements in this regard. In Switzerland, hazard insurance for buildings is mandatory across almost the whole country, whereas in France all household, business and motor vehicle insurance policies are tied to the mandatory CATNAT disaster insurance scheme (OECD, 2017).

Despite the absence of a clear legal responsibility, some good practices of business engagement in disaster risk management are emerging. Ecopetrol, the country's primary oil producer, has conducted risk assessments of its facilities and along its pipelines, mostly with a focus on intentional man-made threats, such as terrorism linked to internal conflict. Since Ecopetrol has increasingly been affected by natural hazards, such as mudslides during the 2010/11 La Niña events, it has recognised the need to improve its capacity to assess the link between natural and technological hazards and adapt its preparedness capacity as well as mitigating measures.

There are also cases that demonstrate that more can be done to ensure resilience engagement among private or semi-private actors. The crisis that has been unfolding on the Hidroituango dam (see Box 2.4 in Chapter 2) shows that more can be done, especially by critical infrastructure operators, to incorporate prevailing natural hazards and interconnected natural and man-made risks into their planning process as well as their operations and maintenance.

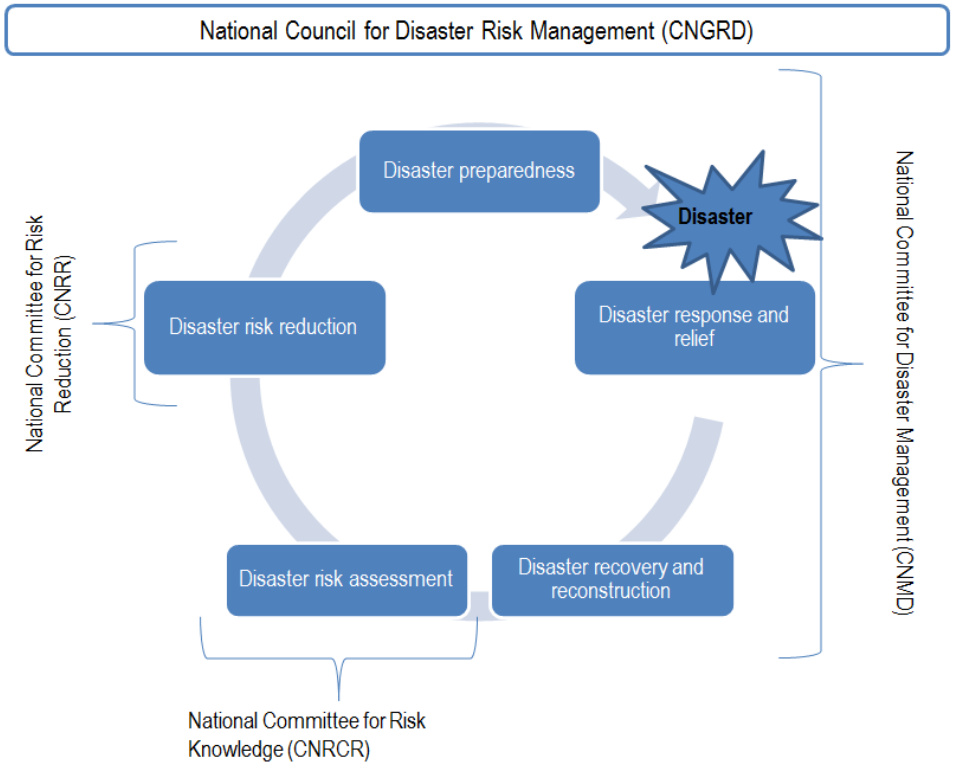
Cross-government co-ordination

To prevent duplication of efforts, and ensure maximum outcomes, transboundary (i.e. across sectoral and municipal jurisdictions) and effective co-operation and co-ordination between stakeholders is necessary. To this end, the OECD Recommendation (OECD, 2014) promotes interagency platforms that foster co-ordination, guide policy design and implementation, prevent duplication of efforts, and foster exchange of good practices. Co-ordination mechanisms include standing working groups or committees that bring together responsible government stakeholders and, where applicable, business and civil society representatives. They also include networks of experts that convene on technical matters or public consultation processes.

In Colombia, stakeholder co-ordination for disaster risk management is organised through inter-institutional platforms that are anchored in the National Disaster Risk Management System (Figure 3.4). Three technical committees cover all steps in the disaster risk management cycle: the National Committee for Risk Knowledge (Comité Nacional de Conocimiento del Riesgo, CNRCR) that focuses on disaster risk identification activities,

the National Committee for Risk Reduction (Comité Nacional para la Reducción del Riesgo, CNRR) that co-ordinates disaster risk reduction policies, and the National Committee for Disaster Management (Comité Nacional para el Manejo de Desastres, CNMD) that is in charge of advising preparedness and response operations, as well as recovery and reconstruction. The technical committees are presided by the National Council for Disaster Risk Management (Consejo Nacional para la Gestión del Riesgo de Desastres, CNGRD), which encompasses delegates from all ministries and guides the policies and actions of the SNGRD. Departmental, district and municipal councils complement the national councils' activities at subnational level. Although the committees bring together a wide range of relevant stakeholders, they might not all be comprehensive. For instance, the armed forces, navy and air force are members of the CNMD, but the Ministry of Defence (Ministerio de Defensa Nacional) as the ministry overseeing the military is not represented in this committee (Table 3.1).

Figure 3.4. National committees that co-ordinate activities of the disaster risk management cycle



Sources: Adapted from (Todd and Todd, 2011; OECD, 2014; UNGRD, 2018; Congress of Colombia, 2012)

Each committee informs the design of national policies and co-ordinates the implementation of national policies in its respective technical domain. The Risk Knowledge Committee is tasked with the identification and assessment of hazards and risks as well as the promotion of risk-informed policy making. The Risk Reduction Committee co-ordinates "the design of the risk reduction process" (Law 1523/2012, Article 23). This includes the formulation of a disaster risk financing strategy for disaster recovery and reconstruction, whereas a financing strategy for disaster risk reduction measures is not amongst the responsibilities of the Risk Reduction Committee. The Disaster Management Committee, in turn, leads and co-ordinates policy making in support of the disaster management process and provides a platform to co-ordinate policies for disaster response and recovery.

The committees' roles are not always clearly spelled out, and in some cases roles are redundant. In addition, the linkages between them could be leveraged to improve their outcomes and ensure effective co-ordination. For instance, the Risk Knowledge Committee and the Risk Reduction Committee are both tasked with developing action plans for disaster recovery, whereas the Disaster Management Committee is supposed to take the lead in recovery preparation. It may also cause committees to prioritise tasks of exclusive jurisdiction, expecting those of shared jurisdiction to be completed by other stakeholders. In other cases, tasks are clearly assigned to one committee, but their actual content may be ambiguous. For example, the Risk Reduction Committee is mandated to lead the "actions and corrective interventions in the current conditions of vulnerability and threat" (Law 1523/2012, Article 23), which would suggest a responsibility for carrying out structural disaster risk reduction measures. However, actual practice suggests that the Risk Reduction Committee only offers a platform to exchange, but leaves policy implementation to subnational and central government actors.

Table 3.2. Stakeholder representation in national committees in disaster risk management in Colombia

National Committee for Risk Knowledge	National Committee for Risk Reduction	National Committee for Disaster Management
	National Unit for Disaster Risk Management (UNGRD)	
Department of National Planning	Department of National Planning	Department of National Planning
National Administrative Department of Statistics	Colombian Security Council	National Army
Geographic Institute Agustín Codazzi	Federation of Insurers	Navy
Colombian Geological Survey (previously INGEOMINAS)	Universities	Air Force
Institute of Hydrology, Meteorology and Environmental Studies	Association of Regional Autonomous Corporations	National Board of Colombian Fire Fighters
General Maritime Directorate	Federation of Municipalities	National Police
Association of Regional Autonomous Corporations		Colombian Red Cross
National Federation of Departments		Civil Defense
Federation of Municipalities		

Source: Based on (Congress of Colombia, 2012)

To ensure co-ordination at subnational level, the structure at national level is mirrored at departmental, district and municipal levels. Territorial councils bring together all relevant stakeholders from the respective level of government, co-ordinated by the governor (state councils) or the mayor (municipal councils) and play an important role in translating Law 1523/2012 and the corresponding planning instruments to the regional and local level.

Representatives from the respective regional autonomous corporation (*corporación autónoma regional*, CAR) under the oversight of the Ministry of Environment join these councils to support the integration of disaster risk considerations in land-use planning and environmental management processes. Some initiatives exist in support of co-ordination between the national and subnational levels, including in the national committees for risk knowledge and risk reduction. To adequately analyse the links between the national and subnational levels, a separate study is required.

Open and inclusive policy making

Households and businesses are those who are directly impacted by natural hazards, as well as by disaster risk management measures and policies. Public consultation processes for disaster risk management policies ensure ownership and support from all stakeholders, and facilitate greater stakeholder engagement in disaster risk management. The OECD Recommendation calls for openness and inclusiveness in disaster risk management policy-making processes, as well as in policy implementation.

In Colombia, various means to engage stakeholders in the policy-making process in disaster risk management are available. Most public stakeholders in the SNGRD participate in technical workshops that include representatives from other line ministries or levels of government. The UNGRD, as the lead organisation in the SNGRD, organises these workshops, as well as the intra-institutional platforms. Half of the responding stakeholders also stated that they organise and participate in conferences and workshops with civil society representatives, in some cases including from marginalised groups. Technical advisory panels, such as the technical advisory commission for risk management (comisión técnica asesora de conocimiento del riesgo) and the technical advisory commission for technological risks (comisión técnica asesora de riesgos tecnológicos) may be set up as needed, and provide for an engagement of researchers and scientists.

A small number of stakeholders stated that public policies are put to scrutiny and discussion through public consultation processes, town hall meetings and public hearings. Some public policies, such as land-use decisions and the seismic code, are by default open to public consultation once the initial draft has been approved by all involved policy makers.

Some stakeholders, such as the UNGRD, also use the Colombian citizen participation website "Crystal Urn" (Urna de Cristal) to consult with the public in the development of strategic and sectorial policies. The UNGRD also uses several other online tools to inform policy making with stakeholder input, including an online petition tool and surveys. In addition, the UNGRD organises annual public hearings that are open to all stakeholders in the SNGRD that manage public funds, assets and projects related to disaster risk management. As part of this public hearing, stakeholders have the opportunity to review activities carried out by the UNGRD and to discuss evaluation results, which are also made publicly available. A survey among stakeholders informs the public hearing agenda to identify priority issues (Box 3.3).

Notes

[1] Law 49/1948, Congress of Colombia, www.ifrc.org/docs/idrl/621ES.pdf (in Spanish, consulted on 17 July 2018).

[2] Based on Decree 3398/1965, Ministry of Justice, https://www.minjusticia.gov.co/portals/0/MJD/docs/decreto_3398_1965.htm; and Decree 606/1965, Presidencia de Colombia, https://www.defensacivil.gov.co/recursos_user/Documentos%20Institucional/Decretos%20no%20compilados/DECRETO%20NUMERO%20606%20DE%201967.pdf (in Spanish, consulted on 17 July 2018).

[3] Law 46/1988, www.ideam.gov.co/documents/24024/26915/C_Users_hbarahona_Desktop_Monica+R_normas+pag+web_ley+46+de+1988.pdf/7990561a-63f5-4927-9c91-fad4e81383a7; and Decree 919 of 1989, www.alcaldiabogota.gov.co/sisjur/normas/Norma1.jsp?i=13549 (consulted on 17 July 2017).

[4] Law 9/1989, www.alcaldiabogota.gov.co/sisjur/normas/Norma1.jsp?i=1175; Law 2 of 1991, www.alcaldiabogota.gov.co/sisjur/normas/Norma1.jsp?i=1575; and Law 388 of 1997, www.alcaldiabogota.gov.co/sisjur/normas/Norma1.jsp?i=339 (consulted on 17 July 2018).

[5] Law 1523/2012, Congress of Colombia, www.ideam.gov.co/documents/24189/390483/11.+LEY+1523+DE+2012.pdf/4e93527d-3bb8-4b53-b678-fbde8107d340?version=1.2 (in Spanish, consulted on 17 July 2018).

[6] The UNGRD was created by Decree 4147/2011.

[7] The PNGRD monitoring results are available at: http://repositorio.gestiondelriesgo.gov.co/handle/20.500.11762/756.

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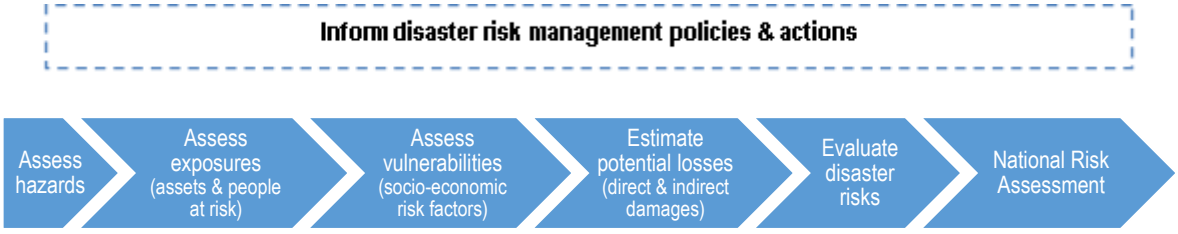
Chapter 4. Disaster risk identification and assessment in Colombia

This chapter evaluates Colombia's progress in identifying and assessing natural hazards and disaster risk across its territory, as well as the consideration of interconnected risks. The chapter reviews the openness and accessibility of disaster risk information, which includes the mechanisms for sharing risk information across governmental and non-governmental stakeholders. Finally, the chapter looks at whether the available information on risks is effectively used to inform disaster risk management decisions.

All aspects of decision making in disaster risk management depend on the availability and quality of local hazard and disaster risk information. Hazard maps identify geographic areas potentially affected by adverse events. Risk maps tie the hazard information in with data on socio-economic assets that are exposed to the identified hazards. This, in turn, allows decision makers to identify "disaster risk hotspots", where disaster risk management interventions should be prioritised. National risk assessments support this process by identifying the most serious disaster risks, based on an all-hazards approach, facing a country at the national level (OECD, 2014).

Figure 4.1. Disaster risk assessments



Sources: Based on (OECD/G20, 2012)

The *OECD Recommendation of the Council on the Governance of Critical Risks* (OECD, 2014) suggests developing location-based inventories of exposed populations and assets, as well as infrastructures that reduce exposure and vulnerability. It highlights the importance of identifying and assessing inter-linkages between different types of critical risks and their potential cascading effects. The Recommendation furthermore suggests to use the best available evidence incorporating up-to-date scientific models and to take an all-hazards approach to help prioritise disaster risk management interventions. Finally, it is recommended that risk assessments be periodically reviewed to incorporate new information as well as the lessons learnt from recent disaster events.

Quality information on natural hazards and disaster risk: Centrepieces of Colombia's disaster risk management objectives

Colombia's Law 1523/2012 promotes the identification of hazards and the assessment of disaster risks as key objectives to be fulfilled by the National Disaster Risk Management System (Sistema Nacional de Gestión del Riesgo de Desastres, SNGRD). While Law 1523/2012 focuses on natural hazards only, the National Plan for Disaster Risk Management (Plan Nacional de Gestión del Riesgo de Desastres, PNGRD) recognises the importance of an all-hazards approach and calls for improving the evidence base on natural as well as man-made hazards. Finally, Law 1523/2012 calls for the public access to hazard and disaster risk information (Congress of Colombia, 2012).

Hazard and risk information: Availability to date

The current availability and granularity of hazard information differs by type of hazard (Table 4.1). At the national level (resolution of 1:25,000), the available hazard assessments cover almost all hazards and for hydrometeoroligical hazards 96% of the territory. Three national seismic hazard maps, a national landslide hazard map and national flood hazard maps are available. In addition, a national wildfire hazard map was recently developed. At the regional level (resolution of at least 1:5,000), nine departmental drought hazard assessments have been conducted (IDEAM and UNDC, 2013; IDEAM, 2014; IGAC, 2015;

SGC, 2015; SGC, 2018; SGC, 2018; DNP, 2018; UNGRD, 2018). At the local level, the implementation review of the National Development Plan confirms that municipal flood hazard mapping is increasingly conducted, albeit substantial work is needed to cover all of the exposed territory.

Table 4.1. Availability of hazard and disaster risk assessments and maps

	Hazard assessments/maps in place		If yes: Scope		Disaster risk assessments/maps in place	
	Yes	No	National	Regional	Yes	No
Earthquakes	✓		✓	✓	Under development	
Volcanic activity	✓			✓	Under development	
Tsunami		✓			Under development	
Flood	✓		✓	✓	✓	
Landslides/rockslides	✓		✓	✓	Under development	
Storms	✓					✓
Cold wave		✓				✓
Heat wave		✓				✓
Drought	✓		✓			✓
Wildfire	✓		✓			✓
Snow avalanche		✓				✓

Source: 2018 OECD Colombia Risk Governance Survey.

In terms of disaster risk assessment, although the available information is scarce, the PNGRD includes a number of projects to change this in the future. The monitoring of the National Plan for Disaster Risk Management shows that several pilot studies for assessing disaster risk are under way. For example, tsunami exposure and vulnerability analyses have been carried out for 56 villages in Cauca and Nariño, and a landslide risk assessment is under way for the municipality of Villarrica, which is one of 120 to be completed by 2025. Following the implementation of Laws 388/1997[1] and 1454/2011,[2] and the seismic building regulations (Reglamento Colombiano de Construcción Sismo Resistente, NSR-10)[3], the National Plan for Disaster Risk Management also includes objectives for municipal seismic risk assessments, carried out already in Bogota. Another ongoing project, conducted in co-operation with Japan, focuses on the modelling of earthquake, tsunami and volcanic disasters with a view to estimate potential disaster losses and damages (JICA, 2014; SIAC, 2012).

The National Disaster Risk Management Unit has been collecting comprehensive disaster damage and loss data for the past 20 years, which can provide valuable information for modelling risk assessments. The disaster loss and damage information is made available in a central public disaster repository, the DESINVENTAR database, which is maintained by the Colombian civil society organisation OSSO Corporation (Corporación OSSO), together with the United Nations Office for Disaster Risk Reduction (OECD, 2018; UNGRD, 2018).

Good practices on how risk information can effectively guide disaster risk management decisions are emerging. For example, the Bogota Urban Disaster Risk index (UDRi) identifies hazard-prone areas and assesses vulnerabilities and exposure in these locations, with the objective of using the risk information to inform land-use decisions, as well as the

development of local building codes (Baker, Anderson and Ochoa, 2012; Carreño, Cardona and Barbat, 2005; IDIGER, 2018; UNGRD, 2018).

National risk assessments are an important tool to guide priority-setting in disaster risk management. National risk assessments synthesise available hazard and disaster risk information to identify a country's most critical disaster risks (Box 4.1 provides an example from the United Kingdom's practice). As the process of preparing such an assessment should build on broad stakeholder engagement, they also serve as an important tool to build consensus on disaster risk management priorities (OECD, 2014). Currently, no national risk assessment is carried out in Colombia, but with the recently published National Risk Atlas (Atlas de riesgo de Colombia), the UNGRD has taken an important first step in establishing a national risk assessment process (UNGRD, 2018). As a national risk assessment process also builds on an established co-ordination mechanism that brings a wide range of inputs from across departments and scientific expertise together, the committees within the National System for Disaster Risk Management, with the National Committee for Risk Knowledge in the lead, would be an ideal platform that could serve this purpose.

Box 4.1. United Kingdom National Risk Assessment

The United Kingdom's National Risk Assessment (NRA) is a yearly process to identify all major hazards and threats that may cause significant negative impacts at any point during the following five years. Led by the United Kingdom's Civil Contingencies Secretariat (Cabinet Office), it involves a multi-agency process. Risks are ranked based on the likelihood and impact of the "reasonable worst-case scenario".

The assessed risks cover three broad categories: 1) natural hazards; 2) major accidents; and 3) malicious attacks. Eighty types of major hazard and threat scenarios have been identified and analysed through the NRAs over the years.

The NRA results are used in capabilities-based planning for emergency preparedness and response at all levels of government, as well as in assigning responsibilities for managing the identified risks to different agencies. While in part confidential, a public version of the NRA is made available through the National Risk Register, which serves as a valuable risk communication tool.

Sources: OECD (2017), Natural Hazards Partnership (2017), United Kingdom Cabinet Office (2017).

Roles and responsibilities

The National Disaster Risk Management Plan and the national development plans make hazard and disaster risk assessments a shared responsibility between central and subnational governments (Table 4.2.). While the central government agencies are to assess risks at national scale, subnational governments, with technical support from central agencies, are to develop municipal hazard and disaster risk assessments (DNP, 2018; DNP, 2014; UNGRD, 2016).

Recognising the diversity of actors contributing to the hazard and risk assessment process, the National Committee for Risk Knowledge was established as part of the National Disaster Risk Management System as a platform to co-ordinate stakeholders' efforts to fulfil the shared objectives. Although it convenes many of the stakeholders with responsibilities related to hazard and disaster risk assessments, the National Committee for Risk Knowledge currently focuses on exchange of technical expertise. In the future, the committee's convening power and the technical expertise of its members have the potential to carry out a full national risk assessment informed by whole-of-government engagement (see above).

The National Plan for Disaster Risk Management requires all infrastructure as well as all public service providers to assess disaster risks arising to their operation. Concrete actions include:

- the development of technical guidelines for disaster risk assessments in the telecommunication sector by the Ministry of Information Technologies and Communications that are to be used in turn by both public and private operators;
- risk scenarios for strategic infrastructure sectors to be carried out by the National Infrastructure Agency (Agencia Nacional de Infrastructura, ANI);
- disaster risk assessment prepared for critical transport infrastructure to be carried out by the Ministry of Transport.

There is scope to improve the sharing of risk knowledge, especially between businesses and government agencies. For example, some oil and energy businesses have conducted detailed analysis of its exposure to a variety of hazards, as have other large industrial sectors, but this information does not have any explicit mechanism that allows for it to be combined with risk information generated by public bodies. Combining these disparate bodies of knowledge could provide new insights and even improve the resolution of the national datasets. With the UNGRD's guide for shared disaster risk management responsibilities, a first instrument to support public and private stakeholders throughout the disaster risk management cycle, including in the exchange of hazard and disaster risk information, is in place (UNGRD, 2018).

Increasing the availability and quality of hazard and risk information

The National Plan for Disaster Risk Management has put in place specific actions to develop Colombia's hazard and risk information base. They focus on the assessment of hydrometeorological hazards, sea-level rise induced flood hazards, as well as geophysical hazards. In terms of disaster risk assessment, the National Plan for Disaster Risk Management's priorities for action are the assessment of landslide risk in "critical" areas, the assessment of risks related to extreme climate events and disaster risk assessment for all major metropolitan areas. The National Development Plan includes further targets to be achieved by 2018, such as on the number of monitoring stations for geological, hydro-meteorological and maritime hazards, as well as for flood and flash flood hazard maps (UNGRD, 2016).

Projects to implement the objectives laid out in the National Disaster Risk Management and the National Development Plan are ongoing. The biannual monitoring report of the National Plan for Disaster Risk Management (Box 3.3) shows some progress to date, with 1 project completed, 34 under way and 4 that have yet to start. The annual implementation review of the National Development Plan (Table 4.3) shows that while the objective to increase the number of Colombian Geological Service monitoring stations was exceeded,

none of the other objectives have been fully met yet (Lacambra et al., 2014; DNP, 2017; DNP, 2018).

Table 4.2. Hazard and disaster risk assessment actions in Colombia's National Plan for Disaster Risk Management, 2015-25 (selection)

Objective	Responsible stakeholder(s)	Timeline	Status
Natural hazards			
Seismic micro-zoning maps for 45 cities with a population > 100 000 located in high/medium seismic hazard zones	Territorial entities	Long term	↗ (2/2018)
Probabilistic earthquake risk assessment carried out for 13 capital cities	Territorial entities	Long term	↗ (2/2018)
Critical buildings prioritised, and vulnerability assessment carried out for critical buildings in capital cities with high/medium seismic hazard	Territorial entities	Long term	?
100% of Colombia's territory covered with seismic monitoring network	SGC	Short term	O (2/2017)
Seismic sources for tsunami risk in the Pacific and Caribbean identified	SGC	Medium term	↗ (2/2017)
Causes of climatic variability as drivers of hydrometeorological hazards analysed and communicated	IDEAM; INVEMAR; DIMA	Medium term	↗ (2/2018)
Methodological guide for flood and flash flood hazard assessment published and communicated	IDEAM	Short term	↗ (2/2018)
353 municipalities have received support in the development of landslide risk assessments	UNGRD; CARs	Long term	↗ (2/2017)
Technological hazards			
Guidelines for integrating technological risk in territorial planning and development	UNGRD	Short term	↗ (2/2018)
Municipal technological risk scenarios developed and published	Territorial entities	Medium term	?
Technological risk scenarios in strategic infrastructure sectors published and communicated	ANI	Long term	?
Chemical risk of dangerous facilities analysed and evaluated as per OECD guidelines	MinAmbiente; MinSalud; MinTrabajo; UNGRD	Short/medium term	↗ (2/2018)

Notes: Short term: 2015-18; medium term: 2019-21; long term: 2022-25.
SGC: Colombian Geological Service; IDEAM: Institute of Hydrology, Meteorology, and Environmental Studies; INVEMAR: Institute for Marine and Coastal Research "Jose Benito Vives de Andreis"; DIMAR: Directorate General of Maritime Affairs; UNGRD: National Unit for Disaster Risk Management; CAR: regional autonomous corporation; ANI: National Infrastructure Agency; MinAmbiente: Ministry of Environment and Sustainable Development; MinSalud: Ministry of Health and Social Protection; MinTrabajo: Ministry of Labour.
↗ under implementation; O no activities/not started; ☑ finalised; **?** no information on implementation status available. Symbol describes the most recent status available.
Sources: (UNGRD, 2016; UNGRD, 2016; UNGRD, 2017; UNGRD, 2017; UNGRD, 2018)

Table 4.3. National Development Plan: Disaster risk knowledge objectives, 2014-18

	Responsible stakeholder	Baseline value 2013	Objective for 2018	PND Review 2017
Monitoring stations	SGC	675	766	864
Monitoring station	IDEAM	136	666	270
Monitoring station	DIMAR	23	28	?
Volcanic hazard maps (national)	SGC	10	13	14
Flood hazard maps at a scale of 1:5 000	IDEAM	29	35	New flood maps at a scale of 1:5 000 for Achí, Pinillos, Montelíbano, Ayapel, San Marcos, San Benito
Flash flood hazard maps at a scale of 1:5 000	IDEAM	10	20	

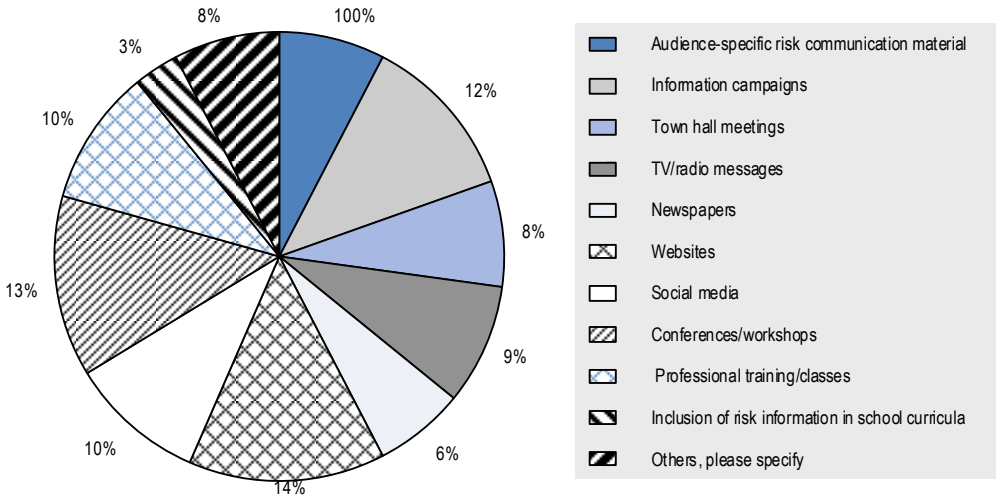
Notes: SGC: Colombian Geological Service; IDEAM: Institute of Hydrology, Meteorology, and Environmental Studies; DIMAR: Directorate General of Maritime Affairs.
Sources: DNP (2014), DNP (2018), DNP (2017), DNP (2018).

Accessibility of hazard and disaster risk information

Accessible hazard and disaster risk information is indispensable for resilient land-use planning and stakeholder compliance with the accompanying regulations such as building codes (OECD, 2014). Particularly in the context of rapid urbanisation in hazard-prone areas, as is the case in Colombia, easy access to hazard maps may be a decisive factor in limiting informal construction in hazard-prone areas, or in incentivising households to carry out resilience measures.

Law 1523/2012 requires stakeholders in the National Disaster Risk Management System to communicate hazard and risk information to the public, as well as to public and private entities. The National Plan for Disaster Risk Management includes the communication of risk information as part of several objectives under the "disaster risk knowledge" pillar. As a result, hazard and disaster risk assessments are made publicly available online and free of charge, published in print and broadcast media and communicated across departments and levels of government[4] (e.g. by way of conferences, workshops and trainings) (Figure 4.2). There might be room for further leveraging the National Committee for Risk Knowledge to share hazard and risk information, to co-ordinate collaboration among actors to assess interlinkages of hazards, as well as to evaluate potential cascading effects especially between natural and technological hazards, such as in the case of the Hidroituango dam.

Figure 4.2. Hazard and disaster risk information dissemination channels



Notes: The question asked: "How does your organisation communicate disaster risk information?". Eighteen out of 23 public sector respondents answered this question.
Source: 2018 OECD Colombia Risk Governance Survey.

Box 4.2. Mexico and Austria: Open access to risk and hazard data

Open access to risk assessment data ensures transparency. Mexico's National Risk Atlas and Austria's Natural Hazard Overview and Risk Assessment (HORA) platform are noteworthy tools for giving open access to risk and hazard data.

Mexico's National Risk Atlas is an online portal (www.atlasnacionalderiesgos.gob.mx) that compiles all available risk information on Mexico, drawing information from the National Centre for Disaster Prevention, the National Seismological Service, the Earth Observation Laboratory and the National Oceanic and Atmospheric Administration. The available information includes various hazard and vulnerability maps on an evolving GIS-based platform, as well as results of hazard and risk assessments. Metadata on exposed assets and information on socio-economic losses from disasters complements the available information.

Similarly, Austria's HORA platform (www.hora.gv.at) is a publicly accessible Internet portal that compiles available hazard information into a national hazard map. Individual exposure to hazards (such as floods, avalanches and torrents) can be explored based on one's address, enabling home owners and businesses to limit construction in hazard zones.

Sources: Nieto Muratalla (2017), OECD (2013), OECD (2017), Austrian Federal Ministry for Sustainability and Tourism (2018).

Accountability and transparency in the hazard and disaster risk assessment processes

For available hazard and disaster risk information to be trusted and acted upon, it is important to ensure transparency in the process of information collection and in the methods used to model hazards and risks Opening up datasets and methodologies to the scientific and academic communities helps encourage scrutiny from learned bodies and specialised individuals, helping improve the quality of the risk information being produced. Opening dialogue with citizens in the hazard and disaster risk assessment processes, through public review and commenting periods for hazard maps, can be useful in creating acceptance of the information and in determining acceptable levels of risks, hence increasing the likelihood that communities threatened by hazards are taking actions to increase their resilience.

In Colombia, all public actions can be put to scrutiny as per Law 1712/2014,[5] but such processes are not yet institutionalised for hazard and disaster risk assessments. The Austrian practice to put draft hazard maps up for public review, during which comments are collected and assessed by a commission,[6] is a good practice in this regard (Box 4.3). Aside from offering an opportunity to put hazard maps to public scrutiny, these consultations are used to improve hazard maps with local knowledge on experiences with past disasters. Often, the implication of stakeholders in this process has led to an expansion of the proposed hazard zones, which points to an increased acceptance of hazard assessments (Gamper, 2008; OECD, 2017).

Box 4.3. Austria: Improving hazard maps with through public consultation

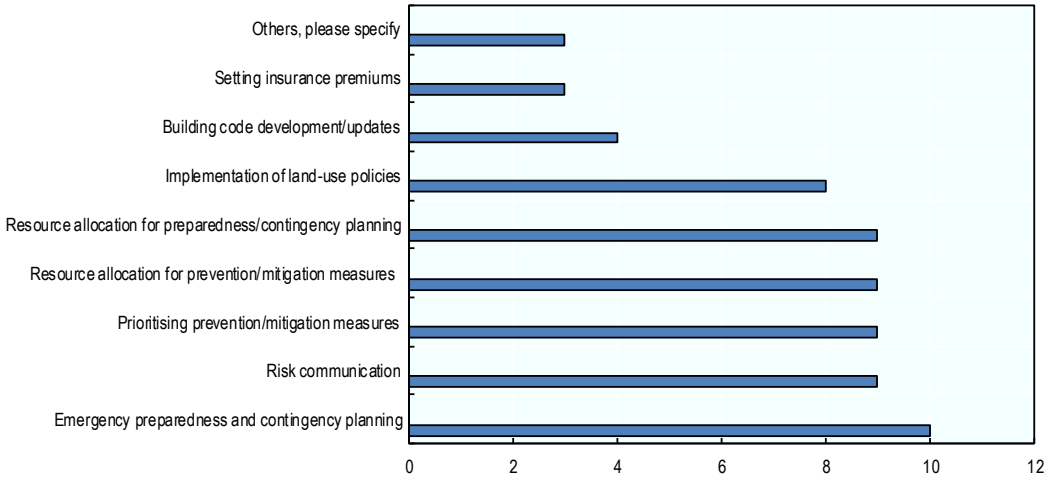
Hazard mapping in Austria benefits from public participation. Following hazard assessments carried out by the subnational offices of the responsible expert units (Austrian Service for Torrent and Avalanche Control, Federal Water Engineering Administration) within the Ministry of Agriculture, Forestry, Environment and Water Management stakeholders have the opportunity to comment on draft hazard maps.

During the public consultation period comments are collected and subsequently assessed by a commission. On the one hand, this ensures public support for the hazard maps and enables increased hazard awareness. Stakeholders have the opportunity to ensure specific local knowledge: good practice from Austria's needs are considered, and are informed of hazards early on. On the other hand, making hazard mapping inclusive may increase accuracy of the maps, and may result in plea for extending hazard zones. The local population may, for instance, have additional insights into hazards, e.g. from experiences with past disasters, or hope for the installation of structural disaster risk reduction measures, if hazard zones are expanded. Overall, the public consultation periods have seen active engagement, particularly in areas where settlement space is scarce.

Sources: Gamper (2008), OECD (2017).

Law 1523/2012 seeks for hazard information and disaster risk assessments to inform disaster risk management decisions, in particular in land-use planning (as also required by the land-use Laws 388/1997 and 1454/2011, and the seismic code). Results from the OECD survey show that many stakeholders in Colombia use the available hazard and disaster risk information in policy making (Figure 4.3). Many respondents noted that the available evidence base is used to guide resource allocation for disaster preparedness, or for planning and prioritising *ex ante* measures. However, Figure 4.3 also illustrates that there may be scope for further reinforcing the integration of hazard information in land-use planning and building code development. The Ministry of Housing, City and Territory is providing technical support to 250 municipalities on this (DNP, 2014).

Figure 4.3. Use of hazard information across public stakeholders in the National System for Disaster Risk Management



Notes: The question asked: "Are the results of hazard assessments used in the following activities?". Thirteen out of 23 public sector respondents answered this question.
Source: 2018 OECD Colombia Risk Governance Survey.

Using available hazard information in decision-making

Colombia's land-use territorial planning advisory councils (consejo consultivo de ordenamiento territorial, CCOT) are a good practice for ensuring that hazard information gets integrated in local land-use plans. The advisory councils are required for all municipalities with more than 30 000 inhabitants (Law 388/1997; Decree 879/19987) and include representatives from across the municipal government, the territorial planning council (consejo territorial de planeación), trade unions and chambers of commerce, and civil society organisations. They are platforms for broad stakeholder review of land-use decisions and may propose revisions, when necessary (Orozco-Sánchez, 2017). The publication of territorial planning advisory council meeting protocols required by Law 1454/2011 creates an incentive for sound decision making and acts as an accountability mechanism. Open access to these protocols can also prevent actors from exercising undue influence, such as developers with an interest to develop hazard-prone areas such as coasts attractive for tourism development (Orozco-Sánchez, 2017).

Notes

1. Law 388/1997, Congress of Colombia, http://recursos.ccb.org.co/ccb/pot/PC/files/ley388.html (in Spanish, consulted on 16 July 2018).

2. Law 1454/2011, Congress of Colombia, www.senado.gov.co/images/stories/Dependencias/Comision_ordenamiento/LEY_1454_DE_ORDENAMIENTO_TERRITORIAL.pdf (in Spanish, consulted on 25 July 2018).

3. Seismic building regulations (Reglamento Colombiano de Construcción Sismo Resistente, NSR-10), Colombian Association for Earthquake Engineering, www.asosismica.org.co/decretos-modificatorios-nsr-10 (in Spanish, consulted on 25 July 2018).

4. Ninety-three per cent of the respondents to the 2018 OECD Colombia Risk Governance Survey stated that hazard information is publicly accessed free of charge; 92% noted that this information is communicated across departments and levels of government to ensure policy consistency.

5. Law 1712/2014, Congress of Colombia, http://suin.gov.co/viewDocument.asp?ruta=Leyes/1687091 (in Spanish, consulted on 25 July 2018).

6. The commission usually includes one ministerial delegate, the regional planner, the regional head of section and one representative of the municipality for which the plan has been designed (mayor). In some cases, additional technical experts participate.

7. Decree 879/1998, Presidency of Colombia, www.alcaldiabogota.gov.co/sisjur/normas/Norma1.jsp?i=1369 (in Spanish, consulted on 25 July 2018).

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Chapter 5. Disaster risk reduction in Colombia

In this chapter, Colombia's efforts to reduce existing disaster risks and avoid the creation of new risks are reviewed. The chapter shows that with Law 1523/2012 disaster risk reduction has been placed at the heart of Colombia's national policy agenda, and it reviews the key steps taken to put the formulated objectives into action. It reviews roles and responsibilities of all stakeholders involved in the disaster risk reduction process and discusses opportunities for reinforcing Colombia's disaster risk reduction agenda.

Disaster risk reduction have become the focus of international, and a growing number of national, policy commitments in disaster risk management. In complement to disaster preparedness and response capacities, disaster risk reduction are indispensable for reducing disaster losses over time. The *OECD Recommendation of the Council on the Governance of Critical Risks* (OECD, 2014) suggests that countries raise awareness of critical risks to mobilise all of society's actors to invest in disaster risk reduction. It furthermore calls for strengthening the mix of structural and non-structural disaster risk reduction measures. Finally, the Recommendation suggests that businesses, and especially infrastructure operators, take steps to ensure business continuity (OECD, 2014).

Disaster risk reduction at the heart of Colombia's national policy agenda

The overview of institutional trends in chapter three shows that Colombia's disaster risk management policy has shifted in favour of reducing disaster risks. While disaster risk reduction became part of the disaster risk management policy mix as early as the 1990s, Law 1523/2012 established them as priorities (World Bank, 2012; UNGRD, 2018).

Law 1523/2012 builds on the identification and assessment of risks as a basis for disaster risk communication and other disaster risk reduction activities. The law frames disaster risk reduction actions as a two-pronged objective: to avoid creating new risks and to reduce existing ones, in complement to developing a financial protection strategy through risk retention and risk transfer instruments. The law's strategic disaster risk reduction objectives have been anchored in the National Development Plan (Plan Nacional de Desarrollo, PND), which underlines the need to prevent disaster risks in order to sustain the country's growth, to improve the quality of life and to foster sustainable development.

Following Law 1523/2012, the National Plan for Disaster Risk Management (Plan Nacional de Gestión del Riesgo de Desastres, PNGRD) recognises the importance of disaster risk reduction to prevent disasters and reduce the resources needed to respond to and recover from disasters. The PNGRD distinguishes disaster risk reduction objectives by actions that avoid the creation of new risks and those that reduce existing ones. Although this distinction in itself is clear, the actions mentioned in each of the pillars do not clearly reflect this distinction (see below), with some of the actions falling into different disaster risk management categories altogether, such as disaster preparedness and response.

Avoiding the creation of new risks: Recognising the role of all stakeholders

To avoid the creation of new risks, the National Plan for Disaster Risk Management (PNGRD) mirrors the vision laid out in the PND. The PNGRD recommends that government across sectors and levels as well as businesses, incorporate disaster risk management into investment planning to make sure that the levels of existing risk are not increased by any new investments made.

The PNGRD formulates objectives and concrete actions for government actors across national sectors and for subnational levels of government. The actions include the formulation of disaster risk management objectives in sectoral development plans, as well as the inclusion of concrete risk reduction projects in the local development plans. The Disaster Risk Management Plan calls for the national government to ensure that land-use planning at the local level incorporates disaster risk management and recommends the local planning offices to monitor the incorporation of disaster risk in local construction projects.

Against the explicit recognition in the 2014 OECD Recommendation (OECD, 2014), the Disaster Risk Management Plan does not currently include a concrete role for businesses. Even though the role of businesses in increasing or containing disaster risks is recognised, Law 1523/2012 does not mention the concrete contribution they should make to avoid the creation of new risks through their activities. Businesses include infrastructure operators that could potentially generate larger and more systemic risks. The operator of the Hidroituango hydropower dam (see Box 2.4 in Chapter 2) demonstrates the urgency of the issue: private operators can generate significant new risks that impact the potential continuity and reliability of the service they provide, but also create risks to the communities, in this case downstream of the dam's operation (Villamizar, 2018; National University of Colombia, 2018).

The PND recognises the significant guidance that has been issued on how the creation of new risks can be avoided, but points to persisting gaps in implementation. The latest annual monitoring report of the implementation of the PNGRD (UNGRD, 2018) reveals that concrete actions three years after the issuance of the PNGRD are limited. Notable actions that have been carried out include the development of guidelines on the incorporation of disaster risk reduction in territorial planning as well as a roadmap document that guides the integration of disaster risk reduction in national sectoral planning. Aside from these efforts, the monitoring report shows that there are a number of stakeholders that have not engaged in any of their assigned activity at all, including the Ministry of Housing, City and Territory and the Ministry of Transport. The list of suggested actions to avoid the creation of new risks is exhaustive, but some important strategic objectives seem to be missing. For example, as was shown in Chapter 2, one of the core drivers of disaster risk in Colombia has been informal housing and unplanned urban development, which is not sufficiently covered in the list of suggested actions under the PNGRD. A comprehensive strategy that aims at avoiding the creation of new risks is still missing.

Reducing existing risks

To reduce existing disaster risks, the PNGRD calls on all entities, public or private, to assess the disaster risks to which their assets and activities may be exposed (see Chapter 4). The PNGRD also recommends formulating disaster risk reduction actions on the basis of the available risk information. For agencies in charge of housing development, this includes resettlement of people out of high-risk areas as well as the retrofitting of the existing housing stock with disaster-resistant materials. For entities in charge of the environment, the PNGRD recommends measures that manage soil in a way that helps protect from disaster risks. Other objectives are less clearly focused on reducing existing risks and may pertain to other policy objectives as well. For example, the health-related actions include the articulation of a health emergency management system or an emergency evacuation plan for all buildings located in risk-prone areas, which would typically fall under emergency preparedness and disaster response functions.

The PNGRD monitoring reports show some progress in terms of reducing existing risks. For some projects under the PNGRD, no information is available on their current status in any of the monitoring reports (Lacambra et al., 2014; UNGRD, 2018).

Reinforcing the disaster risk reduction agenda

To reap the full benefits of the National Plan for Disaster Risk Management's disaster risk reduction agenda, institutions should motivate and support actors and leverage investments. In formulating disaster risk reduction goals and actions for each actor, the PNGRD offers a clear road map for disaster risk reduction projects. In doing so however, there is a large untapped potential that a more co-ordinated and collaborative approach could bring. Even though local governments are in the driver's seat for implementing disaster risk reduction measures through local planning instruments and investments, not all have the technical or financial capacities to implement these objectives alone.

At central government level, funding from the National Fund for Disaster Risk Management (Fondo Nacional de Gestión de Riesgo de Desastres, FNGRD) may be used in support of disaster risk reduction measures. In addition, the National Adaptation Fund (Fondo Adaptación, AF), put in place to finance projects for reconstruction following the 2011-12 La Niña events, may be used towards disaster risk reduction (Law 1753/2015[1]). Neither fund is fully leveraged to support subnational governments in carrying out disaster risk reduction measures (e.g. with clear rules for co-financing, and pre-determined cost-sharing rates). Limited resources, in part linked to the circumstance that sectoral contributions to the National Fund for Disaster Risk Management are required by Law 1523/2012, but the required size of the contributions is not prescribed, inhibit the potential for co-financing disaster risk reduction measures. In the National Plan for Disaster Risk Management, the National Unit for Disaster Risk Management (Unidad Nacional para la Gestión del Riesgo de Desastres, UNGRD) appears to have a very limited role in steering or contributing to the disaster risk reduction agenda. The UNGRD's responsibility is limited to actions such as support to subnational governments in the integration of disaster risk considerations in their local development plans. As such, the UNGRD has not tapped into central funding mechanisms to foster implementation of disaster risk reduction measures.

In recognition of the heterogeneity of local capacities as well as the different levels of protection needed, most OECD countries have implemented some form of a co-operative and cost-sharing approach between central and subnational governments. The national government, in the form of technical assistance and co-financing capacity, supports the local level efforts in a way that allows all communities to attain an acceptable level of risk (Box 5.1 provides a country example from Austria).

Box 5.1. Austria's cross-governmental co-operation mechanisms in disaster risk reduction

As many other policies in Austria's federal government set-up disaster risk reduction is a task that is shared by all levels of government. The need for structural disaster risk reduction measures, for example, is evaluated at the local level by municipalities or local interest groups, who in turn make a request for funding and technical implementation to the regional office of the national agency in charge of structural protection measures.

The national agency, in co-operation with its regional office, assesses the value of the public interest of the investment, and subsequently prioritises it among other requests for funding received. If approved, local authorities develop a proposal for their financial contribution to the measure. The provincial government is approached for co-financing and

the central government agency concludes an agreement of the formal cost-sharing mechanism. The usual co-financing rate from the central level amounts to 50%, 20% is contributed by the province and some 30% are assumed by the local level authorities. This approach fosters solidarity to ensure that those communities most exposed to natural hazards can afford the investments needed to protect the lives and assets of their community.

Source: OECD (2017).

Examples from across the OECD also offer insights on how additional resources for disaster risk reduction can be unlocked. In France, the national disaster risk reduction fund, the Fonds Barnier, is sourced from a mandatory insurance contribution from holders of business and motor vehicle insurance, as well as from the compulsory public-private CATNAT hazard insurance scheme. In Austria, the Austrian Catastrophe Fund (KatFonds), initially set-up for disaster recovery and reconstruction, has been reformed to serve a double function in that the annual remaining balance that has not been used to respond to emergencies is transferred to a disaster risk reduction account at the end of the year. Each year, the KatFonds is sourced with 1.1 percent of Austria's total federal tax income (OECD, 2017). In Costa Rica, the National Emergency Fund also serves a double-function as a disaster risk reduction and recovery and reconstruction fund, and is sourced from a fixed percentage of budget surplus. Similarly, Mexico's FONDEN benefits from a regular contribution of at least 0.4% of programmable federal spending (OECD, 2013; Colombian Ministry of Finance and Public Credit, 2011; Kellet, Jan; Caravani, Alice; Pichon, Florence, 2014; OECD/ World Bank, Forthcoming). Mexico's FONDEN is also a good example for how post-disaster assistance can be used to reduce disaster risks, by incentivising reconstruction that does not replicate pre-existing disaster risk conditions (Box 5.2).

Box 5.2. Reducing existing risks: Mexico's Fund for Natural Disasters disaster assistance scheme

A large share of Mexico's disaster risk management spending by the central government comes from the Fund for Natural Disasters (Fondo de Desastres Naturales, FONDEN). The law mandates FONDEN to be spent to finance emergency assistance, recovery and reconstruction of public infrastructure, as well as for the reconstruction of low-income housing. Specifically, FONDEN provides disaster assistance for the following items:

- 100% of the costs for recovery and reconstruction of federal public infrastructure damage
- Up to 50% of the costs for recovery and reconstruction of subnational public infrastructure damage.

Support can be requested for the replacement costs of damaged infrastructure, as well as for their improvement to strengthen resilience against future disasters. Central government post-disaster assistance is only available if a disaster declaration is officially issued, and if a damage assessment has been carried out (usually done by the central and

subnational governments together), based on which an official request for FONDEN support can be submitted.

To avoid repeated requests for damage compensation and hence an overreliance on public disaster assistance, rules have been established that limit the repeated eligibility for FONDEN funding for uninsured public infrastructure. Damaged uninsured federal infrastructure for which reconstruction is requested a second time will only be compensated at 50% instead of 100%. For subnationally owned infrastructure, this percentage is 25% for a third request. For any subsequent reconstruction requests, FONDEN will not provide any disaster recovery assistance at all. For insured public infrastructure, eligibility for FONDEN funding remains the same even after repeated reconstruction requests.

Source: OECD/ World Bank (2019).

The National Plan for Disaster Risk Management does not include any specific disaster risk reduction objectives for households and businesses. Households and businesses, like other societal actors, can add to the creation of new risks as much as they can undermine the public disaster risk reduction efforts with their behaviour. They can also take important steps to reduce the disaster risks they are exposed to.

The government has several levers to encourage disaster risk reduction among households and businesses, such as building codes and provisions to incentivise disaster risk reduction, such as through subsidies or tax deductions for private resilience measures. Public-private partnerships offer an additional pathway for encouraging households and businesses to engage in disaster risk reduction. Austria's water boards are a public-private partnership between any number of individuals, municipalities or businesses along a shared body of water. All members contribute to a shared fund that finances the development and maintenance of disaster risk reduction measures (Box 5.3). For all these measures, it helps if risks are communicated to exposed stakeholders and the broader public alike in a way that is easy to understand and act upon.

Box 5.3. Austria's water boards: a public-private partnership to reduce flood risk

In Austria, any number individuals, municipalities or businesses along a shared body of water, can form a public-private partnership in the form of a 'water board' to finance and maintain disaster risk reduction measures. The level of contribution to the water board fund set up for this purpose is determined by a point system derived from the exposure of a member's property or dwelling. The initial determination of membership fees is automatically transferred to new property owners.

Water boards are statutory corporations under Austrian law (Water Act of 1959) and can take three organisational forms: a voluntary board with voluntary membership; a board with obligatory membership (determined by the majority of interested members and considering the number of opposing members in a given hazard area); or an obligatory board enforced by the provincial governor.

Water boards, just like municipalities, can initiate and request the construction of protective infrastructure, and thereby oblige its members to finance the suggested measures. As water boards become the formal owners of the protective infrastructure they build, they are responsible for maintaining protective infrastructure. This has led to significantly better results in the quality of protective infrastructure over time, compared to infrastructure for which maintenance is the responsibility of other interest groups, such as municipalities, which have faced financial constraints to cover the costs.

Source: OECD (2017).

The government can continue exploring or supporting the availability of risk transfer instruments, such as disaster risk insurance for households, as much as for businesses to secure their assets as well as their operations. The current ambitions under the PNGRD, including a project that seeks to inform the design of disaster risk insurance instruments for central and subnational public assets, critical infrastructure, as well as for businesses and households are a useful step in this direction (UNGRD, 2018). To encourage disaster risk reduction and a culture of risks, premiums should reflect disaster risk exposure, as well as disaster risk reduction measures carried out by insurance holders (OECD, 2017; OECD/ World Bank, Forthcoming).

Finally, the UNGRD's function in the monitoring process of implementing the National Plan's goals should not be limited to a task-by-task reporting exercise. Instead, the UNGRD could use the reporting intervals as an opportunity to reassess the feasibility of the set targets, to identify the barriers to implementation as well as to present solutions that help actors better accomplish their objectives.

Note

[1] Law 1753/2015, Congress of Colombia, www.secretariasenado.gov.co/senado/basedoc/ley_1753_2015.html (in Spanish, consulted on 10 September 2018).

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Chapter 6. Disaster preparedness and response in Colombia

This chapter reviews Colombia's disaster response capacities under the leadership of a central lead institution, and reviews the effectiveness of co-ordination mechanisms established to mobilise a timely disaster response. The chapter reviews disaster preparedness planning and emergency response capacity across the country. This is includes an evaluation of the effectiveness and coverage of early warning systems, provisions for crisis management exercises and drills and mechanisms for continuous improvement in disaster response.

Effective and timely disaster response that limits disaster losses and damages hinges on solid preparedness and planning. Disaster response units need to put the necessary resources and operational capacities in place and regularly practice emergency management plans to ensure co-ordinated disaster response. The *OECD Recommendation of the Council on the Governance of Critical Risks* (OECD, 2014) underlines the need to build preparedness, establish well co-ordinated response mechanisms with clear leadership and protocols, and stresses the need for good governance throughout disaster preparedness and response activities (OECD, 2014). This chapter evaluates Colombia's practices in this regard against the provisions of the OECD Recommendation, with a focus on the extent to which these are promoted in disaster preparedness and response policies.

Effective disaster preparedness and response: Key aspects of Colombia's disaster risk management

Disaster preparedness and response are at the heart of Colombia's national disaster risk management agenda. In line with the OECD Recommendation (OECD, 2014), Law 1523/2012 calls for stakeholders to engage in preparedness planning, including the adoption of national and subnational strategies for disaster response, civil protection exercises and trainings, and the installation of warning systems.

The National Plan for Disaster Risk Management (Plan Nacional de Gestión del Riesgo de Desastres, PNGRD) formulates concrete disaster preparedness objectives for public stakeholders in the National System for Disaster Risk Management (Sistema Nacional de Gestión del Riesgo de Desastres, SNGRD) (Table 6.1). The objectives aim at strengthening preparedness and response capacities at subnational government levels, with a strong technical assistance role given to the National Unit for Disaster Risk Management (Unidad Nacional para la Gestión del Riesgo de Desastres, UNGRD).

The UNGRD is tasked with ensuring that the National Emergency Response Strategy (Estrategia Nacional para la Respuesta a Emergencias, ENRE)[1] is implemented at all levels of government, that national as well as subnational stakeholders receive the necessary emergency response trainings, and that the necessary capacities are in place. The latter includes the installation of early warning systems, carried out by technical agencies and municipalities, but overseen by the UNGRD. To this end, the UNGRD has started to identify the national maximum required response capacity. The United Kingdom's Resilience Capabilities Programme could be a model worth considering for Colombia. The programme's goal is to increase response and disaster recovery capabilities by means of understanding what capacities are needed for which type of emergency (United Kingdom Cabinet Office, 2018)(Box 6.1).

Box 6.1. United Kingdom's Resilience Capabilities Programme

The United Kingdom's Resilience Capabilities Programme (RCP) supports departments in understanding the capabilities needed to effectively respond to and recover from disasters.

The RCP is informed by the UK National Risk Assessment (NRA) (see Box 4.1), and benefits from co-operation between responsible stakeholders. Around 80 scenarios, including disasters, major accidents and malicious attacks, have been identified in the NRA, and have guided the development of capacities under the respective lead department. The Civil Contingencies Secretariat within the UK Cabinet Office oversees and steers the development of capacities under the RCP. Close co-operation with the Resilience and Emergencies Division in the Ministry for Housing, Communities and Local Government and the Infrastructure Resilience team within Cabinet Office ensures adequate capacities at subnational as well as at critical infrastructure levels.

The Resilience Capabilities Programme Board, together with the Ministerial Sub-Committee on Resilience and the National Security Council Ministerial Sub-Committee on Threats, Hazards, Resilience and Contingencies oversees capacity assessment.

Sources: United Kingdom Cabinet Office (2018), United Kingdom Cabinet Office (2017).

Roles and responsibilities

The actors involved in response to a disaster depend on the scale of the respective crisis. Law 1523/2012 differentiates between municipal, departmental and national disasters. The mayor or governor of an affected municipality or department can declare a state of disaster, upon recommendation by the respective subnational council. The President of Colombia declares a state of disaster following the recommendation of the National Council, reflecting the fact that disaster declarations open up access to central government assistance (see Chapter 7). Disasters may be declared up to two months after the onset of a disaster.

The National Strategy for Disaster Response specifies roles and responsibilities for stakeholders involved in disaster preparedness and response. Colombia's local response entities are first in line to respond to disasters. These include the local police and military units (fuerza pública), the fire brigade, as well as the local branches of the civil society organisations of the Colombian Red Cross (Cruz Roja Colombiana) and the Colombian Civil Defense (Defensa Civil Colombiana). The response functions at the local level include search and rescue, the provision of first aid and emergency relief. If a disaster is declared, additional response units from other territorial entities or the central government can be mobilised in complement to local response units. This may include the Military Forces of Colombia (Fuerzas Militares de Colombia).

Table 6.1. Disaster preparedness and response management objectives in the National Plan for Disaster Risk Management, 2015-25 (*selection*)

Objective	Responsible stakeholder(s)	Timeline	Status
Preparedness (national level)			
National Disaster Response Strategy implemented (at functional response level)	UNGRD	Short term	↗ (2/2018)
National entities trained to participate in emergency response operations	UNGRD	Medium term	↗ (2/2018)
National Emergency Telecommunications Network connected at territorial and national level	MinTic; ANE	Medium term	☑ (2/2017)
32 departments and 32 cities equipped with operating crisis and radio rooms	Territorial entities	Short term	↗ (2/2018)
Preparedness (territorial level)			
Response strategies implemented in all territorial entities	Territorial entities	Short term	↗ (2/2017)
Disaster management capacities of departmental and municipal councils managing a disaster reinforced	UNGRD; territorial entities	Short term	↗ (2/2018)
Disaster response capacities strengthened in all 32 departments and in their capital cities	Territorial entities	Long term	↗ (2/2018)
Emergency response protocols in place in 100% of the departments exposed to seasonal climatic phenomena	UNGRD; territorial entities	Medium term	↗ (2/2018)
Emergency response protocols in place in 100% of the departments exposed to active volcanoes	UNGRD; territorial entities	Medium term	↗ (2/2018)
Emergency response protocols in place in 100% of the departments exposed to tsunami	UNGRD; DIMAR; territorial entities	Short term	↗ (2/2018)
Emergency response protocols in place in 100% of the departments exposed to hurricane hazard	UNGRD; DIMAR; territorial entities	Short term	↗ (2/2018)
Emergency response protocols in place in 100% of the departments exposed to seismic hazard	UNGRD; territorial entities	Short term	O (2/2017)
Early warning systems			
Maritime hazards early warning systems in place for the Pacific and Caribbean coastlines (including islands)	DIMAR	Long term	↗ (2/2018)
78 hydrological hazards monitoring networks for early-warning systems installed	Territorial entities; CARs; UNGRD; IDEAM	Short/medium term	↗ (2/2018)

Notes: Short term: 2015-18; medium term: 2019-21; long term: 2022-25.
UNGRD: National Unit for Disaster Risk Management; MinTic: Ministry of Information Technology and Communications; ANE: National Spectrum Agency; DIMAR: Directorate General of Maritime Affairs (*Dirección General Marítima*; CAR: regional autonomous corporation; IDEAM: Institute of Hydrology, Meteorology, and Environmental Studies.
↗ under implementation; O no activities/not started; ☑ finalised; **?** no information on implementation status available. Symbol describes the most recent status available.
Source: (UNGRD, 2016; UNGRD, 2016; UNGRD, 2017; UNGRD, 2017; UNGRD, 2018)

In recognition of the whole-of-society approach in disaster risk management that was adopted through Law 1523/2012, the National Strategy for Disaster Response specifies roles for businesses, including infrastructure operators, as well as individual citizens. Infrastructure operators are, for example, required to contribute to the provision of relief items listed in the strategy. To engage citizens in disaster response, local response units offer first aid trainings and organise preparedness seminars for local populations. The Colombian Civil Defense, for instance, has trained over 16 000 volunteers for disaster response operations, and the UNGRD trains community leaders as first responders, complementing public response capacities with civil society potential (Colombian Civil

Defence, 2017; UNGRD, 2017). Good practice from Mexico offers further inspiration for engaging citizens in disaster response efforts to complement government information on the extent of disaster damages and response needs (Box 6.2).

Box 6.2. Mexico: Using data in disaster response

In Mexico, various tools to support disaster response operations are available. Following the September 2017 earthquake in south-central Mexico (Morelos, Chiapas, State of Mexico, Guerrero, Oaxaca and Mexico City), these tools were put to a test, showing their use in improving and co-ordinating disaster response. Shortly after the 7.1 earthquake, the Mexican government, through its National Digital Strategy and the National Emergency Committee, started to make use of these tools:

- To quickly collect information on the extent of damage to buildings and infrastructure, a public call through an open, online process was launched, resulting in ca. 17 000 data points. To support the citizen-driven collection of data, the government of Mexico released information on public Wi-Fi spots, along with information on the list of municipalities affected by the earthquake. With the use of this data, the National Emergency Committee was able to plan emergency response in a timelier manner, and better concentrate efforts on the most affected areas.
- To boost the efficiency of response efforts, digital tools such as Google's Person Finder, Alerts and Crisis Map; Waze's data about traffic in Mexico City; Facebook's Safety Check and automated chatbot; Twitter's communication efforts; and Carto's mapping infrastructure were used in planning and co-ordinating disaster response efforts. For this purpose, the government agreed a communication protocol with the various technology companies. Agreements with third-sector efforts (e.g. comoayudar.mx and sismomexico.org) further contributed to co-ordinating and prioritising disaster response efforts.

Source: OECD (2018), OECD (2016).

Early warning systems

In the event of a disaster, stakeholders with disaster response responsibilities need to be able to act quickly (OECD, 2014). Early warning systems monitor hazards and issue timely warnings in case of disaster, making them a critical factor in enabling effective disaster response from responsible stakeholders, as well as from those directly affected by a disaster. In addition to setting up early warning systems, the OECD Recommendation provides that results should be fed directly into timely decision making (OECD, 2014).

In Colombia, Law 1523/2012 provides for the establishment of early warning systems to activate disaster response capacities. Currently, warning systems are in place for some hazards and in some areas. To warn about impeding earthquakes and volcanic activity, the Colombian Geological Service (Servicio Geológico Colombiano, SGC) maintains a

warning system as part of its seismological network (Red Sismológica Nacional de Colombia, RSNC). For hydrometerological hazards, including storms, torrential rain and landslides, the Institute of Hydrology, Meteorology, and Environmental Studies (Instituto de Hidrología, Meteorología y Estudios Ambientales, IDEAM) issues alerts, but does not yet have a real-time early warning system in place (Box 6.3). In La Guajira, the Colombian Red Cross and the Autonomous Corporation of La Guajira (Corpoguajira) monitor hydro-meteorological conditions and alert communities (Colombian Red Cross, n.d.; UNGRD, 2015; UNGRD, 2018).

Box 6.3. Vigicrues: France's flood warning system

To enable timely and co-ordinated response to floods, the French Ministry of Ecology, Sustainable Development and Energy collects information on water levels of the country's main bodies of water. The ministry makes information on water levels available on the Vigicrues online platform (www.vigicrues.gouv.fr). Flood alerts are also issued through this public platform, with the level of risk illustrated on a colour scale (green, yellow, orange and red) on a map of France. A click on the map activates a zoom function and highlights individual monitoring stations, where the user can get additional information on current water levels. Periodic information bulletins from monitoring stations complement this information with further details, as well as with self-protection guidance.

Source: French Ministry of Ecology, Sustainable Development and Energy (2018).

To close gaps in coverage, the National Plan for Disaster Risk Management includes several projects to expand early warning systems. For instance, a project on early warning systems for maritime hazards is currently under way, with permanent tsunami hazard monitoring and a tsunami alert centre (Centro de Alerta por Tsunami, CAT) already established. In addition, as part of a project to install 78 early warning systems for hydrological hazards, 16 cities have installed early warning systems that monitor water levels and issue warnings in case of high flash flood risk. Additional flash flood early-warning systems are under development in 14 municipalities in the Putumayo and Huila departments (DIMAR, 2018; UNGRD, 2015; UNGRD, 2018)

Emergency and response planning

Emergency management plans and response protocols are important factors in ensuring effective and co-ordinated response to disasters. In Colombia, Law 1523/2012 requires the adoption of national and subnational strategies for disaster response, which should include emergency plans and response protocols. With the National Strategy for Disaster Response, an emergency management plan accompanied by response protocols for all aspects of emergency response is in place at the national level. In addition, the National Plan for Disaster Risk Management includes a series of projects for scenario-based emergency planning. Emergency response protocols for volcanic eruptions (Galeras, Chiles and Cerro Negro volcanoes) and tsunamis have been prepared, and the national hurricane response protocol is currently undergoing revision. Response protocols for seasonal climatic phenomena, earthquakes, as well as industrial, technological and bio-sanitary hazards are to follow in the short- and medium term (UNGRD, 2015; UNGRD, 2018).

Law 1523/2012 also requires all public service providers to develop emergency management plans. Some service providers already have plans in place, whereas others noted that plans are currently being developed following the adoption of Decree 2157/2017. For instance, Ecopetrol, Colombia's primary oil producer, already has emergency management plans in place, and organises regular trainings to ensure employees are familiar with the emergency provisions.

Crisis management exercises and drills

Regular crisis management exercises and drills for stakeholders engaged in disaster response activities ensure that all stakeholders are familiar with the emergency plans and response protocols, and know exactly what to do during a crisis. Exercises also present an opportunity to validate emergency plans and protocols, and to communicate hazard and risk information. They represent an opportunity to promote the need for whole-of-society preparedness to the public (OECD, 2014).

In Colombia, the UNGRD, together with stakeholders in the National System for Disaster Risk Management, have a strong track record in organising disaster management exercises. Typically, these exercises are also used for risk communication and to raise public awareness. Communication material on the exercises includes websites, video clips and social media posts. Examples include the annual National Emergency Response Simulation (Simulacro Nacional del Respuesta a Emergencias).[2] This simulation offers an opportunity to practice response procedures for the main natural hazards Colombia is exposed to. The UNGRD regularly organises bilateral disaster preparedness exercises with neighbouring countries, including Ecuador and Peru, as well as with international organisations. The 2016 SIMEX exercise in Bogota, for instance, was organised with United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA), to exercise the use of UN search and rescue procedures in earthquake response activities.[3] Upcoming international exercises include the tsunami exercises "Caribe Wave 18" with countries in the Caribbean, and "PacWave18" organised with the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System.[4]

Co-ordination mechanisms for effective and timely disaster response

Effective and timely disaster response requires strong co-ordination mechanisms and government leadership. To this end, the OECD Recommendation provides that a crisis cell to co-ordinate disaster response efforts should be in place, and government leadership should be reinforced (OECD, 2014). In Colombia, the UNGRD is the lead agency in charge of co-ordinating the national response to national emergencies. It brings liaison officers from all stakeholder groups involved in the response efforts together in a national crisis room, along with delegates from all other relevant ministries, the three technical committees and the National Council, to co-ordinate actions (Box 6.4). The National Committee for Disaster Management (Comité Nacional para el Manejo de Desastres, CNMD), as the body to co-ordinate policy making for disaster response and recovery, provides technical and strategic advice and guidance throughout the disaster response efforts.

Box 6.4. Colombia's National Crisis Room: Co-ordinating multi-stakeholder disaster response

Established by Law 1523/2012, the national crisis room is Colombia's main co-ordination and decision-making mechanism in case of national disaster. In it, the National Unit for Disaster Risk Management (UNGRD) brings liaison officers from all response units engaged in response operations together with delegates from relevant ministries, the three technical committees and the National Council to co-ordinate response and relief throughout the stages of an emergency. By centralising emergency information, planning the response operations and adjusting response capacities in line with the situation, the National Crisis Room enables effective decisions, avoids duplication of efforts and improves the effectiveness of disaster response efforts.

Activated as a mechanism to support subnational governments in case of a disaster declaration, the National Crisis Room co-ordinates with its respective counterparts at a regional, departmental and municipal level. Therefore, response efforts at the national level are designed and implemented as a complement to departmental, municipal and district response strategies to emergency situations.

Source: UNGRD (2016).

At the subnational level, departmental and municipal crisis rooms, supported by a risk management office in large cities (greater than 250 000 inhabitants), co-ordinate the response efforts. However, the latest implementation monitoring report of the National Plan for Disaster Risk Management shows that to date, only 14 of Colombia's 32 departments are equipped with a departmental crisis rooms (UNGRD, 2016; UNGRD, 2018).

Mechanisms for continuous improvement in disaster response

In the aftermath of a disaster, it is important to draw lessons and to identify success factors and address bottlenecks to be overcome in future disaster response efforts. Along with mechanisms to evaluate the effectiveness of prevention and preparedness activities, the OECD Recommendation suggests carrying out post-event reviews of disaster response efforts (OECD, 2014) . There are no institutionalised mechanisms in Colombia for drawing lessons from disaster response operations. Law 1523/2012 does not require it. To this end, the UNGRD could leverage the National Committee for Disaster Management. Already tasked with overseeing and advising disaster response efforts, this committee would be an ideal platform to bring stakeholders together to identify lessons and feed them into the disaster response policy-making process. Good practices, such as the RETEX lessons learning procedure in France, could serve as inspiration in establishing a systematic lessons learnt approach in Colombia (Box 6.5).

Box 6.5. RETEX: Improving emergency response through lessons learnt

Post-disaster lessons learning ensures that with each disaster response operations are improved, capacities strengthened and good practices taken forward. In France, the French Ministry of Interior put a standard process in place to do so after each activation of an emergency plan (including after exercises): the lessons learnt (*retour d'expérience*, RETEX) mechanism.

The RETEX mechanism is a lessons learnt process during which all stakeholders involved in the response efforts get together to jointly identify what went well during disaster response and relief, and what could be improved in future response operations. The RETEX process provides a common space for all stakeholders to share insights, ideas for improvements and agree on recommendations to improve disaster response operations going forward. Recommendations obtained through the RETEX are protocolled and followed up by the responsible stakeholders.

Sources: French Ministry of the Interior, n.d.; Grant Thornton (2018).

Notes

[1]http://repositorio.gestiondelriesgo.gov.co/bitstream/handle/20.500.11762/20419/Documento%20soporte%20Estrategia%20Nacional%20para%20la%20Respuesta%20de%20Emergencias.PDF?sequence=1&isAllowed=y (in Spanish, consulted on 24 July 2018).

[2] Law 1712/2014, Congress of Colombia, http://suin.gov.co/viewDocument.asp?ruta=Leyes/1687091 (in Spanish, consulted on 24 July 2018).

[3]See:http://portal.gestiondelriesgo.gov.co/Noticias_SIMEX/Lists/EntradasDeBlog/Post.aspx?List=3142fa85-0caa-4c02-9eb1-329c6566c047&ID=6&Web=94004342-783a-4a98-8f9d-cbdcf7741d0b (consulted on 25 July 2018).

[4]See:http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=2267&Itemid=2786 (consulted on 25 July 2018).

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Chapter 7. Disaster recovery and reconstruction in Colombia

This chapter gives an overview of Colombia's disaster recovery and reconstruction process, particularly its ability to avoid the replication of risks in that process. As part of this, the chapter reviews the disaster recovery and reconstruction commitments in place and gives an overview of the disaster risk financing tools available for meeting these commitments in case of a disaster. It pays particular attention to Colombia's approach to ensuring an efficient use of public resources for disaster recovery and reconstruction purposes.

Following disaster, prompt recovery of disrupted services and economic activity, as well as timely reconstruction of damaged assets are important to limit longer term negative impacts on people's lives and economic growth. The reconstruction phase is an important opportunity to "build back better", which means to avoid recreating the pre-existing risks as well as the creation of new risks. Clear legal responsibilities and budgetary arrangements facilitate successful and timely disaster recovery and reconstruction. The *OECD Recommendation of the Council on the Governance of Critical Risks* (OECD, 2014) suggests establishing governance arrangements that facilitate efficient use of public funds through procurement arrangements that protect from undue influence and corruption.

Facilitating disaster recovery and reconstruction: Building back better

When recovering and reconstructing assets left damaged or destroyed during disaster, vulnerabilities should be reduced rather than replicated to build long-term resilience (OECD, 2014). With Law 1523/2012, Colombia embraces this "build back better" principle as a core objective to adhere to in recovery and reconstruction in the aftermath of disaster, providing that recovery and reconstruction should result in more resilient assets. To ensure resilient recovery, the law designates the UNGRD as the lead agency to co-ordinate and plan disaster recovery and reconstruction efforts, recognising shared responsibilities by all societal actors. To ensure broad stakeholder consensus, Law 1523/2012 requires the UNGRD to develop recovery action plans in co-operation with the National Committee for Risk Knowledge and the National Committee for Risk Reduction. The National Committee for Disaster Management supports the UNGRD in the preparation of recovery and reconstruction efforts. The National Plan for Disaster Risk Management (Plan Nacional de Gestión del Riesgo de Desastres, PNGRD) provides that a National Disaster Recovery Strategy (Estrategia Nacional para la Recuperación ante Desastre Nacional) should be in place by 2021 along with sectoral recovery strategies to establish a shared approach to recovery and reconstruction processes (UNGRD, 2015).

Post-disaster damage assessments

Following the declaration of a public calamity or disaster in Colombia, damages caused by the disaster are to be assessed to guide recovery and reconstruction efforts, and inform the provision of central government support. This is in line with the OECD Recommendation (OECD, 2014) that calls for the investigation and the assessment of damages and losses derived from disasters as soon as possible after they occur. In Colombia, responsibility for carrying out post-disaster damage assessments lies with the respective municipal or departmental government of the affected area. To ensure a coherent assessment of damages for all disasters, the UNGRD has designed a standard method for early damage assessment to be carried out as soon as possible after the event. A more detailed damage assessment is to be carried out once relief operations have ended. All damage assessments should be submitted to stakeholders that are part of the National Crisis Room (see Box 6.4 in Chapter 6). The results are used to inform the design and financing of recovery action plans (UNGRD, 2013).

Disaster recovery and reconstruction commitments

In terms of financial assistance for disaster recovery and reconstruction, Law 1523/2012 requires the central government to provide financial support for recovery when a public calamity or disaster has been declared. The level of financial support and the type of asset for which support will be made available are not prescribed in the law. The only exceptions are transport infrastructure assets under the authority of the National Roads Institute

(Instituto Nacional de Vías, INVIAS) and the National Infrastructure Agency (Agencia Nacional de Infraestructura, ANI), whose recovery assistance is regulated by Law 1682/2013[1] and Decree 4165/2011).[2]

Central government recovery funding may be requested once subnational and sectorial resources have been exhausted. However, Law 1523/2012 does not specify any cost-sharing agreements. Negotiations are currently underway to change this for subnational governments. (OECD/ World Bank, Forthcoming).

Unclear rules on "who pays what" following a disaster may lead to delays in recovery and reconstruction, as well as a higher financial burden for the state. Reviews of public spending in the aftermath of disasters suggest broad commitments to provide financial support, such as in Law 1523/2012, may lead to higher than necessary payments for recovery and reconstruction (OECD/ World Bank, Forthcoming). The OECD recommends to develop rules for compensating losses that are clearly spelled out at all levels in advance of emergencies to the extent that this is feasible (OECD, 2014).

Past practice in Colombia shows that government compensation was made available for a wide range of damaged or destroyed public assets, going beyond public transport infrastructure, to include for example damages incurred by state-owned enterprises (Ministry of Finance and Public Credit, 2011; World Bank, 2011; OECD, 2018). Specifying cost-sharing arrangements across levels of government could be beneficial in managing expectations regarding available recovery and reconstruction support. Canada's disaster financial assistance arrangements (Box 7.1) may offer inspiration for specifying cost-sharing arrangements for central government disaster recovery support in Colombia. Cost-sharing arrangements could also integrate considerations for avoiding payments for repeated damages so as to reward prior investments in disaster risk reduction, such as is the practice of FONDEN in Mexico (see Box 5.2 in Chapter 5).

Financing arrangements for disaster recovery and reconstruction

Disaster recovery and reconstruction is cost-intensive and requires a quick mobilisation of substantial funds. Given the broad explicit and implicit disaster-related contingent liabilities the Colombian government faces, various pre-funding mechanisms are in place.

The National Fund for Disaster Risk Management (Fondo Nacional de Gestión del Riesgo de Desastres, FNGRD), a reserve fund managed by the UNGRD (see Box 3.2 in Chapter 3) is the main central government instrument to finance disaster recovery and reconstruction. In the event of a disaster or public calamity, the board of the FNGRD decides on the allocation of resources, reflecting the provisions of the specific recovery action plans. Before requesting central government assistance, subnational governments are to provide support for disaster recovery and reconstruction. Law 1523/2012 requires municipal, district and departmental governments to set up their own disaster risk management funds. However, as with the FNGRD, Law 1523/2012 does not provide for concrete budgetary arrangements that determine the level of available funding on an annual basis. To ensure that predictable and sufficient resources are available for disaster recovery, Costa Rica's National Emergency Fund (Fondo Nacional de Emergencia) requires all public institutions to allocate 3% of their budget surplus per year to the fund. Mexico's Fund for Natural Disasters (Fondo de Desastres Naturales, FONDEN) requires at least 0.4% of programmable federal spending to be distributed to FONDEN (OECD, 2013; Colombian Ministry of Finance and Public Credit, 2011; Kellet, Jan; Caravani, Alice; Pichon, Florence, 2014; OECD/ World Bank, Forthcoming).

In addition to the funds established by Law 1523/2012, Colombia has several other pre-funding mechanisms for disaster recovery and reconstruction support in place. The Adaptation Fund (Fondo de Adaptación, AF)[3] may, for instance, be tapped into for financing recovery and reconstruction, such as in the aftermath of the 2010/11 La Niña episodes. A Catastrophe Deferred Drawdown Option provided through the World Bank provides an additional USD 250 million that is made available in the event of a specific level of disaster for recovery and reconstruction purposes. A recently signed USD 1 billion catastrophe bond agreed between Colombia, Chile, Mexico and Peru under the Pacific Alliance further adds to the available resources for disaster recovery and reconstruction (Artemis, 2018). Finally, additional financing can be made available through either reassigned sectoral budgets or the general budget administered by the Ministry of Finance and Public Credit (OECD, 2014; Colombian Ministry of Finance and Public Credit, 2010)

The Ministry of Finance and Public Credit is committed to reducing the government's fiscal vulnerability to disasters. It leads a multi-stakeholder technical working group on financial protection and carries out several projects under the PNGRD. One such project seeks to inform the design of disaster risk insurance instruments for central and subnational public assets, critical infrastructure, as well as for businesses and households. The insurance instruments should be available by 2025, with preliminary research on available insurance policies and public assets to be covered under way. In addition, the PNGRD provides that two parametric insurance instruments should be available by 2021. A seismic risk transfer instrument has already been designed as part of this project (UNGRD, 2018).

Box 7.1. Canada's disaster financial assistance arrangements

In Canada, the vast majority of the federal government's financial resources for post-disaster relief and recovery are financed by the disaster financial assistance arrangements (DFAAs). The DFAA is financed through an annual budget that can be topped up with debt financing when earmarked funding does not suffice.

Reimbursements to subnational governments via the DFAA are made on a progressive scale. The threshold that needs to be met in order to qualify for federal reimbursements via the DFAA starts at CAD 3.07 (USD 2.53) per provincial citizen, resulting in initial thresholds ranging from CAD 114 450 (USD 94 162) in the relatively low-populated Nunavut region to over CAD 43 million (USD 36 million) in Ontario (Table 7.1).

Table 7.1. Expense thresholds under the disaster financial assistance arrangements, 2017

Province/territory	Population 2017 (Q1)	Initial threshold amounts in CAD (50% reimbursement)	Final threshold amounts in CAD (90% reimbursement)
Alberta	4 280 127	13 139 990	65 785 552
British Columbia	4 777 157	14 665 872	73 424 903
Manitoba	1 328 346	4 078 022	20 416 678
New Brunswick	757 771	2 326 357	11 646 940
Newfoundland and Labrador	529 696	1 626 167	8 141 428
Nova Scotia	952 024	2 922 714	14 632 609
Northwest Territories	44 263	135 887	680 322
Nunavut	37 280	114 450	572 994
Ontario	14 094 167	43 269 093	216 627 347
Prince Edward Island	149 383	458 606	2 296 017
Quebec	8 356 851	25 655 533	128 444 800
Saskatchewan	1 158 339	3 556 101	17 803 670

Source: (Public Safety Canada, 2018)

Once eligible disaster recovery expenses incurred by the affected provincial or territorial government exceed the initial threshold, at least half of the expenses eligible for financial assistance under the DFAA are reimbursable. The maximum federal reimbursement rate is 90% of eligible costs, when the final threshold of CAD 15.37 (USD 12.65) per citizen has been passed (Table 7.2) The cost-sharing formula is adjusted annually for inflation.

Table 7.2. Cost-sharing formula under the disaster financial assistance arrangements

Provincial/territorial expense thresholds (per capita of provincial population)	Provincial/territorial share (%)	Federal share (%)
First CAD 3.07	100	0
Next CAD 6.15	50	50
Next CAD 6.15	25	75
Remainder (over CAD 15.37)	10	90

Source: Public Safety Canada (2018).

Ensuring the efficient use of public resources for disaster recovery and reconstruction

To ensure an efficient use of public resources for disaster recovery and reconstruction, it is important to protect the funding process from any irregularity to preserve trust in public institutions (OECD, 2014). In Colombia, government support for disaster recovery and reconstruction is subject to the provisions of the Anticorruption Plan (Plan Anticorrupción y de Atención al Ciudadano), which promotes transparency and citizen engagement as mechanisms to ensure efficient use of public resources. Law 1150//2007 specifies these provisions, requiring transparency in the use of resources, which applies to the use of simplified procurement procedures for prompt disaster recovery and reconstruction (DNP, 2018).

Good practices from across the OECD may offer insights for Colombia to put these provisions into action and strengthen transparency and oversight throughout the recovery and reconstruction efforts. Italy's Open Data Ricostruzione portal, for instance, collects information on the allocation and use of funds during recovery and reconstruction from the 2009 l'Aquila earthquake, and on progress in implementing public reconstruction works. All is publicly accessible, enabling oversight and transparency. A second good practice is Mexico's the ReconstrucciónMX tool, which tracks assistance made available from FONDEN by cross-checking it with data from stakeholders involved in the recovery and reconstruction process. The ReconstrucciónMX tool also allows citizens to directly report on any observed misuses of the fund's resources, creating a valuable accountability mechanism to prevent undue influence and illegitimate use of public assistance (OECD, 2016; Open Data Ricostruzione, n.d.).

Notes

[1] https://www.mintransporte.gov.co/descargar.php?idFile=13089 (in Spanish, consulted on 30 July 2018).

[2] https://www.ani.gov.co/sites/default/files/u233/dec_4165.pdf (in Spanish, consulted on 30 July 2018).

[3] http://sitio.fondoadaptacion.gov.co/index.php/el-fondo/normatividad/normatividad (in Spanish, consulted on 30 July 2018).

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UNGRD (2013), *Estándarización de Ayuda Humanitaria de Colombia: Colombia menos vulnerable, comunidades más resilientes [Standardisation of Colombia's Humanitarian Aid: A less vulnerable Colombia, more resilient communities*, http://portal.gestiondelriesgo.gov.co/Documents/Manuales/Manual_de_Estandarizacion_AHE_de_Colombia.pdf.

Annex A. Stakeholder interviewees

Government stakeholders

Administrative Department of Science, Technology and Innovation	*Departamento Administrativo de Ciencia, Tecnología e Innovación*	Colciencias
Colombian Institute of Hydrology, Metereology and Environmental Studies	*Instituto de Hidrología, Meteorología y Estudios Ambientales*	IDEAM
Directorate General of Maritime Affairs	*Dirección General Marítima*	DIMAR
Ministry of Agriculture and Rural Development	*Ministerio de Agricultura y Desarrollo Rural*	MinAgricultura
Ministry of Education	*Ministerio de Educación Nacional*	MinEducación
Ministry of Finance and Public Credit	*Ministerio de Hacienda y Crédito Público*	MinHacienda
Ministry of Health and Social Protection	*Ministerio de Salud y Protección Social*	MinSalud
Ministry of Housing, City and Territory	*Ministerio de Vivienda, Ciudad y Territorio*	MinVivienda
Ministry of Information	*Ministerio de Tecnologías de la*	MinTIC

Technology and Communications	*Información y las Comunicaciones*	
Ministry of Mines and Energy	*Ministerio de Minas y Energía*	MinMinas
Ministry of National Defence	*Ministerio de Defensa Nacional*	MinDefensa
Ministry of Transport	*Ministerio de Transporte*	MinTransporte
National Infrastructure Agency	*Agencia Nacional de Infraestructura*	ANI
National Planning Department	*Departamento Nacional de Planeación*	DNP
National Roads Institute	*Instituto Nacional de Vías*	INVÍAS
National Statistics Department	*Departamento Administrativo Nacional de Estadística*	DANE
National Unit for Disaster Risk Management	*Unidad Nacional para la Gestión del Riesgo de Desastres*	UNGRD

Local government stakeholders

District Institute for Risk Management and Climate Change	*Instituto Distrital de Gestión de Riesgos y Cambio Climático*	IDIGER

Academia, business and civil society stakeholders

Colombian Association for Earthquake Engineering	*Asociación Colombiana de Ingeniería Sísmica*	AIS

Colombian Association of Insurers	*Federación de Aseguradores Colombianos*	FASECOLDA
Colombian Civil Defence	*Defensa Civil Colombiana*	DCC
Colombian Red Cross	*Cruz Roja Colombiana*	CRC
Ecopetrol S.A.		
Transport and Logistics of Hydrocarbons	*Transporte y Logística de Hidrocarburos S.A*	CENIT
University of Los Andes	*Universidad de los Andes*	UNIANDES

Annex B. List of respondents to the questionnaire

Government stakeholders

Administrative Department of Science, Technology and Innovation	*Departamento Administrativo de Ciencia, Tecnología e Innovación*	Colciencias
Agustín Codazzi Geographic Institute	*Instituto Geográfico Agustín Codazzi*	IGAC
Colombian Air Force	*Fuerza Área Colombiana*	FAC
Colombian Geological Service	*Servicio Geológico Colombiano*	SGC
Colombian Institute of Hydrology, Metereology and Environmental Studies	*Instituto de Hidrología, Meteorología y Estudios Ambientales*	IDEAM
Colombian National Army	*Ejército Nacional de la República de Colombia*	EJC
Colombian National Navy	*Armada Nacional de la República de Colombia*	ARC
Directorate General of Maritime Affairs	*Dirección General Marítima*	DIMAR

Mining and Energy Planning Unit	*Unidad de Planeación Minero Energética*	UPME
Ministry of Agriculture and Rural Development	*Ministerio de Agricultura y Desarrollo Rural*	MinAgricultura
Ministry of Environment and Sustainable Development	*Ministerio de Ambiente y Desarrollo Sostenible*	MinAmbiente
Ministry of Foreign Affairs	*Ministerio de Relaciones Exteriores*	Cancillería
Ministry of Health and Social Protection	*Ministerio de Salud y Protección Social*	MinSalud
Ministry of Housing, City and Territory	*Ministerio de Vivienda, Ciudad y Territorio*	MinVivienda
Ministry of Information Technology and Communications	*Ministerio de Tecnologías de la Información y las Comunicaciones*	MinTIC
Ministry of Mines and Energy	*Ministerio de Minas y Energía*	MinMinas
Ministry of Transport	*Ministerio de Transporte*	MinTransporte
National Infrastructure Agency	*Agencia Nacional de Infraestructura*	ANI
National Planning Department	*Departamento Nacional de Planeación*	DNP

National Police of Colombia	*Policía Nacional de Colombia*	PNC
National Roads Institute	*Instituto Nacional de Vías*	INVÍAS
National Unit for Disaster Risk Management	*Unidad Nacional para la Gestión del Riesgo de Desastres*	UNGRD

Academia, business and civil society stakeholders

Colombian Association for Earthquake Engineering	*Asociación Colombiana de Ingeniería Sísmica*	AIS
Colombian Civil Defence	*Defensa Civil Colombiana*	DCC
Colombian Red Cross	*Cruz Roja Colombiana*	CRC
Transport and Logistics of Hydrocarbons	*Transporte y Logística de Hidrocarburos S.A.*	CENIT
University of Los Andes	*Universidad de los Andes*	UNIANDES
University of Pereira	*Universidad de Pereira*	UTP

Annex C. Questionnaires

Public sector questionnaire

1. Governance of disaster risk management

This part of the questionnaire asks for information on Colombia's national disaster risk management system and the legislative framework underpinning the system. It focuses on coherence of roles and responsibilities among key stakeholders, priority setting and the ability to achieve objectives, and capacities for flexibility and adaptiveness to major changes. This information will be used to examine the effectiveness of disaster risk governance arrangements in Colombia.

1.1. Aside from Law 1523/2012, which laws and regulations underpin your organisation's work related to the governance of critical risks? Please list all relevant policies and provide links where available.

Policy document/ law	Link

1.2. What are the roles and responsibilities of your organisation in terms of managing critical risks and natural hazards within the framework of the above laws and regulations, and in practice? *Please define the roles and responsibilities, and provide examples of relevant good initiatives, if available.*

Stage of the disaster risk management cycle	Roles/responsibilities	Examples of relevant good initiatives
Disaster risk/hazard assessment		
Disaster risk reduction		
Disaster preparedness and response		
Disaster recovery and reconstruction		

1.3. Which of the following disaster risk governance functions does your organisation carry out? *Please select all that apply by double-clicking on the boxes and selecting "checked".*

- ☐ Design/formulate disaster risk management policies
- ☐ Prioritise disaster risk reduction measures and allocate resources accordingly
- ☐ Prioritise disaster preparedness measures and allocate resources accordingly
- ☐ Set performance targets for disaster preparedness measures
- ☐ Set performance targets for disaster risk reduction
- ☐ Provide incentives for the implementation of disaster risk management measures
- ☐ Monitor disaster risk management policy implementation
- ☐ Evaluate disaster risk management policy implementation
- ☐ Disseminate results of disaster risk management policy evaluations to the public
- ☐ Promote policy coherence across government departments with disaster risk management authorities
- ☐ Align competing policy objectives between different departments with disaster risk management authorities
- ☐ Co-ordinate disaster risk management actions across central and subnational levels of government
- ☐ Co-ordinate co-operation between government and non-governmental entities
- ☐ Carry out hazard/risk assessments
- ☐ Monitor disaster risks
- ☐ Others, *please specify:* Click here to enter text.

1.4. How have your organisation's roles and responsibilities changed with the adoption of Law 1523?

Please elaborate.

1.5. How have your organisations' disaster risk management capacities been reinforced/reduced with the adoption of Law 1523?

Please elaborate.

1.6. What means are available for your organisation to be involved in the policy co-ordination work within the National Disaster Risk Management System? *Please select all that apply by double-clicking on the boxes and selecting "checked".*

☐ National Disaster Risk Management Council (Consejo Nacional para la Gestión del Riesgo)

☐ National disaster risk management committees

☐ Co-ordination platforms to discuss disaster risk management policies

☐ Partnerships to foster co-operation between governmental and non-governmental entities

☐ Platforms for technical co-operation (e.g. expert discussions, mutual trust building, information sharing, disaster risk assessment workshops)

☐ Meetings between subnational and central government stakeholders

☐ National committees for understanding and reducing disaster risk, and disaster management

☐ Others, *please specify:* Click here to enter text.

1.7. The National Disaster Risk Management System involves many institutions and organisations. How are their various policy agendas and competing priorities co-ordinated and aligned with the goals of the system, and underpinning Law 1523?

Please elaborate.

1.8. How effective would you rate the disaster risk management policy co-ordination work of the National Disaster Risk Management System? *Please rank it on a scale of 0-5.*

0 Ineffective	1	2	3	4	5 Very effective
☐	☐	☐	☐	☐	☐

Please elaborate the rating.

1.9. **Self-assessment:** In your opinion, what are the most effective aspects of the co-ordination work of the National Disaster Risk Management System? Where is there room for improvement?

Please elaborate.

1.10. What means does the National Disaster Risk Management System use to involve stakeholders/interest groups in formulating disaster risk management policies? *Please select all that apply by double-clicking on the boxes and selecting "checked".*

☐ Workshops with representatives from relevant line ministries

☐ Workshops with representatives from subnational levels of government

☐ Conferences/workshops with participation from interest groups and non-governmental organisations

☐ Expert meetings with representatives from academia

☐ Town hall meetings open to citizens

☐ Public consultation process

☐ Citizen participation website Crystal Urn (Urna de Cristal)

☐ Others, *please specify:*

1.11. **Self-assessment:** In your opinion, what are the key challenges and success factors in ensuring broad stakeholder/interest group involvement in the disaster risk policy-making process in Colombia?

Please elaborate.

1.12. What accountability mechanisms are in place to ensure that stakeholders fulfil their respective disaster risk management responsibilities as foreseen by the legal framework? *Please select all that apply by double-clicking on the boxes and selecting "checked".*

☐ Regular audits that consider resilience and disaster risk management objectives

☐ Public hearings

☐ Corrective measures for non-compliance with resilience and disaster risk management requirements:

☐ Budget reductions

☐ Legal proceedings

☐ Fines

☐ Other sanctions, *please specify:* Click here to enter text.

☐ Other, *please specify:* Click here to enter text.

1.13. **Self-assessment:** How effective would you rate the existing accountability mechanisms? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

0 Ineffective	1	2	3	4	5 Very effective
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

1.14. **Self-assessment:** In your opinion, what are the key challenges in ensuring that each stakeholder fulfils his/her disaster risk management responsibilities? What are success factors in this regard?

Please elaborate.

2. Hazard and disaster risk assessments

This part of the questionnaire asks for information on the use of hazard and disaster risk assessments to inform land-use decisions and civil contingency planning, and to inform disaster risk management measures. It will also look at whether forward-looking techniques are incorporated, and how the results of these assessments are communicated across stakeholders.

2.1. Who prepares hazard assessments/maps for the below hazards in Colombia? *Please check the applicable boxes by double-clicking on the box and selecting "checked".*

Risk	Hazard assessment/maps		If yes: Scope		Please provide details on the organisation conducting the hazard assessments/maps
	Yes	No	National	Regional	
Earthquakes	☐	☐	☐	☐	
Tsunami	☐	☐	☐	☐	
Landslides	☐	☐	☐	☐	
Rock fall	☐	☐	☐	☐	
Volcanic activity	☐	☐	☐	☐	
Storms	☐	☐	☐	☐	
Cold wave	☐	☐	☐	☐	
Heat wave	☐	☐	☐	☐	
Drought	☐	☐	☐	☐	
Wildfire	☐	☐	☐	☐	
Flood	☐	☐	☐	☐	
Avalanche	☐	☐	☐	☐	
Click here to enter text.	☐	☐	☐	☐	
Click here to enter text.	☐	☐	☐	☐	
Click here to enter text.	☐	☐	☐	☐	

2.2. Which stakeholders does your organisation co-operate with when preparing hazard assessments/maps?

	Hazard assessments/maps
Other ministries at central government level	Please list stakeholders you co-operate with
Subnational governments	
Scientific community and/or academia	
Private sector (e.g. insurance)	
Non-governmental organisations (e.g. Red Cross)	
Citizens (e.g. local population)	
International organisations/bilateral co-operation agencies	
Associations (e.g. engineering association)	
Others, *please specify:* Click here to enter text.	

2.3. Do hazard assessments incorporate forward-looking approaches, such as horizon scanning or foresight analyses, to include prospective trends (e.g. climate change, demographic trends, urbanisation, etc.)? If so, who conducts these?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

2.4. Are hazard assessments/maps regularly updated for the below disaster risks in Colombia? If so, how often are they updated?

	Earthquakes	Tsunami	Landslides	Rock fall	Volcanic activity	Storms	Cold wave	Heat wave	Drought	Wildfire	Flood	Avalanche	Others, *please specify:* Click here to enter text.
Not updated	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Every year	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Every 1-2 years	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Every 2-3 years	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Every 3-5 years	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other, *please specify:* Click here to enter text.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

2.5. In your opinion, are the experts conducting hazard assessments/maps impartial? Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".

0 Not impartial	1	2	3	4	5 Very impartial
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

2.6. Are the results of hazard assessments publicly available and free of charge?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

2.7. Are the results of hazard assessments communicated across departments and levels of government to ensure policy consistency?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

2.8. Are the results of hazard assessments used in the following activities?

Actions	Yes	No	Examples of usage of hazard/risk information in policy making
Implementation of land-use policies	☐	☐	
Building code development/updates	☐	☐	
Risk communication	☐	☐	
Prioritising disaster risk reduction measures	☐	☐	
Resource allocation for disaster risk reduction measures	☐	☐	
Emergency preparedness and contingency planning	☐	☐	
Resource allocation for preparedness/contingency planning	☐	☐	
Setting insurance premiums	☐	☐	
Others, *please specify:* Click here to enter text.	☐	☐	

2.9. **Self-assessment:** How effective would you rate the integration of hazard information into policy making in Colombia? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

	0 Ineffective	1	2	3	4	5 Very effective
Hazard information	☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

2.10. Is there a process to call into question hazard assessments and land-use decisions based on the results of hazard assessments? If so, how can this be done?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

2.11. **Self-assessment:** In your opinion, what are the main areas in need of improvement related to the development of hazard/disaster risk assessments/maps and the way they are used in policy making in Colombia?

Please elaborate.

2.12. Who prepares disaster risk assessments/maps for the below disaster risks in Colombia? *Please tick applicable boxes by double-clicking on the box and selecting "checked".*

Disaster risk	Disaster risk assessments/maps		If yes: Scope		Please provide details on the organisation conducting the disaster risk assessments/maps
	Yes	No	National	Regional	
Earthquakes	☐	☐	☐	☐	
Tsunami	☐	☐	☐	☐	
Landslides	☐	☐	☐	☐	
Rock fall	☐	☐	☐	☐	
Volcanic activity	☐	☐	☐	☐	
Storms	☐	☐	☐	☐	
Cold wave	☐	☐	☐	☐	
Heat wave	☐	☐	☐	☐	
Drought	☐	☐	☐	☐	
Wildfire	☐	☐	☐	☐	
Flood	☐	☐	☐	☐	
Avalanche	☐	☐	☐	☐	
Click here to enter text.	☐	☐	☐	☐	

2.13. Which of the following impact criteria are used in disaster risk assessments?

Impact criteria	Yes	No	Please provide details, if applicable
Human impact	☐	☐	
Direct economic impacts (i.e. damages)	☐	☐	
Indirect economic impacts (i.e. losses, for example due to business disruptions)	☐	☐	
Environmental impact	☐	☐	
Cultural stakes at risk	☐	☐	
Others, *please specify:* Click here to enter text.	☐	☐	

3. Disaster risk reduction

This part of the questionnaire asks for information on the structural and non-structural disaster risk reduction measures in Colombia to reduce the exposure and vulnerabilities of households, critical infrastructure and businesses, and public institutions.

Non-structural measures

3.1. What are your organisation's role and responsibilities in improving disaster risk awareness across stakeholders (households, businesses, departments and levels of government)?

Please elaborate.

3.2. How does your organisation communicate disaster risk information? *Please provide examples/weblinks, where applicable.*

	Yes	No	Examples/weblinks of good practices
Audience-specific risk communication material, e.g. for vulnerable groups, businesses, etc.	☐	☐	
Information campaigns	☐	☐	
Town hall meetings	☐	☐	
TV/radio messages	☐	☐	
Newspapers	☐	☐	
Websites	☐	☐	
Social media	☐	☐	
Conferences/workshops	☐	☐	
Professional training/classes	☐	☐	
Inclusion of risk information in school curricula	☐	☐	
Others, *please specify:* Click here to enter text.	☐	☐	

3.3. Do your organisation's disaster risk communication materials also provide information on self-protection and preparedness measures available to households and businesses?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

3.4. Do you co-operate with other stakeholders in the disaster risk communication process?

☐ Yes. *Please provide details in the table below.* ☐ No

	Please list stakeholders you co-operate with	Examples of joint risk communication initiatives
Other ministries at central government level		
Subnational governments		
Private sector (e.g. media, insurance)		
Non-governmental organisations (e.g. Red Cross)		
Scientific community and/or academia		
Others, *please specify:* Click here to enter text.		

3.5. Are disaster risk communication efforts regularly evaluated to ensure their effectiveness?

☐ Yes. *Please provide details and/or links to evaluation results in the field below.*

☐ No

Please elaborate.

3.6. **Self-assessment:** In your opinion, how effective are your organisations' disaster risk communication efforts? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

0 Ineffective	1	2	3	4	5 Very effective
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

3.7. **Self-assessment:** In your opinion, is the general public sufficiently aware of the risks and hazards they face? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

	0 Unaware	1	2	3	4	5 Very aware
General public	☐	☐	☐	☐	☐	☐
Private sector	☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

3.8. **Self-assessment**: In your opinion, what are the main challenges for increasing disaster risk awareness in Colombia?

Please elaborate.

3.9. **Self-assessment:** In your opinion, have there been changes in disaster risk knowledge and the levels of disaster risk reduction since the adoption of Law 1523/2012?

Please elaborate.

3.10. How does your organisation encourage households to carry out self-protection or preparedness measures (e.g. with subsidies, awareness campaigns, rewards for good practices, etc.)? *Please provide details in the field below.*

Please elaborate.

3.11. Which incentives does your organisation use to encourage businesses to carry out disaster risk management measures? *Please select all that apply in the table below by double-clicking on the boxes and selecting "checked".*

☐ Financial incentives for disaster risk reduction measures:
☐ Loans for the implementation of disaster risk management measures
☐ Grants/subsidies or conditional cash transfers for the implementation of disaster risk management measures
☐ Discounts on prices or insurance premiums
☐ Other, *please specify:* Click here to enter text.
☐ Non-financial incentives for disaster risk reduction measures:
☐ Awards or certification and/or endorsement of good practice
☐ Provision of guidance for business continuity planning
☐ Provision of disaster risk management standards/toolkits
☐ Access to reliable hazard and risk information
☐ Access to guidance and/or training on context-specific disaster risk management
☐ Disaster risk communication campaigns
☐ Other, *please specify:*

3.12. **Self-assessment:** In your opinion, how effective are the efforts to encourage businesses and households to carry out self-protection or preparedness measures? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

	0 Ineffective	1	2	3	4	5 Very effective
Efforts to promote business continuity planning	☐	☐	☐	☐	☐	☐
Efforts to promote household preparedness and self-protection	☐	☐	☐	☐	☐	☐

Please elaborate.

3.13. **Self-assessment:** In your opinion, what are the key challenges in boosting the implementation of self-protection or preparedness measures amongst households/businesses?

Please elaborate.

3.14. What are your organisations role and responsibilities in the design and enforcement of land-use policies?

Please elaborate.

3.15. Which other stakeholders play a role in the design and enforcement of land-use policies in Colombia?

	Design phase	Enforcement
Other ministries at central government level	Please list relevant stakeholders	Please list relevant stakeholders
Subnational governments		
Scientific community and/or academia		
Private sector (e.g. insurance)		
Non-governmental organisations		
Citizens (e.g. local population)		
Others, *please specify:* Click here to enter text.		

3.16. What are your organisations role and responsibilities in the design and enforcement of urban development policies?

Please elaborate.

3.17. Which other stakeholders play a role in the design and enforcement of urban development policies in Colombia?

	Design phase	Enforcement
Other ministries at central government level	Please list relevant stakeholders	Please list relevant stakeholders
Subnational governments		
Scientific community and/or academia		
Private sector (e.g. insurance)		
Non-governmental organisations		
Citizens (e.g. local population)		
Others, *please specify:* Click here to enter text.		

3.18. How does your organisation incentivise subnational governments to ensure coherent land-use and urban planning policies?

Please elaborate.

3.19. How does your organisation consult with the private sector and/or households concerning coherent land-use and urban planning policies?

Please elaborate.

3.20. How does your organisation consult with the scientific community and/or non-governmental organisations concerning coherent land-use and urban planning policies?

Please elaborate.

3.21. How is the implementation of land-use and urban planning policies monitored in Colombia?

Please elaborate.

Structural measures

3.22. Is your organisation responsible for the design and implementation of structural measures?

☐ Yes. Please provide details in the table below. ☐ No

Hazard	Role (e.g. financing, design, construction)	Type of measures your organisation is responsible for
Earthquakes		
Tsunami		
Landslides		
Rock fall		
Volcanic activity		
Storms		
Cold wave		
Heat wave		
Drought		
Wildfire		
Flood		
Avalanche		
Click here to enter text.		

3.23. Which stakeholders/interest groups are consulted in the design and implementation of structural measures that your organisation is responsible for? *Please list the stakeholders in the field and provide details on the nature of the co-operation (e.g. cost-sharing, joint decision making, etc.)*.

Please elaborate.

3.24. What are the decision-making mechanisms for resource allocation to the development and/or maintenance of structural prevention measures?

Please elaborate.

3.25 **Self-assessment**: How well are structural measures maintained in Colombia? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

0 Not maintained	1	2	3	4	5 Very well maintained
☐	☐	☐	☐	☐	☐

If available, please also provide additional details and/or links to monitoring results in the field below.

Please elaborate.

3.26. How effective are structural measures in Colombia in terms of reducing disaster risks? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

0 Not effective	1	2	3	4	5 Very effective
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

3.27. How has the adoption of the Law 1523/2012 affected funding available for the implementation and maintenance of structural measures (e.g. via the National Fund for Disaster Risk Management – FNGRD)?

Please elaborate.

3.28. How does your organisation finance structural disaster risk management measures?

Please elaborate.

3.29. Are there provisions for sharing the costs of structural measures with other stakeholders, e.g. subnational governments or neighbouring households and businesses?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

3.30. How has your organisation co-financed structural measures through the FNGRD?

Please elaborate.

3.31. **Self-assessment**: In your opinion, would you say that overall the available funding for structural measures is sufficient to protect Colombia from major disasters? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

0 Insufficient	1	2	3	4	5 Sufficient
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

3.32. **Self-assessment**: In your opinion, what are the main challenges in the implementation and maintenance of structural measures in Colombia?

Please elaborate.

4. Disaster preparedness and emergency response

This part of the questionnaire asks for information about the response system to prepare for and respond to the complexities of emergencies and their consequences. This section will analyse co-ordination between different stakeholders in the multi-agency response network and their ability to interact effectively for optimal emergency response; the use of new technologies; investments in emergency preparedness, training and exercises; and the ability to engage with the private sector and voluntary organisations.

4.1. Is your organisation responsible for providing real-time early warning systems? If yes, is it made publicly available? *Please provide details in the table below.*

Hazard	Yes	No	Weblink to publicly available information
Earthquakes	☐	☐	
Tsunami	☐	☐	
Landslides	☐	☐	
Rock fall	☐	☐	
Volcanic activity	☐	☐	
Storms	☐	☐	
Cold wave	☐	☐	
Heat wave	☐	☐	
Drought	☐	☐	
Wildfire	☐	☐	
Flood	☐	☐	
Avalanche	☐	☐	
Click here to enter text.	☐	☐	

4.2. What is the process for initiating emergency plans following early warnings?

Please elaborate.

4.3. What accountability measures are in place for false negative/positive alerts issued by early warning systems?

Please elaborate.

4.4. **Self-assessment**: How effective do you rate Colombia's early warning systems? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

0 Ineffective	1	2	3	4	5 Very effective
☐	☐	☐	☐	☐	☐

Please elaborate.

4.5. **Self-assessment**: In your opinion, are there areas where there is need for improvement in Colombia's early warning systems?

Please elaborate.

4.6. What are your organisation's roles and responsibilities in emergency preparation and response?

Please elaborate.

4.7. **Self-assessment**: Have you encountered challenges in co-ordinating with other organisations with responsibilities for disaster preparedness and emergency response, e.g. overlapping responsibilities?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

4.8. To what extent does the private sector and civil society participate in emergency preparation and response?

Please elaborate.

4.9. Does your organisation engage in international disaster response and relief trainings?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

4.10. Do international organisations, bilateral co-operation agencies and international non-governmental organisations have a role in supporting emergency preparedness and response in Colombia?

☐ Yes. *Please provide details/examples in the table below.* ☐ No

Stakeholder	Role
Andean Committee for Disaster Prevention and Response (CAPRADE)	
United Nations organisations, *please specify:* Click here to enter text.	
Development banks, *please specify:* Click here to enter text.	
Bilateral co-operation agencies, *please specify:* Click here to enter text.	
International non-governmental organisations; *please specify:* Click here to enter text.	
Other, *please specify:* Click here to enter text.	

4.11. **Self-assessment**: How do you evaluate Colombia's overall capacity for emergency management? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

0 Ineffective	1	2	3	4	5 Very effective
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

4.12. **Self-assessment**: In your opinion, what has been the impact of the adoption of Law 1523 on Colombia's overall capacity for emergency management?

Please elaborate.

4.13. **Self-assessment**: Where do you see opportunities for improvement in Colombia's overall capacity for emergency management?

Please elaborate.

5. Disaster risk financing, recovery and reconstruction

This section asks for information on disaster risk financing mechanisms and their effectiveness in terms of enabling rapid disaster recovery. Public compensation and assistance mechanisms will be analysed, as will the role of risk transfer. This section will also analyse how the government manages its financial exposure to disaster recovery and reconstruction costs.

5.1. What are your organisation's roles and responsibilities in the disaster recovery and reconstruction phase?

Please elaborate.

5.2. Does your organisation work and/or co-ordinate with other stakeholders during disaster recovery and reconstruction?

☐ Yes. *Please provide details in the table below.* ☐ No

	Stakeholder/interest group	Details on co-ordination/co-operation
Other ministries at central government level		
Subnational governments		
Non-governmental organisations		
Insurance sector		
Citizens (e.g. local population or community groups)		
Others, *please specify:* Click here to enter text.		

5.3. Is public assistance for disaster recovery and reconstruction purposes available for any of the below purposes? If so, what is the legal basis? Is information on financial transfers related to recovery or reconstruction made public after a disaster event? *Please also provide a weblink to publicly available information on disbursed recovery and reconstruction assistance, if available*.

Purpose	Availability of recovery assistance?		Legal basis	Is information on financial transfers publicly available?		Weblink to publicly available information on disbursed recovery and reconstruction assistance
	Yes	No		Yes	No	
Reconstruction/recovery of central government public infrastructure	☐	☐		☐	☐	
Reconstruction/recovery of subnational public infrastructure	☐	☐		☐	☐	
Reconstruction/recovery of state-owned enterprises	☐	☐		☐	☐	
Reconstruction/recovery of critical infrastructure	☐	☐		☐	☐	
Recovery assistance for households (e.g. assistance for basic needs and/or livelihood support)	☐	☐		☐	☐	
Housing reconstruction	☐	☐		☐	☐	
Assistance for vulnerable segments of the population unable to access insurance	☐	☐		☐	☐	
Reconstruction/recovery of private businesses	☐	☐		☐	☐	
Reconstruction/recovery of agricultural businesses	☐	☐		☐	☐	
Other, *please specify:* Click here to enter text.	☐	☐		☐	☐	

5.4. Are there publicly available and clearly defined eligibility criteria for receiving public financial assistance for disaster recovery and reconstruction? If so, how is this requirement enforced?

	Yes	No	Assistance to individuals	Assistance to companies
Requirement to build back better	☐	☐		
Requirement to purchase insurance (where it is available)	☐	☐		
Appropriate use of funds (e.g. use for clearly defined purposes such as basic needs)	☐	☐		
Other, *please specify:* Click here to enter text.	☐	☐		

5.5. Are there provisions against the misuse of public assistance for disaster recovery and reconstruction purposes?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

5.6. How are national public expenditures for recovery and reconstruction financed? *Please select all that apply in the table below, and provide additional details if applicable.*

	Financing for disaster recovery?	Financing for disaster reconstruction?	Additional details (e.g. name of reserve fund/budget line)
Reserve fund (e.g. National Fund for Disaster Risk Management)	☐	☐	
Reallocation of budget	☐	☐	
Debt	☐	☐	
International assistance	☐	☐	
International borrowing	☐	☐	
Risk transfer arrangements	☐	☐	
Other, *please specify:* Click here to enter text.	☐	☐	

5.7. Is there is a strategy for managing the impacts of disasters on public finances? If so, is this strategy regularly updated?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

5.8. What accountability mechanisms are in place to ensure the continued relevance and effectiveness of the strategy for managing the impacts of disasters on public finances? *Please select all that apply in the table below by double-clicking on the boxes and selecting "checked".*

☐ Regular audits that consider resilience and disaster risk management objectives ☐ Public hearings ☐ Other, *please specify:* Click here to enter text.

5.9. **Self-assessment**: How effective would you rate the existing accountability mechanisms? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

0 Ineffective	1	2	3	4	5 Very effective
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

5.10. What is the process for deciding on the amount of funding available for reconstruction and recovery purposes from public finance mechanisms, such as the FNGRD?

Please elaborate.

5.11. **Self-assessment:** In your opinion, is contingency funding for disaster recovery and reconstruction sufficient to enable rapid and sustainable disaster recovery in Colombia? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

	0 Insufficient	1	2	3	4	5 Sufficient
Funding for disaster recovery	☐	☐	☐	☐	☐	☐
Funding for disaster reconstruction	☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

5.12. How have provisions and available funding for disaster recovery and reconstruction purposes changed since the adoption of Law 1523?

Please elaborate.

5.13. Are the government's potential financial exposures to recovery and reconstruction expenses considered in fiscal planning?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

5.14. Does the government assess the availability and affordability of insurance for catastrophic risks? If so, are there measures in place to address lack of availability or unaffordability?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

5.15. Are national and subnational public sector organisations encouraged to purchase insurance or make arrangements to self-insure?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

5.16. What is the role of international assistance in supporting disaster recovery and reconstruction efforts in Colombia?

Stakeholder	Role
Andean Committee for Disaster Prevention and Response (CAPRADE)	
United Nations organisations; *please specify*: Click here to enter text.	
Development banks; *please specify*: Click here to enter text.	
Bilateral co-operation agencies; *please specify*: Click here to enter text.	
Non-governmental organisations; *please specify*: Click here to enter text.	
Other, *please specify*: Click here to enter text.	

5.17. **Self-assessment:** Law 1523 calls for a strategic plan for the co-ordination of international assistance. In your opinion, how effective is this plan in terms of managing international assistance, and channelling it to affected areas? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

0 Ineffective	1	2	3	4	5 Effective
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

5.18. **Self-assessment**: In your opinion, what are the main challenges hampering rapid and sustainable disaster recovery and reconstruction in Colombia?

Please elaborate.

5.19. Does your organisation have a lessons learnt process in place to ensure continuous policy improvement, e.g. following the completion of disaster recovery activities?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

5.20. Have those lessons translated into policy changes?

☐ Yes. Please provide details on actions taken in the field below. ☐ No

Please elaborate.

5.21. **Self-assessment:** In your opinion, what are the key challenges in ensuring that the impacts of disasters on public finances are effectively managed? What are success factors in this regard?

Please elaborate.

Private sector questionnaire

1. Governance of disaster risk management

This part of the questionnaire asks for information on Colombia's national disaster risk management system and the legislative framework underpinning the system. It focuses on coherence of roles and responsibilities of the private sector. The information gathered will help examine the effectiveness of disaster risk governance arrangements in Colombia.

1.1. What are the roles and responsibilities of your company in terms of managing critical risks and natural hazards?

Stage of the disaster risk management cycle	Role/responsibilities	Legal basis
Disaster risk/hazard assessment		
Disaster risk reduction		
Disaster preparedness and response		
Disaster recovery and reconstruction		

1.2. How does your company/industry contribute to achieving the goals set out by Law 1523?

Please elaborate.

1.3. How have your company's roles and responsibilities changed with the adoption of Law 1523?

Please elaborate.

1.4. Is there a process for designating specific infrastructure as critical infrastructure?

☐ Yes. *Please provide additional details in the field below.* ☐ No

Please elaborate.

1.5. Does your company manage or operate critical infrastructure?

☐ Yes. Please provide additional details in the field below. ☐ No

Please elaborate.

1.6. Are there specific laws, policies and/or regulations that address critical infrastructure protection or resilience?

☐ Yes. Please specify which laws are available and provide links. ☐ No

Please elaborate.

1.7. Does your company receive disaster risk management guidance from the central government, e.g. from the National Unit for Disaster Risk Management (UNGRD)?

☐ Yes. Please specify in the field below which guidance is available, and how it is used.
☐ No

Please elaborate.

1.8. How is your company involved in the design of disaster risk management policies to implement Law 1523? *Please select all that apply in the table below by double-clicking on the boxes and selecting "checked".*

☐ Workshops with representatives from relevant line ministries

☐ Workshops with representatives from subnational levels of government

☐ Conferences/workshops with participation from interest groups and non-governmental organisations

☐ Expert meetings with representatives from academia

☐ Information-sharing mechanisms or platforms for critical infrastructure operators and the government

☐ Town hall meetings open to citizens

☐ Public consultation process

☐ Citizen participation website Crystal Urn (*Urna de Cristal*)

☐ Others, *please specify:* Click here to enter text.

1.9. What role does your company have in terms of co-ordinating with the National Disaster Risk Management System?

Please elaborate.

1.10. In your opinion, what are success factors to your company's involvement in the disaster risk policy formulation and co-ordination process in Colombia?

Please elaborate.

1.11. **Self-assessment:** How effective would you rate the disaster risk management policy co-ordination work of the National Disaster Risk Management System? *Please rank it on a scale of 0-5.*

0 Ineffective	1	2	3	4	5 Very effective
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

1.12. **Self-assessment:** In your opinion, what are the most effective aspects of the co-ordination work of the National Disaster Risk Management System? Where do you see room for improvement?

Please elaborate.

1.13. What accountability mechanisms are in place to ensure that your company is carrying out its responsibilities as foreseen by the legal framework? *Please select all that apply in the table below by double-clicking on the boxes and selecting "checked".*

☐ Regular audits that consider resilience and disaster risk management objectives
☐ Internal reviews
☐ Public hearings
☐ Corrective measures for non-compliance with resilience and disaster risk management requirements:
☐ Budget reductions
☐ Legal proceedings
☐ Fines
☐ Other sanctions, *please specify*: Click here to enter text.
☐ Other, *please specify*: Click here to enter text.

1.14. **Self-assessment:** In your opinion, what are the key challenges in ensuring that the private sector fulfils its disaster risk management responsibilities? What are success factors in this regard?

Please elaborate.

2. Disaster risk reduction

This part of the questionnaire asks for information on the structural and non-structural disaster risk reduction measures designed to reduce the exposure and vulnerabilities of households, critical infrastructure and businesses, and public institutions.

2.1. Does your company participate in disaster risk communication efforts?

☐ Yes. *Please provide details in the table below.* ☐ No

	Yes	No	Examples/weblinks to good practices
Audience-specific risk communication material, e.g. for vulnerable groups, businesses, etc.	☐	☐	
Information campaigns	☐	☐	
Town hall meetings	☐	☐	
TV/radio messages	☐	☐	
Newspapers	☐	☐	
Websites	☐	☐	
Social media	☐	☐	
Conferences/workshops	☐	☐	
Training/classes	☐	☐	
Others, *please specify*: Click here to enter text.	☐	☐	

2.2. **Self-assessment**: In your opinion, what are the main challenges in increasing disaster risk awareness in your company/industry?

Please elaborate.

2.3. Does your company engage in business continuity planning, e.g. emergency or business continuity plans?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

2.4. Are there specific self-protection or preparedness measures that your company is required by law to implement (e.g. emergency management plans, redundancy or back-up operating systems, insurance against disruptions, etc.)?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

2.5. What incentives are in place to motivate companies to carry out disaster risk management measures? *Please select all that apply in the table below by double-clicking on the boxes and selecting "checked".*

☐ Financial incentives for disaster risk reduction measures:
☐ Loans for the implementation of disaster risk management measures
☐ Grants/subsidies or conditional cash transfers for the implementation of disaster risk management measures
☐ Discounts on prices or insurance premiums
☐ Other, *please specify*: Click here to enter text.
☐ Non-financial incentives for disaster risk reduction measures:
☐ Awards or certification and/or endorsement of good practice
☐ Access to hazard and risk information (free of charge)
☐ Access to guidance and/or training on context-specific disaster risk management
☐ Other, *please specify*: Click here to enter text.

2.6. **Self-assessment**: In your opinion, what are the main challenges your company/industry faces in undertaking disaster risk reduction activities?

Please elaborate.

2.7. **Self-assessment:** In your opinion, have there been changes in disaster risk knowledge and the levels of disaster risk reduction since the adoption of Law 1523 in 2012?

Please elaborate.

3. Disaster risk financing, recovery and reconstruction

This section of the questionnaire asks for information on disaster risk financing mechanisms, and their effectiveness in terms of enabling rapid disaster recovery, particularly for businesses and public services. Public compensation and assistance mechanisms will be analysed, as will the role of risk transfer. This section will also analyse how the government manages its financial exposure to disaster recovery and reconstruction costs.

3.1. Are there public policies in place to provide for public disaster recovery and reconstruction assistance to companies?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

3.2. Are there publicly available and clearly defined eligibility criteria for receiving public financial assistance for disaster recovery and reconstruction? *If so, how is this requirement enforced, and has your company previously received assistance for disaster recovery and reconstruction purposes?*

	Are eligibility criteria in place?		Details on enforcement provisions	Has your company received public assistance in the past?		Details on assistance received in the past
	Yes	No		Yes	No	
Requirement to build back better	☐	☐		☐	☐	
Requirement to purchase insurance (where it is available)	☐	☐		☐	☐	
Appropriate use of funds (e.g. use for clearly defined purposes such as basic needs)	☐	☐		☐	☐	
Other, *please specify*: Click here to enter text.	☐	☐		☐	☐	

3.3. What measures does your company take to financially prepare for disaster recovery and reconstruction (e.g. contingency funds, uptake of catastrophic risk insurance)?

Please elaborate.

3.4. For which hazards is catastrophic risks insurance available, and against which hazards is your company insured?

Hazard	Is insurance available?		Did your company purchase insurance?		Additional details (e.g. affordability of insurance options)
	Yes	No	Yes	No	
Earthquakes	☐	☐	☐	☐	
Tsunami	☐	☐	☐	☐	
Landslides	☐	☐	☐	☐	
Rock fall	☐	☐	☐	☐	
Volcanic activity	☐	☐	☐	☐	
Storms	☐	☐	☐	☐	
Cold wave	☐	☐	☐	☐	
Heat wave	☐	☐	☐	☐	
Drought	☐	☐	☐	☐	
Wildfire	☐	☐	☐	☐	
Flood	☐	☐	☐	☐	
Avalanche	☐	☐	☐	☐	
Click here to enter text.	☐	☐	☐	☐	

3.5. **Self-assessment**: In your opinion, what are the main challenges hampering rapid and sustainable disaster recovery and reconstruction?

Please elaborate.

Civil society questionnaire

1. Governance of disaster risk management

This part of the questionnaire asks for information on Colombia's national disaster risk management system and the legislative framework underpinning the system. It focuses on coherence of roles and responsibilities of the civil society. The information gathered will help examine the effectiveness of disaster risk governance arrangements in Colombia.

1.1. What are the role and responsibilities of your organisation in terms of managing critical risks and natural hazards?

Stage of the disaster risk management cycle	Role/responsibilities	Legal basis
Disaster risk/hazard assessment		
Disaster risk reduction		
Disaster preparedness and response		
Disaster recovery and reconstruction		

1.2. How does your organisation contribute to achieving the goals set out by Law 1523?

Please elaborate.

1.3. How have your organisation's roles and responsibilities changed with the adoption of Law 1523?

Please elaborate.

1.4. Does your organisation receive any disaster risk management guidance from the central government, e.g. from the National Unit for Disaster Risk Management (UNGRD)?

☐ Yes. *Please specify which guidance is available, and how it is used.* ☐ No

Please elaborate.

1.5. How is your organisation involved in the design of disaster risk management policies to implement Law 1523? *Please select all that apply in the table below by double-clicking on the boxes and selecting "checked".*

☐ Workshops with representatives from relevant line ministries
☐ Workshops with representatives from subnational levels of government
☐ Conferences/workshops with participation from interest groups and non-governmental organisations
☐ Expert meetings with representatives from academia
☐ Information-sharing mechanisms or platforms for critical infrastructure operators and the government
☐ Town hall meetings open to citizens
☐ Public consultation process
☐ Citizen participation website Crystal Urn (Urna de Cristal)
☐ Others, *please specify*: Click here to enter text.

1.6. What role does your organisation have in terms of co-ordinating with the National Disaster Risk Management System?

Please elaborate.

1.7. In your opinion, what are success factors to your organisation's involvement in the disaster risk policy formulation and co-ordination process in Colombia?

Please elaborate.

1.8. **Self-assessment:** How effective would you rate the disaster risk management policy co-ordination work of the National Disaster Risk Management System? *Please rank it on a scale of 0-5.*

0 Ineffective	1	2	3	4	5 Very effective
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

1.9. **Self-assessment**: In your opinion, what are the most effective aspects of the co-ordination work of the National Disaster Risk Management System? Where do you see room for improvement?

Please elaborate.

1.10. What accountability mechanisms are in place to ensure that your organisation is carrying out its responsibilities as foreseen by the legal framework? *Please select all that apply in the table below by double-clicking on the boxes and selecting "checked".*

☐ Regular audits that consider resilience and disaster risk management objectives

☐ Internal reviews

☐ Public hearings

☐ Corrective measures for non-compliance with resilience and disaster risk management requirements:

☐ Budget reductions

☐ Legal proceedings

☐ Fines

☐ Other sanctions, *please specify*: Click here to enter text.

☐ Other, *please specify*: Click here to enter text.

1.11. **Self-assessment:** How effective would you rate the existing accountability mechanisms relative to the requirements of accountability? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

0 Ineffective	1	2	3	4	5 Very effective
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

1.12. **Self-assessment**: In your opinion, what are the key challenges in ensuring that civil society fulfils its disaster risk management responsibilities? What are success factors in this regard?

Please elaborate.

2. Hazard and disaster risk assessments

This part of the questionnaire asks for information on the use of hazard and disaster risk assessments to inform land-use decisions, civil contingency planning and to inform disaster risk management measures. It will also look at whether forward-looking techniques are incorporated, and how the results of these assessments are communicated among stakeholders.

2.1. Who prepares hazard assessments/maps for the below hazards in Colombia? *Please tick applicable boxes by double-clicking on the box and selecting "checked".*

Risk	Hazard assessments/maps		If yes: Scope		Please provide details on the organisation conducting the hazard assessments/maps
	Yes	No	National	Regional	
Earthquakes	☐	☐	☐	☐	
Tsunami	☐	☐	☐	☐	
Landslides	☐	☐	☐	☐	
Rock fall	☐	☐	☐	☐	
Volcanic activity	☐	☐	☐	☐	
Storms	☐	☐	☐	☐	
Cold wave	☐	☐	☐	☐	
Heat wave	☐	☐	☐	☐	
Drought	☐	☐	☐	☐	
Wildfire	☐	☐	☐	☐	
Flood	☐	☐	☐	☐	
Avalanche	☐	☐	☐	☐	
Click here to enter text.	☐	☐	☐	☐	
Click here to enter text.	☐	☐	☐	☐	
Click here to enter text.	☐	☐	☐	☐	

2.2. What is the UNGRD's role to ensure coherence of the hazard assessments/maps in Colombia?

Please elaborate.

2.3. Which stakeholders does your organisation co-operate with when preparing hazard assessments/maps?

	Hazard assessments/maps
Other ministries at central government level	Please list stakeholders you co-operate with
Subnational governments	
Scientific community and/or academia	
Private sector (e.g. insurance)	
Non-governmental organisations (e.g. Red Cross)	
Citizens (e.g. local population)	
International organisations/bilateral co-operation agencies	
Associations (e.g. engineering association)	
Others, *please specify*: Click here to enter text.	

2.4. Do hazard assessments incorporate forward-looking approaches, such as horizon scanning or foresight analyses, to include prospective trends (e.g. climate change, demographic trends, urbanisation, etc.)? If so, who conducts these?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

2.5. Are hazard assessments/maps regularly updated? If so, how often are they updated?

	Earthquakes	Tsunami	Landslides	Rock fall	Volcanic activity	Storms	Cold wave	Heat wave	Drought	Wildfire	Flood	Avalanche	Others, *please specify* Click here to enter text.
Not updated	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Every year	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Every 1-2 years	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Every 2-3 years	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Every 3-5 years	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other updating period, *please specify:* Click here to enter text.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

2.6. In your opinion, are the experts conducting hazard assessments/maps impartial? Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".

0 Not impartial	1	2	3	4	5 Very impartial
☐	☐	☐	☐	☐	☐

Please elaborate on the rating.

2.7. Are the results of hazard assessments publicly available and free of charge?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

2.8. Are the results of hazard assessments communicated across departments and levels of government to ensure policy consistency?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

2.9. Are the results of hazard assessments used in the following activities?

Actions	Yes	No	Examples of usage of hazard/risk information in policy making
Implementation of land-use policies	☐	☐	
Building code development/updates	☐	☐	
Risk communication	☐	☐	
Prioritising disaster risk reduction measures	☐	☐	
Resource allocation for disaster risk reduction measures	☐	☐	
Emergency preparedness and contingency planning	☐	☐	
Resource allocation for preparedness/contingency planning	☐	☐	
Setting insurance premiums	☐	☐	
Others, please specify: Click here to enter text.	☐	☐	

2.10. **Self-assessment**: How effective would you rate the integration of hazard information into policy making in Colombia? *Please rank it on a scale of 0-5 by double-clicking on the box and selecting "checked".*

0 Ineffective	1	2	3	4	5 Very effective
☐	☐	☐	☐	☐	☐

Please elaborate.

2.11. Is there a process to call into question hazard assessments and land-use decisions based on the results of hazard assessments? If so, how can this be done?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

2.12. **Self-assessment**: In your opinion, what are the main areas in need of improvement related to the development of hazard/disaster risk assessments/maps and the way they are used in policy making in Colombia?

Please elaborate.

2.13. Who prepares disaster risk assessments/maps for the below disaster risks in Colombia? *Please tick applicable boxes by double-clicking on the box and selecting "checked".*

Disaster risk	Disaster risk assessments/maps		If yes: Scope		Please provide details on the organisation conducting the disaster risk assessments/maps
	Yes	No	National	Regional	
Earthquakes	☐	☐	☐	☐	
Tsunami	☐	☐	☐	☐	
Landslides	☐	☐	☐	☐	
Rock fall	☐	☐	☐	☐	
Volcanic activity	☐	☐	☐	☐	
Storms	☐	☐	☐	☐	
Cold wave	☐	☐	☐	☐	
Heat wave	☐	☐	☐	☐	
Drought	☐	☐	☐	☐	
Wildfire	☐	☐	☐	☐	
Flood	☐	☐	☐	☐	
Avalanche	☐	☐	☐	☐	
Click here to enter text.	☐	☐	☐	☐	

2.14. Which of the following impact criteria are used in disaster risk assessments?

Impact criteria	Yes	No	Please provide details, if applicable
Human impact	☐	☐	
Direct economic impacts (i.e. damages)	☐	☐	
Indirect economic impacts (i.e. losses, for example due to business disruptions)	☐	☐	
Environmental impact	☐	☐	
Cultural stakes at risk	☐	☐	
Others, *please specify*: Click here to enter text.	☐	☐	

3. Disaster risk reduction

This part of the questionnaire asks for information on the structural and non-structural disaster risk reduction measures designed to reduce the exposure and vulnerabilities of households, critical infrastructure and businesses, and public institutions.

3.1. Does your organisation have a role in communicating about disaster risks?

☐ Yes. *Please provide details in the table below.* ☐ No

Communication tools	Yes	No	Examples/weblinks to good practices
Audience-specific risk communication material, e.g. for vulnerable groups, businesses, etc.	☐	☐	
Information campaigns	☐	☐	
Town hall meetings	☐	☐	
TV/radio messages	☐	☐	
Newspapers	☐	☐	
Websites	☐	☐	
Social media	☐	☐	
Conferences/workshops	☐	☐	
Training/classes	☐	☐	
Others, *please specify*: Click here to enter text.	☐	☐	

3.2. **Self-assessment**: In your opinion, what are the main challenges in increasing disaster risk awareness in Colombia?

Please elaborate.

3.3. What are your organisation's roles and responsibilities in carrying out disaster risk reduction measures (aside from the disaster risk communication responsibilities mentioned in the previous question)?

Please elaborate.

3.4. **Self-assessment**: In your opinion, what are the main challenges your organisation faces in undertaking disaster risk reduction activities?

Please elaborate.

3.5. **Self-assessment:** In your opinion, have there been changes in disaster risk knowledge and the levels of disaster risk reduction since the adoption of Law 1523 in 2012?

Please elaborate.

4. Disaster preparedness and emergency response

This part of the questionnaire asks for information about the response system to prepare for and respond to the complexities of emergencies and their consequences. It will analyse co-ordination between different stakeholders in the multi-agency response network and their ability to interact effectively for optimal emergency response.

4.1. Does your organisation have a role in emergency preparation and response?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

4.2. How is your organisation involved in the disaster preparedness and emergency response activities under the National Disaster Risk Management System?

Please elaborate.

4.3. **Self-assessment**: Have you encountered challenges in co-ordinating with other organisations with responsibilities for disaster preparedness and emergency response?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

4.4. **Self-assessment**: In your opinion, what has been the impact of the adoption of Law 1523 on Colombia's overall capacity for emergency management?

Please elaborate.

5. Disaster risk financing, recovery and reconstruction

This section asks for information on disaster risk financing mechanisms, and their effectiveness in terms of enabling rapid disaster recovery.

5.1. What are your organisation's role and responsibilities in facilitating disaster recovery and reconstruction, e.g. in terms of providing financial assistance for household and business recovery?

Please elaborate.

5.2. Does your organisation have access to public assistance for disaster recovery and reconstruction purposes, e.g. to channel them to affected populations?

☐ Yes. *Please provide details in the field below.* ☐ No

Please elaborate.

5.3. How is your organisation involved in the National Disaster Risk Management System during the disaster recovery and reconstruction phase?

Please elaborate.

5.4. **Self-assessment**: In your opinion, what has been the impact of the adoption of Law 1523 on Colombia's capacity to recover from disasters?

Please elaborate.

5.5. **Self-assessment**: In your opinion, what are the main challenges hampering rapid and sustainable disaster recovery and reconstruction in Colombia?

Please elaborate.

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ISBN 978-92-64-62948-6 – 2019

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ISBN 978-92-64-62948-6