

# CHAPTER 2

**What** are the Ten Essentials for Making Cities Disaster Resilient?



*Port-au-Prince, Haiti, 2010: It is not the earthquakes that kill people, but the buildings collapsing on them.*

This chapter offers a brief overview of the “Ten Essentials,” including the critical and interdependent steps local governments may take to make their city more disaster resilient. It provides the rationale for each Essential, pointing out strategic areas of intervention and identifying key actions. The actions identified under each Essential should be part of the overall disaster risk reduction planning process and influence urban development planning and design.

### The Ten Essentials for Making Cities Resilient Checklist

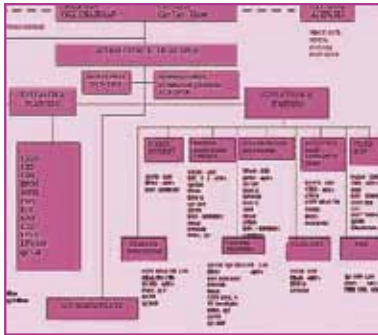
1. Put in place **organisation and coordination** to understand and reduce disaster risk, based on participation of citizen groups and civil society. Build local alliances. Ensure that all departments understand their role in disaster risk reduction and preparedness.
2. **Assign a budget** for disaster risk reduction and provide incentives for homeowners, low income families, communities, businesses and the public sector to invest in reducing the risks they face.
3. Maintain up to date data on hazards and vulnerabilities. **Prepare risk assessments** and use these as the basis for urban development plans and decisions, ensure that this information and the plans for your city’s resilience are readily available to the public and fully discussed with them.
4. Invest in and maintain **critical infrastructure that reduces risk**, such as flood drainage, adjusted where needed to cope with climate change.
5. Assess the safety of all schools and health facilities and upgrade these as necessary.
6. Apply and enforce **realistic, risk compliant building regulations and land use planning principles**. Identify safe land for low income citizens and upgrade informal settlements, wherever feasible.
7. Ensure that **education programmes and training** on disaster risk reduction are in place in schools and local communities.
8. **Protect ecosystems and natural buffers** to mitigate floods, storm surges and other hazards to which your city may be vulnerable. Adapt to climate change by building on good risk reduction practices.
9. Install **early warning systems and emergency management capacities** in your city and hold regular public preparedness drills.
10. After any disaster, ensure that the **needs of the affected population are placed at the centre of reconstruction**, with support for them and their community organisations to design and help implement responses, including rebuilding homes and livelihoods.

► Refer to Annex 1 for a list of key questions to use in benchmarking and monitoring progress in each of the Ten Essentials.



## Essential 1: Institutional and Administrative Framework

“Put in place an organisation and coordination to understand and reduce disaster risk, based on participation of citizen groups and civil society. Build local alliances. Ensure that all departments understand their role in disaster risk reduction and preparedness.”



*Queson City organization for Disaster Risk Management*

► The tasks of the coordination entity/office may include preparation of awareness campaigns, coordination of risk assessments and disaster risk reduction plans, ensuring that resilience planning is part of the city’s development practices, its strategies and projects for resource mobilization, and tracking of progress.

### Why?

To be effective and contribute to a city’s development and safety, managing disaster risk and understanding the potential threats of complex events requires a holistic approach and must include the involvement of local government decision makers, city officials and departments, academia, business and citizens groups. Experience gained through the Hyogo Framework for Action has shown that appropriate policies and an institutional framework are preconditions for decision making and sound disaster risk reduction actions. Accompanied by decentralized power and resource allocations and the participation of all major groups and actors in planning, implementation and monitoring mechanisms, this Framework contributes to the city’s development objectives and sustainability.

### What?

#### Establish or strengthen the city-level institutional and coordination capacity

- Assign a lead entity or establish a designated office within the city administration to lead a coordination mechanism among departments and other actors.
- Define and review, on a regular basis, the roles and responsibilities of departments and services involved; clarify the limitation of authority of each.
- Involve different actors, volunteers, NGOs, academia, the business community and encourage the involvement of community-based organisations as early as possible in the process.

► Risk reduction planning should make the operations of all actors run more smoothly in the emergency and recovery phases.

### **Establish a legislative framework for resilience and disaster risk reduction**

- Identify the obligations, constraints and opportunities that current urban planning and regulations, national laws and regulatory devices impose on the city administration; improve local regulations with resilience criteria.
- Generate municipal ordinances that support disaster risk reduction in all sectors (public and private).
- Update environmental, building and planning standards and bylaws to support risk reduction and anchor them in recent risk assessments.
- Ensure a degree of flexibility in regulations for low-income areas, without compromising safety.

### **Coordinate all emergency services within the city**

- Generate a collaborative strategy to integrate and coordinate all existing units responsible for emergency response, relief and recovery, even if under the jurisdiction of multiple authorities.
- Use formal protocols to maintain recognition of individual organisations and services (fire departments, ambulance services, health services, police, NGOs and others), increase inter-operability among these units (language, tools, communication) and generate scenarios for coordinated drills.

### **Create alliances and networks beyond the city**

- Seek and promote alliances, incorporating a cluster approach among neighbouring municipalities with similar or interdependent risks, to strengthen partnerships, improve decentralized action, plan for common territorial risks and multiply resources.
- Develop partnerships with local, national or international universities, NGOs or scientific-technical bodies that can provide data, expertise and research.
- Consider an exchange programme with cities in other countries that face similar risk patterns or challenges.
- Participate in regional and international fora and in the global campaign “Making Cities Resilient,” to promote initiatives, exchange experiences and increase local-national-international cooperation.

## Examples

### **Albay Province: Local Government Makes Risk Reduction a Formal and Permanent Priority**

The **Albay provincial** government in the Philippines established a permanent disaster risk management office in 1995 to deal with the high risk of typhoons, floods, landslides and earthquakes. Disaster risk reduction was institutionalized, funded properly, and genuinely mainstreamed into local government planning and programmes, making it clear that disaster reduction was a formal and permanent priority within regular planning, governance and local government programmes. As a result, disaster prevention, preparedness and response have been well coordinated and, with the exception of 2006 and 2011, no casualties have resulted in 15 of the last 17 years.

*Read more at <http://www.unisdr.org/we/inform/publications/13627> (page 48) and <http://tinyurl.com/ck6btmb>.*

### **Beirut: Concerted Action on the Ten Essentials**

Councilor Nada Yamout, from **Beirut**, Lebanon's city council stated at the Third Global Platform for Disaster Risk Reduction (May, 2011): "We are a newly elected council; we are concerned about disaster risk reduction and so we registered as a Campaign City in October 2010. As a first step, the Council looked at allocating a budget to begin risk reduction activities: risk assessment, building a risk database, developing a DRR master plan, etc. We analyzed our needs and took stock of what was available and performed a gap analysis. We have several heritage sites within Beirut and protecting and preserving their character is important. We will move ahead using four pillars: technical support; financial support; involvement of the private sector and civil society; and national government support. If we do not allocate the right resources, we run the risk of not prioritizing projects. Building resilience is not the responsibility of the mayor alone. Action must be taken at the following levels: national and provincial governments, city government politicians—whether elected or appointed; and the municipal administration."

Lebanon's National Platform for Disaster Risk Reduction is helping small and medium-sized local governments to sign on to the Campaign for Resilient Cities, undertaking baseline studies and stepping up disaster risk reduction actions (November, 2011).

### **North Vancouver: Innovation and Community Engagement**

**North Vancouver**, Canada formed a natural hazards task force comprised of eight volunteer district residents. Their mandate was to recommend to the Council the community's tolerable level of risk from natural hazards. After listening to subject matter experts and consulting the public for their input, the resulting recommendations make up the District's current policy for risk tolerance. Hazards and risks are carefully considered when granting building and development permits. Risk is compared with the risk tolerance criteria and further reduced to as low a level as is reasonable. The District works with residents, private corporations and neighbouring government land owners to collectively reduce risk from landslides and forest fires by taking action to improve drainage on slopes and create defensible spaces along the urban-wild land interface areas.

"North Vancouver is setting a high standard for communities across Canada, and has become a model of engaging municipal and federal government and the private sector in the promotion of a resilient approach to disaster risk reduction," said Vic Toews, Canada's Minister of Public Safety, when the District of North Vancouver received the United Nations-Sasakawa Award for Disaster Risk Reduction, in 2011 (the award was shared with San Francisco, Cebu, Philippines and Santa Fe, Argentina). North Vancouver has incorporated risk reduction criteria into its official community plan, strategic planning, and development permit processes, and has instituted early warning systems for landslides and debris flows. The jury for the UN-Sasakawa Award says the District "demonstrates capacity for challenging, absorbing and producing technology, traditional knowledge, new knowledge and products, and innovative practices."

"This international recognition is evidence of the work by the professional staff who serve the citizens of North Vancouver District, the leaders and many volunteers of the North Shore Emergency Management Office, and all agencies dedicated to the public safety needs of their community. It is something our entire community can take pride in," said North Vancouver District Mayor Richard Walton. "The work is ongoing as we continue to seek best practices and learn from the experience of communities around the world." Read more at: [www.nsemo.org/](http://www.nsemo.org/), [www.getprepared.gc.ca/](http://www.getprepared.gc.ca/), <http://tinyurl.com/d4m85ry>.

## Developing a FireSmart Community

# Community Workshop

Regarding Fire Risk Reduction and Ecosystem Restoration  
in Grousewoods Park

### Pre-Treatment



Dense, small trees and fallen woody debris under a canopy of mature trees provide fuels for forest fires and prevent understory vegetation from growing.



### Post-Treatment



Retention of the large trees, snags and decaying logs creates structure similar to that found in old forests. It also reduces fire hazard and allows understory vegetation to re-establish.

If you have any questions, please contact:  
Mark Brown, District Arborist 604-990-3809






Place: Montroyal School - 5310 Sonora Drive      Date: Feb. 11, 2008    6:30 p.m.



## Essential 2: Financing and Resources

“Assign a budget for disaster risk reduction and provide incentives for homeowners, low-income families, communities, businesses and the public sector to invest in reducing the risks they face.”

### Why?

An action plan remains just that—a plan—unless it has dedicated resources to ensure that actions related to the Ten Essentials can be carried out. Local governments require capacities and mechanisms to access and manage resources, including for disaster risk reduction, as part of the city’s vision, mission and strategic plans. Resources can come from city revenues, national disbursements and allocations to sectoral departments, public-private partnerships and technical cooperation, and from civil society and external organisations. Chapter 3 has additional information on how to finance disaster risk reduction.

### What?

#### Invest in risk reduction measures and awareness campaigns

- Integrate risk reduction measures into the local government budget to increase the resilience of the city’s economy, ecosystems and infrastructure (i.e. schools, hospitals, critical assets, water supply, drainage and solid waste management).
- Along with your own funds, seek to access complementary national and provincial funds and programmes to support your actions (i.e. urban infrastructure, environmental management and public works).
- Encourage public and private sector participation in developing awareness campaigns and information that promote resilience actions for the general public, home owners, education and health workers, industry, real estate developers and others.

#### Ensure a budget for preparedness and response

- Make provisions in the budget to maintain well-trained and equipped emergency response services, communications, early warning systems and risk assessment capacities.
- Institutionalize disaster management and actions, with capacity for decision making and access to funds.
- Consider establishing a contingency fund for post-disaster recovery
- Build a contingency fund to meet post-disaster needs with stockpiles for relief assistance, response equipment and vehicles, a reserve for post-disaster interventions and rapid recovery, and assign resources to develop toolkits and standard operating procedures for post-disaster and recovery activities.

- Develop a strategy to access funds from national and international sources, the private sector or individuals to support cash grants, soft loans for restarting livelihoods and to begin more sustainable rebuilding in disaster-affected communities.

### **Put in place incentives for risk reduction—and penalties**

- Provide incentives for the construction of safe housing and infrastructure and for local businesses that invest in disaster resiliency and risk reduction. For example, apply lower local taxes, offer grant subsidies, and/or partial cost grants for assessing, strengthening and retrofitting vulnerable housing.
- Support safer standards by providing design options and subsidized actions in high-risk areas. Encourage local businesses, banks and insurance companies to reduce the cost of more sustainable building supplies and support low-income communities with insurance and savings and credit schemes that favor them.
- Consider penalties and sanctions for those who increase risk and environmental degradation.
- Give public recognition and/or awards to good city practices that increase safety.

### **Improve economic performance**

- Identify the concerns and priorities of the economic sector, including areas of potential vulnerability such as the location or robustness of its buildings and the sustainability of resources they depend on.
- Ensure that city plans are risk-sensitive, for example, by identifying areas suitable or not suitable for human settlement and economic development.



## Examples

### Cairns: Regular Budget for Disaster Preparedness and Response

The city of **Cairns, Australia** has an annual operating budget to cover its Disaster Management Unit, Coordination Centre, volunteer emergency services and community awareness programs. Its annual capital budget has, in recent years, covered allocations for building construction, emergency response vehicles and equipment, new risk assessment software, upgrading flood warning network and drainage and flood mitigation investments—a clear demonstration of the city’s commitment to disaster risk reduction. This is complemented by investment and partnerships at national level, for instance, through a review of building codes following Cyclone Yasi in 2011, which also involved built environment professionals, private sector and academic institutions.

*Read more about their work at: <http://tinyurl.com/7qm2vvgg>.*

### Manizales: Innovative Financial Measures to Promote Disaster Risk Reduction

The government of **Manizales, Colombia** has taken innovative financial steps to promote disaster risk reduction, including: Tax reduction for those who implement measures to reduce the vulnerability of housing in areas at high risk for landslides and flooding; An environmental tax on rural and urban properties, spent on environmental protection infrastructure, disaster prevention and mitigation, community education, and relocation of at-risk communities; A system of collective voluntary insurance to allow low-income groups to insure their dwellings. The city government has an agreement with an insurance company and allows any city resident to purchase insurance coverage through municipal taxes. *For more information consult the 2009 Global Assessment Report on Disaster Risk Reduction (UNISDR), [www.preventionweb.net/gar](http://www.preventionweb.net/gar). Click on GAR-2009, Chapter 6.2.*

### Philippines, China and Sri Lanka: Supporting Investment in Disaster Risk Reduction

Since 2001, cities in the Philippines are required to allocate 5% of their local government budget to a calamity relief fund (CRF). Under the Disaster Risk Reduction and Management Act of 2010, they can spend 70% of this allocation for preparedness and procurement of relief /rescue equipment and stockpiles.

Sri Lanka’s Disaster Management Ministry announced in 2011 an allocation of Rs. 8 billion for a programme to control floods in the capital, Colombo, while launching a secure town planning programme to minimise disasters as part of the Resilient Cities Campaign. The money will be used to clear canals, reconstruct the drainage system and for other measures to prevent floods. Under the “secure towns” programme, 15 towns have been selected as disaster-free cities.

Provincial governors in two of China’s disaster-prone provinces committed additional resources to disaster reduction. Wei Hong, Executive Deputy Governor of Sichuan province, said that 2 billion Yuan will be invested to improve the local geological disaster prevention system. Gu Chaoxi, Deputy Governor of Yunnan province, which is highly at risk for geological disasters, vowed to invest at least 10 billion yuan over 10 years in the local disaster prevention and assessment system. *The report on Sri Lanka available at: <http://tinyurl.com/7t23osr>; the report on China: <http://tinyurl.com/858rfyo>.*



## Essential 3: Multi-hazard Risk Assessment— Know your Risk

“Maintain up-to-date data on hazards and vulnerabilities, prepare risk assessments and use these as the basis for urban development planning and decisions. Ensure that this information and plans for improving resilience are readily available to the public and fully discussed with them.”



*Satellite pictures of Venice.*

► Risk assessments provide local authorities, investors and the general community with vetted and updated data, maps and other information on hazards, vulnerabilities and risk in order to take decisions regarding timely interventions before, during and after a disaster.

### Why?

Unless cities have a clear understanding of the risks they face, planning for meaningful disaster risk reduction may be ineffective. Risk analysis and assessments are essential prerequisites for informed decision making, prioritizing projects, planning for risk reduction measures and identifying high-, medium- or low-risk areas, according to their vulnerability and the cost effectiveness of potential interventions. A well-maintained database of disaster losses and a Geographic Information System to map hazards, vulnerabilities, the exposure of people and assets and capacities will provide the foundation for the risk assessment.

### What?

#### Determine the nature and extent of disaster risk

- Led by the appropriate city department, prepare a comprehensive risk assessment and risk maps with loss scenarios, including the impact of climate change, using technical expertise available through city entities or local technical institutions.
- Enlist, as necessary, technical support from national, regional and international experts. Make sure to consult and involve local stakeholders. Make the information available to the public.
- Historic loss data: Prepare and maintain an updated database of disaster losses from past events and current potential hazards in the city.
- Hazard assessment: Establish and map the nature, locale, intensity and probability of hazards (including natural events, technological and other man-made hazards).

The basic components of a risk assessment include:

- **Historic loss data:** Prepare and maintain an updated database of disaster losses from past events and current potential hazards in the city.
- **Hazard assessment:** Establish and map the nature, locale, intensity and probability of hazards (including natural events, technological and other man-made hazards).
- **Vulnerability assessment:** Determine the degree of vulnerability and exposure to the hazard of the population, development sectors, infrastructure and ongoing or planned city projects. Map and work with populations in high-risk areas.
- **Capacity assessment:** Identify the capacities and resources available institutionally and at neighborhood or district level.
- **Identify corrective actions and plans to reduce the risks.**

- **Vulnerability assessment:** Determine the degree of vulnerability and exposure to the hazard of the population, development sectors, infrastructure and ongoing or planned city projects. Map and work with populations in high-risk areas.
- **Capacity assessment:** Identify the capacities and resources available institutionally and at neighborhood or district level.
- **Identify corrective actions and plans to reduce the risks.**

### **Disseminate risk information and apply to development decisions**

- **Prioritize actions based on an analysis of the urban plan, land-use zoning, investment decisions and worst-case scenarios for emergency preparedness plans and exercises.**
- **Make the results available through websites and other means of information.**
- **Update the risk assessment, preferably annually.**
- **Establish a city-wide geographic information and monitoring system**
- **Consider creating a geographic information and monitoring system that includes input data from and is accessible to all actors, including civil society, the production sector (for example, agriculture, mining, commerce and tourism) and the scientific and technical community.**
- **Maintain outputs in the city's Geographic Information System (GIS).**

## Examples

### Peru, Cape Town: Reviewing Impact of Disaster Risk on New Development Projects

Many countries, particularly in Latin America, have systems for assessing the impact of disaster risk on productive infrastructure. The UNISDR Global Assessment Report 2011 highlights **Peru**, which established a pioneering legal requirement that all public investment projects be evaluated for disaster risk. If the risk is not addressed, the project will not be funded. Of the US \$10 billion investment approved in 2008, about half was to be executed by local governments. Similarly, under its Disaster Risk Management (DRM) framework, the city of **Cape Town** has mandated that the Municipal DRM Center be involved in the review process of all new development projects.

*Read more about opportunities and incentives for disaster risk reduction management at: <http://tinyurl.com/7sganme> and consult Cape Town's DRM framework at <http://tinyurl.com/cw9n22x>.*

### Cuttack: Data Collection and Risk Mapping for Urban Development Planning

Mahila Milan is a women's group taking leadership roles in informal settlements. The mapping process in **Cuttack**, India is carried out by community organisations comprised of residents of informal settlements and other districts, through a partnership between local Mahila Milan groups and local slum dweller federations. The data gathered is used to generate digital maps for city authorities and to negotiate support for upgrading or relocating houses, thus reducing disaster risk. This process is applied in all informal settlements and results in an accurate, detailed and disaggregated database on risk and vulnerability for the entire city, showing the boundaries of all informal settlements.

*For more information: <http://tinyurl.com/7wg3ktd>.*

### An Urban Risk Assessment Framework

The World Bank, with UN-Habitat, UNEP and Cities Alliance, has developed an urban risk assessment (URA) framework based on experiences in many cities. The URA offers a flexible approach that project and city managers can use to identify feasible measures to assess a city's risk. The methodology focuses on three reinforcing pillars that collectively help to understand urban risk: a hazard impact assessment, an institutional assessment, and a socioeconomic assessment. The assessment is based on four principal building blocks to improve the understanding of urban risk: historical incidence of hazards, geospatial data, institutional mapping and community participation. The URA is flexible in how it is applied, depending on available resources and institutional capacity in a given city.

*Read more at: <http://go.worldbank.org/VW5ZBJBHA0>.*



## Essential 4: Infrastructure Protection, Upgrading and Resilience

“Invest in and maintain critical infrastructure that reduces risk, such as flood drainage, adjusted where needed to cope with climate change.”

► **Critical areas for flood risk and landslide prevention include: urban drainage and sewerage systems; disposal and control of solid waste; “green management” of the city with increased flood retention ponds; open permeable spaces and trees; slope stabilization and erosion control; dikes and embankments and coastal protection.**

► **Recognize that flood defenses increase risks for those outside the protected area and that residents’ over-reliance on defenses can lead to a false sense of security.**

### Why?

Not all hazards are destined to cause disasters. Preemptive measures can help avoid the disruption, incapacitation or destruction of networks, grids and infrastructure, which can cause severe social, health and economic consequences. Collapsed buildings are the greatest cause of mortality during earthquakes. Poorly planned roads or insufficient drains cause many landslides. Lifelines such as roads, bridges and airports, electric and communications systems, hospital and emergency services and energy and water supplies are essential for a city to function during a response to disaster.

### What?

#### Strengthen protective infrastructure

- Adopt city policies, management strategies and plans for geological, climate-related and technological hazards and extremes that combine structural and non-structural measures to strengthen protective infrastructure.
- Assess the risks to each system, review their operation, effectiveness and functions and develop programmes to redesign or strengthen those that are malfunctioning (these measures will also improve service delivery in general).
- Recognize physical environmental changes that could potentially alter flood patterns and take into account future impacts of climate change, such as sea level rise, storm surge, and increased rainfall; establish early warning and monitoring systems that alert crisis management agencies to risks that approach coping thresholds.
- Ensure that roads and sites are designed to be accessible in case of emergencies, including fire or earthquakes. Ensure that all public buildings follow seismic codes adapted to the area; promote compliance with these codes by all developers and builders.

► **Critical infrastructure includes transport (roads, bridges, airports, railway stations and bus terminals), vital facilities (including hospitals and schools that may also double as refugee shelters), the power grid, telecommunications, security and emergency services, and water supply and sanitation, all key assets for a well-functioning and healthy city and critical for effective disaster response and quick recovery.**

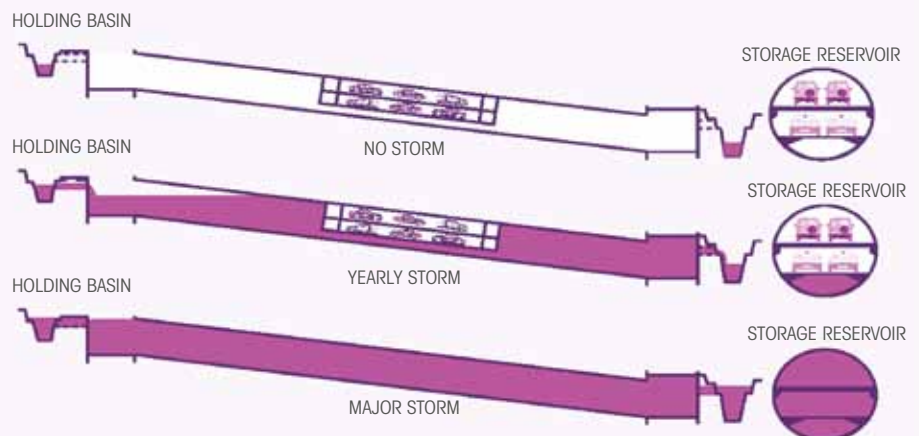
### Protect critical infrastructure

- Assess the vulnerability of existing infrastructure to natural hazards, undertake measures to prevent damage and develop long-term capital investments to retrofit and/or replace the most critical emergency lifelines.
- Plan for business continuity to ensure that lifelines and services are quickly restored.
- Develop special programmes to protect historic buildings and the city's cultural heritage.

### Develop resilient new infrastructure

- Establish minimum criteria and standards of resilience and safety, as part of urban design (see Essential 6).
- Invest, design and construct new sustainable infrastructure in appropriate locations and to a higher standard of hazard and climate resilience so they withstand destructive events and function effectively during an emergency.
- Conduct an assessment to prioritize maintenance improvements and repair programmes and, if required, the retrofitting, capacity redesign, demolition or replacement of damaged or obsolete structures.
- Take preventive measures in buildings that are damaged, not being used, in a state of disrepair or obsolete. Discourage occupation of these buildings to avoid jeopardizing human safety.
- If possible, consider demolishing at-risk infrastructure if the building has no cultural or historic value or cannot be repaired.

**Figure 4:** Three modes of operation of the SMART Tunnel



## Examples

### Kuala Lumpur: Dual-use Drain and Car Tunnel

Locating infrastructure out of harm's way is one way to ensure that new infrastructure does not introduce new risk. Where that may not be possible, another way is to execute multipurpose infrastructure projects, such as **Kuala Lumpur's** Stormwater Management and Road Tunnel (SMART). Floods from heavy rains are a hazard, and the 9.7 km. long, \$514 million tunnel has three levels, the lowest for drainage and the upper two for road traffic. The drain allows large volumes of flood water to be diverted from the city's financial district to a storage reservoir, holding pond and bypass tunnel. Combining the drain with the road has two advantages: it ensures that this "critical infrastructure" is subject to higher-than-usual margins of safety (the extra strength that engineers build into designs). In 2010, local government officials commented that "the RM 2 billion provided by the government to construct the SMART Tunnel in Kuala Lumpur is a significant investment. But in the three years since its launch in 2007, the SMART operations have successfully averted at least seven flash floods and have saved hundreds of millions of RM in potential losses. Together with the revenue from toll fees, we are very close to recovering the investment cost," said Datuk Hj Salleh Bin Yusup, Director General of City Hall. A local newspaper reported in 2010 that since SMART operations began in 2007, it was used 114 times to divert excess water and prevented seven potentially disastrous flash floods, which far exceeded the original target of diverting flood waters only two or three times a year.

In addition to the SMART Tunnel, another RM 140 million was spent on maintaining flood retention ponds and main drains; RM 40 million is provided for maintenance and cleansing of rivers and main drains; and 300 million has been allocated for river cleansing and beautification. "These substantial investments, both from the Federal Government and City Hall, are the results of efforts to mainstream disaster risk reduction into all policies and development and land use plans such as the Kuala Lumpur Structure Plan 2020, the Kuala Lumpur City Plan and the Flood Mitigation Plan," said the Lord Mayor to UNISDR.

*For more information about the SMART tunnel, consult pages 6-7 of: *Natural Hazards, UnNatural Disasters: The Economics of Effective Prevention* (World Bank- United Nations, GFDRR, 2010). <http://tinyurl.com/7aalwlj>*

### Pune: Investing in Measures to Reduce Risk

**Pune**, India, has been affected by severe periodic flooding for decades. Anticipating that the impact of climate change may increase the frequency, the city has put programmes in place to build capacity, assess hazards and vulnerability, and implement a city-wide action plan that contains structural and planning measures for restoring natural drainage, widening streams, extending bridges and applying natural soil infiltration methodologies. Watershed conservation techniques, such as afforestation and building small earthen check dams, were undertaken in the hill zone. Property tax incentives were provided to encourage households to recycle wastewater or to store run-off rainwater for domestic use. These efforts were complemented by improvements in flood monitoring and warning systems and social protection for affected families. The initiative was driven jointly by the elected municipal government, the municipal commissioner and Alert (active citizen groups), and involves many different city departments.

*Consult Briefing Note 02: *Adaptation to climate change by reducing disaster risks: Country practices and lessons* (UNISDR 2010) at <http://tinyurl.com/6nmww8t>.*



## Essential 5: Protect Vital Facilities: Education and Health

“Assess the safety of all schools and health facilities and upgrade these as necessary.”

► While it is true that the collapse of a school or hospital generates severe problems for a disaster-affected city, it is more common to see the “functional” collapse of these facilities, where structures may remain standing but cannot be used for a variety of preventable reasons. To avoid this, hospitals and schools must be constructed to high standards of resilience, access routes must remain open and the water supply, electric power and telecommunications must continue providing services to the facilities to guarantee continuity of operations.

### Why?

Schools and health facilities provide essential social services. As such, special attention must be paid to their safety and risk reduction efforts must focus on ensuring they can continue providing services when most needed. Not only do they house among the most vulnerable groups in society, schools and hospitals are also places of care, development and well-being. They carry out essential functions during and after a disaster, where they are likely to accommodate and treat survivors. The normal educational routines of children must be restored as soon as possible to avoid social and psychological repercussions.

### What?

#### Keep schools and health facilities operating and functional

- Establish and implement action plans and programmes, maintain the structural and physical resilience and robustness of these facilities.
- Examine the geographical location and investigate capacity requirements in emergency and recovery situations.
- Assess disaster risk in schools and hospitals and strengthen/retrofit the most vulnerable
- Introduce data on the vulnerability of schools and health facilities into risk assessments and ensure compliance with safety standards when deciding on the location, design and construction of all new infrastructure.
- Create an action plan to assess and reduce vulnerability and risk in existing schools and health facilities by selecting and retrofitting the most critical (and vulnerable) facilities and incorporating stringent maintenance and repair programmes.



► The “One Million Safe Schools and Hospitals Campaign” is a global advocacy initiative to make schools and hospitals safer from disasters. Make a pledge and save a life!

[www.safe-schools-hospitals.net/](http://www.safe-schools-hospitals.net/)

- Generate wider action and more resources by encouraging surveyors, engineers and other built environment professionals, the private sector and communities to participate in this critical risk reduction work.

### Recognize the relevance of priority services and operations after a disaster

- Improve the safety of public health and educational facilities that have complementary and supporting roles in emergency response and recovery.
- Strengthen and motivate private facilities that can contribute to relief efforts and provide complementary services in the emergency and recovery phase.
- Provide incentives to eligible private institutions to become partners.

## Examples

### Cayman Islands: Making Health Care Facilities Safer

The **Cayman** Islands are one of the most frequent targets of Atlantic hurricanes, and in 2004, Hurricane Ivan, the worst storm in 86 years, struck the largest island, Grand Cayman, damaging 90% of the buildings. Power, water and communications were disrupted for months in some areas. The island began a major rebuilding process, and within the National Strategic Framework for Disaster Risk Reduction, the Health Services Authority addressed structural, non-structural, functional and workforce issues. For instance, the 124-bed Cayman Islands Hospital (the territory’s principal healthcare facility), which had been built to Category 5 hurricane standards, remained functional during and after Hurricane Ivan, while providing an impromptu shelter for more than 1,000 people. However, older facilities needed to be upgraded to new local and international building codes and protocols for healthcare facilities. Seismic risk reduction elements were also introduced into the design of new facilities.

For more information consult <http://www.caymanprepared.gov.ky>.

### Hospital Safety Index: Will My Hospital Be Able to Function in a Disaster?

A growing number of countries worldwide are using the **Hospital Safety Index**, a low-cost tool that helps health facilities assess their safety and avoid becoming a casualty of disasters. The Hospital Safety Index provides a snapshot of the likelihood that a hospital or health facility can continue to function in emergency situations, based on structural, nonstructural and functional factors, including the environment and the health services network to which it belongs. By determining a hospital’s safety index or score, countries and decision makers will have an overall idea of its ability to respond to major emergencies and disasters. The Hospital Safety Index does not replace costly and detailed vulnerability studies. However, because it is relatively inexpensive and easy to apply, it is an important first step towards prioritizing investments in hospital safety. The Hospital Safety Index is available in English, Spanish, Arabic, Russian and French.

Download background information and forms at <http://tinyurl.com/c53gdvw>.



## Essential 6: Building Regulations and Land Use Planning

“Apply and enforce realistic, risk-compliant building regulations and land use planning principles. Identify safe land for low income citizens and develop upgrading of informal settlements, wherever feasible.”

► According to the Pan American Health Organisation, the cost of a building designed and built to withstand hazards such as earthquakes may increase the total cost of the structure by 1% to 5%. When it comes to certain non-structural elements, the cost savings are dramatic. For example, a severely damaged electric generator could result in the loss of power and cost as much as US\$50,000 to replace. This situation could be avoided by installing seismic isolators and braces to prevent the generator from moving, at a cost as low as US\$250.

### Why?

Countries and cities will have safer infrastructure when standards are in place through building codes and regulations. The application of construction codes and mechanisms for planning and monitoring the use of city land is a valuable way to reduce disaster vulnerability and risk from extreme events such as earthquakes, floods, fires, the release of hazardous materials and other phenomena. It is the responsibility of local authorities to monitor their application, compliance and follow up. Using resilient design standards and land use planning is cost effective when compared to relocation and/or retrofitting unsafe buildings (a cost/benefit ratio of 4 to 1).

### What?

#### Enforcement of and compliance with risk-sensitive building codes and regulations

- Ensure that municipal regulations and laws include building codes that set standards for location, design and construction to minimise disaster risk and ensure enforcement by investing in building capacity of local officials, increasing public awareness and using motivational means to increase compliance.
- Ensure adequate clarity about differences in building regulations for critical public infrastructure, engineered buildings and more simple and accessible guidelines for smaller non-engineered homes.

### **Develop city and land use planning based on risk assessments**

- Incorporate disaster risk reduction and climate change impacts into the urban land use plan and regulations, based on the city risk assessment. Land use planning must incorporate peripheral land around urban developments and the wider rural environment.
- Use plans to prevent/control development in extreme-risk areas and to mitigate risk in existing developments; prescribe restrictions on building type, use, occupancy and density in high-risk areas. New regulations leave existing buildings vulnerable, so assess their risks and implement plans for retrofitting or alternative means to reduce risks.
- Spread out the location of critical infrastructure, evacuation shelters, emergency services and lifelines. Identify escape routes and routes for delivery of relief supplies.
- Maintain an updated inventory of land use classification and vulnerability and an urban spatial and building database to monitor development in hazard-prone areas of the city.

### **Upgrade informal settlements and promote safe construction of non-engineered buildings**

- Establish a participatory mechanism to reduce risk in vulnerable settlements; take into account the population's needs and difficulties of rapidly changing existing building practices. When possible, relocate informal settlements to safer locations, while improving the quality of life, addressing livelihood needs and patterns, and seeking innovative ways to finance improved services on new sites.
- Promote resilient design, safer construction and strengthening of non-engineered buildings, using low-cost techniques and locally available materials.
- Share know-how through public campaigns and demonstrations of safer construction techniques.

### **Build local capacities and strengthen participation in urban planning and land use**

- Build the technical capacity and competence of local enforcement officials, builders, tradesmen and practicing professionals to promote compliance with regulations, plans and building codes and to promote/develop innovative local buildings, plans and technologies.
- Build local citizen awareness to monitor and report unsafe building practices and constructions to improve compliance.
- Create special technical task forces to conduct independent periodic inspections.

Building and Planning Regulations that <b>Facilitate</b> Local Disaster Risk Reduction	Building and Planning Regulations that <b>Impede</b> Local Disaster Risk Reduction
<ul style="list-style-type: none"> <li>• National mandates that give local governments responsibility for safe construction practices (while contributing technical expertise and resources to make and implement plans and enforce building regulations).</li> <li>• Recognition by local government of the needs of the poor and accountability to them.</li> <li>• Plans, codes and standards that are developed with and include the perspectives of businesses, residents and diverse communities.</li> <li>• Flexible regulatory frameworks that accommodate changing economies, environments and building densities.</li> <li>• Recognition of informal building processes and encouragement of safe building practices through education and advocacy.</li> </ul>	<ul style="list-style-type: none"> <li>• Safe construction or secure land tenure is unaffordable or unobtainable by the poor.</li> <li>• Inequalities in access to land or housing.</li> <li>• Forced evictions or reduced security with regard to tenure for inhabitants of informal settlements</li> <li>• Regulations that fail to take into account realities on the ground, where existing density in urban areas is ignored, where the construction of small dwellings or workspaces or the use of more affordable alternative building materials is prohibited.</li> </ul>

See more in the 2011 Global Assessment Report on Disaster Risk Reduction (UNISDR), [www.preventionweb.net/gar](http://www.preventionweb.net/gar). Click on GAR-2011, Chapter 6.5.

## Examples

### Thailand: Upgrading Informal Settlements

The government of Thailand has launched an ambitious slum and squatter upgrading initiative. The Baan Mankong (secure housing) programme channels funds in the form of infrastructure subsidies and housing loans directly to community organisations of low-income inhabitants in informal settlements. The funding comes almost entirely from domestic resources—a combination of national government, local government and community contributions. Under this national programme, illegal settlements can obtain legal land tenure through a variety of means such as direct purchase from the landowner (supported by a government loan), negotiating a community lease, agreeing to move to another location provided by the government or agreeing with the landowner to move to part of the site they are occupying in return for tenure of that site (land sharing). For more information consult <http://tinyurl.com/72p7375>.

### Santa Tecla: A Risk-Sensitive City Development Plan

**Santa Tecla** is part of the metropolitan area of El Salvador's capital, San Salvador. "Santa Tecla suffered two earthquakes in 2001. In just five seconds, a mudslide caused more than 700 deaths, displaced 20% of the city, and badly damaged 38% of the infrastructure. Real estate prices plummeted. We had to think deeply about what we could do," says Oscar Ortiz, the Mayor. "In order to turn our city around and make it disaster resilient, we realized we needed to stop improvising when disaster strikes and start planning ahead. We need to manage our land in a responsible and sustainable manner. We developed a ten-year plan to redevelop the city and now have a longer-term plan for a sustainable future through 2020. Citizens need to understand the significance of what we are doing or very little change will take place. We try to do this by encouraging participation in "Mesas de Ciudadanos" (citizens groups), which bring a wide cross section of stakeholder organisations together in periodic discussions and decision making. They soon come to understand that these are issues and decisions that concern their livelihood, their children, their schools and their productivity."

(Source: Interview with Mayor Oscar Ortiz, February 2011, UNISDR)

For more information consult <http://www.santatecladigital.gob.sv/> Click on: *Gestión de Riesgos 13.11* (in Spanish).



*Kabul Municipality, Afghanistan:  
before and after urban improvement  
works with drains and sanitation.*





## Essential 7: Training, Education and Public Awareness

“Ensure education and training programmes on disaster risk reduction are in place in schools and local communities.”



*Learning for life in schools*

► **Focus on people-to-people communication; involve children and youth in hands-on learning activities; use credible and influential spokespersons to serve as safety and disaster risk reduction advocates; and learn from documented good practices from other cities/programs.**

### Why?

If citizens are to take part in the collective responsibility of creating disaster-resilient cities, training, education and public awareness are critical (these must also be incorporated into all Ten Essentials). The entire community must know about the hazards and risks to which they are exposed if they are to be better prepared and take measures to cope with potential disasters. Awareness, education and capacity building programmes on disaster risk and mitigation measures are key for mobilizing citizen participation in the city's disaster risk reduction strategies. This will improve preparedness and help citizens respond to local early warnings.

### What?

#### Raise public awareness in the city

- Conduct and promote a public awareness campaign on citizen safety and disaster risk reduction, with messages on local hazards and risk and steps the city is taking to mitigate and manage these, including the potential effects of climate change.
- Encourage local citizens' groups, schools, the mass media and the private sector to join/support the global Campaign by spreading awareness of these messages.

#### Integrate disaster risk reduction into formal education programmes

- Work with educational authorities, professors, students and advocates to include disaster risk reduction at all levels of the school curriculum and in all public and private institutions.
- Seek necessary technical support for curriculum development from related institutions and agencies. Collect and learn from past experiences.

### Develop risk reduction training and capacity building at the city level

- Establish a sustainable and permanent training programme for key city personnel, in partnership with communities, a variety of professionals from the social and economic sector and specialized local and national institutions. Work with local resources such as the Red Cross, universities, NGOs, teachers and others.
- Focus on training priority target groups such as: municipal departments and emergency management authorities; fire and rescue services; medical emergency teams and law enforcement personnel; specialists in engineering, water and sanitation, surveying, planning and zoning, environment, health and communications; the media; the private sector; community leaders; and educators. Distribute this Handbook and other guidance material, offering short courses and ongoing training opportunities.

### Establish city-wide disaster safety initiatives

- Commemorate the anniversary of locally-memorable disasters with a “disaster safety day,” a time when people are very receptive to safety messages.
- Establish a memorial in the city and/or organize a small exhibition/disaster museum to preserve the memory of the impact of past disasters.
- Find creative new ways to participate in the International Day for Disaster Reduction, celebrated each year on 13th October, and in other related events such as World Meteorological Day, World Health Day, World Habitat Day and events commemorating major national disasters.

### ► Read more about the International Day for Disaster Reduction:

[www.unisdr.org/2011/iddr/](http://www.unisdr.org/2011/iddr/)



## Examples

### **Saijo City: Watch and Learn: Children and Communities Study Mountain and Urban Risks**

As early as kindergarten, schools in Japan are educating children about how to detect and react in disaster situations, conducting regular drills and “disaster watches.” This long-time investment undoubtedly saved many lives in the March 2011 Great East Japan earthquake and tsunami.

In 2004, **Saijo City, Japan** was hit by record typhoons that caused flooding in urban areas and landslides in the mountains. Saijo City’s aging population represents a particular challenge. Young able-bodied people are very important to community systems of mutual aid and emergency preparedness. As young people move away to bigger cities, the population of smaller towns in Japan grows older than the already imbalanced national average. Small cities like Saijo City are also often spread over a mix of geographic terrains – an urban plain, semi-rural and isolated villages on hills and mountains or along the coast. To meet these challenges, the Saijo City government began a risk-awareness programme, targeting school children. Focusing on the city’s physical environment, the “mountain-watching” and “town-watching” project takes 12-year-olds on risk education field trips. Young urban dwellers meet with the elderly to learn together about the risks facing Saijo City and to remember the lessons of the 2004 typhoons. A “mountain- and town-watching” handbook has been developed, and a teachers’ association for disaster education and a children’s disaster prevention club have been set up.

*For more information consult <http://www.unisdr.org/we/inform/publications/13627> (page 29).*

### **Disaster Safety Days Commemorate Anniversaries of Past Events**

In Nepal, 15th January marks the anniversary of the great **Nepal** earthquake of 1934. In **Kathmandu**, political leaders and prominent personalities commemorate the event with activities such as street parades, shake table demonstrations, exhibitions on safe construction, street drama, interactive seminars, posters, art and other competitions and presentations for children. Earthquake simulation drills are the highlight of the observance, with wide public participation and media coverage. The national and city governments have a strong sense of ownership of and leadership in the event.

Japan observes Disaster Safety Day each year on 1st September, the anniversary of the great Kanto earthquake of 1923. Each year, many students visit the Earthquake Memorial Museum in **Kobe**, built on the experience of the Great Hanshin-Awaji Earthquake of 18 January 1995.

**China** has established 12th May as its National Disaster Safety Day, commemorating the Wenchuan earthquake of 2008. The cities of **Ratnapura, Sri Lanka and Dagupan, Philippines** also observe disaster safety days on anniversaries of local historic events.

*For more information on how cities and others celebrate the International Day for Disaster reduction, see [www.unisdr.org/iddr](http://www.unisdr.org/iddr).*





## Essential 8: Environmental Protection and Strengthening of Ecosystems

“Protect ecosystems and natural buffers to mitigate floods, storm surges and other hazards to which your city may be vulnerable. Adapt to climate change by building on good risk reduction practices.”

► Ecosystem-based management considers the whole ecosystem, including humans and the environment. It focuses on natural environmental units such as watersheds, wetlands or coastal ecosystems (and the human communities that live within them or rely on their resources). It recognizes pressures from societal needs and excesses and seeks to promote patterns of land and resource use that do not undermine the core ecosystem functions and services that city dwellers rely on.

### Why?

Ecosystems serve as protective buffers against natural hazards. They increase the resilience of communities by strengthening livelihoods and the availability and quality of drinking water, food supplies and other natural resources. Through the process of urban expansion, cities transform their surrounding environment and often generate new risks. The urbanization of watersheds can modify hydrological regimes and destabilize slopes, increasing hazards such as floods and landslides. Maintaining a balance between human actions and ecosystems is an excellent strategy for reducing risk and contributing to resilience and sustainability.

### What?

#### **Raise awareness of the impact of environmental change and degradation of ecosystems on disaster risk**

- Recognize and communicate the multiple functions and services that ecosystems provide to a city, including natural hazard protection or mitigation.
- Educate the public about the negative consequences of global warming and climate change.

### Promote green growth and ecosystem protection in planning for sustainable livelihoods and development

- Review the environmental consequences of existing plans, policies and programmes; integrate ecosystem considerations into future planning processes; and tackle drivers of degradation.
- Reduce greenhouse gas emissions and promote the transition to a green economy; and invest in risk reduction and ecosystem-based measures to adapt to climate change.

### Establish alliances with environmental managers and the private sector

- Build capacity with partners to carry out risk and vulnerability assessments, environmental assessments and scientific monitoring, expanding governance capacities for ecosystem-based disaster risk management through multi-sector, multidisciplinary platforms, involving local stakeholders in decision making.
- Build partnerships with the private sector to leverage technical and financial resources and ensure that private investments follow environmental and risk reduction norms.

### Strengthen existing ecosystem management instruments or establish them where they do not exist

- Establish a sustainable watershed management programme to balance water needs; protect the ability to capture, store and release water; control sedimentation; maintain downstream flows for environmental needs and mitigate water-related hazards.
- Incorporate ecosystem-based flood reduction measures into engineered infrastructure to support coastal protection, upstream reforestation, wetland and river bank restoration, and floodplain regulation to achieve urban development goals.



*San Francisco Municipality, Camotes Island, Philippines: Their ambitious “two million trees project” engages communities, improves the ecosystem and reduces emission of greenhouse gases.*

## Examples

### Hubei Province and New York: Ecosystem-based Disaster Risk Management

In **Hubei Province, China**, a wetland restoration programme reconnected lakes to the Yangtze River and rehabilitated 448 km<sup>2</sup> of wetlands with a capacity to store up to 285 million m<sup>3</sup> of floodwater. The local government subsequently reconnected eight more lakes covering 350 km<sup>2</sup>. Sluice gates at the lakes are re-opened seasonally and illegal aquaculture facilities have been removed or modified. The local administration has designated lake and marshland areas as natural reserves. In addition to contributing to flood prevention, restored lakes and floodplains have enhanced biodiversity, increased income from fisheries by 20-30% and improved water quality to potable levels. Read more in the UNISDR Global Assessment Report, chapter 6.4.

In **New York**, untreated storm water and sewage regularly flood the streets because the ageing sewerage system is no longer adequate. After heavy rains, overflowing water flows directly into rivers and streams instead of reaching water treatment plants. In New York City, traditional pipe and tank improvements are estimated to cost US\$6.8 billion. Instead, New York City will invest US\$5.3 billion in green infrastructure on roofs, streets and sidewalks. This promises multiple benefits. The new green spaces will absorb more rainwater and reduce the burden on the city's sewage system, air quality is likely to improve, and water and energy costs may fall.

*Read more about these initiatives at <http://www.preventionweb.net/gar>, chapter 6.4.*

### Overstrand Municipality: Addressing the Increasing Risk of Droughts

The **Overstrand Municipality, Hermanus District, in South Africa** has faced rapid and seasonal population growth and projected shortages of water in Hermanus, where rainfall has declined since 1997. Climate change threatens to bring more variable rainfall patterns and more extreme temperatures. In response, the municipality adopted a comprehensive water resource management and development programme, which draws on the national policy and legislative platform developed by the South African National Department of Water Affairs and Forestry. Seeking a longer-term, multi-stakeholder programme with growing public recognition of drought risk, two strategies were devised: better management of water demand and finding additional, sustainable sources of water. After careful analysis of various options, groundwater drilling was initiated to locate local water sources. The permanent coordinating role of the local government was vital in conducting this long-term, multi-stakeholder programme involving national and provincial water agencies, a regional biodiversity conservation institute and a group of community-based organisations. Uncertainty and skepticism among stakeholders regarding the extraction of groundwater was overcome by establishing a participatory monitoring committee and preparing baseline data.

*For more information consult <http://www.unisdr.org/we/inform/publications/13627> (page 52).*



## Essential 9: Effective Preparedness, Early Warning and Response

“Install and develop preparedness plans, early warning systems and emergency management capacities in your city and hold regular public preparedness drills.”



► **Risk and Disaster Scenarios:** Start by thinking about the potential impact of a major event of the kind that your community/institution/enterprise has experienced, such as an earthquake, hurricane or flood. To what degree are residential, commercial, health, education and other infrastructure vulnerable to this type of hazard? Where is the infrastructure located and how or why has it become vulnerable? Can this vulnerability be prevented?

### Why?

Well-conceived emergency preparedness and response plans not only save lives and property, they often also contribute to resilience and post-disaster recovery by lessening the impact of a disaster. Preparedness efforts and early warning systems help ensure that cities, communities and individuals threatened by natural or other hazards can act in sufficient time and appropriately to reduce personal injury, loss of life and damage to property or nearby fragile environments. Sustainability can be achieved if the community itself and local authorities understand the importance of and need for local emergency preparedness and response.

### What?

#### Strengthen and improve preparedness

- Establish institutional and legislative mechanisms to ensure that emergency preparedness forms part of the policies and actions of all sectors and institutions throughout the city.
- Prepare, review and enhance city-wide inter-agency institutional preparedness and response plans, using credible scenarios.
- Integrate the results of local-level risk analysis into the design of communication and disaster preparedness strategies.
- Ensure that the city's preparedness plan has effective systems for delivery of immediate relief and survivor support, in partnership with pre-identified local citizens' organisations.

### **Create or improve an accessible multi-hazard early warning system**

- Establish an early warning and communication system that includes protective measures and clear evacuation routes, as part of the preparedness plan.
- Strengthen local capacity to avoid dependence on external resources and to encourage participation and knowledge sharing.
- Clearly define who has the institutional and decision-making responsibility for updating risk information and activating early warning systems. Simulate contingencies to test the effectiveness of proposed responses and public information and education on risks and risk management.

### **Upgrade the city's emergency response services**

- Determine what type of equipment, training and resources may be needed to deal with the hazards and vulnerabilities a city faces and establish priorities for procuring and/or upgrading as needed.
- Provide specialized training for first responders not only in the use of equipment but also in new techniques for dealing with the type of emergency situations they may potentially face.

### **Develop tabletop exercises and periodic drills**

- Carry out tabletop simulation exercises in which local actors evaluate a community, institution or agency's ability to respond and execute one or more parts of an emergency preparedness plan.
- Conduct exercises on a regular basis to test complex responses and evaluate the plan, policies, and procedures. This will help reveal any weaknesses and identify resource gaps.
- Involve a wide range of organisations, including fire, law enforcement, emergency management, and when necessary, other agencies such as local public health, public safety, the Red Cross and others.

### **Plan for recovery before disaster happens**

- Before a disaster, tackle the challenges of planning and implementing a successful post-disaster recovery, in collaboration with the public, local professionals as well as the private sector. Planning for recovery enables city government to build consensus on recovery goals and strategies, gather critical information to inform recovery decisions, define roles and responsibilities and develop the necessary capacity to efficiently manage recovery operations.

# Examples

## Jakarta: Many Partners, One Integrated Early Warning System

**Jakarta**, Indonesia, a coastal city and the exit point of 13 rivers, is highly at-risk for floods. Some 40% of Jakarta lies below sea level and the provincial authority area includes 110 islands. Hydrometeorological hazards have caused much damage in coastal areas and in residential areas near the river banks. During annual and five-year floods, Jakarta has lost billions of dollars' of investment in buildings and infrastructure. Integrating improvements into the city's flood early warning system has been a true multi-stakeholder process, involving a broad range of local authorities and partners. By managing everyone's interests and roles and improving coordination, the early warning system was upgraded from top to bottom. Technical improvements mean that earlier flood warnings can now be issued. But more importantly, preparedness capacity has been built and streamlined. Key coordination hubs and standard operating procedures have been established and tested with comprehensive drills, so that institutions and communities are now more ready to act on warnings. *For more information consult <http://www.unisdr.org/we/inform/publications/13627> (page21).*

## Makati City: Emergency Operations Center

Located in heart of the National Capital Region of the Philippines, **Makati City** is home to the vibrant and bustling central business district, housing the country's top corporations and making it the financial capital of the Philippines. The city's dynamic social and economic growth required significant improvements to its services to ensure the safety and security of its constituents. In 2006, then Mayor and now Vice President, Jejomar C. Binay, established Makati Command, Control and Communication (Makati C3) to serve as the city's Emergency Operations Center. It was tasked with monitoring, coordination, and the integration of services and resources during disasters and emergencies.

The Makati C3 was placed under the leadership of then Councilor, now the City Mayor, Jejomar Erwin S. Binay, Jr. who sought to continually improve the delivery of efficient and timely services by adopting an emergency 3-digit access number, 168, and upgrading technical equipment, including a Geographic Information System and video surveillance. Makati C3 enhanced the operational capabilities and standards of its staff by engaging with international organisations such as the ASEAN, INSARAG, and UNDAC. Strong linkages were also established with national, regional, local, and non-governmental organisations as well as with the private and business sectors.

Within the city, Makati C3 takes an active role in risk-sensitive land use planning and community-based disaster risk reduction and capacity building programmes for the barangays and other stakeholders, as part of its mission to create safer and disaster-resilient communities. Furthering its commitment, Makati supports many other cities and municipalities through its services and aims to set up a national training centre. *Read more at <http://tinyurl.com/7su6wtw>.*

## **Essential 10: Recovery and Rebuilding Communities**

“After any disaster, ensure that the needs of the survivors are placed at the center of reconstruction, with their support in the design and implementation of the recovery and response, including rebuilding homes and livelihoods.”



► **Post-disaster recovery and reconstruction programmes offer the opportunity to build back better and safer and achieve systemic improvements and fundamental revamps of affected city systems.**

► **Some key issues that must be addressed in recovery plans include debris removal, temporary housing and land for the sites, and policies regarding whether buildings that do not conform to current zoning can be rebuilt in the same location.**

### Why?

Cities are built by many entities over decades or centuries, and hence difficult to rebuild in a short period of time. There is continual tension between the need to rebuild quickly and to rebuild as safely and sustainably as possible. A well-planned and participatory recovery and reconstruction process helps the city reactivate itself, restore and rebuild its damaged infrastructure and recover its economy, empowering citizens to rebuild their lives, housing and livelihoods. Reconstruction must begin as soon as possible—in fact, cities can foresee needs, establish operational mechanisms and pre-assign resources before a disaster. Leadership, coordination and obtaining money are key.

### What?

#### **Recovery must be part of disaster reduction plans and public policies**

- Consider recovery and reconstruction as integral parts of the city’s routine risk reduction and development processes.
- Determine what resources will be needed and plan, in advance, for securing these.

#### **Include the affected population in the definition of needs**

- From the beginning and throughout the reconstruction process, focus attention on the needs of survivors and the affected population, promoting their participation in decisions about the design and execution of actions that help guarantee resilience and sustainability.

- Carry out activities that enable the city to return to levels of normalcy as quickly as possible, including the reopening of schools.
- Ensure that action and programmes include counselling to support the economic situation in the aftermath of disasters.

### Recovery is an opportunity to build back better and improve development

- Evaluate the city's strategic plan, designating as priority those areas that are most affected by and sensitive to development; apply disaster risk reduction criteria as a crosscutting measure.
- Reformulate programmes and projects as needed, strengthening those that lead to resilience; define mechanisms, laws and a solid institutional and political framework for the city.
- Create and strengthen capacities, with an emphasis on local capacities, and strengthen development from within, using local knowledge and resources.
- During the recovery process, don't overlook the protection of natural and cultural resources and values.
- Pay special attention to transitional shelters, ensuring that they are resilient and compliant with local regulations and that they do not become permanent slums.

### Seek resources, strengthen alliances and ensure sustainability

- Prepare a resource management strategy to initiate the reconstruction process. Convene national and international cooperation agencies, businesses and other potential partners.
- Strengthen existing or seek new partnerships and networks to contribute to reconstruction, looking at ways to create new capacities and take advantage of technical and scientific innovation to reduce future risk and increase resilience.

## Examples

### Sri Lanka: An Owner-driven Approach to Reconstruction

The December 2004 tsunami completely destroyed approximately 100,000 dwellings in Sri Lanka and damaged 44,290. The State Task Force used an innovative owner-driven approach to support reconstruction, providing grants directly to the owners to rebuild; owners supplemented this grant with other donations. Most activities related to planning, layout, design and construction were delegated to local beneficiaries, who were supported by technical staff, allowing groups of beneficiaries to negotiate down their costs. In contrast, a donor-assisted programme that followed a contractor-driven approach, without involvement of the community, had a much lower satisfaction rate. Owner-driven reconstruction produced more houses, more quickly, of better construction quality, and at less cost. Space standards were generally better and the design, layout, and location more acceptable to beneficiaries. The programme appears to have fostered a cooperative local social fabric and institution. *Read the report at <http://tinyurl.com/chjv6ps>.*



