

## 3.2 Local authorities

*As disaster risk management strategies are being pursued in more countries, the primary emphasis is often given to national initiatives and organizational structures focused around the authorities and activities of national agencies. Less seldom does one see an initial recognition of the importance of targeting the vulnerabilities, needs and opportunities presented by cities of all sizes and their local authorities. Similarly, fewer resources are committed at local levels of responsibility to routine hazard identification or to support sustained community-based risk management strategies, despite some evident advantages in seeking to do so.*

*Because of the great influence that local authorities exert on all societies, this section will provide a review of experience pertinent to their particular needs and interests related to disaster risk management at local levels of responsibility. The following aspects will be addressed, noting especially the continuing rapid growth of all types of local areas throughout the world, and the numerous conditions of vulnerability and opportunities which they represent.*

- *importance of disaster risk reduction at local levels;*
- *growing relevance of disaster risk reduction for local areas;*
- *opportunities for protecting local areas and environments;*
- *varieties of experience; and*
- *supporting initiatives for local authorities in disaster risk reduction.*

### Importance of disaster risk reduction at local levels

As residents of the local communities in which they serve, local authorities are themselves well placed to be conversant with both the disaster risks experienced, as well as the resources and opportunities available to identify and manage those risks. Many times a local environment can provide a more concise or focused environment that enables a concentration on primary concerns which can be more challenging than the much wider variations or multiple hazards evident on a national scale.

Local governments tend to enable a concerted effort of a dynamic mayor or an involved local council to motivate associated interests among the local business, educational and professional interests. There is also an opportunity for the more direct allocation of available resources, for obvious local benefit. Public awareness programmes can be more precisely targeted to the concerns and needs of the inhabitants, emphasizing the more locally familiar conditions or past events that relate to individual experience within the community.

As these factors can increase effective motivation for assessing local disaster risks or the engagement of professional and material resources to manage them, disaster risk reduction needs to be encouraged and supported at local levels. Such an emphasis should become increasingly important as more people move into cities, urban vulnerabilities intensify, and public attention is driven by economics of an ever more urbanized world.

Local authorities of all sizes regularly have offices and budgets dedicated to responding to crisis situations and assisting to meet the urgent needs of residents following a disaster. By contrast, very few local authorities in the world presently have a designated office to monitor potential risks and to motivate public and private efforts to manage risks before they result in major disasters.

As the decision-making authority and many resources are often concentrated in or otherwise determined by national policies, it can be difficult to systematically forecast, monitor or assess disaster risks in specific areas. With the competing priorities of multiple national agendas, often challenged by strong competition for limited



external or federal resources, local officials can defer decisions and responsibility about disaster risks to the central authorities if there is not strong local support to address more immediate concerns. As a result, local government action regarding disaster risk management can often be ineffective, or content in the limited assurances of emergency services that can be deployed only in response to an emergency crisis.

While there is no standard set of practices or a uniform methodology to address disaster risk management in all cities and local areas, there are measures being employed in a variety of settings that can demonstrate the benefits from a sustained commitment to disaster risk reduction. These include activities related to vulnerability and risk analysis, building local institutional knowledge and capabilities, increasing public awareness and participation, and protecting critical public infrastructure. These commitments can be summarized by integrating disaster risk management into daily local government actions, supported by dedicated financial and human resources.

### Growing relevance of disaster risk reduction for local areas

Urban vulnerability is one of the most underestimated issues in urban development. By 2050, the world population is expected to grow by three billion people. Almost all of this growth will take place in developing countries, and particularly within their cities and towns.

By more than doubling the urban population, large numbers of people will be concentrated in mega-cities and their increasingly fragile landscape, with huge impacts on the natural resources surrounding them. There are currently almost 450 cities worldwide with a population of more than one million inhabitants. Of these, 50 cities have a population greater than 3.5 million, and 25 urban areas have more than eight million inhabitants.

The stresses and strains of rapid urbanization are nowhere more apparent than in the local areas in developing countries. Collectively, they will have to accommodate 150,000 new arrivals daily. This figure is expected to rise to 180,000 people by

2010. Expressed in more dramatic terms, more than one million new inhabitants will be added to local areas every week.

This human inflow into local areas needs to be set against the continuing deterioration of conditions of shelter and the difficulties of providing basic social services in expanding human settlements in urban areas. Resulting population densities also place many more people at risk to any hazards that may routinely impact the area. In addition, developmental analyses regularly document the fact that poverty in urban areas is rising and that the number of poor people in urban areas in some countries is now increasing at a faster rate than in rural areas.

Urban infrastructure is itself vulnerable to natural hazards. People in urban areas are more dependent on increasingly sophisticated but also often poorly maintained infrastructure. These conditions can threaten the supply of water and adequate sanitation, or place electricity grids at risk. Physical conditions within cities tend to further intensify the effects of hazards emanating from natural phenomena. The amount of concrete and built-up structures in cities radiate large amounts of heat making them localized heat islands, or otherwise contribute to intense water run-off, with disastrous effects. Urban generated pollutants in the atmosphere contribute to high levels of harmful ozone, smog, and conditions that can contribute to increased thunderstorms.

Risk-accumulation processes in urban centres, such as ever-increasing numbers of people at risk from floods or accidental fires, are not so much inherent to urban development as produced by complex and dynamic interactions between human and naturally induced hazards and extreme conditions of vulnerability. The vulnerability of urban populations is not natural, but is constructed and amplified by economic, social and political systems. It is only compounded as more people are packed ever more densely into areas already exposed to natural hazards because of their geographic location.

Some sobering statistics further underscore the physical exposure and potential financial costs of disaster risks faced by urban and local areas in the developing world. Almost half of the world's largest cities are situated along major earthquake

faults or are exposed to tropical cyclone tracks. On average, the number of disaster victims in developing countries is 150 times higher than among industrialized or richer countries. The corresponding economic losses are 20 times greater, when expressed as a percentage of their gross national products.

Throughout the world, cities represent the centres of authority, power and wealth for states. They also include the greater concentrations of resources, assets, and are often the basis of national economies. For these reasons, one may consider that the protection of critical assets and essential infrastructure should have a particularly high priority. In the case of the United Kingdom, the Thames Barrier protects the city of London with its pre-eminent economic and political importance to the nation from a 500-year flood, whereas all other towns and cities exposed to coastal floods in the country are only protected from a 100-year flood.

Recurring disasters can erode the social and economic accomplishments in all countries, and even more severely set back national development in those countries striving to overcome conditions of poverty. With the growth and importance of cities and local areas as the basis of national and local economies in developing and industrialized countries alike, the reduction of vulnerability to disasters in metropolitan areas is one of the critical challenges facing development. Integrating disaster reduction in development is an essential part of making cities and communities sustainable.

### Opportunities for protecting local areas and environments

While shifts in policy regarding disaster risk management are most frequently expressed in terms of national attention and development agendas, useful practices are universally acknowledged as being measured in terms of local effectiveness. The specific conditions that exist within

local authorities' realm of responsibilities invite more opportunities for local involvement if there is an explicit programme to address risk issues.

Experience and modern risk management practice recognize the importance of a strong and well-structured local disaster risk management capacity. Failing such prior developments, it is often only at the time of a crisis that local governments are confronted with the responsibility of acting. It is precisely at the time of greatest need that many local authorities find that they have neither the means nor adequate legislative authority to mobilize necessary resources.

However, in a growing number of countries, the introduction of a specific disaster risk reduction programme has been able to provide an umbrella for local authorities to work in a coordinated fashion, often at first informally and then with a more structured approach that relate to risk management. This can provide an institutional and information basis to coordinate various interests, including those represented by local departments of transportation, education, health, public utilities and electricity.

Additionally, more local authorities are recognizing that greater focus can be maintained and a more manageable scale of coordinated efforts is possible in addressing risk factors at a local level. One may also consider that there can be more opportunities to apply local knowledge and resources that may be more easily tapped through already existing professional, public and official contacts within a community where professionals and officials both live and work themselves.

Municipal authorities are well placed to reduce the human and financial costs of disasters by establishing a competent disaster management plan. Today, technology and know-how can empower urban decision makers to develop and implement actions to reduce the human and economic losses from hazardous

*“One cannot underestimate the value of being a part of something bigger, which is good in and of itself. Most people are pretty good at what they do – or want to be. Many times those people who do not act, often do not know how to do so, but they respond willingly when shown how they can.”*

*Jim Mullen, Office of Emergency Management, Seattle*



events and also speed up recovery and install less vulnerable conditions particularly following disasters. Such an approach can preserve the local area's resources for improved public services and much needed economic development.

However, implementation of such plans also relies on central governments establishing a national strategy that enables decentralized decision-making, providing resources for local planning, assessment and intervention. There is a need to promote the development of strong expressions of political will at local levels of interest to institutionalize knowledge and mobilize resources. To ensure success, all of these efforts should be based on cooperative arrangements, extended partnerships and broad local community input.

### Varieties of experience

Conducting a systematic risk assessment strategy is an effective vehicle to advocate greater awareness of disaster risk reduction across different segments of the population. It is, of course, crucial to have capable emergency services in place, but this cannot be allowed to substitute for more sustained and multidisciplinary abilities required to pursue other commitments to risk assessment, monitoring and risk management on a continuous basis.

#### Case: South America

Often it takes an individual champion of the subject drawn from either influential political or professional motivations to provide the spark to interest and then motivate a community. More often, the severe consequences of a disaster that has shaken a community awakens the public to support efforts to embark on a strategy of risk management guided by local leadership.

In Colombia, the National Council for Social and Economic Policy has designed a strategy for the short- and medium-term implementation of the national disaster prevention and management plan. One of the strategy's accomplishments can be seen in the city of Manizales. There, a local environmental action plan has been established through public dialogue and widespread

consultation among the community, local officials and the technical agencies concerned. The plan is integrated into the local area's development plan and budget, and includes specific measures to reduce the risk of landslides. While it seeks to relocate the population living on steep slopes, the programme is also linked to the development of ecological parks. Some of the parks are located on slopes too dangerous for settlements, but others have been integrated into the city's watershed thereby protecting important economic functions.

In Bolivia too, a comprehensive national policy for prevention and risk management was established in 2002. Among other applications, the identification and management of risk has been introduced through guidelines for adapting local development plans. Intended to be implemented in 30 pilot local areas, these guidelines will contribute to ensuring that local plans for risk reduction will become consistent with national policy. Manuals are being prepared to guide the design of local plans for risk reduction in relation to town and country planning, human settlements and environmental management.

#### Case: New Zealand

Following the devastation caused by the 1994 earthquake in Northridge, California in the United States, the Wellington City Council in New Zealand began a series of local and international consultations on updating both the extent and methods for an improved approach to managing the city's own exposure to seismic risks. Led by the mayor and supported by the city's business community, the extended consultation worked closely with the fire service and reached out to many different professional and commercial interests not previously involved in the traditional measures of emergency management.

The city authorities first shifted the focus of shared community interests to reducing Wellington's exposure to a variety of possible urban risks, considering the growth and economic foundations of the city. A consensus emerged quickly that the prevailing disaster management regime focused almost exclusively on emergency response and short-term preparedness measures.

A functional analysis of existing practices showed that emergency managers were ill placed to contribute to important and more far-reaching policy decisions regarding comprehensive disaster risk management programmes. There was a noticeable lack of connection between operational abilities for one type of activity – the provision of emergency services – and the understanding necessary for planning and implementing another – ensuring advance protection for critical economic and social assets of a growing capital city. The approach proved so successful, that it was later expanded, with some revisions for national federal authorities, to wider national application.

Following these recommendations, the city of Wellington and later the government of New Zealand embarked on the revision and implementation of legislative reforms in disaster risk management. With the motivation to encompass an all-hazards approach to risk and to appeal to all segments of society, the following accomplishments have been achieved over recent years:

- broadened responsibilities for local authority emergency managers, with increased roles in training and developing community capacities for risk identification, vulnerability reduction and disaster resilience;
- decentralized emergency management groups, with membership including neighbouring local authorities, emergency services and utility companies in order to ensure that while the national emergency management strategy is focused at the local level, there is improved coordination of human and technical resources across the country; and
- a comprehensive risk management strategy was adopted that integrates disaster management into environmental and community management practices at national and local levels.

Elsewhere in New Zealand, the Auckland Local Authority Hazard Liaison Group was established subsequently by the Auckland Regional Council to enhance communications among local authorities on hazard management issues and to facilitate intra-council communication. It was composed mainly of planners and policy analysts drawn from the city, district and regional councils “to recognize the link between hazard mitigation

and land-use planning and the related need to develop tools to manage risk and improve communications among those people working in sustainable development and environmental management”.

### Case: Cologne, Germany

With its 969,000 inhabitants, Cologne, Germany, is Europe’s most flood-prone city. Increasingly frequent floods put major parts of the historic city as well as its large industrial area at risk. A flood in December 1993 caused about US\$ 75 million in damages, in striking the largely unprepared community. Improvements in flood protection and related risk management measures led to significantly reduced damages of about US\$ 32 million in a flood of similar magnitude two years later.

While emergency protection measures had to be deployed at a cost of about US\$ 3 million, it nevertheless became clear that the city averted a disaster. A crest of only a few centimetres more in 1995 would have inundated the historic city centre necessitating the evacuation of 100,000 inhabitants. Large factories, several chemical industry refineries, and the Cologne exposition facilities barely escaped major damage that would have involved large losses. The sewer network as well as the underground railway system would have led water to distant areas with ground elevation below the Rhine River.

The proximity of the two events, and the recognition that better protection was possible led to a significant change in the public’s outlook. The Cologne municipality developed a comprehensive flood protection scheme, and then adopted it unanimously for introduction in 1996.

The strategy emphasized the equal importance of water retention, reduction of potential material damages and better preparedness of the residents. Water retention was improved by using ecologically-based technical measures like reconstructing embankments in the hinterland, reshaping smaller waterways in a natural way, and unsealing land areas to allow for increased percolation of groundwater.

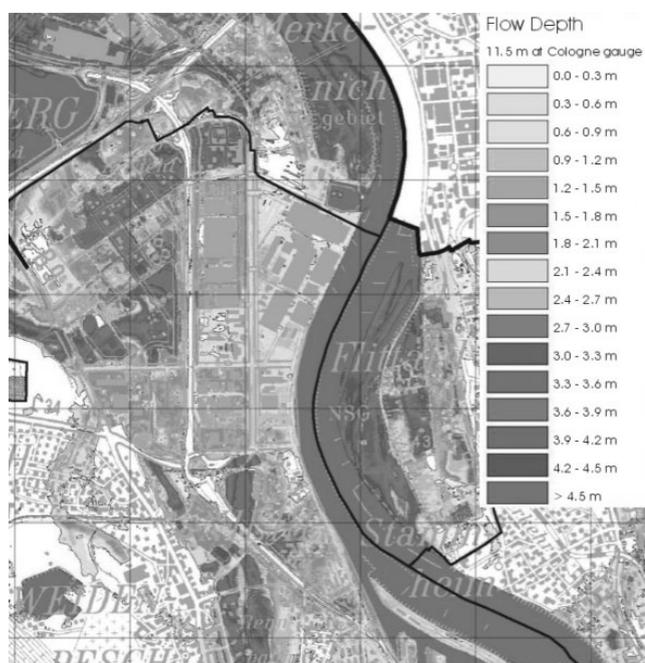
The best use for the flood plain was considered, as well as reconstructing river embankments. In the



city vicinity, 28 kilometres of embankments were newly constructed with 27 kilometres more rebuilt. The sewer network was protected by numerous construction measures positioned at various outlets and at locations to control the runoff from wastewater treatment plants.

The uses of information played a crucial role too. Documentation about the earlier responses to the floods was recognized as an information management system that could transfer knowledge and practical experience between different generations of disaster managers and the general public, alike.

Flood map for a catastrophe scenario



An inexpensive and effective measure for raising awareness throughout the population turned out to be the distribution of leaflets at the beginning of the annual period of possible flooding. Posters that informed about precautionary measures, the location of information centres and various media outlets were added in the areas of greater risk.

The use of radio and television was particularly successful in 1995 in aiding the emergency management activities. Individual citizen's flood-protection initiatives further supported precautionary efforts and worked in association with emergency management and flood control authorities.

Notably, by relating flood forecasting and response measures to an electronically distributed emergency plan, further improvements were made in preparedness and response measures. This improved the timely reaction capabilities and remedied previous deficiencies in communication.

Terminals were placed in all organizations concerned with emergency management, and they were all linked online to a central database. Both real time and cumulative information were available to provide information about successful efforts as well as failed or problematic approaches to specific problems. Information related to data for forecasting water levels, as well as citing specific actions to be taken by previously indicated authorities when certain thresholds were reached. These actions were then codified into a series of emergency procedures.

The integration of GIS into the current flood-risk management system is expected to provide a new generation of disaster mitigation tools for urban areas. The Cologne municipality already completed flood maps (see map).

There is further possibility for the use of dynamic maps that could show the location of various protection measures and their effects, such as identifying individual gate valves to be closed and the resulting effects if the action were to fail. Such maps can be very useful to anticipate elapsed times before maximum water levels are reached. However, like other technical options, further evaluation remains necessary to determine if the intended benefits from dynamic maps would warrant the cost of producing and maintaining them at the required levels of accuracy.

While the Cologne municipal flood management system continues to evolve, the following beneficial effects have been widely accepted:

- acceleration of executing protection measures;
- increased information about the interdependence of protective measures;
- enhanced emergency management supervision;
- improved visualization of risk consequences;
- introduction of effective reporting;
- methodical description and maintenance of responsibilities;
- provision of evaluation opportunities for officials concerned;

- centralized and cumulative data storage;
- standardized forecast procedures; and
- effective transfer of knowledge and experience between generations of disaster managers, and the general public.

Many times local areas have difficulties in accessing funds for risk management activities as central budgetary allocations are rigidly designated for either establishment costs or development funds. Emergency funds are often restricted to immediate rescue and relief works following a crisis event. When developmental funds are designated for risk mitigation activities, donors typically negotiate programmes with, or related to, national government authorities.

These conventions that shape international technical assistance programmes can leave local areas at a disadvantage, regardless of either their expressed interests or demonstrated commitment to risk management. It is an important step to establishing a sustained commitment to disaster risk management in practice if means can be found to reach out to local governments. Measures that enable local authorities to building local capabilities, to acquire more knowledge and resources, or to provide legislated authority to implement disaster risk management policies locally are policy investments.

### Case: South Africa

Experience has shown that activities relating to disaster management cannot function separately from broader governmental responsibilities. Isolated or disjointed planning of functions associated with different aspects of disaster and risk management by numerous government institutions leads to duplication and the waste of valuable public resources. In an effort to ensure the best allocation of resources, the South African government embarked on an integrated planning strategy. By working through an integrated development planning framework, all activities relating to disaster and risk management now must be incorporated into the established responsibilities of the various line functions and sectors of state activity.

Integrated development planning is a process by which municipalities prepare a five-year strategic development plan that is reviewed annually in consultation with communities and stakeholders. The resulting “integrated development plan” (IDP) is a principal strategic planning mechanism which guides and informs all planning, budgeting, management and decision-making within a municipality, whether rural or urban. The plan promotes the integration of disaster and risk management considerations by balancing social, economic and ecological pillars of sustainability without compromising the capacity of the institution to implement its basic responsibilities. The IDP also aims to coordinate actions across the various subject sectors and operational spheres of government.

The Municipal Systems Act 32 of 2000 requires all municipalities (metropolitan, district and local governing authorities) to undertake an integrated development planning process to produce currently relevant IDPs. As a legislated requirement, IDPs have a legal status and they supersede all other plans that guide development at local government levels of responsibility. Accordingly, every newly elected local municipal council has to prepare its own IDP which will guide it for the five years they are in office. The new council has the option either to adopt the IDP currently in force if deemed appropriate, or alternatively to develop a new one taking account of already existing documentation.

Integrated development planning strives to be an interactive and participatory process which requires the involvement of many stakeholders. Because of its widespread participation, a municipality typically requires from six to nine months to complete an IDP. Crucially the timing to adopt an IDP is related closely to the municipal budgeting cycle so that both resources commitments and planned activities are compatible. The IDP also is reviewed annually with the possibility of amendment should it prove necessary.

The IDP has several core components that function as different phases in its development:

- The analysis phase involves an assessment of the existing levels of development, including the identification of communities without access to basic services.



**Table 3.6**  
**Disaster and risk management considerations and the development planning process (South Africa)**

Integrated Development Plan	Disaster and Risk Management Integration
<p><b>Phase 1: Analysis</b></p> <p>Compilation and reconciliation of the following information: Existing information related to development (what is available?) Community and stakeholder analysis (who should be involved?) Municipality level analysis Spatial Gender Environment Economic Institutional</p> <p>The analysis should identify and involve in-depth study of priority issues.</p>	<p><b>Phase 1: Analysis</b></p> <p>Compile disaster management information: Hazard assessment (which hazards are prevalent?) Vulnerability assessment - the extent to which the municipality and inhabitants are vulnerable in terms of: Social / cultural environment Economic environment Political environment Natural / ecological environment Physical environment Capacity assessment (what exists to cope with the effects of hazards?) Livelihoods analysis Capacity analysis Resilience analysis Critical facility analysis Historical disaster occurrences (which disasters have occurred in the past?) Historical loss parameters (magnitude of disasters and their effects) Communities-at-risk (who is at risk of hazards?)</p> <p>The analysis is specific to the line functions of government e.g. the department of health links this analysis to its own disaster risk reduction priorities.</p>
<p><b>Phase 2: Strategy</b></p> <p>Vision of the municipality Objectives of each priority issue (as per Phase 1) Localised strategic guidelines: Spatial Poverty Gender Environmental Economic Institutional Develop strategies for each priority issue Identify projects in order to implement the above strategies</p>	<p><b>Phase 2: Strategy</b></p> <p>Formulate disaster and risk management strategies: Prevention and mitigation strategies Vulnerability reduction strategies Capacity-building Contingency plans Emergency preparedness Implement disaster and risk management in the municipality – identify projects: Setting up structures Community awareness Volunteer structures</p> <p>It is essential that strategies be integrated into identified projects in the parallel IDP process, e.g. the department of works may identify an infrastructure project to supply water to a community that can then reduce vulnerability to epidemics and drought. Projects identified by other line functions in the municipality also need to be assessed for any disaster risk they may impose.</p>
<p><b>Phase 3: Projects</b></p> <p>Design development projects: According to the projects identified and minimum specifications set by government.</p>	<p><b>Phase 3: Projects</b></p> <p>Design disaster management projects: According to the disaster management projects identified, e.g. establish district disaster management centre or conducting a livelihoods analysis. Includes all disaster management related activities for ALL other projects undertaken. All project plans MUST be assessed according to the disaster risks they may pose</p>

Integrated Development Plan	Disaster and Risk Management Integration
<p><b>Phase 4: Integration</b></p> <p>Compilation of integrated plans and programmes: Sector programmes (e.g. water, housing, health etc.) Five year financial plan Five year capital investment programmes Five year action programme Integrated spatial development framework Integrated local economic development programme Integrated environment programme Integrated poverty alleviation programme Institutional plan Integrated HIV/AIDS programme Development and performance management indicators Disaster Management Plan</p>	<p><b>Phase 4: Integration</b></p> <p>Compile Disaster Management Plan, includes: Risk profile of municipality (primary hazards and prevalent vulnerability) Risk reduction strategy Disaster response strategy Field operation guides Standard operating procedures Emergency preparedness Disaster management information system GIS (linked with spatial development framework) Electronic databases (link with other sectors) Communications</p> <p>Provide input to other relevant plans: Financial implications of the Disaster Management Plan Roles, responsibilities and actions that need to be taken as part of disaster management Spatial indication of areas / communities at-risk Institutional implications e.g. to address capacities to prevent disasters, or establishment of disaster management centres Management performance indicators</p>
<p><b>Phase 5: Approval</b></p> <p>Adoption of IDP including Disaster Management Plan, and submission to various bodies designated in the Municipal Systems Act 32 of 2000.</p>	<p><b>Phase 5: Approval</b></p> <p>Adoption of the Disaster Management Plan, and submission to various bodies designated in the Disaster Management Act 57 of South Africa (2002)</p>

- The strategic development phase provides a municipality the opportunities to formulate critical elements of its emerging development strategies, such as:
  - The municipality’s vision, including internal transformation needs.
  - The council’s developmental priorities and objectives.
  - The council’s development strategies.
- The project identification phase enables a coherent set of project activities to be planned and scheduled according to the various dimensions of the development strategies and the respective risk factors which might be involved. The projects can take a variety of forms depending on the relative priorities of such areas as infrastructure development, local economic enhancement, establishment or revision of key governmental institutional capacities, improvements in service delivery, expanded public information and awareness, training capabilities, etc.
- The integration phase aims to ensure that all the projects identified are synthesized into a coherent set of concepts and realistic implementation processes, while taking account

too of the wisest use of limited resources available to the municipality. The following supplementary plans and tools assist in this integration:

- a spatial development framework;
- disaster management plan;
- integrated financial plan for both capital and operational budgets;
- key performance indicators and targets; and
- linkages with other integrated programmes.

- The approval phase follows all planning and integration, and occurs as the municipal council adopts all the plans and projects associated with the IDP. This constitutes a final political authorization and the council assumes ownership and responsibility for all development initiatives that will proceed in the municipality for the next five years.

Disaster and related risk management responsibilities now must be incorporated into each phase of the IDP in all 51 municipality jurisdictions in the country. At the local government levels they must function as being integrated, multisectoral and multidisciplinary



approaches involved in developmental planning, disaster risk reduction, emergency preparedness and disaster recovery.

Table 3.6 illustrates how disaster and related risk management considerations are to be integrated into all aspects of the development planning process. Each sector of government is responsible under the legislation for implementing disaster risk reduction activities. Such an approach ensures that a municipality shall take all hazards, vulnerability and relevant capacities into account throughout all project development and execution stages. High-risk developments can then be identified before the project is implemented and remedial action can be taken.

Although it is still in its developmental phase, more municipalities in South Africa are now realizing the importance of integrating disaster and related risk management activities into their planning processes. A tangible accomplishment of compliance with the Disaster Management Act is that district, metropolitan and provincial disaster management centres are being established currently to fulfil the functions of comprehensive disaster and risk management strategies.

### Case: Asia

The Asian Urban Disaster Mitigation Program (AUDMP) was started in 1995 and has been implemented by the Asian Disaster Preparedness Center (ADPC) with core funding provided by OFDA/USAID. It is based on the belief that loss of life and property from disasters hinders sustainable development, and that such losses can be reduced if appropriate methodologies are introduced through different aspects of city and local administration.

The programme's goal is to reduce disaster vulnerability of urban populations, infrastructure, lifeline facilities and shelter in Asia by establishing sustainable public and private sector mechanisms for disaster mitigation.

As good governance and decentralization of governing responsibilities are high on most countries' political agendas, AUDMP promotes country initiatives that demonstrate the value of strategic approaches to urban risk reduction as part of urban development planning processes.

Working to common standards in association with partner organizations in ten Asian countries, AUDMP works to build the capacities of local authorities, national governments, NGOs, businesses and other institutions that can contribute to reducing risk in urban areas.

Primary tools are employed to facilitate organizational networks, share knowledge and successful experiences and to promote dialogue among key stakeholders. By these means, it is anticipated that successful mitigation approaches can be replicated in other cities and countries worldwide.

Risk reduction practices employed include physical measures, such as flood protection embankments or the wider use of safe building designs. Other practical measures that are vital to reducing risk also receive attention. These range from matters of policy advocacy and legislation to public awareness and training. AUDMP encourages and supports community participation in activities such as hazard mapping and creating more public dialogue in determining policy environments in disaster-prone communities.

While AUDMP activities have contributed to many successful accomplishments in local disaster risk management, they have also been able to disclose some persistent limitations to wider acceptance of disaster risk management practices in Asian urban environments. These include:

- lack of local government will and other organizational interests to assume responsibility;
- other political preoccupations or institutional impediments;
- scarcity of funds, or non-allocation of human or material resources;
- lack of awareness of roles of other relevant agencies;
- lack of recognized mechanisms for sharing information and promoting coordination at local scale, and between local and national authorities;
- lack of consistent donor policies or limited donor collaboration;
- cooperation not sufficiently institutionalized within countries, so that if a key individual leaves, cooperation and collaboration may lapse; and
- different or overlapping concepts of shared interests within geographical sub-regions.

**Box 3.7**

**Asian Urban Disaster Mitigation Program and their partners**

Demonstration projects undertaken by Asian Urban Disaster Mitigation Program (AUDMP) partner organizations in ten Asian countries vary widely in accordance with local priorities.

In Bangladesh, Cambodia, and Thailand the focus is on floods, while India, Indonesia and Nepal concentrate on earthquakes. The Philippines and Sri Lanka address multiple hazards. Laos is concerned with urban fire, and Viet Nam pursues housing requirements in flood-prone areas.

Some of the specific project activities and lessons include the following:

- Hazard mapping and risk assessment: Projects in Sri Lanka and Philippines have demonstrated methodology for development of urban land use through integration of risk reduction measures. Projects in Bangladesh and Cambodia demonstrate community-based approaches.
- Mitigation planning and implementation: Lessons learned from AUDMP initiatives demonstrate that the planning and implementation of disaster risk reduction practices should involve government officials, community organizations, and NGOs working in partnership.
- Public awareness and education: Different approaches, tools and products have been used in public awareness campaigns for different audiences in Bangladesh, Indonesia, Nepal and Sri Lanka.
- Capacity-building: AUDMP's approach to training, resource materials and continuing education is to develop generic curricula on urban disaster mitigation, which are then adapted and institutionalized at the national and local levels through national partner training institutes.
- Safer building construction: Country projects have carried out detailed analysis of existing building construction practices and the condition of existing building codes, acts, bylaws and construction guidelines to find ways to increase effectiveness. Different initiatives have promoted safer construction in India, Indonesia, Nepal and Sri Lanka.
- Community-based approaches to disaster mitigation: The country projects in Bangladesh and Cambodia specifically focus on the importance of people's perception of flood risks, the purpose and tools of community flood risk assessment, and the strategies for community organizing, resource mobilization and capacity-building.
- Policy, legal and institutional arrangements: Sound policies and legislation for disaster mitigation, as well as institutional arrangements that have clear lines of responsibilities need to be in place. AUDMP's project partners in Indonesia and Sri Lanka have taken the initiative to review country policies related to disaster management.

**Case: Naga City, Philippines**

In recent years, disaster management has evolved from concentrating on the response of crisis events to a wider consideration of risk management. In pursuing the objectives of IDNDR during the 1990s and further motivated by the encouragement of AUDMP, Naga City in the Philippines has adopted the following disaster risk management principles:

- an all-hazards approach to risk management;
- a comprehensive strategy that incorporates prevention, preparedness, mitigation, response and recovery capabilities;
- an all-agencies approach to participation; and
- building prepared and resilient communities.

Both natural and human-induced hazards that have the potential to cause significant environmental, social and economic losses were considered for the particular risks they posed to the loss of life and damage to communities and critical infrastructure. The local authorities recognized that land use that failed to take account

of these hazards was not sustainable and could cause considerable losses to the community and harm to the environment.

In seeking to ensure that their community could grow and prosper in a sustainable manner, Naga City officials sought to ensure a close linkage between hazard mitigation and land-use planning. Following a study to determine the priority areas of attention, they crafted a strategy to manage hazards and to prevent environmental degradation in order to uplift the quality of urban life. A coordinated set of activities was formulated in the Naga City Disaster Mitigation Project (NCDMP).

NCDMP became the focus of the city's evolving disaster risk management initiatives. Its major concern was to identify risk reduction measures that could help the residents, while also promoting the importance of awareness and city planning for potential hazards that could threaten the city. As the first model city in the Philippines, Naga City used its project to help strengthen the capacity of its citizens to develop and implement disaster mitigation standards and practices.



First, the Naga City authorities determined that many of the losses to life and damage to property could be avoided through proper planning, especially with more attention given to locate settlements and centres of economic activity in safer areas. Community-based surveys were further developed with technical data provided by the weather service flood forecasting division, leading to hazard mapping.

The local authorities maximized the use of GIS capabilities as a foundation for planning their disaster risk reduction measures. It also proved to be an effective tool for anticipating which areas of the city would most likely become flooded. This became a useful tool for city officials to target specific households for evacuation. On a longer-term basis, GIS provided the information for systematic land use and urban planning, including the identification of primary areas for watershed development on nearby Mount Isarog.

Having identified the most vulnerable areas of their community, local authorities then proceeded to shift the focus of economic activity from the lower, more flood-prone central business district to elevated and less risky areas of the city. Using their five-year development plan, land-use regulations and economic incentives, new areas have been developed into growth centres. Additional market development areas have been designated in residential districts of the city to encourage residents to become less dependent on the main public market.

Even though the central business district will never be abandoned, as public dependence on this area has now been lessened, even if there were to be a serious future flood crisis, the city would be able to continue operating with minimal disruption and less loss to economic activity. This thrust towards decentralization is likewise reflected in the opening and upgrading of new roads for rural communities, and the establishment of additional social service facilities outside the urban area.

The city officials also looked at the need to enforce the critical provisions of the national building code locally. Even though the national building code had more than enough provisions to ensure that buildings could withstand typhoons as well as

other hazards, means were sought to gain greater compliance to its provisions. Existing enforcement of national regulations depended on many different levels of authority and various national offices.

To expedite enforcement and the application of punitive action for violations, the Naga City government authorities drew up their own building ordinances. While they picked up key components of the national code, they also supplemented them with regulations unique to the situation in Naga City. As a result, the city government could prosecute violators on its own with dispatch and without need for the intervention of any additional national bureaucracy. This has dramatically improved compliance with building regulations and the safety of the local structures, bringing them in line with UN-HABITAT guidelines on settlement planning for flood-prone communities.

Through the Naga Kaantabay sa Kauswagan (Partners in Progress Programme), a socialized housing policy was employed to relocate informal settlements from high-risk areas and also to provide them with basic amenities and facilities. So far, more than 12,500 households have been transferred to the city's resettlement sites keeping them safe, far from likely hazards, providing them access to previously lacking basic services.

The Metro Naga Development Council was also enlisted in linking disaster risk management efforts with local development objectives. As the Bicol River snakes through two provinces and dozens of local areas prior to reaching Naga City, successful mitigation of flood hazards within the local area depended on solutions beyond its own boundaries. A wealth of data and recommendations were generated by ten previous studies on flood control within the river basin area over the years, but many remained to be acted upon. By developing a partnership with 14 neighbouring local areas, the resulting Metro Naga Development Council was able to provide resources and to guide more systematic approaches to collective benefits realized on a basin-wide scale. With even greater potential impact, the creation and joint action initiated by the Metro Naga has been able to promote more balanced and sustainable growth within the area.

Environmental dimensions of both risk management and development were also taken into account. By the use of engineered revetments supported by USAID, erosion was reduced along the Naga River and informal settlements were able to be discouraged. Another dimension of the risk reduction measures has worked to restore the watershed of the river by integrating the protection of the river's ecosystem with the development of the livelihoods among its riverine communities.

With the assistance of the Metro Naga Water District and USAID as co-partners, other efforts aim to rehabilitate the upper Naga River by dredging creeks and small tributaries or removing debris from previous flooding and soil erosion. These activities include the use of natural resources and terrain to impound water, minimizing excessive water runoff from the slopes of nearby Mount Isarog.

Institutional management capabilities have been enhanced to reflect a broader commitment to disaster risk management. The Naga City Integrated Emergency Management System (NCIEMS) has been adopted as the basis for comprehensive emergency management. It has been developed in conjunction with the Naga City Disaster Mitigation Office (NCDMO). It is broadly based in that it covers activities that can occur before, during and after crisis situations or hazardous events. To implement the NCIEMS concept, the NCDMO will conduct periodic hazard inventories, followed by capability assessments.

Together these lead to the preparation of a medium-term development plan known as the Capability and Hazard Identification Program. The capability assessment is intended to measure all resources, both internal and external to the city government that can be allocated to counter threats and to optimize the use of the aggregated and intergovernmental resources, as required.

The system further includes means to access additional options to offset shortfalls in capacity on an interim basis. These disaster mitigation measures are actually part and parcel of the growth with equity development programme of the city government, and the departments concerned implement them as part of their regular responsibilities.

The Naga City experience highlights the fact that it is quite possible to associate disaster risk management activities with development strategies. While disaster may set back development efforts, risk management measures and even disaster rehabilitation activities should always be viewed as part and parcel of a locality's overall development programme. To isolate risk reduction from development is to aggravate the impact of hazards and set back development.

### Case: Seattle, United States

With its hilly topography, steep slopes, local geology, and above-normal rainfall, the city of Seattle, Washington, has always been exposed to the possibility of serious landslides. While there were periodic landslides, little prior effort had been made to address hazard mitigation on a systematic basis and the subject was on few official or agency agendas.

The city's awareness to potential hazards was considerably increased in the mid 1960s following the discovery of a new seismic fault line that was nearby, shallow and potentially dangerous. As Seattle's population grew rapidly from the 1980s onwards, many new residents who had arrived from elsewhere possessed little knowledge of local risks, nor any historical or institutional memory of earthquake risks in the Seattle vicinity. New earthquake resistant codes were introduced in the 1980s, and only around 10 per cent of homeowners had earthquake insurance.

Following some serious losses to landslides in 1988 and recognition of even greater potential losses from an eventual earthquake, city authorities began a series of activities to improve disaster preparedness and response capabilities. Importantly, through the efforts of the city's emergency management office a commitment was made to several disaster risk management projects designed to reduce the city's vulnerability to damage from future natural hazards.

In 1998, Seattle was designated as one of the first seven Project Impact pilot communities in the country and the department of emergency management received a grant of US\$ 1 million. (see box 3.8). Through the use of various public events, public information materials and a



### Box 3.8

#### Lessons from Project Impact: public-private partnerships for disaster reduction

The United States Federal Emergency Management Agency (FEMA) approach of encouraging long-term strategies based on public-private partnerships enlarged the scope of disaster risk reduction activities in every state in the United States during the final years of the 1990s before the programme was closed down following a change of political administration.

FEMA launched Project Impact to encourage local authorities to consider public-private partnerships as a basis for developing disaster resilient communities. The programme used modest amounts of seed money and pilot activities to garner common support from individual city, state and federal governments and to leverage wider support and commitments that could stimulate even more participation and involvement.

From the outset different sectors of society were involved in Project Impact. These included business interests, government and local authorities, and representatives of local or civic organizations. This approach helped to foster interest among a wider body of professional interests and at the local community levels of involvement.

As experienced in the city of Seattle, Washington State, the Office of Emergency Management sought to inform, interest and engage other players. In many cases participants initially did not see their personal connection with disasters, but later came to realize their valuable role in risk management. Eventually these partners in the public interest included the Port of Seattle, GIS experts and scientists from the University of Washington, the city's department of education, individual homeowners and the city's leadership. The project also met with acceptance from the small and local business community because these small investors understood the importance of establishing contingency plans to protect their businesses. As time passed and the public appreciation of the new concepts increased, their interest and participation also grew.

The core components of Project Impact as implemented in Seattle over four years responded to the needs expressed from within the local community. First schools and then individual homeowners responded favourably to technical advice and explicit plans that enabled each of them to increase the structural integrity of their buildings through simple retrofitting procedures. Later the technical, scientific and research communities became involved with the opportunity to update and even expand the existing documentation of seismic and landslide risks necessary for advanced hazard mapping. This in turn was seen to provide useful information to the business community and commercial interests.

Previously, people had laboured under the misapprehension that only the government should be involved in disaster risk reduction. Later, the community took pride that some Seattle secondary school students had won a prestigious national film award for the public awareness film about public earthquake safety they had made as a school project.

The programme demonstrated in many places that people wanted to participate once the concepts of risk reduction were sufficiently understood as being beneficial to them, where they lived and worked. They also protected essential services that the people depended upon, so the relevance of the initial activities extended beyond the original grant periods. Later costs for these risk management services were met through local resources.

Key success factors in Seattle were to identify commonly perceived needs, pursue them methodically as local familiarity and capabilities increased, and seek to maintain a sense of local control and widely shared involvement.

The overarching goal was to make people's own community safer for all, and show that everyone had something to contribute. By working together, they could identify priority concerns that they were then able to manage progressively.

community web site, the general public were provided opportunities and tools to learn more about the natural hazard risks of the region and resources that were available to lessen their impact.

By pooling the knowledge and talents of the many local partners, including those from government agencies, large and small businesses, educators, scientists, neighbourhood organizations, and dedicated volunteers, Seattle's experience has led to several successful programmes, which have continued even after the cessation of the original Project Impact grant funds.

As the community became more involved in disaster risk management activities, new programmes were designed to engage other segments of the population. By working closely with the technical and scientific community, the local university and commercial interests, earlier hazard maps were improved and expanded to include other forms of risk.

Landslide maps now integrate existing records with new data about historical rainfall and the soil properties of Seattle's landslide-prone areas. For earthquakes, a new three-dimensional map of the coastal area is being produced that incorporates the complex geological relationships beneath the

surface with earthquake ground motion data. While engaging the technical community in the process, the mapping helps area residents understand more about the risks they face and aid in the development of sound land-use policies.

The most recent efforts of Seattle's local authorities have been to devise a programme that involves and benefits the small business community, an often overlooked and vulnerable segment of the community. As they are a crucial economic mainstay of any community, the small business disaster reduction programme introduces technical risk specialists to business people to provide advice on measures and available resources to protect businesses from disaster losses.

### Supporting initiatives for local authorities in disaster risk reduction

In the 1990s the sustainable cities movement emerged as a powerful driver of policy-making, institutional reform and investment by thousands of local and sub-national authorities, as well as by the development assistance community. A recent survey by the International Council for Local Environmental Initiatives (ICLEI) and the UN Department for Policy Coordination and Sustainable Development (UN-DPCSD) shows there are now more than 6,400 local authorities in 113 countries engaged in local Agenda 21 development programme activities.

A resilient community or local area is a city, town or neighbourhood that reduces vulnerability to extreme events and responds creatively to economic, social and environmental change in order to increase its long-term sustainability. The more a society is confronted by risks and change, the more resilient a community needs to become to ensure its social well-being and economic viability.

"Resilient Communities" was lauded as a partnership at the World Summit on Sustainable Development by ICLEI in August 2002. The concept of a resilient community encompasses the acceptance of developing capacities to identify vulnerabilities and activities to reduce them. It employs tools and strategies for hazard reduction and risk management that include planning measures, urban design features, regulations that are enforced and the investment of resources to

protect important assets. It also needs to support institutional and community-based systems for crisis management, response and recovery when necessary.

<[http://www.iclei.org/johannesburg2002/ips/ip\\_5\\_resilient\\_communities.pdf](http://www.iclei.org/johannesburg2002/ips/ip_5_resilient_communities.pdf)>

Another quality of a resilient community is its ability to identify and pursue creative opportunities arising from change. While change may require emergency response at the time of a crisis, a resilient community would also consider not only how to return to its earlier state, but how to address changed circumstances. It can also seek to capitalize on the increased public awareness that often follows a disaster to improve local conditions and to pursue more strategic aspirations proactively.

The resilient communities agenda pursues two lines of action among the worldwide community of local government authorities. First, it asserts the central emphasis of locality-focused and locally specific disaster reduction planning measures. Even though hazards and extreme events generally are not specific to a locality, vulnerabilities and resilience to these events often arise from unique local conditions. Programme activities, therefore, need to support assessment, planning, policy and implementation practices that are sensitive and responsive to local conditions. There is a growing acknowledgement globally that widespread public participation is necessary at local levels, as well as strong and responsive public institutions.

The second line of action promotes a comprehensive approach to vulnerability reduction and building resilience within communities. It is a series of continuous activities that gives priority to the immediacy and levels of risk, but extending into other related fields such as those of urban governance, public administration, planning, finance, social and economic development, and environmental and resource management.

The initiative focuses on introducing policies, tools and methods that can be shared by both the disaster risk management community and the body of interests more readily identified with the principles of sustainable development. This includes focused commitments in such areas as mobilizing already existing efforts for the improvement of infrastructure, upgrading services,



extending environmental management and further engaging governance practice that embodies risk factors into developmental planning.

Resilient communities and cities seek to define a comprehensive concept of urban resilience with the ultimate aim to build communities that are fully engaged and commit resources to reduce vulnerability and risk. Only then can they be well positioned to respond creatively to a century of social, economic and environmental change.

As part of the expanding resilient communities movement, the Earthquakes and Megacities Initiative (EMI) developed an essential tool for managing disasters known as a disaster management master plan (DMMP). DMMP consists of five elements: assessment, preparedness, response and relief, mitigation, and the acquisition of know-how and expertise. It is intended to serve as a guide for the coordination of a city's action and policies for disaster and risk management, and includes citywide action plans and related protocols for each of these five key areas of responsibility. Additionally, it provides information and data for sound decision-making in routine local administration along with specific risk management functions.

The implementation of a citywide DMMP is a rational and efficient approach to building local capacity because its structure fits the conventional local government operating framework which is grounded in similar areas such as urban development, land-use planning, capital planning and public safety that are directly related to disaster risk management activities. The DMMP creates a useful context in which to institutionalize disaster risk management within a city's central administration and operational policies.  
<<http://www-megacities.physik.uni-karlsruhe.de/>>

UNESCO and ISDR have joined forces to pursue shared objectives in coordinating a multidisciplinary initiative to reduce natural disasters in Asia, Latin America and the Caribbean. The goal of the project is to preserve sustainable development and reduce poverty by reducing the impact of natural disasters.

Emphasis is given to promoting measures that can incorporate risk management as an integral part of public policy, city development plans and processes. The project builds on previous accomplishments in risk identification in the participating cities. In particular, it uses the results of the Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters (RADIUS) project conducted from 1997 to 2000 under the aegis of IDNDR. The UN has since distributed these tools to local authorities of earthquake-prone cities worldwide (also see box 2.26).

One of the end products envisaged in the later activities is a set of recommendations for local governments that convey normative actions that can be used in urban planning and to empower citizens to enhance disaster reduction. The long-term vision is for cities worldwide to adopt effective measures that local authorities can employ in wider application of existing knowledge to manage risks. By reducing levels of exposure to natural hazards and related risks, opportunities for sustainable development can also be increased.

In each of the cities already belonging to the RADIUS network and selected initially to participate in the expanded programme, they will have the following aims:

- Train local leaders and experts in the use and application of the RADIUS earthquake damage assessment tool.
- Prepare simplified earthquake scenarios for different conditions.
- Prepare simplified earthquake scenarios for future conditions considering current local growth tendencies.
- Test current urban growth plans and policies to understand their implications in changing levels of urban risk.
- Identify and test possible risk reduction measures.
- Perform simplified cost-benefit analyses.
- Compare the relative risk among participating cities.
- Promote the exchange of experiences, information and best practices among the participating cities.
- Raise awareness of the existing risk and the availability of affordable solutions at local and international levels of activity.

Initial activities are focused in Tijuana, Mexico; Antofagasta, Chile; Kathmandu, Nepal; and Dehradun, India. Working groups in each of these

cities have already evaluated current and future earthquake risks by using the risk assessment tools and methodology provided by the project. The estimated growth trends of each city were also considered so that projections could be prepared about future changes in exposure to earthquake risk factors.

The resulting risk analysis and estimation of results has provided documentation to local and state authorities that can assist them in considering the most appropriate measures to reduce their exposure to risks. In the case of Kathmandu, the recommendations included the immediate implementation of building codes and land-use regulations. In Antofagasta, the application of improved construction standards were determined to be crucial for reducing the number of structural failures and collapsed buildings.

#### Box 3.9

##### Resilient communities

Resilient communities and cities develop from:

- managing and coordinating programmes through partnership;
- documenting and promoting good policy and best practices;
- reviewing governance structures, policies, tools and practices and documenting their impacts on sustainable communities;
- identifying reference and pilot cities and communities;
- modeling methodological frameworks;
- promoting pilot projects in local areas;
- disseminating the benefits of project learning and experience; and
- maintaining project documentation and circulating outputs.

## Future challenges and priorities

### Local authorities

The preceding discussion and examples demonstrate that important opportunities exist within municipal areas for authorities to focus attention on disaster risks to which the immediate community is exposed. Similarly, municipal authorities can exert means by which to engage broad measures of public support. Municipal administrations often command authority over a more manageable area that holds more immediate relevance to the resident population than is likely in comparison to national scales.

Disaster risk management can be presented as a matter of tangible and proximate value to inhabitants, which can encourage their more willing involvement as they appreciate the prospective benefits in their own surroundings. While there are various social and economic perceptions that shape exposure to risk as in any population, government structures in municipalities often tend to be more centralized in focus, but still rooted in local, neighbourhood, or localized community interest groups.

The primary challenge for authorities is to understand and then adopt the importance of disaster risk reduction as an important criteria for the municipality's own economic and social well-being. This will become even more pressing as municipalities become subjected to more rapid population growth, and reflect greater concentrations of productive resources and wealth at the same time that they make greater demands on existing natural resources and threaten the local environment. While growth is accompanied by risk, protection and well-being of a community results from how accurately those risks are assessed and then managed - in the public interest and by sustained civic support.

It is widely recognized that effective disaster risk management must be realized at local community levels, but the overall impetus needs to be provided by broader and consistent forms of leadership. Municipal authorities and local governments play leading roles in relating their current and localized threats or needs to opportunities that may exist in larger jurisdictions such as those at provincial or state levels. They also need to demonstrate the likelihood of practical accomplishments at local levels that can be supported by the more broadly described and heavily resourced national policies or development incentives.

Matters of public awareness, urban and regional planning, risk assessment and later decisions regarding priority allocation of resources for managing risks all depend on holistic, sustained, and balanced strategies. However as municipal authorities need to motivate a wider public interest and involvement through government practice, sustained commitment to protecting communities is dependent on the extent to which the emphasis can successfully be transferred to the importance for individual neighbourhoods, "our" children's schools, or the public infrastructure on which "we" depend in daily life and livelihoods. Such an approach can often suggest that rather than necessarily requiring new or additional resources, awakened sensibilities can make use of the reallocation of already existing resources, whether they are expressed in material or human terms.

Success factors can be outlined easily, but they need to be given both means and structure if they are to be achieved. First there is the requirement to identify commonly perceived needs, and then to convey them for a clear and broad understanding about how they relate to the community's own interests. Once established as a set of core values, they then should be pursued consistently and methodically, however expanding or progressing only as the developed civic familiarity and capabilities increase. Throughout the process, it is important that local control be maintained and widespread participation consistently encouraged for vitality to be assured. Both the values as well as the work need to be widely shared, with the interests of multiple generations leading to sustained attention to the subject, and with a sense of obvious benefit for the locality.

In a functional capacity guided by municipal authorities, these principles can be realized through a systematic approach that most frequently begins with a commitment to localized risk assessment. This often results in a surprising recognition of both the widened extent and the growing interest of more people becoming involved within a community, to protect their vulnerable physical and social assets from disaster risks. Through the continuing process of analysing disaster risks institutional knowledge grows and their capabilities increase. The process expands and succeeds to the extent that the subject of disaster risk management in practice becomes integrated into daily governmental actions and public responsibilities. A useful illustration of this value may be the public recognition and official commitment of resources to ensure that seismic safety of schools is an inherent part of routine school maintenance responsibilities. Similarly, a municipal public works authority routinely should review the exposure of crucial physical infrastructure in a rapidly expanding municipality to the likelihood of annually expected natural hazards such as storms, floods or icing.

The role, and the challenge, for municipal authorities in reducing disaster risks can be summarized most easily as adopting a broadly-based strategy that provides civic direction that can inform and engage the interest and abilities of a community working together to assess and manage the risks that may threaten their own home and way of life. In this there are mutually shared self-interests, between municipal authorities and all inhabitants of the community.