Resilience management and financial programs for resilience development and disaster recovery

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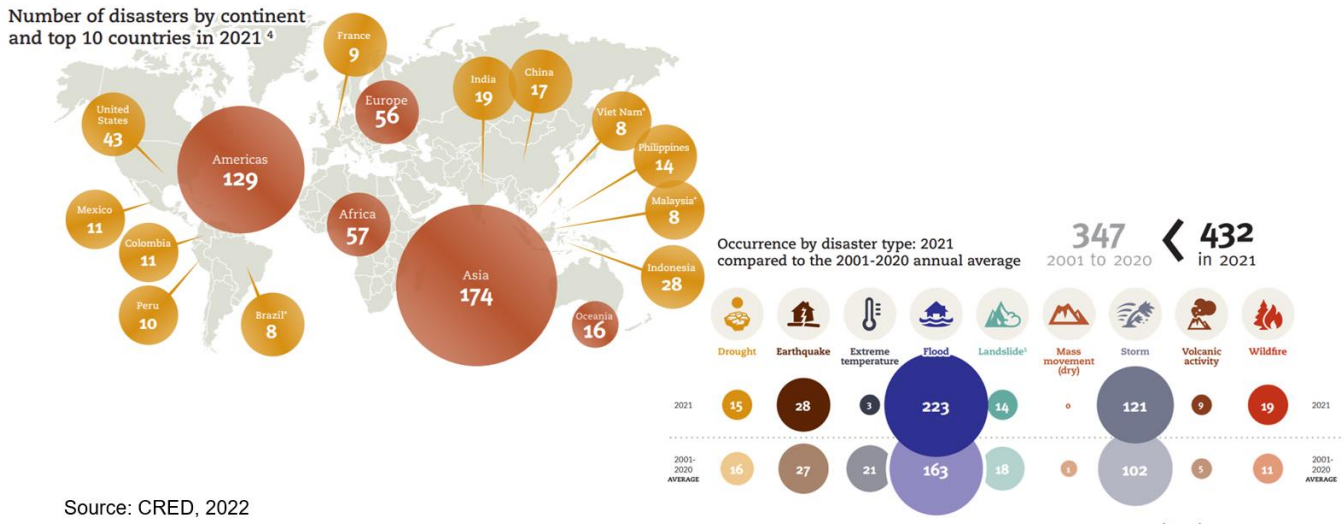
With the frequency and severity of natural disasters and other crises on the rise, resilience management has emerged as an essential component of urban planning and development. Resilience is the capacity of a city or community to absorb, adjust to, and recover from adverse events, keeping its citizens safe and its infrastructure running smoothly. This brief article will examine what resilience management is, how it might be strengthened in smart cities, and what kinds of resources may be used to fund such initiatives. We'll also talk about EU-related projects that help with catastrophe recovery and resilience building.

Are disasters that common?

Let's start our discussion with the question; are disasters that common?



Source: CRED, 2022

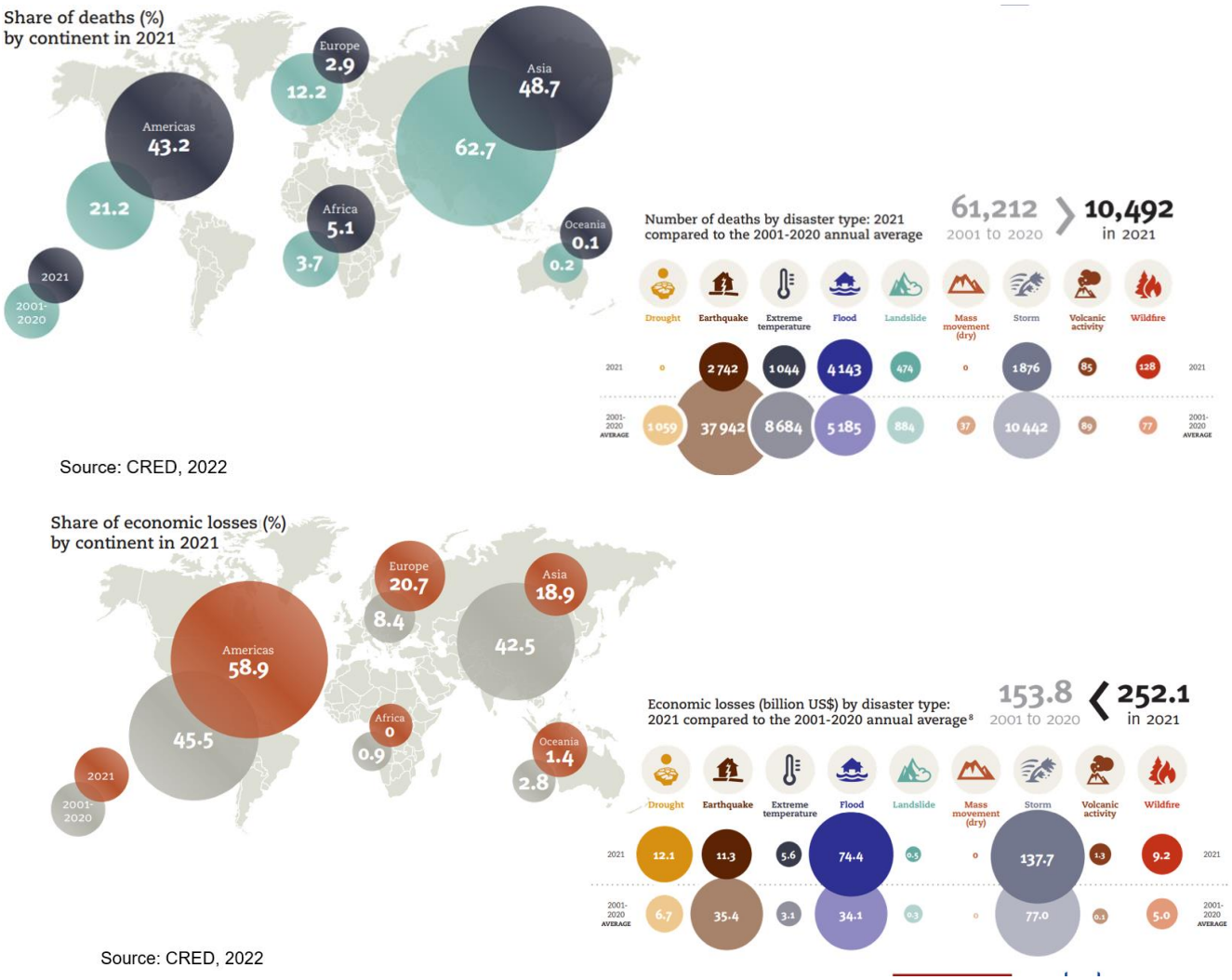


Figure 1 Infographics on Disaster Statistics (Source: Centre for Research on the Epidemiology of Disasters 2022)

From the previous infographics it is quite evident that disasters are more common than we might think, affecting millions of people in the short and long term.

Moreover, a negative trend is clearly exhibited where in many cases, the adverse results of disasters in year 2021 supersede those that took place in the whole last decade!

These observation lead to the conclusion that effective disaster risk reduction, disaster risk management and resilience development must be elevated as societal goals of great importance and top priority.

An Overview of Resilience Management

Managing a city or community's resilience requires figuring out how to make it more resistant to shocks and pressures while also increasing its ability for adaptation and recovery. This calls for a holistic strategy that takes into account the economy, government, social institutions, and infrastructure as a whole. The ultimate objective of resilience management is to make cities more sustainable and hospitable by making them better equipped to respond to and recover from events such as natural disasters and economic downturns.

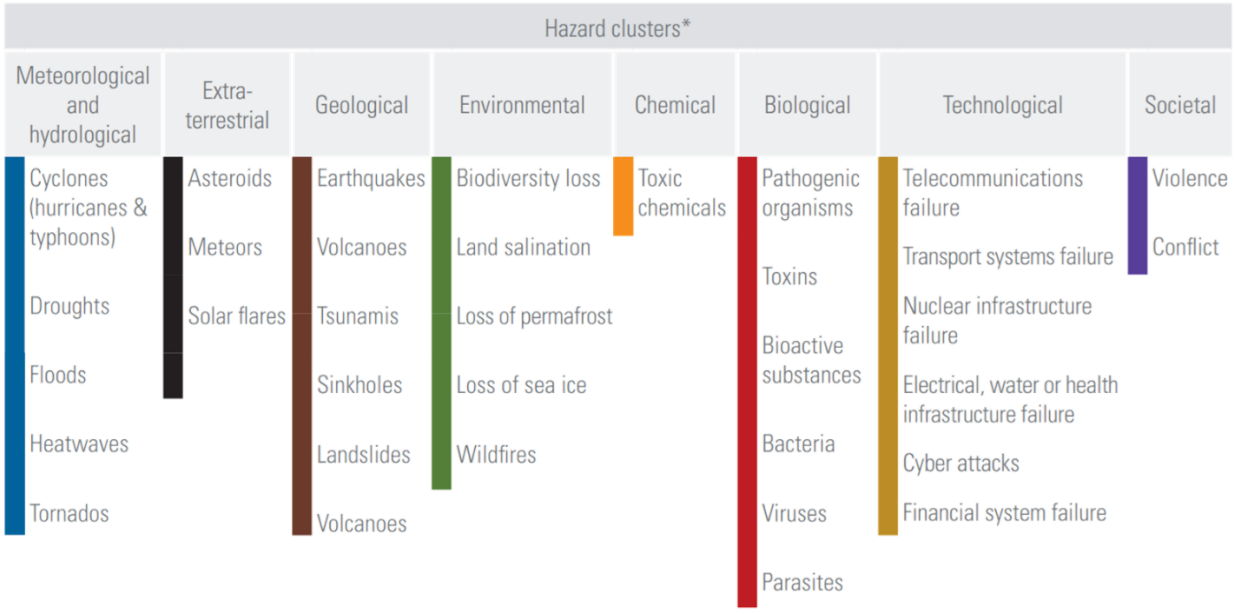


Figure 2 Types of Hazards a City can Face (Source: UNDRR, 2022)

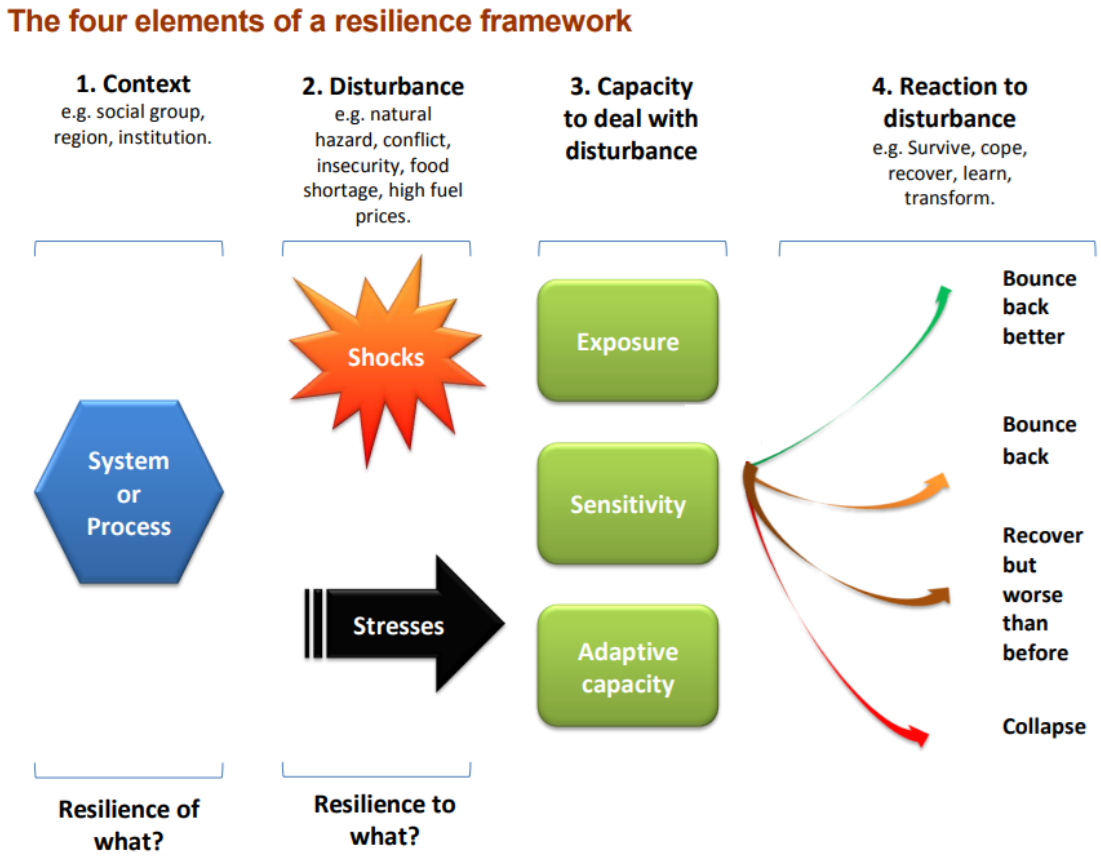


Figure 3 Elements of Resilience Framework (Source: Crown, 2011)

Key Steps Towards Smart City Resilience

1. Conducting a comprehensive risk assessment and vulnerability analysis is the first step in bolstering smart cities' resilience. The city's vulnerability and ability to adapt must be assessed, as must the likelihood and possible effect of certain hazards. Having this knowledge allows for more efficient prioritization and resource management.

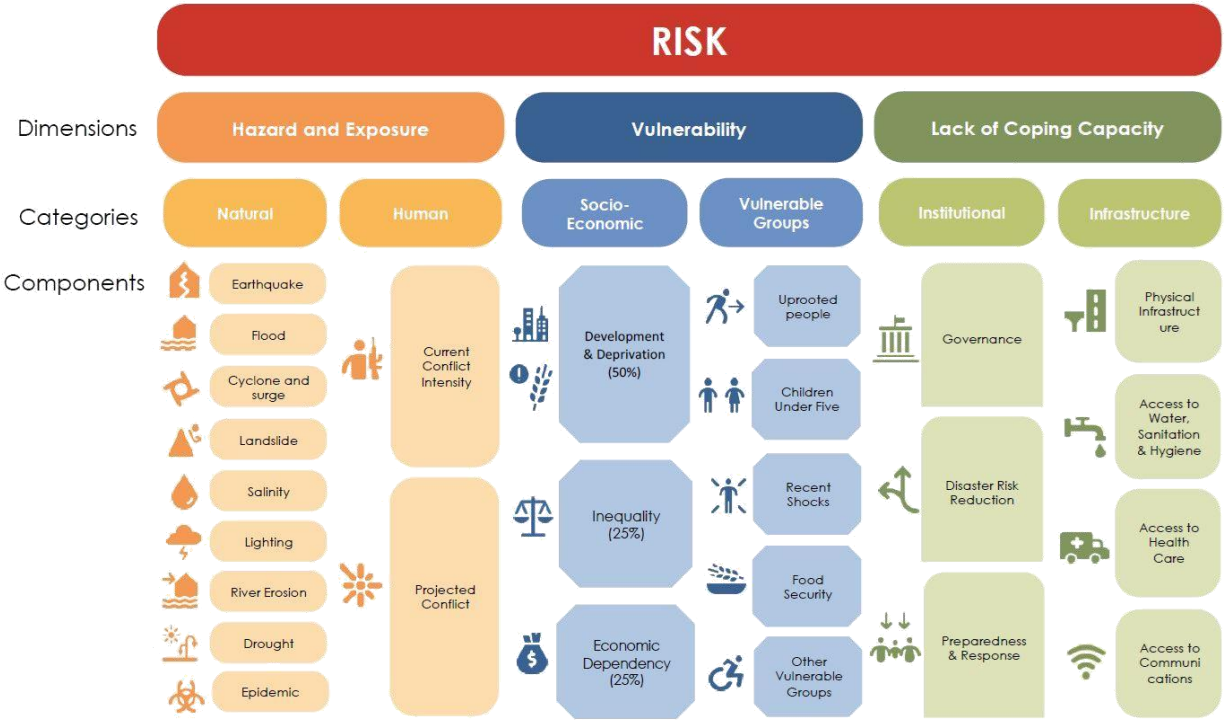


Figure 4 Risk dimensions, categories and components (Source: UNDRR, 2022)

The UN's Office for Disaster Risk Reduction with the support of EU and other organizations and partners have created an assessment tool, structured around UNDRR's Ten Essentials for Making Cities Resilient, that allows local governments to assess their disaster resilience.

This tool is known as the "**Disaster Resilience Scorecard for Cities**" and can be accessed here.

2. Building and maintaining resilient infrastructure is critical to the safety of municipal residents and the smooth operation of important services. Everything from roads and utilities to water supplies and telephone networks, not to mention public buildings like hospitals and shelters. In order to better withstand shocks and pressures, smart cities should invest in the creation and upkeep of resilient infrastructure by using cutting-edge technology and design concepts.
3. Strengthening social networks, community cohesiveness, and residents' sense of belonging are key components of social resilience. This may be done through efforts including social support services, urban planning and design, and community participation programs. Maintaining the health of city residents and their capacity to rebound from setbacks depends on a high level of social resilience.
4. Resilience management in smart cities relies heavily on strong governance and institutional capabilities. Coordination mechanisms between government agencies, private sector companies, and civil society groups, as well as the creation of laws, regulations, and institutional frameworks that support resilience-building initiatives, are all part of this process. In addition, smart cities should finance capacity-building projects to better equip their workforce with disaster management and recovery expertise.

The aforementioned actions are all part of what is known as **Disaster Risk Management (DRM)**, which according to UNDRR, is a systematic process of implementing policies, strategies, and coping capacities to decrease the devastating consequences of natural hazards and linked environmental and technological disasters. Its goal is to lessen the impact of catastrophes on communities and to guarantee that disaster response is effective and efficient.

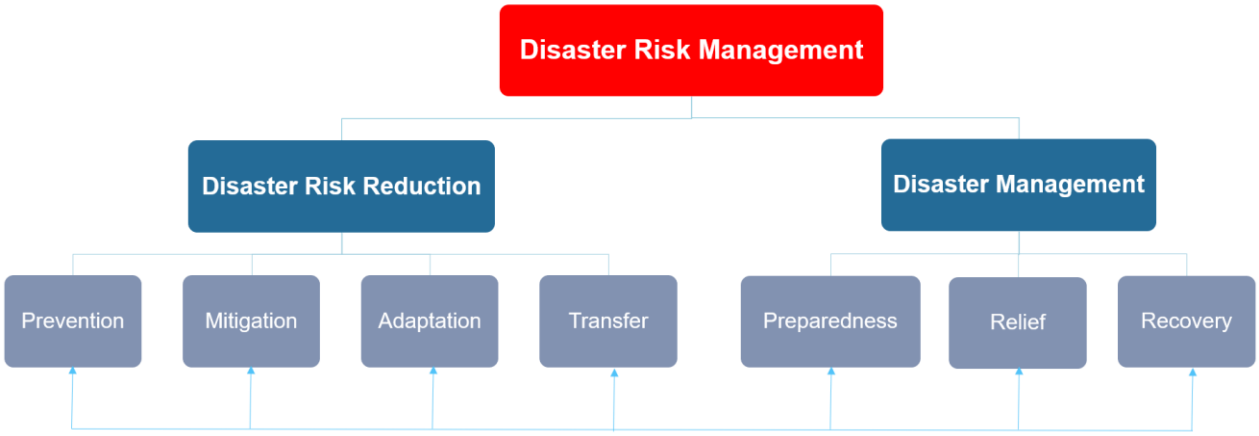


Figure 5 Disaster Risk Management Components

When developing/assessing DRM plans, one must be aware of the current initiatives, "agendas" and frameworks developed by international organizations in view of tackling global wide problems. The main ones are;

- The Paris Agreement
- The Sendai Framework for Disaster Risk Reduction 2015-2030, and
- The Sustainable Development Goals (Agenda 2030)

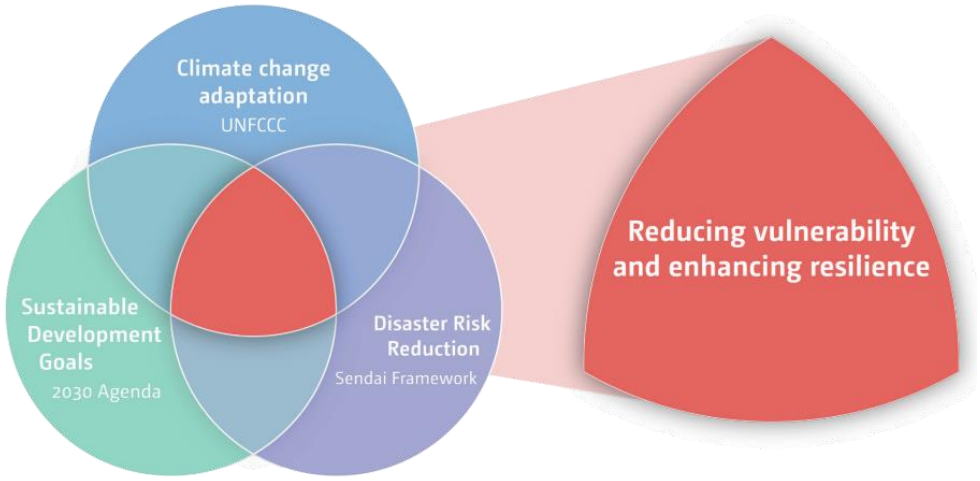


Figure 6 DRM and Global Initiatives/Frameworks (Source: UNFCC, 2017)

These initiatives deal with numerous aspects, tasks and goals related to disaster risk management, often in an overlapping fashion, providing important guidance and assistance for that matter

Figure 7 Sendai Framework and Agenda 2030 Interelations

Resources for Building Resilience and Recovering from Disasters / Disaster Risk Financing (DRF)

Financial initiatives are critical in disaster recovery and resilience development. They offer the resources required to assist communities in disaster preparation, response, recovery, and mitigation.

There are a variety of financial resources that may be used to help smart cities with resilience building and catastrophe recovery. Among these are:

- Public-private partnerships (PPPs), in which the public and private sectors work together to build and maintain infrastructure and provide related services. In the face of few public funds, they can be an efficient way to pool resources and knowledge for resilience-building efforts.
- The financial risks posed by natural disasters and other crises can be mitigated via the use of insurance and other risk transfer mechanisms like catastrophe bonds and resilience bonds. These tools can both incentivize investments in resilience-building measures and provide a financing source for recovery activities.
- Grants and loans are available from a wide range of sources, including international organizations, development banks, and national governments, to assist with urban resilience development and catastrophe recovery. Infrastructure projects, capacity-building efforts, and other efforts to increase resilience can all be financed with the help of these financial instruments.

When designing, implementing and assessing financial programs for resilience development and disaster recovery, several factors should be considered;

- **Risk assessment**: The program should be based on a thorough risk assessment that takes into account the potential dangers and vulnerabilities, as well as the community's capacity to deal with them.
- **Purpose**: The program should have specific goals and objectives, and the financial assistance should be targeted towards achieving those goals.
- **Coordination**: The program should be cohesive with other current programs and resources so that actions are complementary and resources are utilized effectively.
- **Flexibility**: The program should be flexible enough to adapt to changing needs and circumstances, and be able to respond quickly to new disasters.
- **Transparency**: The program should be designed to be transparent, with clear and easy-to-understand rules and procedures.
- **Community engagement**: The community should be involved in the program's design and implementation, and its benefits should be widely distributed.

- **Community Resilience and Capacity Building**: The program should include a focus on building community resilience and capacity, by empowering communities to identify, plan, implement and sustain their own resilience and recovery actions.
- **Monitoring and evaluation:** The program should include a system for monitoring and evaluating the program's effectiveness and making adjustments as necessary.
- **Eligibility**: The program should clearly define who is eligible to receive assistance and what criteria must be met to qualify.
- **Sustainability**: The program should be designed to be financially sustainable over the long term, and not create a dependency on ongoing government assistance.
- **Impact evaluation**: The program should include an impact evaluation to assess its effectiveness, and identify what worked well, what needs to be improved, and what lessons can be learnt.
- **Dissemination of results**: The program should widely disseminate its results and lessons learnt, to promote knowledge sharing and replication of best practices.

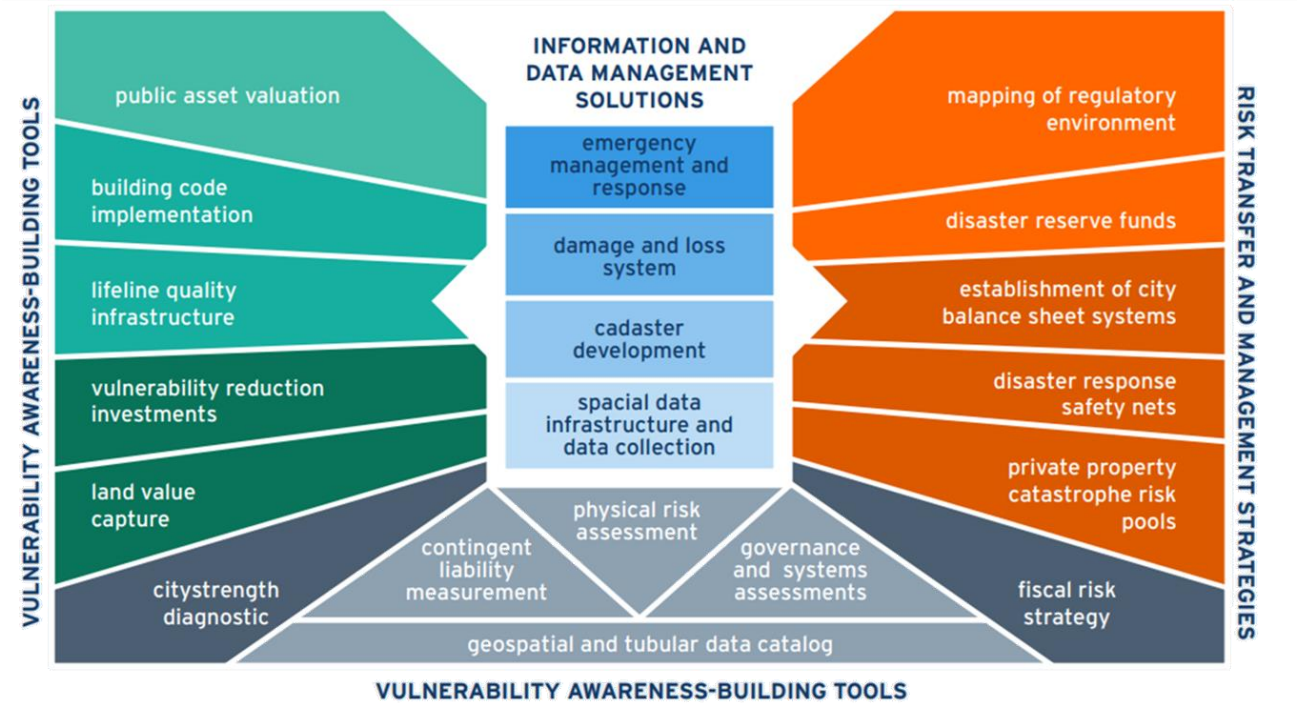


Figure 8 Areas for potential funding from DRF programs (Source: GFDRR, 2015)

Strategies/factors for overcoming common challenges and obstacles towards building Smart City Resilience

10 Essentials	11 Success Factors
1. Organise for disaster resilience 2. Identify, understand and use current and future risk scenarios 3. Strengthen financial capacity for resilience 4. Pursue resilient urban development and design 5. Safeguard natural buffers to enhance ecosystems' protective functions 6. Strengthen institutional capacity for resilience 7. Understand and strengthen societal capacity for resilience 8. Increase infrastructure resilience 9. Ensure effective disaster response 10. Expedite recovery and build back better	1. Integrated approach: broad-based, multi-disciplinary 2. Partnership and co-ordination 3. Long-term perspective (and adaptive management) 4. Leadership 5. Public engagement 6. Enabling environment: national legal and policy frameworks 7. Inclusion 8. MCR and other campaign 9. Review, analysis, evidence, learning 10. Economics, finance and funding 11. Risk data and assessment

Figure 9 Factors for overcoming common challenges and obstacles towards building Smart City Resilience (Source: UNDRR, 2019)

EU-Related Initiatives

The European Union (EU) has been instrumental in encouraging disaster recovery and bolstering the resilience of its member nations. Among the most significant EU-related initiatives are;

- The European Union Solidarity Fund (EUSF) was set up to respond to major natural disasters and express European solidarity to disaster-stricken regions within Europe. The Fund was created as a reaction to the severe floods in Central Europe in the summer of 2002. Since then, it has been used for 100 natural disasters covering a range of different catastrophic events including floods, forest fires, earthquakes, storms and drought. The Fund also have been mobilized for 20 interventions as a response to public health emergencies. 28 different European countries have been supported so far for an amount of over 7 billion €.

- The Resilience and Recovery Facility (RRF) is a temporary recovery instrument. It allows the Commission to raise funds to help Member States implement reforms and investments that are in line with the EU's priorities and that address the challenges identified in country-specific recommendations under the European Semester framework of economic and social policy coordination. It makes available €723.8 billion (in current prices) in loans (€385.8 billion) and grants (€338 billion) for that purpose.
- The European Regional Development Fund (ERDF) aims to strengthen economic, social and territorial cohesion in the European Union by correcting imbalances between its regions. In 2021-2027 it will enable investments in a smarter, greener, more connected and more social Europe that is closer to its citizens.
- The Cohesion Fund provides support to Member States with a gross national income (GNI) per capita below 90% EU-27 average to strengthen the economic, social and territorial cohesion of the EU. For the 2021-2027 period, the Cohesion Fund concerns Bulgaria, Czechia, Estonia, Greece, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Portugal, Romania, Slovakia and Slovenia.
- REACT-EU (Recovery Assistance for Cohesion and the Territories of Europe) will be one of the largest programmes under new instrument Next Generation EU amounting to EUR 50.6 billion. These additional resources should be used for projects that foster crisis repair capacities in the context of the coronavirus crisis, as well as investments in operations contributing to preparing a green, digital and resilient recovery of the economy.
- Moreover, the European Union's Civil Protection Mechanism promotes coordination between EU member states during times of crisis by assisting with things like emergency planning and response. It's a hub for organizing responses to disasters and other emergencies, as well as exchanging information and fostering collaboration.

The long-term viability and quality of life in smart cities depends on the establishment of funding programs for resilience building and catastrophe recovery. Smart cities can ensure the safety of their residents and the upkeep of vital services by taking a holistic approach to resilience management, investing in disaster-proof infrastructure and social systems, and making use of a wide range of financial instruments and EU-related initiatives.

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