FRANCES BAARD DISTRICT MUNICIPALITY

DISASTER MANAGEMENT POLICY FRAMEWORK

COMPILED BY

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ACRONYMS AND ABBREVIATIONS	
CCA	*Climate Change Adaptation*
DMA	*Disaster Management Act*
DRM	*Disaster Risk Management*
DRR	*Disaster Risk Reduction*
EIA	*Environment Impact Assessment*
EOC	*Emergency Operating Centre*
EWS	*Early Warning System*
ICT	*Information and Communication Technology*
NGO's	*Non-governmental organizations*
PRA	*Participatory Rural Approach*
SEA	*Strategic Environmental Assessment*
VCA	*Vulnerability and Capacity Assessment*

TABLES AND FIGURES

TERMINOLOGY

Disasters are usually described as a result of the combination of conditions of vulnerability; insufficient capacity or measures to reduce or cope with the potential negative consequences; and exposure to a natural hazard. Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social wellbeing, together with damage to property, destruction of assets, loss of services, social and economic disruption, and environmental degradation. Hence, the term 'natural disaster' is not entirely accurate, since the conditions that lead to the catastrophic impacts of a natural hazard are linked to the prevailing socio-economic conditions that are not natural, but rather, determined by human actions and decisions. The widely used United Nations Office for Disaster Risk Reduction (UNISDR) terminology thus defines 'disaster' as a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

Disaster risk can be deemed as the potential disaster losses in lives, health status, livelihoods, assets and services that could occur to a particular community or a society in the future. For the purpose of this report, disasters are therefore understood as the outcome of conditions of risk.

Disaster risk governance refers to the way in which the public authorities, civil servants, media, private sector and civil society coordinate at the community, national and regional levels in order to manage and reduce disaster and climate related risks. This requires sufficient levels of capacity and resources are made available to prevent, prepare for, manage and recover from disasters. It also entails mechanisms, institutions and processes for citizens to articulate their interests, exercise their legal rights and obligations, and mediate their differences.

Disaster risk management (DRM) refers to the systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster. This term is an extension of the more general term 'risk management' to address the specific issue of disaster risks. DRM aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness.

Disaster risk management (DRM) Law refers, for the purposes of this report, to a country's national law (or identified ensemble of laws) that establishes responsibilities, priorities and institutional frameworks specifically for DRM, regardless of the exact terminology used in the law's title, or its translation.

Disaster risk management system or arrangements refers to the legal, policy, administrative and institutional frameworks established within a country for coordinated and systematic DRM.

Disaster risk reduction (DRR) refers to the concept and practice of reducing disaster risks through systematic e orts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

Early warning system (EWS) refers to the set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss

Emergency management also frequently referred to as 'disaster management', can be deemed as the organization and management of resources and responsibilities for addressing all aspects of emergencies, in particular, preparedness, response and initial recovery steps. The expression 'disaster management' is sometimes used instead of emergency management.

Exposure refers to the people or types of assets located in a particular hazard zone that are thereby subject to potential losses. Processes of human development and disaster risk are intimately related. Rapid economic and urban development can lead to a growing concentration of people and economic assets in areas that are prone to natural hazards, such as earthquakes, droughts, floods and storms. The risk increases if such exposure grows faster than countries are able to strengthen their risk-reducing capacities

Natural hazards are naturally occurring physical phenomena caused either by rapid or slow onset events which can be geophysical (earthquakes, landslides, tsunamis and volcanic activity), hydrological (avalanches and floods), climatological (extreme temperatures, drought and wild res), meteorological (cyclones and storms/wave surges) or biological (disease epidemics and insect/animal plagues). Climate change is increasing the frequency and magnitude of a range of climate related hazards.

Vulnerability is deemed as the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors.

1. INTRODUCTION

Disasters caused by natural hazards represent one of the biggest threats to human safety and sustainable development today. With worldwide population density increasing and the intensity and the frequency of disasters are still increasing, it all culminates to devastating results from disasters globally. According to the human cost of natural disasters, 2015: a global perspective, it recorded between 1994 and 2013, 6 873 natural disasters worldwide, which claimed 1.35 million lives or almost 68 000 live on average each year. In addition, 218 million people were affected by natural disasters on average per annum during this 20-year period. It is the climate related disaster that increase with 44% the past six years and well over twice the level in 1980-1989. These impacts of natural disasters left all communities (*rich and poor*) vulnerable – not to mention the social and emotional losses that is very difficult to quantify.

The outbreak of the coronavirus in many countries (2020) placed another emphasize again on the importance of international disaster management laws in order to protect the inhabitant of the earth from such an international epidemic. Let alone the rumours (*or is it truths*) that behind the spreading of this coronavirus lies conspiracy of unseen forces to reduce the world's population.

Laws can be a powerful tool for reducing disaster risks, preventing new risks from arising and making communities safer. For this reason, South Africa moved from a pure reactive, preparedness and response approach to a more pro-active, risk reduction approach. Laws can establish mandates for disaster risk management (DRM) and development institutions, as well as recognize the roles and responsibilities of other relevant actors. In doing so, they can provide incentives for engaging in risk reduction and strengthen accountability for risk creation amongst public and private sector actors. They can also facilitate the participation of stakeholders (*civil society, the private sector, communities and vulnerable groups*) in decision-making for DRM. This can promote greater investment in risk reduction and deters risk creation by all members of society, ultimately protecting lives and livelihoods from the impact of natural hazards.

With the promulgation of the Disaster Management Act, Act 57 of 2002, it sets all spheres of government on a new path to pro-actively prepare and plan to minimize the negative consequences of disasters. The main purpose of legislation is to provide a governing framework. Legislation guides the policy of government and ensures a code of conduct between citizens as well as between the government and citizens. The legislative process in South Africa occurs on a national, provincial and local government level. As legislation can have many purposes: to regulate, to authorize, to outlaw, and to provide (funds), to sanction, to grant, to declare or to restrict. It may be contrasted with a non-legislative act, which is adopted by an executive or administrative body under the authority of a legislative act or for implementing a legislative act. Legislation is regarded as one of the three main functions of government, which are often distinguished under the doctrine of the separation of powers.

The main aim of the Disaster Management Act (DMA) is to set legislation, laws and by-laws in place to minimize losses occurred from disasters, e.g. loss of lives, physical-, economical-, social-, emotional losses, trauma etc.

It is a pity, after eighteen years since the promulgation of the disaster management act that disaster management in South Africa is still dominated by a reactive way of thinking and could not succeed to fully integrate disaster management initiatives into sustainable development objectives. By only observing the current way of thinking where all spheres of government are placing disaster management within the municipal hierarchy and evaluating disaster management agendas and minutes, it is evidence that disaster management still wearing a reactive jacket.

2. GLOBAL DISASTER MANGEMENT

2.1 IMPACT

Cyclone Idai was a storm that hit Beira, Mozambique in southern Africa on March 15th (2019) with peak wind speeds of 170 km/h. The total cost of damages done by the hurricane ends up reaching only $2 billion, but what shocks is the number dead. Over 1,300 people died in the storm and aftermath. Another 2,500 were injured and a total of **3million people affected.** As storms get worse and evolve with increasing temperatures, a terrifying theory is that all cyclones, typhoons, and storms of severity may soon have similar death tolls to cyclone Idai, as cities will not be able to adequately prepare for the storm's wrath.

The Typhoon Lekima, August 9th (2019) caused over $9 billion in damages and 56 people died. The year 2019 not only saw the sixth costliest typhoon in recorded history; it also saw the second. Typhoon Hagibis made landfall in Shizuoka, Japan on October 12th, after passing through the nearby Mariana Islands. The typhoon had wind speeds of almost 200 km/h the Mariana Islands and racked up **$15billion in damages** once it attacked the larger country of Japan. Besides the sky-high cost, 91 people died, and 85,000 homes destroyed.

Flooding in China peaked in July (2019), and damaged nearly 10 000 homes, leading to the evacuation of 356 000 people. The floods killed 60 people and additionally, the floods rendered 3.7 million ha of farmland unusable.

Finally, floods in the South and Midwest of the United States occurred mainly along the Missouri River. The tragedy **affected nearly 14million people in the areas,** and set new record river levels in 42 different locations. Similar to the flood in China, large amounts of farmland destroyed. Farmers of more than 400 000 unusable hectares (ha) suffered losses, with a total damage of $2.9 billion. The New York Times has dubbed the event "The Great Flood of 2019".

The costliest environmental disaster of the year is the California Wildfires. 103 000 ha of homes, farms, and forests went up in flames, with significant wildfires this year starting in May and going up until December (2019). Climate experts warn that the new precipitation pattern becoming normal in California, wherein heavy rainfalls in early months of the year and primes

vegetation to dry out later, create an abundance of fuel for the wildfires. While California has always had a wildfire season, and several of the vegetation species in the state rely on periodic wildfires for offspring to proliferate, changing rain patterns have created an environment that these species did not evolve for, and leads to the fires doing much more harm than good.

Furthermore, additional specific and drastic precautions taken this year in anticipation of a severe wildfire season. Massive "public safety shutoffs" from some of California's biggest power companies affected 800,000 electric customers, and factors more individual people since an entire household counts as a single electric customer. In total, the fires created **$25billion in damages,** a tough hit to recover from when the same pattern may start up again in only a few months.

Source: Maddie Blaauw, January 7, 2020 https://therising.co/2020/01/07/natural-disasters-damages-2019/

Over 18 million hectares have burned in the Australian bushfire season 2019–2020 as of mid-January according to media reports, destroying over 5,900 buildings including over 2,800 homes. In addition to human fatalities, many millions of animals are reported to have been killed.
[*UN Environment Programme: https://www.unenvironment.org/news-and-stories/story/ten-impacts-australian-bushfires*]

Not only does it have an ongoing ecological and biodiversity impacts;

- *The world's terrestrial biodiversity is concentrated in forests: they are home to more than 80 per cent of all terrestrial species of animals, plants and insects. So, when forests burn, the biodiversity on which humans depend for their long-term survival also disappears in the inferno. With over 1 million species currently facing extinction if we continue with business as usual, extreme weather events such "megafires" become an increasing matter of concern for species survival),*

also has a major public health;

- *in January 2020, reports indicated that Canberra measured the worst air quality index of any major city in the world. Wildfires produce harmful smoke which can cause fatalities),*

and economic and environmental costs;

- *Pollution - Ash from the fires has landed in school playgrounds, backyards, and is being washed up on Australia's beaches and into freshwater stores and water catchments. Drinking water catchments are typically forested areas, and so are vulnerable to bushfire pollution.*

with major impacts on the Agricultural sector;

- *The bushfires have scorched pasture, destroyed livestock and razed vineyards, with regrowth and recovery likely to stretch water resources already challenged by drought. Reports indicate that the country's dairy supply will likely be hit hardest, with Victoria and New South Wales—Australia's key milk-producing states—suffering the greatest loss of farmland and infrastructure damage. Meat, wool, and honey output may also be impacted. About 13 per cent of the national sheep flock is in regions that have been*

significantly impacted and a further 17 per cent in regions partially impacted, according to Meat & Livestock Australia.

Drought affected more than one billion people between 1994 and 2013 – that is 25% of the global total.

Forty one percent of drought disasters were in Africa, indicating that lower-income countries are currently overwhelmed by drought despite effective early warnings being in place. While disasters have become more frequent during the past 20 years, the average number of people affected has fallen from one in 23 in 1994-2003 to one in 39 during 2004-2013. This is partly explained by population growth, but the numbers affected have also declined in absolute terms. Death rates, on the other hand, increased over the same period, reaching an average of more than 99,700 deaths per year between 2004 and 2013. This partly reflects the huge loss of life in three mega-disasters (the 2004 Asian tsunami, Cyclone Nargis in 2008 and the 2010 Haitian earthquake). However, the trend remains upward even when these three events are excluded from the statistics.

On average, more than three times as many people died per disaster in low-income countries (332 deaths) than in high-income nations (105 deaths). A similar pattern is evident when low- and lower-middle-income countries are grouped together and compared to "high-and-upper-middle-income countries". Taken together, higher-income countries experienced 56% of disasters but lost 32% of lives, while lower-income countries experienced 44% of disasters but suffered 68% of deaths. This demonstrates that levels of economic development, rather than exposure to hazards per se, are major determinants of mortality.

It is both clear that lower income countries are much more vulnerable than developed countries on the one hand, but also that because of unregulated development practices and the lack of suitable and appropriate building regulations (in high disaster-prone areas) are still absent (*The human cost of natural disasters, 2015: A global perspective*)**.**

Briefly, the human cost of natural disasters, 2015: a global perspective concluded;

- A continued vulnerability of communities to natural hazards.
- The data an analysis raise questions about the effectiveness of global disaster mitigation efforts. More work must be done to evaluate the real outcomes of disaster risk reduction (DRR) interventions on human lives and livelihoods.
- In view of the disproportionate burden of natural hazards in lower-income countries, including the huge disparity in death rates in richer and poorer countries, mitigation measures in less developed countries require significant improvement.
- Better flood control for poorer communities at high risk of recurrent flooding would be an important step in the right direction. Effective, low-cost solutions exist, including afforestation, floodplain zoning, building embankments, better warnings and restoration of wetlands. Such actions would bring development benefits too, since the data show that flooding is the main cause of disaster damage to schools, hospitals etc. in lower-income countries.

- The increase in the frequency of storms and other extreme weather events, better management, mitigation and deployment of storm warnings could save more lives in future.
- Reducing the size of drought-vulnerable populations should be a global priority over the next decade, given the effectiveness of early warnings and the vast numbers of people affected, particularly in Africa.
- Better research into how and why households and communities are affected by disasters is urgently needed so that responses are based on evidence, rather than assumptions. Without such micro-level research, future DRR and disaster prevention will not be effective.

2.2 LEGISLATION

It is clear from these global disaster impacts that no country and municipality can effectively management disasters in isolation. Henceforth, it is of utmost importance that South Africa and its municipalities take cognizance of international trends, global impacts and cross border activities for effective disaster management activities.

Effective disaster management not only requires effective law and regulations but requires now more than ever before that municipalities must fully integrate disaster management into sustainable development initiatives. In the absence of the later, disaster risk reduction initiatives will fail and the impact of disasters will increase as outlaid in the above-mentioned section: *Paragraph 2: "Global Disaster Management Impact".*

Three strategic goals to support the reduction of disaster losses are;

- The integration of disaster risk into development planning.
- The development and strengthening of institutions, mechanisms and capacities for building resilience.
- The incorporation of risk reduction approaches into emergency preparedness, response and recovery programmes

The abovementioned goals were also identified by a multi-country report, 2014 at the World Conference on Disaster Reduction in Hyogo, Japan, in January 2005, identifies priorities for action:

- Ensure that DRR is a national and a local priority with a strong institutional basis for implementation.
- Identify, assess and monitor disaster risks and enhance early warning.
- Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
- Reduce the underlying risk factors.
- Strengthen disaster preparedness for effective response at all levels.

A clear first step to promoting **stronger governance** for disaster risk reduction (DRR) is improving relevant laws and regulations as well as strengthening their implementation and enforcement.

3. DISASTER RISK REDUCTION LEGISLATION

3.1 DEDICATED LAWS FOR DISASTER RISK MANAGEMENT THAT PRIORITIZES DISASTER RISK REDUCTION

When developing or revising a DRM law, consideration should be given to the municipal risk profile, existing risk governance capacity and national development context and how the law relates to and supports the implementation of other relevant sectoral laws.

Promote the coherence and further development, as appropriate, of national and local framework of laws, regulations and public policies, which, by defining roles and responsibilities, guide the public and private sectors;

Encourage parliamentarians to support the implementation of disaster risk reduction by developing new or amending relevant legislation.

Check the broadest law relating to disaster risk management, which may cover:

- *DRM / emergency management / civil defence law (as applicable)*
- *Specific hazards (such as laws on storms and floods, seismic protection / earthquakes, droughts)*
- *The establishment of dedicated DRM agencies*

3.2 ADAPT THE APPROACH TO THE MUNICIPALITY NATURAL HAZARDS RISK PROFILE AND DISASTER RISK GOVERNANCE CAPACITY

There is no 'one-size- fits-all' when it comes to how to draft DRM laws. Some laws may attempt to address all sectors and set out detailed actions and responsibilities, whereas others may be successful with much less detail, seeking only to make connections with other sectoral laws that address DRR.

Research on the characteristics of DRM laws has illustrated that there is considerable variation on how DRR may be addressed within general DRM laws, based on a country's, or municipality's exposure to natural hazards and their disaster risk governance capacity in other sectors and at the local government level.

Promoting a multi-hazard approach, recognising the rights of individuals and clearly assigning responsibilities from the national to the local level. Consider the municipal risk profile, existing risk governance capacity and national development context and how the law relates to and supports the implementation of other relevant sectoral laws.

3.3 ADAPT THE APPROACH TO THE COUNTRY'S NATURAL HAZARDS RISK PROFILE AND DISASTER RISK GOVERNANCE CAPACITY

The typology groups DRM laws into four main types:

- Type 1 laws focus on preparedness and response;
- Type 2 laws have a broad DRM focus;
- Type 3 laws give DRR priority with a high level of detail and
- Type 4 laws give DRR priority with a low level of detail.

While DRM laws may be the primary instrument to address natural hazards in some municipalities contexts, in other contexts sectoral laws that address building, planning and environmental management may be contributing substantially to disaster risk governance, and therefore, reduce the amount of detail that may be needed within the municipal DRM law:-

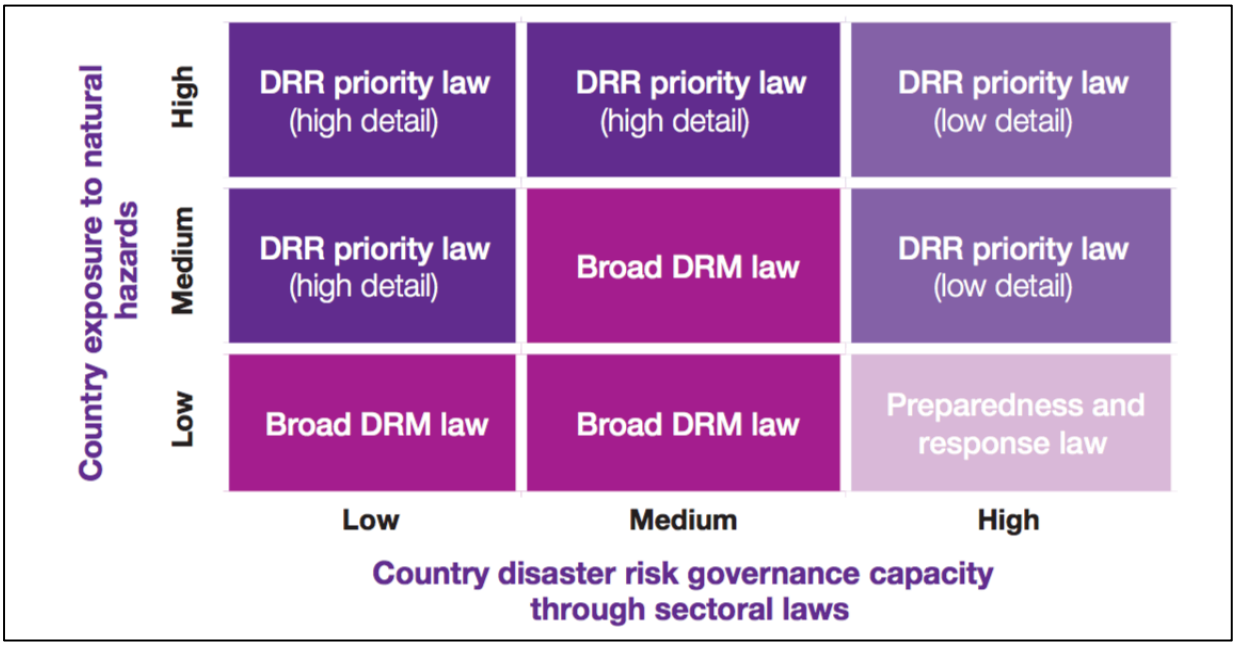

Figure 1: Matrix of DRM law typology and municipal context

3.3.1 EXPLANATION OF TYPOLOGY

Type 1 – Preparedness and response law:

These laws focus on emergency response and elements of preparedness, early warning and recovery. These kinds of laws may be appropriate for municipalities that have a low level of risk and/or those that address disaster risk comprehensively through other sectoral laws and have high levels of implementation.

Type 2 – Broad DRM law:

This type of law covers prevention, preparedness, mitigation and response, and establishes institutions at the national level as well as some allocation of responsibilities at the provincial level. DRR is not a specific focus or priority in the law, and generally there are no references to financing DRR, risk mapping or DRR education. This could be appropriate if other sectoral laws are handling these issues.

Type 3 – DRR priority law (high detail):

These laws cover the same elements as a broad DRM law but give a higher priority to DRR by specifying clear local responsibilities for DRR, providing for cross-sectoral coordination, resourcing, training and education on DRR, as well as risk assessment and mapping.

Type 4 – DRR priority law (low detail):

This type of law is part of an ensemble of laws that are designed to link together to comprehensively address DRM and DRR (e.g. laws on specific hazards, on natural resource management, building and construction, and local governance). This law may play a co-ordination role in linking these other laws. Generally, they will be found in municipalities with high governance capacity.

3.4 SETTING OUT PRINCIPLES AND PRIORITIES THAT GUIDE THE MUNICIPALITY'S APPROACH TO RISK REDUCTION

A municipality is exposed to a medium or high level of natural hazards, establishing DRR as a clear priority of the DRM law is important for steering a national focus towards risk reduction. An important starting place to assess whether DRR is a priority is to look at the objectives, principles and institutional mandates set out within the DRM law, and whether these continue to be reflected in the procedures, activities and responsibilities set out within the law. In determining how well DRR is prioritized within the law, it is important to assess intention and impact rather than terminology.

Disaster risk reduction requires that responsibilities be shared by all spheres of governments and relevant national authorities, sectors and stakeholders, as appropriate to their national circumstances and systems of governance;

Managing the risk of disasters is aimed at protecting persons and their property, health, livelihoods and productive assets, as well as cultural and environmental assets, while promoting and protecting all human rights, including the right to development.

3.5 ESTABLISHING LINKS TO LEGISLATION AND INSTITUTIONS RELATED TO CLIMATE CHANGE ADAPTATION

Because climate change is one of the most important drivers of disaster risk, linking climate change adaptation efforts to DRR is essential (*as is avoiding contradictions and duplication between climate change adaptation and DRR efforts*). To promote the inter-disciplinary approach that is needed for both effective DRR and climate change adaptation, DRM laws can

include specific mechanisms for better coordination and integration (*such as through institutional mandates or activities*) with climate change institutions and policies. For example, the Disaster Management Advisory Forum can be mandated to coordinate all activities for both DRR and climate change adaptation. Additionally, provisions may require "taking into account the requirements of adaptation to the adverse impacts of climate change" when establishing responsibilities or activities, to ensure that due consideration is given to climate change-related risks.

3.6 ENSURING COORDINATION WITH KEY SECTORAL LAWS

DRR needs to be perceived and pursued as a whole-of-government priority and not just a stand-alone responsibility of nodal DRM institutions or agencies. One of the key findings of the DRR Law Report is that there needs to be far greater integration between laws and institutions for DRM and those related to development planning, building and construction and environmental and natural resource management. Also, consider the promotion, within the DRM law better linkages with sectoral laws and regulations and the institutions responsible for their implementation. This may be done through various means, such as including the department of urban planning (or the equivalent) as a member of national and local committees for DRM, referring to provisions of other laws regarding the environment or natural resource management, or including provisions seeking to ensure risk-informed development and planning. For example, how hazard risks should be considered in land use planning and other aspects of development.

3.7 MEASURING SUCCESS AND IMPLEMENTATION

Drafting and adopting a DRM law is just the first step; bigger challenges may arise during its implementation. Full implementation of DRM laws (especially in the first years following their adoption) often presents many challenges, particularly concerning a lack of necessary human and/or financial resources. Including provisions for statutory reporting, oversight or review mechanisms may assist in overcoming key implementation challenges.

For example;

Philippines' law requires parliamentary oversight by a high-level Congressional Oversight Committee as well as a 'sunset review' of the law within five years or as the need arises and the Namibia's DRM law requires reports to be submitted to the executive government or cabinet.

Disaster risk reduction requires that responsibilities be shared by National, Provincial and District Government and relevant national authorities, sectors and stakeholders, as appropriate to their national circumstances and systems of governance;

Disaster risk reduction and management depends on coordination mechanisms within and across sectors and with relevant stakeholders at all levels, and it requires the full engagement of all State institutions of an executive and legislative nature at national and local levels;

While the enabling, guiding and co-ordinating role of National and Provincial Governments remain essential, it is necessary to empower local authorities and local communities to reduce disaster risk, including through resources, incentives and decision-making responsibilities, as appropriate;

3.8 LAWS CLEARLY ESTABLISH CLEAR ROLES AND RESPONSIBILITIES RELATED TO RISK REDUCTION FOR ALL RELEVANT INSTITUTIONS FROM NATIONAL TO THE LOCAL LEVEL

To be effective, laws must clearly assign roles and responsibilities to specific ministries and levels of government for their implementation. Mandating departments, agencies, committees and other institutions to carry out specific tasks related to risk reduction ensures that ambitions or principles that are set out within legislation are realised, as well as promotes accountability and transparency.

Check laws and regulations on:

- *DRM/emergency management/civil defence at the national, provincial and local levels (as applicable)*
- *Local government and decentralization*
- *Specific hazards (such as laws on storms and floods, earthquakes, res and droughts)*
- *The establishment of DRM agencies or authorities*

3.9 ESTABLISHING A NATIONAL INTER-MINISTERIAL / MULTI-SECTORAL COMMITTEE THAT MEETS FREQUENTLY ENOUGH TO BE EFFECTIVE

Most DRM laws establish an inter-ministerial committee to bring together all relevant line ministries – and, in some cases, representatives from the private sector and civil society – to oversee and make major decisions concerning DRM. Having these inter-ministerial committees can promote better mainstreaming and a broader approach to risk governance while also ensuring the engagement of senior officials. Given the high-level nature of these committees, however, they may only meet following the occurrence of a disaster, which creates challenges for the effective mainstreaming of DRR into development and long-term planning. For this reason, some DRM law require that the committee meet quarterly or at least twice a year.

3.10 ASSIGNING A NATIONAL FOCAL POINT AGENCY FOR DISASTER RISK REDUCTION WITH SUFFICIENT INSTITUTIONAL AUTHORITY TO EXERCISE EFFECTIVE LEADERSHIP

As evidenced by considerable research on this topic, local level DRR will usually be enhanced by a strong national entity to oversee, promote and coordinate DRM activities between different levels of government. DRM laws often establish key national focal points for cultivating a whole-of-society approach to DRR, providing national leadership and policy direction. Ensuring that these institutions are not only focused on emergency management but carry out wider outreach to promote a more integrated risk reduction approach, is important to make sure they are 'fit for purpose'. Although the precise institutional location and mandate of national DRM agencies/authorities will differ according to individual country contexts,

experience has shown that the institution assigned to be the focal point agency should be situated at a high enough level to effectively coordinate and promote DRR activities with different departments or ministries (e.g. within President's Office).

Most platforms for DRR is the main instrument for the cross-sectoral coordination of DRR policies and programmes. It is a forum for technical cooperation as well as for strategic leadership of DRR.

However, these platforms in many cases still operates and includes stakeholders predominately responsible for emergency services as if under the old Civil Protection System. Henceforth, stronger leadership at all spheres of government are deemed necessary to include all authorities to ensure sustainable development

3.11 PROMOTING COOPERATION AND INFORMATION EXCHANGE BETWEEN RELEVANT MINISTRIES AND LEVELS OF GOVERNMENT WITH THE NATIONAL FOCAL POINT AGENCY

In light of the leadership role often assigned to DRM lead agencies, relevant laws, regulations should also set out how they coordinate, and share information with other sectors and stakeholders, especially those related to development planning, finance, the environment and climate change adaptation.

For example;

To appointment a 'national focal persons' from every governmental institution, association or organization to serve as a liaison with its national DRM agency and take part in the 'national focal persons forum'. It should be noted, however, that to be effective, such focal points will need to have the knowledge, resources and authority to be able to motivate and 'call the sector to account' for risk reduction. This requires dedicated support and training.

3.12 CONSISTENTLY ASSIGNING INSTITUTIONS THE NECESSARY AUTHORITY AND RESOURCES TO CARRY OUT THEIR MANDATES AND RESPONSIBILITIES

In many countries, primary responsibility for DRM is decentralized among local or municipal authorities. While decentralization is broadly recognized as being a key component of effective governance and development, research undertaken on decentralization has demonstrated that sufficient resources and capacity must match the delegation of legal authority. Local government capacities – particularly in rural areas – remain very limited, despite having important mandated responsibilities. To avoid issues of "uneven decentralization", responsibilities need to be assigned together with the necessary resources for implementation, and there should be no competing authorities at any level.

3.13 CLEARLY ASSIGNING RESPONSIBILITIES BETWEEN DIFFERENT MINISTRIES AND LEVELS OF GOVERNMENT

Ambiguity (*the quality of being open to more than one interpretation*) in roles and responsibilities can create unnecessary challenges in implementation. Activities or procedures required by law, both at national and subnational level, should clearly be assigned to an

institution for implementation. Some countries specifically list within their DRM laws the responsibilities of different institutions and ministries. For example, a municipality can list the responsibilities of each relevant line ministry under its law, including the Ministries of Agriculture and Rural Development, Natural Resources and Environment, National Defence, Information and Communications, and Construction and Transport, as well as the 'People's Committees' responsible for implementing the law at the local level. The role of planning and finance departments are also especially crucial to ensure an adequate focus on and investment in risk reduction. Specific responsibilities or mandates may need to be assigned to these departments to ensure their continued engagement.

3.13.1 Laws ensure that adequate resources are budgeted for disaster risk reduction

A lack of adequate resources is perhaps the biggest challenge to the successful implementation and enforcement of laws and regulations relevant to DRR. Funding for risk reduction often has to compete with funding for other government priorities, especially emergency response. Even if allocations are made, ensuring that funding reaches the local level and is distributed between all the different departments and actors responsible for risk reduction is extremely challenging. There are many ways to approach the issue of funding, and what will be determined to be 'adequate' funding for DRR will depend on national and local plans for DRR based on comprehensive risk assessments.

Allocate the necessary resources, including finance and logistics, as appropriate, at all levels of administration for the development and the implementation of disaster risk reduction strategies, policies, plans, laws and regulations in all relevant sectors;

Encourage parliamentarians to support the implementation of disaster risk reduction by developing new or amending relevant legislation and setting budget allocations.

Check laws and regulations on:

- *DRM/emergency response/civil defence*
- *Local government*
- *Development planning*
- *National budgetary policies and processes*
- *Taxation*
- *Investment*[17]

3.13.2 Allocating sufficient resources for DRR through: development plans

Integration DRR within their development plans to ensure that it is given the necessary priority within funding allocations. For example, to prioritize preventive actions to reduce disaster risks and mitigate the adverse consequences caused by them and to incorporate DRR within considerations of development activities and include DRR in a strategy document that guides annual planning and budget allocations. It must be the responsibility of every ministry or department of all spheres of government to integrate measures for the prevention or mitigation of disasters into its development plans and projects.

3.13.3 Earmarking percentages in annual budgets

Specifying certain percentages of revenue, if not to DRR alone, then at least to the more general activities for DRM, can be a successful way of ensuring that DRR activities are supported. For example, a 30 percent allocation of the annual budget for DRM to response activities and a 70 percent allocation for areas such as risk reduction and recovery might be applicable. Alternatively, a municipality can prepare the DRM budget as part of its functions for which the law guarantees 20 percent of the national budgetary allocation for mitigating ecological problems and underlying risk factors.

3.13.4 Dedicated budget lines

Specific budget lines for DRM established by law, though very few make specific reference to risk reduction. Establishing a budget line (*especially for DRR*) may be important if the municipality is seeking to transition from a more response-focused system to one that prioritizes DRR, as activities may just continue as normal (*on preparedness, response and recovery*) unless specific funding is allocated for risk reduction.

3.13.5 Establishing dedicated funds

A dedicated fund for DRR projects under DRM laws or other laws outside of regular government budgeting might be appropriate, which can then receive revenue from government as well as non- government entities. This may be done within national legislation by establishing a national fund for DRM, including specific DRR criteria for the use of the fund. A National Disaster Response Fund can be established in addition to general DRM budgetary allocations in order to ensure support to provincial, district and local governments during major disasters/emergencies, and thereby allowing states to invest more in risk reduction.

3.13.6 Ensuring available resources for subnational authorities to fulfil their responsibilities

Many local authorities, particularly in rural areas, are not equipped with the resources to implement the responsibilities assigned to them by law. For this reason, particular attention should be paid to ensuring that any responsibilities that are decentralized to local authorities are properly resourced – including to develop local risk governance capacity or have the means to generate their own resources (such as through local co-funding incentives). Additionally, budgets should provide for spending on risk reduction, and not just response, and not only be assigned but also accounted for.

For example:

A law or regulation could establish budget allocation tracking systems at the local level to oversee resource availability and spending and could provide for the training and development of guidelines on the classification of DRR expenditure.

3.13.7 Ensuring a sustained flow of financial resources for DRR and reduced competition with response funds

Even if funds are established, or mandatory percentages assigned, there are often huge challenges in implementation because of unsustainable funding sources, or because of competing funding priorities. In some countries, this will require external donors to supplement or private sector contributions.

3.14 SECTORAL LAWS INCLUDE PROVISIONS TO REDUCE EXISTING RISKS AND PREVENT THE CREATION OF NEW RISKS

No single law can fully address DRR. Sectoral laws – **especially those for development planning**, building, land use, environmental protection, resource management, climate change and education (*whether at national, provincial or local levels*) – also need to include provisions to reduce risk, make people safer and protect their assets. Sectoral laws are especially important because they can reduce exposure and underlying vulnerability, particularly by preventing the creation of new risks.

Encourage the establishment of necessary mechanisms and incentives to ensure high levels of compliance with the existing safety- enhancing provisions of sectoral laws and regulations, including those addressing land use and urban planning, building codes, environmental and resource management and health and safety standards, and update them, where needed, to ensure an adequate focus on disaster risk management;

Strengthen, as appropriate, disaster-resilient public and private investments, particularly through structural, non-structural and function- all disaster risk prevention and reduction measures in critical facilities, in particular schools and hospitals and physical infrastructures; building better from the start to withstand hazards through proper design and construction, including the use of the principles of universal design and the standardization of building materials; retrofitting and rebuilding; nurturing a culture of maintenance; and taking into account economic, social, structural, technological and environmental impact assessments.

Check laws and regulations on:
• *Environmental management and protection (including those related to biodiversity and protected areas)*
• *Natural resource management and Water resource management (including wetlands management)*
• *River basin or watershed management*
• *Coastal zone management and Forest management*
• *Land use planning and urban development planning*
• *Building codes*
• *Environmental impact assessments and strategic environmental assessments*
• *Climate change adaptation and mitigation n Social welfare n Insurance n Education*

3.15 INCLUDING PROVISIONS THAT ADDRESS DRR

In many cases, laws regulating development planning, environmental and natural resource management, and climate change adaptation do not contain specific provisions seeking to address the reduction of natural hazard risks. This is a missed opportunity to promote better mainstreaming of DRR into development, increase human safety and protect valuable economic and social assets.

3.16 AVOIDING DUPLICATION OR CONFLICTING PROVISIONS BETWEEN LAWS

Care should be taken to avoid duplication, contradictory guidance or the establishment of conflicting mandates and between sectoral ministries and different levels of government (for instance, between climate change and disaster-related laws, or between national authorities and city governments). Cross-references between DRM laws and other legislation can promote better coordination and avoid difficulties in interpretation and implementation.

3.17 ENSURING SUFFICIENT FINANCIAL RESOURCES ARE ALLOCATED FOR IMPLEMENTATION OF THE DRR MANDATES SET OUT IN SECTORAL LEGISLATION

Major challenges exist in the implementation and enforcement of key sectoral laws on development planning in many lower- and middle-income countries, particularly at the local level, large because of insufficient resources and capacity. In many cases, DRR has not been able to garner the political support and traction needed for it to be prioritized within different sectoral budgets. When reviewing these laws, emphasis should, therefore, also be placed on whether any provision is made regarding funding mechanisms or the allocation of resources. This assessment should be undertaken under the background of funding mechanisms more generally for local government in DRR.

13.17.1 Special considerations for different sectors

Environment: There is a strong link between the environment and disasters. Degraded environments can increase the risk of disasters. For example, deforested slopes can cause landslides and reclaimed wetlands can exacerbate urban flooding. Natural hazards can also significantly damage the natural environment, which in turn increases local vulnerability to future hazards. Increasingly, there is recognition that investing in the sustainable use and management of ecosystems can reduce disaster risk and increase resilience. Although laws on environmental management are generally related to the protection of the natural environment, they have considerable potential to support DRR and can be leveraged to engage the environmental sector and secure the environmental expertise needed to address the risk of disasters.

3.18 ADDRESSING NATURAL HAZARDS AND CLIMATE CHANGE

To effectively integrate DRR, it is important that environmental management laws explicitly refer to managing natural hazards (including climate change-related risks) and promote coordination with DRM systems and institutions. For example, some countries seek to address environmental management, sustainable development, environmental rights and climate change in one holistic law. It requires the consideration of the prevention of and response to

disasters in a system of integral planning; encourages the sustainable development of natural resources; and requires climate change trajectories to be considered when planning and zoning land use. The Environmental Management Act for instances can tasks the Minister for Environment with preparing guidelines for the management of environmental emergencies in relation to "natural and climate change related disaster such as floods, cyclones, droughts and major pest infestations or other intrusions of alien species of fauna and flora [and] fires".

Strengthen the sustainable use and management of ecosystems and implement integrated environmental and natural resource management approaches that incorporate disaster risk reduction

3.19 INCLUDING DRR CRITERIA IN ENVIRONMENTAL IMPACT ASSESSMENTS FOR PLANNED DEVELOPMENT (TAKING INTO ACCOUNT A CHANGING CLIMATE)

Many countries now require environmental impact assessments (EIA) to be undertaken prior to proceeding with major development projects, and in some countries or regions strategic environmental assessments (SEA) may also be required before implementing certain programmes or plans that may impact the environment. In many cases, however, these assessments do not specifically include criteria related to the impact that development or specific programmes may have on the rise of natural hazard risks.

EIA's (encompassing EIA's of projects and SEA's of sectors and programmes) can be expanded to incorporate natural hazard risks so that both public and private investments (including in post-disaster reconstruction contexts) consider disaster risks and encourage action to mitigate those risks in an environmentally sustainable manner.

Integrating disaster risk in EIA processes may include the following:

- Identifying the potential environmental impacts of proposed development (e.g. projects, programmes or policies) and assessing how environmental impacts potentially exacerbate existing or create disaster risks;
- Identifying and assessing the multiple hazards that could potentially impact on proposed development investments, including potential climate change impacts;
- Identifying environmental mitigation options that also contribute to reducing disaster and climate change-related risks.

Including such requirements can result in safer development practices and prevent the creation of new risks.

3.20 ADOPTING ECOSYSTEM APPROACHES TO DRR

Ecosystem-based approaches for DRR (also referred to as 'Eco-DRR') seek to manage the environment (through sustainable management, conservation and restoration of ecosystems) in such a way that it also builds the resilience of communities. Ecosystems often serve as 'natural infrastructure' with important functions that in influence all three dimensions of the disaster risk equation. This can happen by: regulating hazards (e.g. healthy forests can reduce the incidence of landslides and avalanches); acting as natural buffers and reducing people's

exposure to hazards (e.g. mangroves, coral reefs and sea grasses protect coastal areas from storm surge impacts); and reducing local vulnerability to hazard impacts through the provision of key services (food, water, shelter, fuel) and livelihoods.

Ecosystem-based approaches for DRR have gained widespread attention and acceptance internationally as a 'no regret' approach. To encourage the management and protection of different ecosystems in a way that also reduces the impact of disasters, environmental laws can propose the management of certain ecosystems (e.g. mountain forests, wetlands, river basins, mangroves, coral reefs and sand dunes) and natural infrastructure as a means of reducing risks from natural hazards. Note that such an approach may not only be set out in environmental laws, but also natural resource management, DRM and land use planning laws as well as other relevant policies on integrated environmental and resource management.

3.20.1 Natural resource management

3.20.1.1 Including provisions aimed to reduce the risk of water-related hazards

Floods are the most common hydrological hazards experienced globally, and the way in which water resources are managed (both in urban and rural areas) has a major impact on the risks of floods as well as on other water- related hazards (*such as mudslides and droughts*). Often a DRM law may only address short-term mitigation measures associated with flooding and flood warnings, whilst longer-term risk management approaches may need to be reflected in other laws and regulations related to water resource management.

Additionally, various human factors, such as water demand and water management, can exacerbate the impact that drought has on a region. Most DRM laws, however, do not address slow-onset disasters comprehensively, nor do many water resource management laws. If a country is drought-prone, it may be important to include provisions aiming to reduce drought either within water management, agricultural or other legislation.

Effective water and natural resource management legislation may also include provisions on the impact that certain planning, investment and distribution decisions will have on the risk of floods and droughts (e.g. a decision to improve the water supply in one area may result in flooding in another). Integrated approaches to water resource management that make DRR one of its explicit objectives can have a substantial impact on reducing the risk of floods and droughts, as it requires the involvement of many different actors and recognises the catchment area or river basin as the main unit for water resource management. Such an approach, however, may require special legal mandates to manage resources across district boundaries, and the involvement of many different institutions as well as many pieces of legislation (on flood, water resource management, planning etc.). Integrated water resources management is a complex governance and development process, and it can be a particularly useful tool for DRR.

3.20.1.2 Linking forest or urban fire prevention and management with DRM laws and institutions

Laws related to fire prevention and management are often completely separate from DRM and environmental laws. These laws may address activities related to fire prevention, assign resources, establish fire-fighting institutions and include criminal sanctions for offences associated with fires. To avoid disconnect with other DRM provisions, it may be important to include references that promote better coordination, especially concerning early warning systems (EWS). Some countries are choosing to develop integrated fire management systems as a holistic approach to addressing the management of fire on all vegetation, and to integrate measures for prevention, preparedness and the restoration of forests.

Promote the mainstreaming of disaster risk assessments into land-use policy development and implementation,

Encourage the revision of existing or the development of new building codes and standards and rehabilitation and reconstruction practices at the national or local levels, as appropriate, with the aim of making them more applicable within the local context, particularly in informal and marginal human settlements, and reinforce the capacity to implement, survey and enforce such codes through an appropriate approach, with a view to fostering disaster- resistant structures;

Formulate public policies, where applicable, aimed at addressing the issues of prevention or relocation, where possible, of human settlements in disaster risk-prone zones, subject to national law and legal systems.

3.20.1.3 Land use planning, urban development and building

Development planning laws are essential for achieving better DRM, as they have the best potential to reduce the exposure and vulnerability of populations and assets to hazards and prevent the creation of new disaster risk through urban development. Having an integrated sys- tem in which land use planning decisions and building codes are based on risk mapping can greatly reduce risks. Some countries have building code regimes that integrate construction and spatial planning, and others take a further step by integrating physical planning with that of broader development planning.

3.20.1.4 Promoting coordination with disaster risk management institutions and mechanisms

Land use planning regulations are particularly important, as they can prevent construction or limit the type of land use in areas exposed to natural hazards (such as floodplains, coastal areas, unstable or contaminated land, or areas of especially high seismic risk). Responsibility for land use and development planning is often distributed between different levels of government, and is not necessarily governed by a single law, so it might be necessary to review several laws and regulations at both the national and subnational level, including those regulating the zoning of coastal areas.

To avoid poor planning and unsustainable development decisions, effective land use planning regulations should include specific criteria related to natural hazards. When undertaking an analysis, consider existing implementation challenges and how they could be addressed through dedicated resources, training and awareness raising initiatives.

3.20.1.5 Updating building codes and land use planning regulations and ensuring that priority is given to critical infrastructure such as schools, hospitals and other public buildings and structures

If implemented effectively, a system of building regulation that is tailored to relevant hazards can greatly reduce risks from natural hazards. Revise or develop new building codes, "with the aim of making them more applicable within the local context" might be appropriate. Most countries have building codes of some form, but it is important to check that they are updated according to new building technologies, as well as relevant hazard information, especially in light of any recent disasters. It is rare that building codes refer specifically to DRR, and it may, therefore, be necessary to look closely at the purpose and the content of the codes to ascertain whether disaster risk issues are considered, and determine whether more explicit reference may be necessary.

The implementation of building codes remains a major challenge for many countries, especially low- and middle- income countries. As mentioned above, in most cases, responsibility for building code enforcement is delegated to local governments, but often without the necessary resources or capacity to allow for full implementation. In addition to resource constraints, for many countries excessive bureaucracy, issues of corruption and a weak 'culture of compliance' can exacerbate challenges in implementation and enforcement of building codes and standards.

While these implementation challenges cannot be overcome by simply adopting a new code, certain measures can still be taken to improve compliance and increase safety. The following steps may be considered:

- Strengthen government capacity to enforce the codes and provide training to relevant authorities.
- Check whether building codes reflect customary building techniques and take into account local capacity and resources availability.
- Ensure that particular attention is given to certain types of public buildings, including schools, hospitals and other public buildings as well as large commercial developments where significant numbers of people gather.
- Undertake public education and awareness raising on the importance of building code compliance for public safety.

Introduce and ensure implementation of enforceable legal sanctions for a lack of compliance, as appropriate.

3.20.1.6 Establishing incentives or legal sanctions, where appropriate, in cases of non-compliance leading to unsafe buildings or developments

To promote better accountability and ensure a minimum standard of public safety, incentives and legal sanctions should be included within laws and regulations on building and construction.

3.21 IMPROVING THE SAFETY OF PEOPLE LIVING IN INFORMAL SETTLEMENTS, CONSISTENT WITH THEIR HUMAN RIGHTS

Residents of informal settlements are especially vulnerable, not only to natural hazards, but to a range of health and safety risks. It is estimated that by 2050, 66 percent of the world's population will be urban, and in many countries rapid urbanization has already outpaced the urban planning and development capacity of national or city administrations. This gives rise to highly vulnerable and risk-blind informal settlements susceptible to a range of natural hazards. Mass eviction or demolition is not a durable solution for informal settlements, as it fails to address root causes, can result in serious human rights violations and often ends up being expensive, with people returning to their original homes regardless. Instead, many countries are taking measures to 'upgrade' the conditions of informal settlements, firstly through improvements to the physical environment (including installing basic infrastructure for water, sanitation, waste collection, storm drainage etc.), and secondly through 'regularising' land tenure and seeking to improve access to basic health and social support services. Introducing the necessary legal measures and seeking to full rights to housing and a healthy environment, may reduce risks in these communities and generate incentives within the community to invest in safer building and maintenance practices. In the event that relocation has been deemed the only safe and durable option, procedures for undertaking relocations should be consultative and consistent with a human rights-based framework that safeguards the rights of individuals and communities.

3.22 CLIMATE CHANGE

Climate change adaptation and DRR share a common objective of reducing the vulnerability of people and assets exposed to climate related hazards. Therefore, it is not surprising that those measures taken for climate change adaptation can often be classified as DRR measures. Extensive cross-sectoral coordination and a more integrated approach between the two areas can be promoted through relevant legislation and policy.

3.23 PROMOTING COORDINATION AND INTEGRATION WITH DISASTER RISK MANAGEMENT INSTITUTION AND SYSTEMS

Many laws on climate change are currently focused on mitigation (actions to reduce or remove greenhouse gases) rather than adaptation (measures to adjust natural or human systems to changes in the climate and reduce the impact of those changes). In most countries, climate change law (or more often policy) can promote better linkages with DRM policies or institutions, for example, by referring to relevant laws on DRM, or by ensuring that institutions responsible for adaptation (often ministries of environment) and DRR/DRM work in close coordination. Currently, integrated legal frameworks addressing both DRR and climate change adaptation (CCA) are rare, although there are some models emerging where both CCA and DRR are integrated with development planning and resource management legislation.

3.24 UTILISING DISASTER INSURANCE AND / OR OTHER RISK FINANCE MECHANISMS

Insurance or similar risk-sharing mechanisms are increasingly being used to support economic resilience to disasters, but also as a means to encourage a risk reduction approach (by requiring the insured to take certain measures to reduce risks). Some countries may consider compulsory disaster risk insurance. Many high-income countries either have compulsory general insurance for property owners or have incentives to insure against risk (*for example, Japan has penalties in mortgage costs, and the United States subsidizes home insurance*). Additionally, a new institutional trend is developing relating to the establishment of 'national risk boards' that include insurance supervisors, DRM agencies and other line ministries that are tasked with analysing risks and risk management policies, looking at disaster risk financing within a broader context of DRM and providing recommendations to relevant departments.

Promote mechanisms for disaster risk transfer and insurance, risk sharing and retention and financial protection, as appropriate, for both public and private investment in order to reduce the financial impact of disasters on Governments and societies, in urban and rural areas.

3.25 ESTABLISH CLEAR PROCEDURES AND RESPONSIBILITIES FOR CONDUCTING RISK ASSESSMENTS AND ENSURE RISK INFORMATION IS CONSIDERED IN DEVELOPMENT PROCESSES

A clear and current understanding of specific hazards is indispensable, both to government authorities as well as to the private sector, communities and individuals. A comprehensive risk assessment provides the foundation for risk-informed development and enables the development of effective measures to prevent and reduce disaster risks. As recognised in this Policy Framework, laws, policies and practices "**should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment."** Ensuring that there is accurate baseline data on risk in each locality, and that this information is used to guide decision-making about planning and construction can have an enormous impact on the safety and sustainability of livelihoods, homes and infrastructure.

Promote the collection, analysis, management and use of relevant data and practical information and ensure its dissemination, taking into account the needs of different categories of users, as appropriate;

Encourage the use of and strengthening of baselines and periodically assess disaster risks, vulnerability, capacity, exposure, hazard characteristics and their possible sequential effects;

Make non-sensitive hazard-exposure, vulnerability, risk, disaster and loss-disaggregated information freely available and accessible, as appropriate;

Promote the mainstreaming of disaster risk assessments into land-use policy development and implementation;

Promote the mainstreaming of disaster risk assessment, mapping and management into rural development planning

Check laws and regulations on:

- *DRM/emergency response/civil defence*
- *Land use planning*
- *Building and construction*
- *Water management*
- *Meteorology*
- *Climate change*
- *EIA's*

Encourage the use of and strengthening of baselines and periodically assess disaster risks, vulnerability, capacity, exposure, hazard characteristics and their possible sequential effects;

Make non-sensitive hazard-exposure, vulnerability, risk, disaster and loss-disaggregated information freely available and accessible, as appropriate;

Promote the mainstreaming of disaster risk assessments into land-use policy development and implementation;

3.26 PROMOTE THE MAINSTREAMING OF DISASTER RISK ASSESSMENT, MAPPING AND MANAGEMENT INTO RURAL DEVELOPMENT PLANNING

Legislation should provide for regularly updated risk mapping, of both disaster and climate risks (*i.e. historical and projected risks*), as well as putting in place measures to improve required technical and institutional capacities at all levels. Some DRM laws include provisions about risk mapping. Municipalities should consider identify the undertaking of risk assessments as an integral part of the development process. Many risk assessments, however, are currently still regarded as "linear models with limited capacity to identify and manage complex and interconnected risks." As such, legal provisions on risk assessment or mapping should promote holistic, multi-hazard assessments that look at how different risk drivers (such as climate change, urbanization, etc.) may interact or build upon each other and thus increase or create new risks.

3.27 PROVIDING FOR AT-RISK COMMUNITIES, CIVIL SOCIETY AS WELL AS THE PRIVATE SECTOR TO BE INVOLVED IN THE RISK ASSESSMENT PROCESS AND TO BE INFORMED OF THE OUTCOMES

Communities themselves are often a vital source of information for understanding hazards, vulnerability, capacity, and exposure of persons and assets in a particular locality. This Framework calls for municipalities to ensure the use of traditional, indigenous and local knowledge and practices to complement risk assessment processes. At the same time, ensuring that communities are involved in risk assessments also helps to enable ownership of subsequent efforts to mitigate risk, particularly if drastic measures (such as relocation) are required.

In a similar way, promoting the involvement of the private sector in undertaking risk assessments means private actors may be more likely to use risk information to inform their own plans and activities.

Encouraging clear and transparent communication and dissemination throughout the risk assessment process is equally important. Communication will be essential for translating the information into action. Making risk information publicly available also increases transparency and is recognised as being an important means of prompting individuals to take their own measures to reduce risks.

3.28 REQUIRING RISK INFORMATION TO BE CONSIDERED IN DEVELOPMENT PLANNING, BUDGETARY ALLOCATIONS AND CONSTRUCTION

To reduce underlying risk, comprehensive risk mapping and assessments must inform development planning. Laws and regulations can require the consideration of risk information in investment decisions concerning development planning and construction to prevent the creation of new risks and to better manage existing risks. Risk information could also be used to initiate the retrofitting of buildings (*especially for essential infrastructure, like schools and hospitals*) to withstand the assessed hazard levels, drafting new land use planning guidelines or regulations, and designing financial protection measures. While laws or regulations may not contain extensive detail on procedures, a link may still be made between the information obtained from risk mapping/assessments and decisions related to development planning and construction, including actions and decisions taken by the private sector.

3.29 ESTABLISH CLEAR PROCEDURES AND RESPONSIBILITIES FOR EARLY WARNING (EWS)

Early warning is one of the most crucial functions of any DRM system, given its life-saving impact. This is recognised internationally as one of the seven targets to “substantially increase the availability of and access to multi-hazard EWS and disaster risk information and assessments to people by 2030.” To ensure that accurate information reaches people in time to save lives, it is important that procedures are clear, roles and responsibilities of all those involved are well understood, including by those who are at the receiving end of the information.

Invest in, develop, maintain and strengthen people-centred multi-hazard, multi-sectoral forecasting and early warning systems;
• Disaster Risk And Emergency Communications Mechanisms, • Social Technologies And Hazard-Monitoring Telecommunications Systems; • Develop Such Systems Through A Participatory Process; • Tailor Them To The Needs Of Users, • Including Social And Cultural Requirements, In Particular Gender; • Promote The Application Of Simple And Low-Cost Early Warning Equipment And Facilities; • And Broaden Release Channels For Natural Disaster Early Warning Information
Check laws and regulations on:
• *DRM / emergency response / civil defence* • *Disaster management and response plans* • *Contingency plans* • *Climate change*

3.30 ASSIGNING RESPONSIBILITIES FOR ALL STEPS OF THE EARLY WARNING PROCESS FROM ASSESSING THE HAZARD, MAKING DECISIONS TO ISSUE WARNINGS, TO INITIATING EARLY ACTION

Many aspects of effective EWS **do not require legislation, but rather, technical capacity** and good plans and systems. Where laws and regulations can add value is in ensuring clear legal mandates are assigned to assess hazards and risks, and to make timely decisions to issue warnings. Procedures may appear to be clear on paper, but under the pressure of deciding whether to issue a disaster warning, it may become evident that roles are not as practical or as clear as intended. Additional consideration needs to be given to include accountability mechanisms within legislation for failure to full responsibilities or for misuse of EWS.

3.31 ESTABLISHING ROLES FOR TECHNICAL MINISTRIES AS WELL AS COMMUNITIES, LOCAL AUTHORITIES, SCIENTIFIC INSTITUTIONS, PRIVATE MEDIA COMPANIES AND CIVIL SOCIETY ORGANIZATIONS IN EARLY WARNING SYSTEMS

Legislation can foster end-to-end and multi-hazard EWS that can also generate stronger partnerships and inter-institutional cooperation in information dissemination and the management of EWS. Legal provisions can require institutional cooperation by bringing technical data and expertise from different national research and monitoring systems into the EWS and set out the role of the media.

This Framework call municipalities to develop EWS through “participatory processes” and to make sure they are tailored to the needs of users, including social and cultural requirements, in particular gender. Indeed, research has also indicated that community involvement in the management of EWS can be crucial to their effectiveness. This can be achieved, for example,

by consulting with community members in the design and development of EWS, integrating community based EWS with of official / national EWS and assigning community representatives with maintenance or oversight responsibilities for local warning equipment, such as sirens or drums.

3.32 ENSURING EWS EXIST FOR THE MOST FREQUENT AND SERIOUS HAZARDS

While it is important to have multi-hazard EWS, if a country is particularly prone to a specific type of natural hazard then it may be necessary to include reference to accurate EWS required for this particular type of hazard, and to ensure it is linked with subsequent and necessary early action. For example, if a municipality has a high level of flood risk, its Law on Flood Protection contains detailed provisions on the flood EWS and methods of notification as well as overall priorities for the system.

3.33 LAWS REQUIRE EDUCATION, TRAINING AND AWARENESS-RAISING TO PROMOTE A WHOLE-OF-SOCIETY APPROACH TO DRR

To be resilient, communities must be informed about and engaged in reducing their own risks. Laws and regulations can be important for responsibilities, requiring public awareness- raising, and training initiatives. More specifically, and as set out below, legislation can: establish or promote special training facilities and education through various means for public sector workers and professionals; mandate training on disaster risk reduction and response in school curricula; and require disaster preparedness drills in high-risk areas.

Check laws and regulations on:
• *DRM / emergency response / civil defence* • *Education* • *Local government* • *Specific hazards*

3.34 MANDATING TRAINING ON DRR IN THE SCHOOL CURRICULA

Children and youth, as '***agents of change'*** can help to build a culture of understanding and awareness, especially if DRR is integrated into education. At the same time, children in schools can be made much safer if they have participated in disaster preparedness drills. Either the DRM law or other laws and codes on education may include a requirement to address DRR and preparedness as part of the school curricula, although the content of such requirements may of course differ depending on a municipal risk profile. There is a growing trend of legal provisions requiring the inclusion of DRR in school curricula or conducting disaster preparedness drills in schools.

3.35 PROMOTING TRAINING FOR PUBLIC OFFICIALS AND RELEVANT PROFESSIONALS ON DRR

Even though responsibilities may be assigned under the law, relevant public of officials often lack the technical capacity to fulfil their responsibilities. Requiring public of officials and other relevant professionals to undergo training or take a university degree can promote fulfilment of these important responsibilities and hence lead to better implementation of laws and

regulations. Establishment of special training facilities for public sector workers and other interested trainees might be considered.

3.36 INCLUDING SPECIFIC PROVISIONS ON PROMOTING PUBLIC AWARENESS AND UNDERSTANDING OF DRR

Many countries have legal provisions on increasing public awareness by conducting community education on DRR. To be effective, however, they need to be complemented by clear guidance and direction for implementation. Without this specific direction identifying responsible institutions (*including the media and even the private sector*), activities expected, resources to be allocated, and/or information to be disseminated, well-intentioned legislative provisions may remain aspirational statements.

Additionally, where relevant, attention focused to the possibility of building upon or formally recognizing existing customary laws that promote community understanding and ownership of DRR initiatives.

Promote national strategies to strengthen public education and awareness in disaster risk reduction, including disaster risk information and knowledge, through campaigns, social media and community mobilization, taking into account specific audiences and their needs;

Civil society, volunteers, organized voluntary work organizations and community-based organizations to participate, in collaboration with public institutions, to contribute to and support public awareness, a culture of prevention and education on disaster risk

3.37 MANDATE THE ENGAGEMENT OF ALL RELEVANT STAKEHOLDERS, INCLUDING CIVIL SOCIETY, THE PRIVATE SECTOR, SCIENTIFIC INSTITUTIONS AND COMMUNITIES IN RISK REDUCTION DECISIONS AND ACTIVITIES

It is now widely recognized that DRR is a multi-stakeholder task that needs the involvement of many stakeholder groups. However, well-meaning efforts to be more inclusive of civil society and private sector actors in DRR, and to seek better representation of communities, women and vulnerable groups, have often proven insufficient to ensure their sustained engagement in decision-making processes and in the implementation of risk reduction activities. Legislation needs to guarantee this engagement by assigning clear roles and responsibilities. Specific provisions may be needed to ensure meaningful engagement of women, minorities, and people with disabilities and older persons, as set out below.

Disaster risk reduction requires an all-of-society engagement and partnership. It also requires empowerment and inclusive, accessible and non-discriminatory participation, paying special attention to people disproportionately affected by disasters, especially the poorest;

To assign, as appropriate, clear roles and tasks to community representatives within disaster risk management institutions and processes and decision-making through relevant legal frameworks, and undertake comprehensive public and community

consultations during the development of such laws and regulations to support their implementation;

Civil society, volunteers, organized voluntary work organizations and community-based organizations to participate, in collaboration with public institutions, to, inter alia, provide specific knowledge and pragmatic guidance in the context of the development and implementation of normative frameworks, standards and plans for disaster risk reduction; engage in the implementation of local, national, regional and global plans and strategies

Check laws and regulations on:
• *DRM / emergency response / civil defence* • *National Red Cross/Red Crescent Society* • *National DRR Platform* • *Civil Society and NGOs* • *Local government* • *Insurance* • *Taxation* • *Investment*

3.38 REQUIRING COMMUNITY REPRESENTATION IN DRR DECISION-MAKING BODIES AND PROCESSES

One of the challenges for municipalities is the effective implementation of DRR programmes at the community level. Legislation that requires the participation of communities in DRM and DRR is one way to encourage or require national and local governments to be more inclusive in practice. In particular for communities, a specific legal mandate should recognize their right to be involved in managing the risks they are exposed to. It might be necessary "to assign, as appropriate, clear roles and tasks to community representatives within disaster risk management institutions and processes and decision-making."

There is, however, a great variety in approaches for community involvement. Different countries have different interpretations and definitions of what constitutes a 'community'. In many countries, the locally elected representative bodies lead the formulation or approval process for local development plans and their implementation. This provides a tangible opportunity to address DRR concerns in local development planning and implementation.

There are also different methods to ensure community involvement in decision-making. A good approach and method to follow is the Participatory Rural Approach (PRA). It is an approach used by non-governmental organizations (NGOs) and other agencies involved in international development. The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programmes.

3.39 REQUIRING REPRESENTATION OF CIVIL SOCIETY ORGANIZATIONS AND YOUR NATIONAL RED CROSS / RED CRESCENT SOCIETY IN DECISION-MAKING INSTITUTIONS AND PROCESSES

While many laws may set out general obligations to be inclusive of non-government stakeholders, in order for them to be implemented, further detail and guidance is generally needed. One way to ensure inclusion is to mandate the participation of civil society and National Red Cross/Red Crescent Societies in DRM committees both at the national and subnational level.

While recognizing their leading, regulatory and coordination role, Governments should engage with relevant stakeholders, including women, children and youth, persons with disabilities, poor people, migrants, indigenous peoples, volunteers, the community of practitioners and older persons in the design and implementation of policies, plans and standards;

Women and their participation are critical to effectively managing disaster risk and designing, re- sourcing and implementing gender-sensitive disaster risk reduction policies, plans and programmes; and adequate capacity building measures need to be taken to empower women for preparedness as well as to build their capacity to secure alternate means of livelihood in post-disaster situations;

Children and youth are agents of change and should be given the space and modalities to contribute to disaster risk reduction, in accordance with legislation, national practice and educational curricula;

Persons with disabilities and their organizations are critical in the assessment of disaster risk and in designing and implementing plans tailored to specific requirements, taking into consideration, inter alia, the principles of universal design;

Older persons have years of knowledge, skills and wisdom, which are invaluable assets to reduce disaster risk, and they should be included in the design of policies, plans and mechanisms, including for early warning;

Indigenous peoples, through their experience and traditional knowledge, provide an important contribution to the development and implementation of plans and mechanisms, including for early warning;

Migrants contribute to the resilience of communities and societies, and their knowledge, skills and capacities can be useful in the design and implementation of disaster risk reduction.

3.40 ASSIGNING SPECIFIC ROLES OR DUTIES FOR CIVIL SOCIETY ORGANIZATIONS AND NATIONAL RED CROSS / RED CRESCENT SOCIETIES

Assigning specific tasks or responsibilities to community and civil society organizations can be an effective way to ensure their active and sustained engagement, as well as promote better understanding and ownership of DRR and preparedness measures within the community. A number of countries designate the management of natural resources to community associations for the management and enforcement of DRR activities. For example, the water resource management legislation that provide for water user associations, comprised of local users to manage and oversee the sustainable use of water.

Some countries also assign their National Red Cross or Red Crescent society with specific functions concerning DRR, such as public awareness-raising activities and preparedness drills.

3.41 ENSURING MEANINGFUL ENGAGEMENT AND REPRESENTATION OF WOMEN, MINORITIES, PEOPLE WITH DISABILITIES AND OLDER PERSONS

The Framework recognizes the contributions and knowledge that can be provided by many different groups, in particular women, children and youth, persons with disabilities, older persons, indigenous peoples and migrants. Unfortunately, the explicit inclusion of women and vulnerable groups is not a significant practice in DRM-related laws. Explicitly including these groups in decision-making processes can help ensure that DRR measures take account of their specific needs and draw on their particular experiences and capacities in DRR. This may be done by ensuring that organizations or associations seeking to represent these groups are given a seat within decision-making committees and institutions. For example, municipalities might consider including a representative from the National Commission on the Role of South Africa Women and the Local Disaster Risk Reduction and Management Councils and the Head of the Gender and Development Office as a member. Additionally, laws can require consultation with these specific groups in the development and implementation of new DRM laws, policies, strategies and plans.

A gender, age, disability and cultural perspective should be integrated in all policies and practices;

Disaster risk reduction requires a multi- hazard approach and inclusive risk-informed decision-making based on the open exchange and dissemination of disaggregated data, including by sex, age and disability;

To invest in, develop, maintain and strengthen people-centred multi-hazard, multi-sectoral forecasting and early warning systems, disaster risk and emergency communications mechanisms, social technologies and hazard- monitoring telecommunications systems; develop such systems through a participatory process; tailor them to the needs of users, including social and cultural requirements, in particular gender.

3.42 INCLUDING PRIVATE SECTOR ACTORS IN BOTH DECISION-MAKING BODIES AS WELL AS DRR ACTIVITIES

Whilst unregulated private sector activities have a potential to increase disaster risk levels, it is widely recognized that the private sector can also play a key role in reducing risks through the technical expertise and resources it can offer, as well as by contributing to safer development practices. The National Framework calls on the private sector to integrate DRR within its activities and plans and calls for its engagement in the development of "normative standards and technical standards" for DRM. Laws can promote better private sector engagement by ensuring the representation of private sector associations or bodies within decision-making committees and their consultation in the development of relevant laws, rules and standards. Laws and regulations can also clearly articulate responsibilities of both the public and private sector to promote better accountability, including by requiring that DRM is addressed within business models and practices.

Business, professional associations and private sector financial institutions to integrate disaster risk management, including business continuity, into business models and practices through disaster-risk-informed investments... and actively participate, as appropriate and un- der the guidance of the public sector, in the development of normative frameworks and technical standards that incorporate disaster risk management.

3.43 ENSURING THAT THE BEST AVAILABLE SCIENTIFIC RESOURCES AND ANALYSIS INFORM DEVELOPMENT AND DRR DECISIONS

There is an enormous amount of important research and knowledge contained within scientific institutions and academia on risk reduction. Unfortunately, this has not yet resulted in more informed development decisions. At the international level – particularly in the discussions concerning the Sustainable Development Goals – there has been wide recognition of the need for a greater "science-policy interface", whereby "scientists, policymakers and others link up to communicate, exchange ideas, and jointly develop knowledge to enrich policy and decision-making processes and/or research." At the national level, legislation can play a role in promoting a better science-policy interface by ensuring coordination and information-exchange platforms between scientific institutions and decision-making committees and authorities.

For example:

Japan's Act on Special Measures Concerning Countermeasures for Large-Scale Earthquakes sets out the responsibilities for collating and analysing research from universities and other research bodies, contributing to the development of policies as well as to the dissemination of information to the public.

Academia, scientific and research entities and networks to focus on the disaster risk factors and scenarios, including emerging disaster risks, in the medium and long term; increase research for regional, national and local application; support action by local communities and authorities; and support the interface between policy and science for decision-making

3.44 LAWS ADEQUATELY ADDRESS GENDER CONSIDERATIONS AND THE SPECIAL NEEDS OF PARTICULARLY VULNERABLE CATEGORIES OF PERSONS

It is now widely acknowledged that disasters have disproportionate impacts on certain categories of persons, due to either their special vulnerabilities and/or the influence of social structures and practices. These categories may vary between countries and localities, but they commonly include women, the very poor, older persons, children and people with disabilities, among others. In most cases, these groups may not have strong political voices or positions, so their needs may not be a focus of governmental planning for disasters unless law requires it.

Check laws and regulations on:

- *DRM / emergency response/civil defence*
- *DM and response plans*
- *Disability*
- *Human rights and equal opportunity*
- *Health*
- *Social welfare*
- *Family law*
- *Constitution*

3.45 ENSURING A PROPER ANALYSIS OF WHICH CATEGORIES OF PERSONS MAY BE MOST VULNERABLE OR EXPOSED TO DISASTER RISKS

The laws that refer to the particular needs of vulnerable groups usually do so in a general way. To ensure that the necessary attention is directed towards addressing the needs of the most vulnerable, the first step is to identify whom the most vulnerable are. In that sense, relevant laws, plans and policies can require that an adequately disaggregated analysis be undertaken to determine the more vulnerable categories of persons within a specific risk context. To gain a proper understanding of those most vulnerable, data and analysis should be disaggregated according to key factors such as gender, age, disability, ethnicity and socio-economic status.

The DRM law of the Philippines, for example, refers to a Disaster Risk Reduction and Management Information System maintaining data on vulnerable groups

3.46 ASSIGNING SPECIFIC RESPONSIBILITIES TO INSTITUTIONS TO TAKE THE NEEDS OF THESE GROUPS INTO ACCOUNT

To ensure that active steps are taken to increase the safety and protection of vulnerable groups, specific authorities (or even individual of officials) need to be explicitly assigned to do so. This could include ensuring that DRM plans are developed in consultation with vulnerable groups and include measures to address their needs and reduce their vulnerability.

3.47 ENSURING GENDER SPECIFIC NEEDS OR CONSIDERATIONS ARE TAKEN INTO ACCOUNT

This Framework notes the importance of implementing gender sensitive DRR policies and plans. To ensure more concrete progress in mainstreaming gender considerations, legislation can require gender-sensitive risk assessments, EWS and indicators for measuring progress of any DRM initiative.

A Legislation can also provide for the establishment of task forces / working groups to oversee the mainstreaming of gender considerations, and/or require specific authorities to develop gender strategies or plans. A particular consideration to bear in mind is the growing evidence of gender-based violence in disasters and other emergencies. Relevant laws and policies can recognise gender-based violence as a risk and seek to prevent and prepare for it, including by considering special mechanisms for reporting of abuse in disaster situations. For example, municipalities can develop a specific yearly action plan to prevent violence against women in emergencies based on a recognition of its responsibilities under national legislation.

3.48 ENSURING THAT THE SPECIFIC NEEDS OF OTHER GROUPS WITH PARTICULAR VULNERABILITIES ARE TAKEN INTO ACCOUNT

Groups identified as being particularly vulnerable may have additional or different needs in terms of modes of communication, educational materials, shelters, technology, transportation, medical supplies and other resources. Legislation can make sure that these needs are identified and addressed within DRM planning, including by requiring that government agencies or of officials regularly consult representatives of these groups (for example advocacy groups/councils and other organizations). Legislation may also mandate the engagement of representatives from specific groups to ensure that their voices are heard and their needs addressed.

Some laws refer to addressing the needs or strengthening capacities of vulnerable groups.

For Example:

The Philippines' DRM law aims to "develop and strengthen the capacities of vulnerable and marginalized groups to mitigate, prepare for, respond to, and recover from the effects of disasters," and Ethiopia's formal policy provides that "DRM systems will give due attention to especially vulnerable groups such as women, children, the infirm, people living with HIV/AIDS, the disabled and the elderly."

However, to promote higher chances of implementation it may be important to assign specific responsibilities or tasks to certain authorities.

3.49 ADEQUATE MECHANISMS TO ENSURE THAT RESPONSIBILITIES ARE FULFILLED, AND RIGHTS ARE PROTECTED

Weak implementation of existing regulatory frameworks and accountability is a key reoccurring issue in many countries and has been identified as a major challenge. To address this challenge, legislation can set out enforceable incentives and disincentives to ensure that officials fulfil their responsibilities related to DRR and to dissuade individuals and the private sector from putting themselves or others at unacceptable risk. Indeed, the possibility of being held to account for decisions or actions that result in avoidable disaster losses can be an effective incentive for DRR. To enhance accountability, legislation can also set out pertinent rights – including the right to disaster information, the right to development and the right to a safe and healthy environment – and provide necessary and accessible mechanisms for their protection and fulfilment.

Enhancing relevant mechanisms and initiatives for disaster risk transparency, which may include - financial incentives, public awareness- raising and training initiatives, reporting requirements and legal and administrative measures;

To encourage the establishment of necessary mechanisms and incentives to ensure high levels of compliance with the existing safety-enhancing provisions of sectoral laws and regulations

Check laws and regulations on:

- *Constitution*
- *DRM / emergency response/civil defence*
- *Criminal law*
- *Civil liability*
- *Administrative law*
- *Human rights*

3.50 ESTABLISHING PUBLIC REPORTING OR PARLIAMENTARY OVERSIGHT MECHANISMS FOR GOVERNMENT AGENCIES TASKED WITH DRR RESPONSIBILITIES AND ENSURING SUCH INFORMATION IS MADE PUBLICLY AVAILABLE

Limited accountability of decision-makers to the people they represent has been identified as an underlying driver of risk. Legislation is a useful tool for establishing stronger accountability and monitoring mechanisms, such as parliamentary oversight and transparency requirements, public reporting and anti-corruption measures.

3.51 RECOGNISING THE ROLE FOR THE JUDICIARY IN ENHANCING ACCOUNTABILITY FOR DRR

The role of the judiciary is often neglected in DRR discussions, but it can play an important role in promoting implementation, compliance and accountability, and reducing corruption. A number of DRM laws set out offences and penalties that can be brought before the court

system. The judiciary may also play a role in determining the scope of rights and responsibilities.

3.52 ESTABLISHING LEGAL AND / OR ADMINISTRATIVE SANCTIONS (AS APPROPRIATE) FOR PUBLIC OFFICIALS, INDIVIDUALS AND BUSINESSES FOR A GROSS FAILURE TO FULFIL DUTIES

Legal and/or administrative sanctions for particularly egregious failures to fulfil responsibilities can be another useful tool to promote stronger accountability and transparency. Though there is some divided opinion about liability when it comes to DRR, many countries do use some form of administrative/civil or criminal liability to promote compliance, as set out below:

- ***Civil liability:*** In many countries, private individuals and corporations may be liable to pay damages under civil law if they have caused damage to others through negligence. Although most countries provide whole or partial immunity from such civil claims for government officials when acting in their official capacity, there are exceptions.
- ***Criminal liability***: DRR-related actions by the government, private persons and corporations may be criminally sanctioned in general law, as well as under some DRM laws. For example, the DRM law can set out penalties for anybody (including corporations) who undertake high-risk developments without a disaster risk analysis and consequently cause a disaster. (*In Colombia, Mayors have been held responsible for preventable deaths resulting from disasters*.)
- ***Administrative sanctions***: Additionally, legislation may set out procedures for administrative actions against government agencies or officials for failure to fulfil statutory obligations under the law e.g. internal administrative sanctions can be implemented for government officials or agencies that have failed to fulfil their statutory duties.

Countries address the issues of liability and sanctions differently according to their legal systems and cultures. In determining effective means of liability or appropriate sanctions, it is important to consider available capacity to oversee and enforce such liability, and to prioritize particularly gross failures to meet obligations under legal frameworks.

3.53 CREATING INCENTIVES FOR COMPLIANCE WITH LAWS AND REGULATIONS FOR DRR

In addition to sanctions, incentives can also be used to promote better implementation and compliance with relevant laws and regulations. Examples include the provision of free building permits to promote compliance. Incentives may also be provided through law or regulation in the form of tax waivers, subsidies, micro-insurance products and educational benefits.

3.54 ESTABLISHING RIGHTS RELEVANT TO DRR, INCLUDING THE RIGHT TO DISASTER INFORMATION, AND PROVIDING ENFORCEMENT MECHANISMS

Ensuring an understanding of individual rights and responsibilities is important for generating a whole-of-society approach to DRR. Rights relevant to DRR may be set out in either the constitution, human rights laws, DRM or environmental laws, and may include the right to life or security of the person, to a safe environment, to protection of property, to food, shelter and health, and to information. The right to access information on disaster risk, for example, has been recognised as a first step in reducing disaster losses. Laws may also establish procedural

obligations on the part of the government relating to rights, including ensuring public participation in decision-making (especially concerning the environment), access to information about the implementation of laws and decisions, and access to legal remedies.

3.55 LAWS ESTABLISH INDIVIDUAL RESPONSIBILITIES RELEVANT TO DRR

Disasters are often seen as being a government responsibility, with individual citizens not realizing that they too have a part to play in reducing disaster risks. Laws can support a shift away from this thinking by spelling out individual responsibilities. Relevant laws should provide for both individual rights and responsibilities and include methods to promote their application. In addition, awareness-raising and dissemination initiatives should be conducted to improve under- standing and implementation of these rights, obligations, incentives and disincentives and to build a culture of respect for them.

4. DISASTER RISK REDUCTION GUIDELINES

*We speak of a **"disaster"** when a calamitous event seriously disrupts the functioning of a community or society and causes widespread human, material, economic and/ or environmental losses exceeding the ability of a community or society to cope using its own level of resources.*

In other words, disasters occur when hazards such as earthquakes, landslides or floods have a significant destructive impact on a vulnerable population and overwhelm their capacity to cope on their own. A disaster is always the result of two inter-acting components: hazards and vulnerability. When we talk about **disaster risk,** we talk about something that has not happened yet but that is likely to happen in the future.

Disaster Risk Reduction (DRR) can be described as;

"Systematic efforts to analyse and manage the causal factors of disasters including through reduced exposure to hazards, lessened vulnerability of people and property, wiser management of land and the environment and improved preparedness for adverse events."

Disaster Risk Reduction consists of the following three components:

- Risk Analyses that identify options for
- Risk Prevention / Mitigation and
- Disaster Preparedness.

***Disaster Risk Prevention or Mitigation** includes activities to prevent or mitigate the risk by reducing – if possible - the hazard or – more commonly – vulnerability. This can be achieved through political, legal, administrative, planning and infrastructural measures (i.e. regulating land use; managing river basins; strengthening social structures for prevention activities).*

***Disaster Preparedness** seeks to reduce the loss of life and damages in case an event occurs (i.e. by strengthening self-help capacities, introducing early warning systems, training and exercises).*

An important principle of Disaster Risk Reduction is that it needs to involve multiple relevant sectors (health, education, agriculture etc.), the private sector and civil society. Disaster Risk Reduction is a cross cutting responsibility and not the sole job of Civil Protection or Ministries of Emergency Situations.

4.1 DISASTER RISK ANALYSIS

A Disaster Risk Analysis is a comparative analysis of the nature and extent of risks linked to different kinds of hazards and vulnerable conditions that could harm people, assets, livelihoods, infrastructure and services in a given locality. The result of risk assessment is an evaluation of the likelihood and magnitude of potential losses as well as an understanding of why these losses occur and what impact they have. Common results of risk assessments (besides the risk analysis report) are hazard and risk maps, risk matrices that compare and rank risks from different hazards, scenarios and prioritized action-plans for DRR *(this will be further elaborated in the guide).*

Disaster Risk Reduction aims to make populations safer; and *disaster risk analysis* is a critical step in DRR. Disaster risk analyses show where, how and what kind of risks are of highest priority within a local government area, so that local government staff and stakeholders can plan targeted and effective disaster risk reduction activities. Without understanding the highest risks faced by a population, and their capacity to cope with these risks, it is not possible to make effective plans and development decisions that promote the safety of the population. Therefore, the results of risk analyses should be a fundamental reference point for local government development and planning, policy and resource allocation.

It is important to see Disaster Risk Analysis as an opportunity to raise citizens' awareness of disaster risks but also to establish a dialogue about their priority concerns. Ideally, a risk analysis offers opportunities for vulnerable groups to participate and communicate their experience of disasters risks and related issues that affect them in order to establish viable and relevant solutions. This includes the need to engage with those who will not only be most affected by future events but also participate in the making of that future i.e. children and young people.

Hazards and even more so vulnerability change over time. Therefore, risk analysis is not a one-off exercise but an ongoing process that needs to feed into decision and policy-making. This process requires the participation of different sectors and parts of society to result in a shared understanding of what the risks are and agreed priorities for risk reduction. Though it is challenging risk, analysis can help to develop better coordination between different sectors such as health, education, child protection or social services, emergency services and water and irrigation. The active commitment and leadership of local governments is important to maintain momentum and support all stakeholders throughout the process, as well as to implement recommendations from the analysis.

Disaster Risk Analysis should be prioritized in local government areas that have a history of frequent and destructive disaster episodes. Otherwise, it is unlikely that sufficient commitment to the process and follow-up can be generated. It is best to time risk assessments so

conclusions and action points can be incorporated into local plans (common development and/ or sector-specific plans and programming documents).

The next figure (Figure 2) outlays the Disaster Risk Reduction (DRR) methodology.

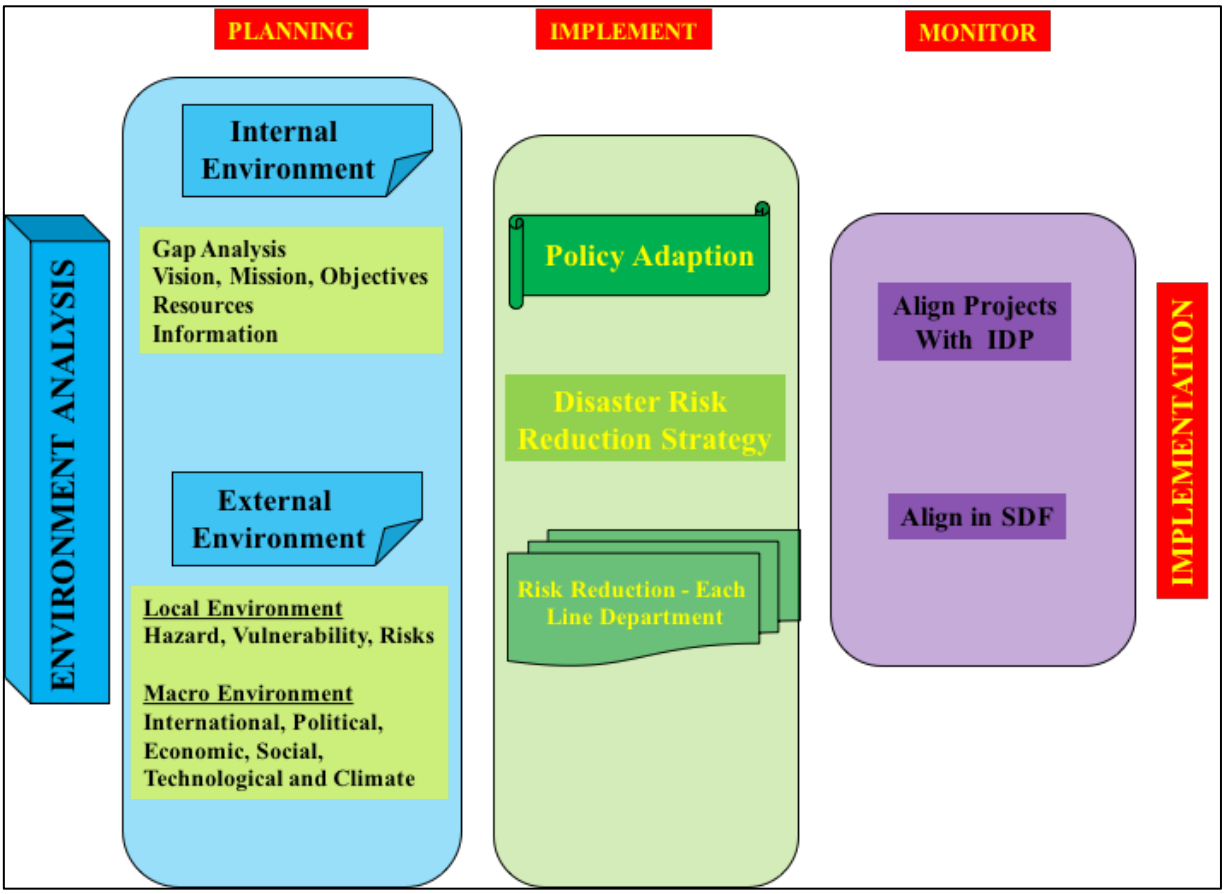

Figure 2: Disaster Risk Reduction Methodology

4.1.1 Gap Analysis

The Gap-Analysis is the point of departure to evaluate the internal environment of the municipal area of jurisdiction. The Gap-Analysis includes, but is not limited to, the evaluation of the Key Performance Area (KPA) and Enablers as prescribed and required by the National Disaster Management Act. The outcome of this analysis will provide useful information to a municipality on its effectiveness and preparedness for disasters. It all reflects the status within the municipality.

The external environment consists out of the local environment (that is outside the building and human resources, but inside of the municipal area of jurisdiction) and the macro environment (that is outside the municipal area of jurisdiction). The local environment is analysis by the execution of the hazard, vulnerability and risk assessment. Municipalities must take into account of what is happening in the political, economic, social, technological, climate and international arena to fully draft an effective and efficient DRR plan. Taking cognisance of both environments will give municipalities a better understanding of these influences on their risks to ensure sustainable development.

4.2 LOCAL ENVIRONMENT

GEO-DATABASE

A good understanding and description of the study area is preferable before proper planning can be done, such as;

Geographic information

- Rivers
- Dams
- Airports
- Railway lines
- Major routes
- Bridges
- Human settlements
- Administrative authorities
- Hospitals
- Clinics
- Schools

Demographic information

- Living patterns (residential and industrial areas)
- Population distribution in the area
- Language spoken
- List of organizations that can be of assistance such as;
- SANDF
- SAPS
- Fire Brigade Services
- Ambulance Services
- NGO's
- Volunteers
- Community Structures

Instead of only giving a description of the area, this framework rather calls for municipalities to develop their own geo-database. In most case, the Department of Town and Regional Planning already has most of this information and can make it available to Disaster Management. The main sources of data are:

- Municipalities;
- Surveys and mapping;
- Stats SA;
- Demarcation;
- Local service providers;
- Data vendors and
- The community (indigenous knowledge)

Contents of such a database can include:

- Topographic data
- Infrastructure data
- Census data
- Function data:
  - Police stations;
  - Hospitals, clinics and other health institutions:
  - Emergency medical services;
  - School, church and public buildings and other facilities that could be used
  - Fire-fighting services; and
  - Airports, airstrips, harbours, seaports and railway stations;
  - Relevant international relief agencies;
  - Emergency shelters or hospitals in the event of a disaster;
  - Research and training facilities for disaster management disciplines
- Hazard data
- Disaster Risk data
- Vulnerable communities and infrastructure data

After the acquisition of relevant data it is cleaned and validated and verified. A geo-database is created that can be used in Disaster Risk Assessments. To ensure the optimum use of disaster related data in a municipality, a work with a dataflow is created. This work and dataflow are based on the data needs of Disaster Management. Data flow in conducting Disaster Risk Assessment can be divided in two main activities. The first one is project driven, where projects are undertaken to execute a hazard and risk assessment. Secondly in-house data flow can be seen as day to day tasks of Disaster Management. These tasks include update of Disaster Management related data and usage of data to perform specific analysis or mapmaking.

The propose project will compile both these data flow diagrams (Figure 3). Composition of the diagram will depend on the following aspects:

- Deliverables of assessment;
- Available data;
- Processes;
- Data sources;
- Quality and status of available data;
- Data capturing needs;
- Etc.

The framework of project data flow diagram is shown in Figure 3.

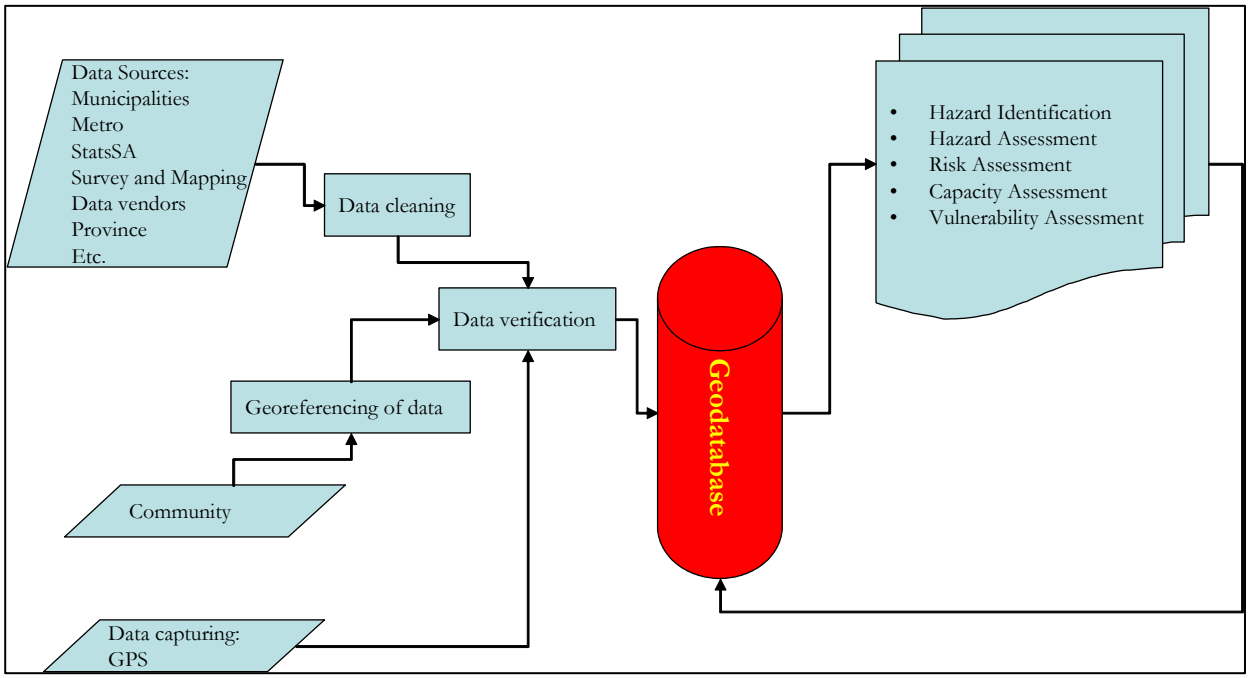

Figure 3: Disaster Management project data flow diagram

Figure 3 shows possible data sources that include municipalities and process to clean data before it can be incorporated in the geo-database. Important to note is the communities is an important source of data. Data is than used in the different disaster risk assessments. Figure 4 indicates that after the geo-database is developed, the same data sources must be used to update the database. Data is used in day-to-day task of Disaster Management.

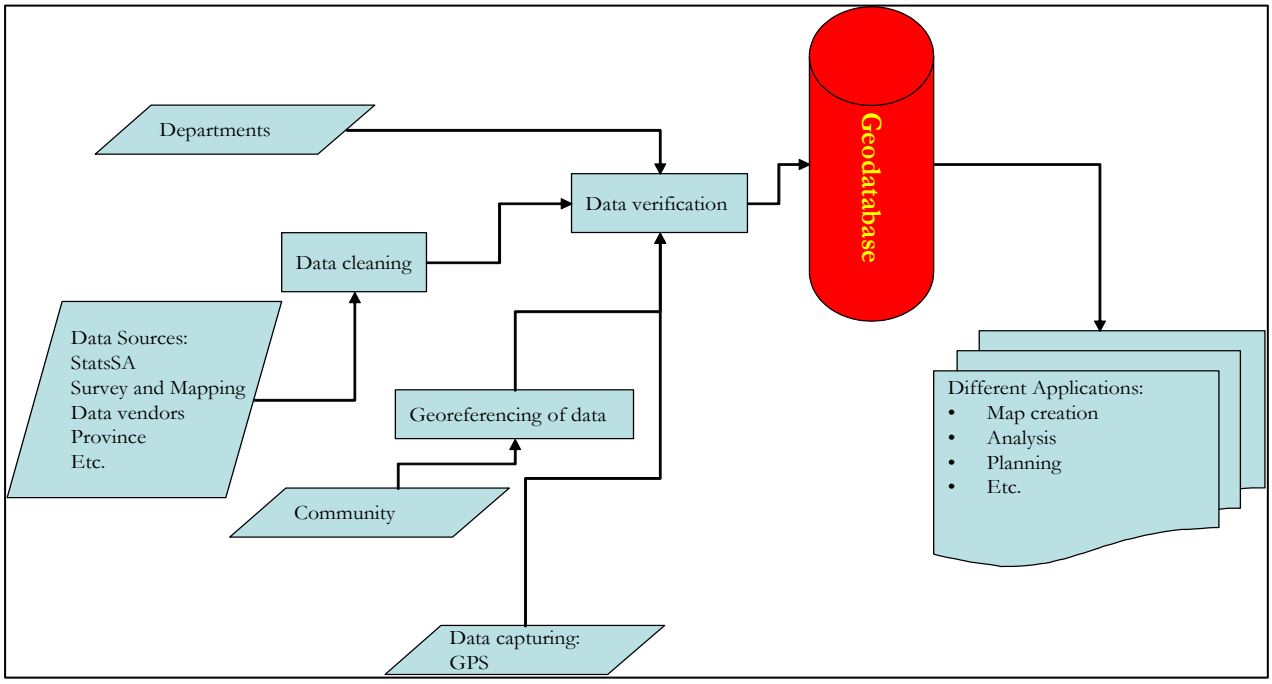

Figure 4: Disaster Management function data flow diagram

4.2.1 Hazard Identification

Various methodologies exists today and this Framework only provides guidelines for the execution of the risk and vulnerability assessment and is not prescriptive in which particular methodology to use.

Hazard Classification

Classification and characterisation of primary hazards as well as secondary hazards that might arise because of the primary hazards. Following are some examples:

- Climatic hazards – tropical cyclones, floods, fires, drought
- Environmental hazards – environmental pollution, oil spills, pes infestation
- Geological hazards – earthquakes, landslides, dolomite areas etc.
- Epidemics
- Industrial / technological hazards
- Social disruption
- Civil strife

Hazard Assessment

As communities themselves are often a vital source of information for understanding hazards, vulnerability, capacity, and exposure of persons and assets in a particular locality, this Framework calls for municipalities to ensure the use of traditional, indigenous and local knowledge and practices to complement risk assessment processes. Henceforth is it highly recommended to identify all the potential hazards using indigenous knowledge.

However, an indigenous knowledge procedure alone will leave the hazards assessment uncomplete. Therefore, a scientific hazard assessment will be deemed necessary to fully analyse the local environment of the municipality. The geographic information system (GIS) is a powerful tool to visualize, question, analyse and interpret data to understand relationships, patterns and trends. GIS is becoming essential to understanding what is happening and what will happen in geographic space. Once we understand, we can prescribe action. GIS are very useful in disaster management planning processes to analyse the local environment and geographically display the location of hazards, vulnerable communities and risk areas. The information is stored in the municipal geo-database and can be used for the execution of the scientific hazard, risk and vulnerability analysis.

During this first step, it is important to portrait all possible hazards, threats and or risks that may and / or could occur. Hence, the following questions are crucial when identifying the pure risks, which the area of jurisdiction could be exposed to;

- What can go wrong?
- If it were to go wrong, what would be the consequences?
- Are we willing to live with these consequences?
- How likely is it to occur?
- Are we willing to live with this level of risk?
- Can we reduce the level of risk?
- Is the risk reduction the level of risk?
- Is the risk reduction worth the money we must spend?

During this phase it involves;

- Using experience from the past,
- Much be systematic in nature,
- Should involve the participation of a wide breadth of relevant experience. This will help to build a sense of ownership not only for hazard identification, but also for the proposed solutions.
- It should develop an implementation plan with the elements prioritised according to a relative risk ranking.

However, experience from the past is only one dimension of the hazard identification process. Hence, appropriate computer models and GIS-techniques are used to predict all possible hazards and threats that may or could imposed in the area of jurisdiction. Integrating these analyses (scientific approach) with indigenous knowledge it is then possible to identify all potential hazards and risk at community level.

Not only is it possible to indicate the location of all the potential hazards, but it become possible to create a hazard profile map for the area of jurisdiction. This map laid down the foundation for the vulnerability analysis.

4.2.2 Vulnerability Assessment

The vulnerability assessment predominately relies on the information available in the municipal geo-database. The more information is stored and available in the geo-database, the better vulnerability assessment can be executed. Using GIS-techniques it become possible to identify all communities, properties and critical facilities at risk.

The vulnerability of communities and its capacity can also be addressed on a socio-economic- and institutional resource level. The socio economic level of communities could influence their vulnerability to disasters, while access to institutions with disaster mitigating or prevention resources could lower this vulnerability. Easy access to institutions or good spatial distribution of emergency services will have no effect on communities' vulnerability if these facilities are not well equipped to deal with potential hazards.

One of the elements of vulnerability of a community is the capacity to deal with the impact of a disaster. Capacity of a community can be measured or depend on institutional, individual and/or social elements. Institutional capacity depends on the location and status of:

- Key installations and other critical lifeline infrastructure;
- Electricity supply and communications systems including alternate sources in the event of a breakdown;
- Water supplies;
- Access routes;
- The availability of stocks of emergency supplies such as water, food and blankets;
- Emergency and essential services and their capacity to contribute to disaster response and recovery activities;

- Location of possible relief centres and, where available, resources that are available at those centres;
- Etc.

A vulnerability profile map laid down the foundation of the risk assessment. From these analyses, it is possible to classify the vulnerability factors (Figure 5).

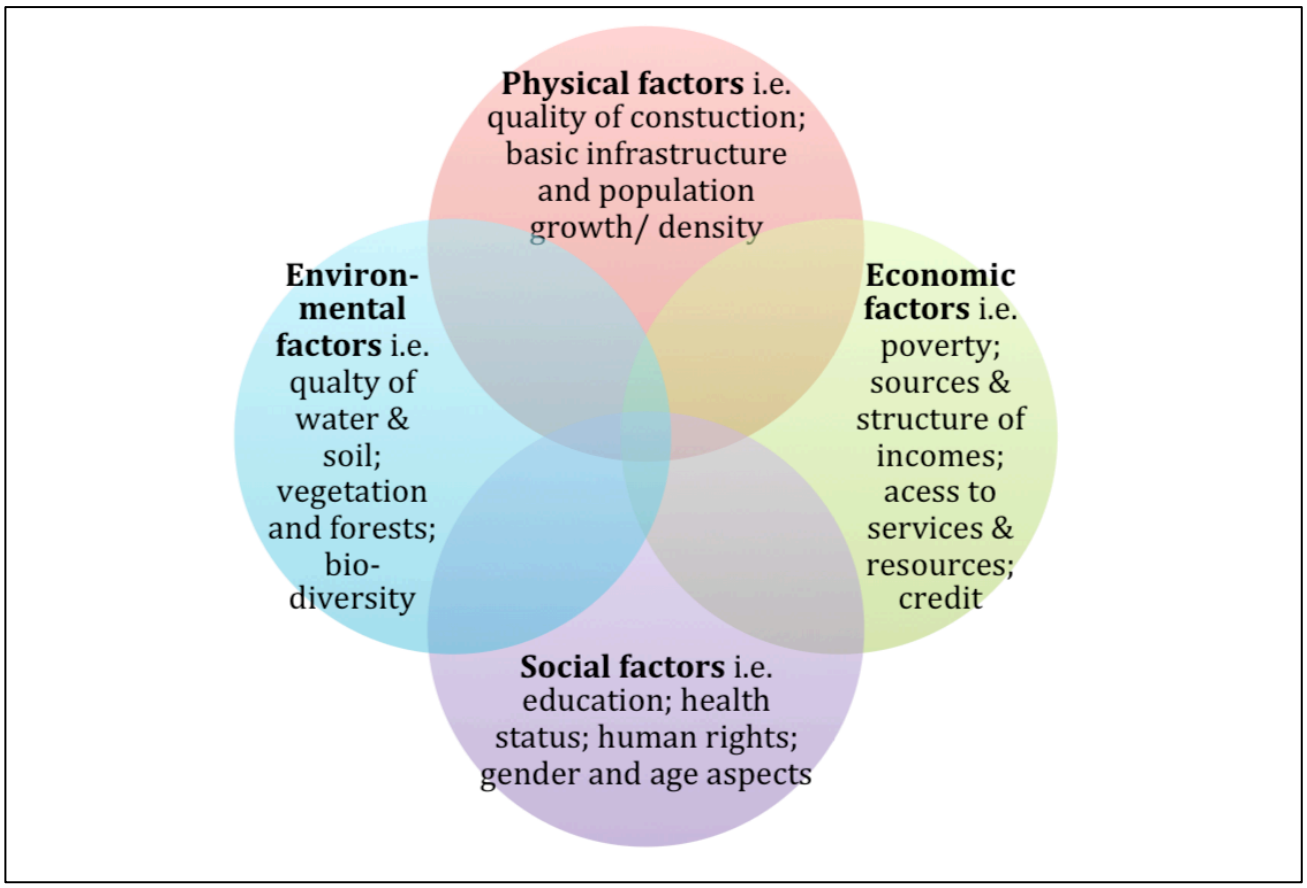

Figure 5: Classification of vulnerability factors

How these factors interact to influence the vulnerability of a population (group) is highly contextual and related to a given political, social and economic reality. Therefore, analysis needs to come up with specific indicators that help to further pinpoint and characterize vulnerability. Thinking through concrete hazard scenarios can help to identify some "obvious" indicators; other situations will require the involvement of technical experts and/ or participatory and qualitative research in hazard-prone locations and communities. The following list contains examples of indicators for measuring vulnerabilities to floods.

4.2.3 Risk Assessment

It becomes possible to execute a risk assessment when the probability of occurrence is added to each hazard. The following questions are important;

- Where do the risks to the business come from?
- How big are these risks?

- What are the major contributors?
- What are these risks sensitive to, therefore how can they be changed?
- What level of risk does the company consider intolerable and what level is considered negligible or trivial?
- From these, what is worth doing to reduce risk?

Methodologies offend neglect to add the probability of occurrences. For example, a one-in-twenty year flood is offend viewed to only occur once in twenty years. However, this is far from the truth. It has a 5 percent change to occur in any given year. However, this probability of occurrence change dramatically when viewed for the next 10-, 20- or 50 years. The same flood (of the same magnitude) has a 40% chance to occur in the next 10 years, 64% chance to occur in the next 20 years and a 92% chance to occur in the next 50 years. This might change the municipality's view when discovered that the same potential risk (of originally 5% to occur in any given year) has now a 40% chance to occur in the next 20 years.

Additional information such as the history, vulnerability of communities, vulnerability of property, the maximum threat and the probability of occurrences might be useful to determine the threshold value of such a risk. Ranking the threshold values (descending order), the highest threat can be identified for the municipality.

Not only are these threshold values useful, but a disaster risk profile map can be generating using GIS to visually display the information on a map. This map laid down the foundation to assist municipalities in the implementation of DRR plans.

4.2.4 Disaster Risk Reduction

As this Framework calls municipalities to integrate disaster management into sustainable development initiatives, the next step is to acknowledge these identified hazards and risk within the line-departments of the municipality. The reduction of all potential disaster risks are predominately the responsibility of each line department. Henceforth, it requires the integration and alignment of all potential threats within the IDP processes of the municipality. Not only does this integrates Disaster Management within sustainable development initiatives, but also ensure the funding of risk reduction programmes within the existed municipal structures.

4.2.4.1 Sustainable Development Policy

Next is to adapt the municipal policies with a specific emphasize on sustainable development. The alignment and integration of the DRR plan with the municipal SDF is deemed necessary for this purpose. Areas suitable for specific land-use types and development must accommodates the risk profile of the municipality. Therefore, areas that are not suitable for specific development nodes must clearly be defined.

4.2.4.2 Community Resilience

This Framework calls municipalities to enhance community resilience.

Community resilience is or the sustained ability of a community to withstand and recover from adversity (e.g., economic stress, influenza pandemic, manmade or natural disasters).

Main Definition:

Community resilience entails the ongoing and developing capacity of the community to account for its vulnerabilities and develop capabilities that aid that community in

- preventing, withstanding, and mitigating the stress of a health incident;
- recovering in a way that restores the community to a state of self-sufficiency and at least the same level of health and social functioning after a health incident; and
- using knowledge from a past response to strengthen the community's ability to withstand the next health incident

Key Components

Key components or "building blocks" of community resilience that affect both a community's pre-event vulnerability to disaster and its adaptive capacity to recover include

- the physical and psychological health of the population;
- social and economic well-being;
- individual, family, and community knowledge and attitudes regarding self-reliance and self-help;
- effective risk communication;
- level of social integration of government and nongovernmental organizations in planning, response, and recovery; and
- the social connectedness of community members

In order to build community resilience, a community must develop capabilities in the following areas:

- active engagement of community stakeholders in health event planning and personal preparedness,
- development of social networks,
- creation of health-promoting opportunities to improve the physical and psychological health of the community (as well as to address disparities in health across subgroups),
- plans and programs that address and support the functional needs of at-risk individuals (including children),
- institution of plans to respond effectively to the post-disaster physical and psychological health needs of community members, and
- rebuilding plans for health and social systems that can be activated immediately

The definition emphasizes the following concepts, which focus group participants suggested would be evident in a resilient community:

- Engagement at the community level, including a sense of cohesiveness and neighbourhood involvement or integration
- Partnership among organizations, including integrated pre-event planning, exercises, and agreements

- Sustained local leadership supported by partnership with national and provincial government
- Effective and culturally relevant education about risks
- Optimal community health and access to quality health services
- Integration of preparedness and wellness
- Rapid restoration of services and social networks
- Individual-level preparedness and self-sufficiency
- Targeted strategies that empower and engage vulnerable populations
- Financial resiliency of families and businesses, and efficient leveraging of resources for recovery

Proposed levers are designed to strengthen the five core components (shown in rectangular boxes), which are correlated with community resilience in the specific context of enhancing health security or public health preparedness. The components are the main domains or factors associated with community resilience, such as the health of the population. The levers are the means of reaching the components, such as improving a population's access to health services.

The levers are highlighted in boldface type below:

- **Wellness** and **access** contribute to the development of the social and economic well-being of a community and the physical and psychological health of the population
- Specific to the disaster experience, **education** can be used to improve effective risk communication, **engagements** and **self-sufficiency are** needed to build social connectedness, and partnership helps ensure that government and non-governmental organizations (NGS)'s) are integrated and involved in resilience-building and disaster planning
- **Quality** and **efficiency** are ongoing levers that cut across all levers and core components of community resilience

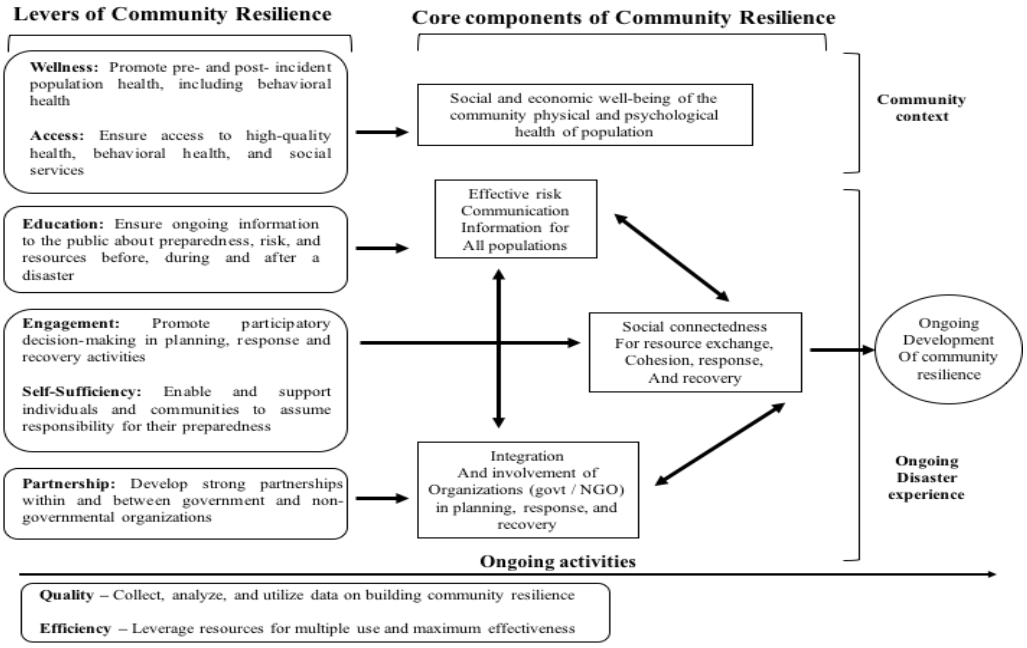

Figure 6: Levers and Core Components of Community Resilience

4.3 MACRO ENVIRONMENT

The Framework calls municipalities to take cognises of aspects happening in the macro environment. The macro environment are those things outside of the municipal area of jurisdiction, e.g. the political, economic, social, technological, climate and international arena.

Neglecting to analyse this environment may lead to an incomplete picture of the true threats and risks for a municipality and to its communities at risk.
For example, in the technological, climate, political and international arena, Global Research first published a secret weapon used for weather modification (electromagnetic warfare) under the heading of “Weather Warfare” on August 2010. The European Union called the project a global concern and passed a resolution calling for more information on its health and environmental risks.

HAARP (High Frequency Active Auroral Research Program) is a little-known, yet critically important U.S. military defence program, which has generated quite a bit of controversy over the years in certain circles. Though denied by HAARP officials, some respected researchers allege that secret electromagnetic warfare capabilities of HAARP are designed to forward the US military’s stated goal of achieving full-spectrum dominance by the year 2020. Others go so far as to claim that HAARP can and has been used for weather modification, to cause earthquakes and tsunamis, to disrupt global communications systems, and more.

“Who control the weather control the world” Paul Chehade

The methods include the enhancing of storms and the diverting of vapour rivers in the Earth's atmosphere to produce targeted droughts or floods.

Scientist Dr. Nicholas Begich-actively involved in the public campaign against HAARP-describes **HAARP** as:

"A super-powerful radio wave-beaming technology that lifts areas of the ionosphere (upper layer of the atmosphere) by focusing a beam and heating those areas. Electromagnetic waves then bounce back onto earth and penetrate everything-living and dead."

Dr. Rosalie Bertell depicts HAARP as "a gigantic heater that can cause major disruption in the ionosphere, creating not just holes, but long incisions in the protective layer that keeps deadly radiation from bombarding the planet."

Such a development in our international environment, using specialised technology to influence global weather patterns can have devastating results, increasing the vulnerability of countries and communities.

“Is it a co-incidence that 41% of drought disasters were in Africa, indicating that lower-income countries are still being overwhelmed by drought?”

4.3.1 Scenario Development

Scenario development is a simple method to prepare for many different “*what if*” type incidents. *What will happen if?* The following table (Table 1) is an example for scenario design

Table 1: Scenario design for Flash Floods

PARAMETER	KEY QUESTIONS	EXAMPLE (indicative)
Hazard	**Which Hazard?**	**Flash Floods**
Summary of events / Development of hazard	What is the chain of events leading to the hazard? (Is there a secondary hazard?)	Torrential rain (thunderstorm) – flash floods
Scene of occurrence	Where does the hazard originate?	*Hilly areas around municipality x*
Geographic extent	Which area is affected by the hazard?	*Villages a, b and c around municipality x.*
Time	When does the hazard take place?	*Afternoon at 13.00. Springtime.*
Duration	How long does it last?	*6 hours from start of heavy rainfall to end of flash floods.*
Intensity	How strong is the hazard/ flash flood?	*No data on flow/ volume. But within 2 hours a creek normally 20 cm deep swells to a torrent of 2 m.*
Warning	Is this an expected/ unexpected event? Is there any advance time to warn the population?	*Weather forecast warns of chance of heavy rains in the wider region but warning is unspecific. There is no advance warning.*
People and elements potentially affected	Who and what is in harms way? (People, infrastructure, services etc.)	*100 houses and gardens (small plots of agriculture) households of 3-4 people on average. Majority of population is old people, children and teenagers (many adults in working age have migrated for work and live abroad). There is one (asphalted) intra-village road and three dirt roads. One aqueduct and two drainage channels. One school and two health posts. One village administration building. with*
Reference for the Scenario	Have there been similar hazard events in the past? In the local government area (or in other adjourning areas)?	*Yes in 1976, 85, 1992 and 2002, 2010 and 2011. In a similar event in 2010 for instance there were 2 fatalities, 15 houses were destroyed, 20 were badly damaged etc. etc.*

In order to assess vulnerability or the expected impact of a hazard on a given territorial unit and population it is good to investigate key impact elements i.e. population, environment (buildings and lands), economy, services and infrastructure. The table (Table 2) below illustrates this step and helps to think through the possible impact of any given scenario.

Table 2: Assessing Impact and Vulnerability to Hazard Scenarios

CATEGORY	DAMAGE TYPE	DESCRIPTION	UNITS
People	Deaths	Persons who die as a consequence of the hazard	Number
	Injuries	Persons who are injured, or who become sick due to the incident	Number
Environment (Buildings, Waters and Lands)	Houses destroyed	Houses that have been totally or partially destroyed	Number
	Agricultural lands damaged	Agricultural land that is damaged/ cannot be used because of the hazard and number of people affected.	Ha Number of farmers/workers
Economy	Physical direct damage[18]	Total sum of replacement value of material damage	National Currency
Infrastructure	Water supply network damaged	Duration and spatial extent as well as number of people affected	Number, hours/ days
	Roads and Bridges damaged, and people isolated.	Duration/ and spatial extent as well as number of people affected	Number, hours/ days
Services	Health facilities and services damaged	Duration and spatial extent as well as number of people affected	Number, hours/ days
	Education facilities and services damaged	Duration and spatial extent as well as number of students affected	Number, hours/ days

It is important to note that different types of damages and underlying vulnerabilities are inter-connected i.e. numbers of deaths may be related to the availability and preparedness (or lack thereof) of health services, poor quality of roads (that delays rescue services) or the poor quality of construction of houses.

4.3.2 Risk Analysis Report

The information presented in the risk analysis report is supposed to be neutral and objective. Reports need to present key findings and conclusions in a way that is transparent and facilitates the verification of data and the tracing of analysis. This means that the methodology and sources of data need to be clearly presented. This includes an explanation of key assumptions and gaps and weaknesses in collected data (i.e. data that is outdated etc.) and how these weaknesses were dealt with.

Reports should be clearly structured and key information and conclusions should be presented in an executive summary preceding the main narrative. Graphs, photos and tables that help to

illustrate findings and conclusions should be included. The structure of reports will vary depending upon context. However, reports should highlight:

- Executive Summary
- Objectives and methodology of the analysis (including duration and key benchmarks of the analysis)
- General information about the reference area
- Key Hazard (Scenarios) affecting the area
- Risk Analysis (narrative, risk matrices(s), map(s)) including an analysis of:
  - *Key vulnerabilities and vulnerable groups*
  - *Key capacities and resources*
- Conclusions and proposed measures to reduce vulnerabilities and risks

Annexes might include further information on the composition of the working group, stakeholders, data-collection process, timeline of the analysis, sources of information etc.

The structure of the report should be agreed with the working group. Key conclusions and recommendations should also reflect agreement with the working group (and potentially with other key stakeholders, community representatives and experts). The local government should approve the final draft of the report officially.

Risk analysis is not an end in itself but performed as an essential component of Disaster Risk Reduction to inform a) prevention and mitigation and b) preparedness efforts. Ultimately risk analysis should result in plans and action. There are two main options once a disaster risk analysis is completed:

- Prepare and implement a disaster risk reduction plan and/ or
- Integrate disaster risk reduction issues and practices into local government plans and programmes (development; sector-specific)

If a Disaster Risk Reduction Action Plan is decided on, the Working Group will manage the transition from analysis to action planning. At this point, the Working Group may remain the same, or change membership; they may also appoint a sub-working group to write the Action Plan. Who will manage and write the plan, what it will include and how it will be implemented are all concerns that should be considered at the beginning of the analysis.

If DRR is mainstreamed into normal local government planning cycles, resource management and prioritization, no separate DRR Action Plan may be written. A process of mainstreaming will be long term and will need ongoing input from a Working Group or Management Team/ Steering Committee.

These plans should pursue the following principles and key goals;

- Ensure the sustainability of development against risks;
- Ensure the safety of the local government population;
- Reduce or eliminate risk to local infrastructure and services;

- Promote effective coordination between the local government administration, professionals, the general population and other agencies involved in disaster risk reduction; and
- Ensure compliance with all relevant legislation and regulation.

In some cases indicative findings from a disaster risk analysis may require further, more technical research into specific hazards and vulnerabilities *(i.e. the investigation and mapping of all landslide hazards or a structural analysis of a dam built 40 years ago of which design documents have not been preserved*). However, such research requires specific funding and will have to be included in local development plans and/ or proposals.

The results of a disaster risk analysis can also be used for awareness raising and education campaigns in the local government area (this may require adaptation of maps and summary of key messages from the report); to advocate for more funding for disaster risk reduction (to external agencies or national level) or to design funding proposals. The risk analysis may also help to promote the forming of local councils, school-based groups or staff associations to continue to bring different people and professions together for the promotion of safety and risk reduction.

5. DISASTER EMERGENCY PLANNING FOR PREPARDENESS, RESPONSE AND RECOVERY

Emergency and disaster planning involve a coordinated, co-operative process of preparing to match urgent needs with available resources

The phases are research, writing, dissemination, testing, and updating. Hence, an emergency plan needs to be a living document that is periodically adapted to changing circumstances and that provides a guide to the protocols, procedures, and division of responsibilities in emergency response. Emergency planning is an exploratory process that provides generic procedures for managing unforeseen impacts and should use carefully constructed scenarios to anticipate the needs that will be generated by foreseeable hazards when they strike. Plans need to be developed for specific sectors, such as education, health, industry, and commerce. They also need to exist in a nested hierarchy that extends from the local emergency response (the most fundamental level), through the regional tiers of government, to the national and international levels. Failure to plan can be construed as negligence because it would involve failing to anticipate needs that cannot be responded to adequately by improvisation during an emergency.

Plans are needed, not only for responding to the impacts of disaster, but also to maintain business continuity while managing the crisis, and to guide recovery and reconstruction effectively. Dealing with disaster is a social process that requires public support for planning initiatives and participation by a wide variety of responders, technical experts and citizens. It needs to be sustainable in the light of challenges posed by non-renewable resource utilization, climate change, population growth, and imbalances of wealth. Although, at its most basic level, emergency planning is little more than codified common sense, the increasing complexity of

modern disasters has required substantial professionalization of the field. This is especially true in light of the increasing role in emergency response of information and communications technology. Disaster planners and coordinators are resource managers, and in the future, they will need to cope with complex and sophisticated transfers of human and material resources. In a globalizing world that is subject to accelerating physical, social, and economic change, the challenge of managing emergencies well depends on effective planning and foresight, and the ability to connect disparate elements of the emergency response into coherent strategies.

5.1 EMERGENCY PLANNING

Emergency planning can be defined as the process of preparing systematically for future contingencies, including major incidents and disasters. The plan is usually a document, shared between participants and stakeholders that specifies tasks and responsibilities adopted in the multi-agency response to the emergency. It is a blueprint for managing events and, as such, should be responsive to management needs. It should specify the lineaments of action, collaboration, command, and communication during a civil contingency such as a disaster or major event; in other words, it is the framework for emergency response. The maintenance of public safety, limitation of damage, protection of the vulnerable, and efficient use of life-saving resources are some of the goals of the plan. Although the end product is a document, emergency planning is more a process than an outcome, especially as the plan itself will need to be updated over time as circumstances change.

An emergency plan must therefore, be adaptable to both anticipated and unexpected hazards. The primary resource is information, and hence everything possible should be done to ensure that flows of vital data and communications are unrestricted and properly focussed on essential needs. Emergency management, as supported by prior and on-going planning, should ensure that organizations can work together effectively under unfamiliar circumstances, possibly including organizations that have no formal relations under normal, non-emergency circumstances. The plan should ensure that every participant in the response to an emergency has a role, and that all anticipated tasks are covered such that the risk of hiatuses or disputes about responsibilities is minimized.

5.2 MULTI-AGENCY PLANNING

One source of complexity in emergency planning is the need to integrate several dimensions into the programmed emergency response. *Hierarchical divisions* refer to the tiers of government—from national, through regional, to local. *Geographical divisions* indicate the spatial jurisdictions to which plans refer, and possibly also to questions of mutual assistance. *Organizational divisions* refer to the different agencies that participate in emergency responses, such as the “blue light” services (police, fire, and ambulance), technical groups, and volunteer organizations. Lastly, *functional divisions* indicate the different fields involved, such as government, health care, public order, public works, economy and employment, finance, and the private sector (**Figure 7**). The emergency plan is one contribution to the process of articulating a system of response to civil contingencies, in which an optimum

balance is sought between integrating these forces and allowing them a degree of autonomy and freedom of action.

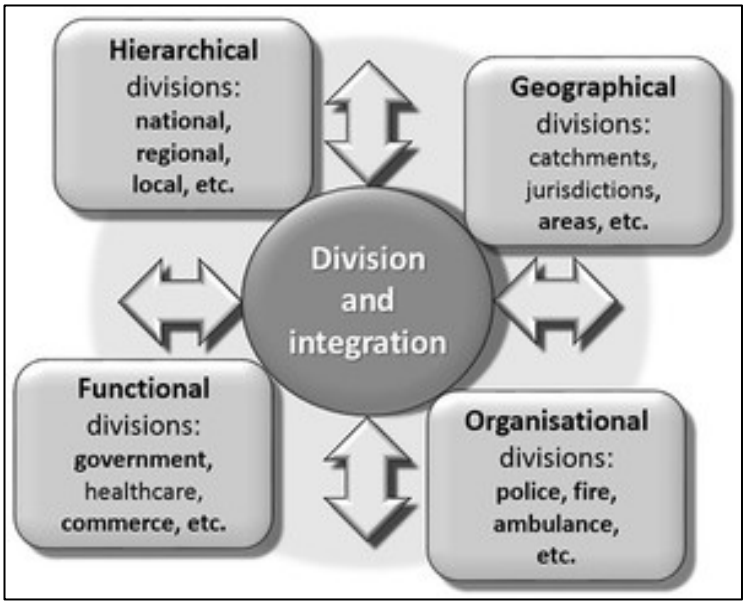

Figure 7: The different dimensions of division and integration in emergency planning and management

5.3 PLANNING AND WARNING PROCESSES

Whether natural or anthropogenic, hazards vary considerably in their predictability and the amount of lead-time, if any, for preparations to take place. Nevertheless, warning and associated responses are two vital elements of most emergency plans. Short-term warning must be distinguished from the longer-term predictability of hazards. Earthquakes, for instance, are mostly predictable in terms of the basic tenets of magnitude, frequency, and location, but not with regard to impending shocks in a short time window, such as 48 hours. In contrast, with adequate monitoring using Doppler radar, warnings can be issued for tornadoes with lead times of 20–120 minutes, and remote sensing together with digital modelling can give a reliable picture of a hurricane track many hours before the storm makes landfall.

Warnings have three essential components:

- scientific and technical,
- administrative, and
- social (**Figure 8**)

The absence or ineffectiveness of any of them renders the warning system inoperable. Scientific information on an impending hazard must be transformed into a message to be acted upon, and a decision must be taken to warn affected people, who must then hear and react appropriately to the warning. The emergency plan should determine how to transform information on hazards to advice or orders on how to react. It should prescribe the means of disseminating the message and monitoring the social reaction to it. In practical terms, evacuation or sheltering is usually the most appropriate reaction to warning and the best way

of moving people out of harm's way. However, the means and the routes to evacuate people must be available (or there must be appropriate, safe locations for in situ or vertical evacuation). Horizontal evacuation may require reception centres with staff, bedding, methods of procuring, preparing, and distributing food, and so on.

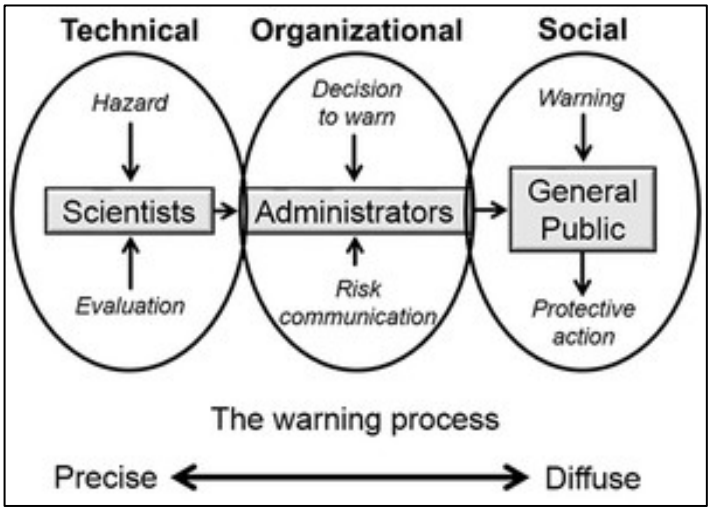

Figure 8: The components of the warning process

5.4 THE ROLE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY

Modern emergency responses are heavily reliant on information and communications technology (ICT). Many algorithms have been written to assist emergency operations, for example, by providing an "expert system" that aids decision making, or by helping record decisions as they are made. Emergency plans should reflect these innovations and the opportunities they bring for sharing information and developing a synoptic picture of a rapidly evolving situation on the ground. Plans can include or refer to protocols for messaging and communications, and thus help clarify and standardize them.

The emergency plan should either prescribe or describe the structure of command and management to be utilized in the case of a disaster or major incident. Modern information technology has tended to flatten the chain of command and has given rise to a more collaborative form of management, which lessens the reliance on militaristic principles of "command and control." Nevertheless, there will need to be a web of formal relationships between different organizations and units that participate in the response to disaster. The focal point of many of these is the emergency operations centre (EOC), which is usually also the "natural home" for an emergency plan, or in other words, the place where it is most appropriate to draw up and maintain such an instrument. The EOC needs to be a centre of communications and management, one that has functional autonomy (e.g., its own electrical generator and fuel stocks).

In a fully functional civil protection system, emergency resource hubs such as EOCs usually operate as a nested hierarchy. They will function within the compass of plans made at different levels of government and by different jurisdictions. It follows that the emergency plans

themselves will need to ensure interoperability and a rational division of responsibilities, so that all tasks can be covered in emergencies of different sizes. Once again, this involves comparative reading of plans and, preferably, some national guidelines for ensuring compatibility.

5.5 SPECIALIZED EMERGENCY PLANNING

A further issue is the need for emergency planning in different sectors. Municipalities might consider obliging the providers of fundamental services in the ***private sector*** to draw up emergency plans. This is necessary, as much of the nation's critical infrastructure is run by private-sector operators. Industrial firms also need plans, so that they can cope with technological failures and their consequences, and commercial companies need to ensure business continuity. Emergency plans are needed in both ***hospitals and the health systems*** of which they form a part. Hospital plans should state the preparations needed for internal and external emergencies. The former refers to contingencies such as fire, structural collapse, or contamination, and the latter mainly deals with the need to cope with mass casualty influxes. In addition, public transport services need emergency plans to guarantee the movement of people and goods during a crisis and its aftermath.

For example, the plans for an airport should be integrated with those of the city and region in which it is situated. Finally, there is an increasing realization that emergency plans are needed to protect cultural heritage, which includes a huge variety of sites and artefacts, many of which have highly specialized conservation requirements. Loss of cultural heritage in disasters such as floods and earthquakes can deal a catastrophic blow to the intellectual and artistic life of a country by obliterating or damaging an irreplaceable legacy.

Among specialized emergency plans, it is worth singling out those required for ***educational institutions.*** The collapse of thousands of schools in earthquakes in Pakistan (2005) and China (2008), and the consequential loss of thousands of young lives, underlines the importance of providing a safe education to pupils and students. This is a moral requirement, as well as one that all parents would support. Despite this, emergency planning for schools tends to be neglected and underrated. It is not merely a question of evacuation. Plans need to assess hazards and design strategies to manage situations safely. As in other forms of emergency planning, scenarios are needed. In one exemplary case, a school has developed different strategies to manage the response to floods and earthquakes, both of which threaten it. As teachers are *in loco parentis* for their young charges, there is a requirement to ensure that school students are looked after in safety throughout an emergency. Schools and other educational institutions have been the target of natural hazards such as earthquakes, tornadoes, landslides, floods, and snowstorms; terrorism, such as marauding gunmen; and structural collapse and fire. When many young lives are lost the sense of moral inadequacy can be universal, but not enough has been done to ensure that emergency planning for schools is transformed into universal practical measures to protect children and young adults.

The art of emergency planning involves "anticipating the unexpected." For example, one important aspect that is often overlooked is ***veterinary planning***.

This has three main categories:

- domestic,
- farm, and
- wild animals

Many people will not evacuate in the face of a major threat unless they can take their pets with them, and hence, provision needs to be made to accommodate domestic animals. In pastoral areas, farm economies are dependent on the care and welfare of animals, which can be trapped and drowned by floods, frozen by blizzards, affected by epizootic diseases, or deprived of feedstock. Planning to manage wild animals mainly refers to threats to the human population posed by ecological disruption in disasters due, for example, to the migration of dangerous reptiles or the possible spread of rabies.

Another form of planning that is roundly neglected is that associated with ***prison populations***. In floods, storms, and earthquakes, these individuals have been either confined to dangerous localities or released indiscriminately into the community. Prisoners have human rights, including the right to custodial safety, but to release hardened criminals into society may pose risks to the general population.

Finally, during the difficult circumstances engendered by disaster, pharmaceutical emergency planning is needed in order to ensure continuity of ***medication*** for patients who depend on medical drugs.

5.6 USING THE PLAN IN AN EMERGENCY

One ingredient of most emergency plans is a stipulation of the alert and call-up procedures for personnel. These need to be integrated with the potential phases of warning, which at their simplest are hazard watch (impact is possible or likely) and hazard warning (impact is highly likely or certain). A part of the plan may be dedicated to the preparations to be made before impact, if time is likely to be available to carry them out. Examples include putting up mobile flood defences, marshalling and readying vehicles and equipment, and testing and readying the means of field communication. The impact phase of a disaster is usually a period, more or less brief, characterized by dynamic evolution and acute shortage of information.

One of the first needs is for an assessment that determines whether to move into emergency mode. The declaration of a state of emergency allows the formal abandonment of normal working procedures and the immediate adoption of those that pertain strictly to the disaster. Hospital beds will be cleared, leave will be cancelled, and personnel will move to predetermined locations, lines of communication will be opened, and so on. The emergency phase may continue for hours or days, and in exceptional cases for weeks. However, it should end with a formal declaration of “stand-down,” as prescribed in the plan, which releases personnel for leave and ordinary duties.

5.7 TESTING AND REVISING THE PLAN

In most parts of the world, major incidents and disasters are, thankfully, rare, although they may be an ever-present threat. The emergency plan therefore needs to be tested under hypothetical conditions. Exercises and drills can be divided into table-top, command post, and field-based simulations. The last category is clearly the most onerous, and it may require up to six months of meticulous planning. Generally, none of these methods is capable of testing the whole plan, and so elements of it must be selected for verification by simulation. One common element is the ability of different organizations to work together under specific, unfamiliar circumstances; for example, the ability of different medical response organizations to set up and run a field hospital together.

Exercises need to be designed with clear, well-formulated objectives, and the progress of the simulation needs to be carefully monitored so that any need for improvements can be detected and communicated to participants in post-exercise debriefings and reports. All of this needs to be done in an atmosphere of constructive support, and certainly not recrimination, as the aim is not to examine but to help participants improve their performance during future emergencies. Simulations need to be treated as learning processes, from which it may be possible to derive improvements to the plan. One hopes that in real emergencies it will also be possible to learn lessons and improve the emergency plan on the basis of real experience. One such lesson is that personal familiarity with other participants in emergency operations greatly improves the ability to work together. This underlines the value of emergency simulations and drills.

The emergency plan should be a living document. In fact, there is nothing worse than the “paper plan syndrome”—or its modern digital equivalent—in which the plan is formulated and relegated to a desk drawer (or a hard drive) without being used or updated. Such plans can do more harm than good when they are eventually put to the test by a crisis. As time wears on, both small and large changes will occur. Hence, the plan should include provisions, for not only disseminating it and training its users, but for a process of constant updating, with checks at regular intervals, perhaps every six months.

5.8 PLANNING THE RECOVERY FROM DISASTER

The so-called “disaster cycle” refers to the phases of resilience building, preparation, emergency response, recovery, and reconstruction. A cycle is used because many disasters are recurrent, although not all are truly cyclical. Clearly, emergency and disaster planning refer primarily to the response phase. However, they have some relevance to all the other phases as well. Emergency planning is largely practiced during the risk mitigation, or resilience-building, phase—the calm periods between major adverse events. It must address the preparation phase as well as the response phase, as there is a need to make preparations systematic, especially where there is enough prior warning of impact for this to be accomplished successfully. While recovery planning may be regarded as a separate process from emergency planning, the two go together in that the phases of recovery offer an opportunity to improve general emergency planning and readiness for the next impact.

In most sudden impact disasters, there is no reason why recovery planning should not begin the day after the event. It is important to note that time is socially necessary in recovery.

Consultation must take place, and alternative strategies must be investigated. The aim should not be to “bounce back,” but to “bounce forward” to a more resilient society that is able to face up to future disasters by a better combination of resistance and adaptation than that which existed before the current impact. Recovery from a major disaster can take decades, and during that time socio-economic conditions will change, and so probably will environmental and hazard conditions. A disaster characterized by death, injury, psychological impairment, destruction, damage, and loss of economic activities, assets, and employment will engender a complex aftermath. In this there is much potential for wrong decisions, unless objectives are carefully set, procedures are clearly identified, and there is a consensus about how the process should take place.

Major disasters such as large floods, cyclonic storms, and earthquakes may not only take a large toll of casualties but may also destroy a great deal of housing stock and business premises. This will stimulate a process of providing shelter, which may involve temporary and transitional solutions to the housing problem before permanent reconstruction of building stock can be achieved. In this process, there is or rather there should be, a social contract that indicates that survivors will endure the privation of temporary or transitional housing providing it is for a finite and not excessive period.

5.9 PLANNING FOR CRITICAL INFRASTRUCTURE AND SUPPLY CHAINS

One of the most complex and challenging aspects for recovery planners is the rebuilding of critical infrastructure. Critical infrastructure (which also includes sectors such as food distribution and banking) can be divided broadly into that of national importance and that of purely local significance. In many cases, resilience in networks is a function of being able to find different routes through the network. However, blockages can be critical, and infrastructure may be peculiarly susceptible to cascading disasters. In these, the consequences of one failure are the cause of others, in a sort of “domino effect.”

Supply chains are essential to humanitarian operations and emergency responses. Emergency planning for them has two aspects. The first is an element of business continuity. It seeks alternative ways to ensure supplies of goods or services, in order to keep productivity from falling because of interruption of normal business. It thus depends on redundancy, which is potentially an expensive quality, as it may require the duplication of assets. This requires planners to determine which assets are critical, and where the destruction or failure of assets may have a critical effect on the whole production cycle. The second aspect of supply chain planning involves ensuring efficiency in humanitarian supply, such that the forces on the ground are not left bereft of the equipment, goods, and manpower that are needed to tackle the emergency effectively.

5.10 RECONSTRUCTION PLANNING

Planning to manage the reconstruction of housing involves some difficult choices about who should build what and where. It is important to avoid excessive price rises in the market for building materials. It is also essential to involve local people, the beneficiaries in the process of designing, constructing, and adapting permanent housing. In some situations, its users build

the best housing, while in others it is not possible to learn the necessary skills and so contractors must be used, but the designs should respond directly to the users' needs.

An important matter in reconstruction planning is the extent to which transitional shelter should be provided. If the terrain studies, site urbanization, preparation, and building processes are likely to take years, and if funding for them is short, then it may be necessary to put people in temporary accommodation, usually consisting of prefabs or so-called "barrack houses." The space allotted per family varies from 10 to 40 square meters.

Recovery and reconstruction planning should aim to revive the local area while at the same time making it safer against future disasters. Revival means rebuilding basic facilities, such as housing, infrastructure, and amenities, but it also means ensuring that livelihoods and the local economy are rebuilt. Experience suggests that this is easiest for settlements that are well connected politically and geographically, and hardest for those that are politically, spatially and economically marginalized. There is a welfare function in recovery from disaster, and this begs the question of what welfare should involve. At its worst, copious but ill-thought-out assistance to a disaster area can bring the population into a state of aid dependency that is bound to end in negative consequences, as the assistance is unlikely to be perpetual. Reviving the local economy can instead create self-sufficiency and tax revenues that help the area revive itself.

5.11 OTHER ASPECTS OF RECOVERY AND RECONSTRUCTION PLANNING

The fundamental purpose of welfare is to support people who lack the ability and resources to provide themselves with a minimum acceptable standard of living. Disaster throws this issue into high relief by differentially affecting the poor and needy more than the wealthy. Welfare should not mean largesse; however attractive this may seem to politicians when they remember that disaster victims are also voters. Instead, scarce resources should be utilized to provide a safety net for the most vulnerable people in society, and thus to mitigate the differential effect of disaster.

From these reflections, it should be apparent that there would be parallel processes of planning that have different weights and salience at different points in the cycle of recurrent disasters (**Figure 9**). To ensure a holistic response to the threat of disaster, recovery, and reconstruction, planning should be linked to on-going emergency planning initiatives and to business continuity planning. Urban and regional planning should have links to all of these processes, because they are all about reducing the risk to development and all about the "hazardousness of place.

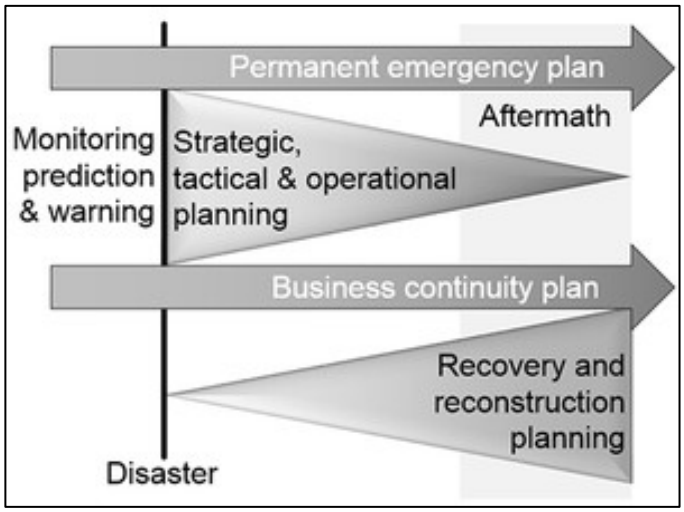

Figure 9: Parallel forms of planning in the sequence of response to and recovery from disasters

6. PUBLIC AWARENESS AND EDUCATION

From experience, it became clearer that disaster prevention and mitigation programs without successfully educating the members of vulnerable communities are inadequate and unsuccessful

From an engineering and an economic point of view, the solution to DRR is quite easy, but complexity is added to the problem when and where humans are exposed to the risk. The social aspects of the human race over rights simple solutions and municipalities have to deal with these more complex issues in the DRR programs. Appropriate public awareness and education (PAE) programs is therefore a necessity.

This Framework calls therefore municipalities to formulate and to implement PAE and path the way with the following four key approaches;

- Campaigns
- Participatory Learning
- Informal Education
- Formal school-based interventions

6.1 CAMPAIGNS

The focus of campaigns is to provide uniform, large-scale impact with standard messages. There are many examples of large-scale national and international public awareness campaigns that have led to massive social change. Examples include childhood immunization, the wearing of seat belts in cars, and smoking restrictions. Campaigns comprise a set of activities that may include:

- publications, including billboards, posters, newspaper or magazine coverage, information cards, flyers, bookmarks and brochures

- curricula, modules and presentations, including slide presentations and oral presentations
- e-learning
- performing and cultural arts
- games and competition
- audio and video materials
- web pages and activities
- social media and telecommunications.

These activities can be divided into the key components and variations of this approach, shown in Table 3.

Table 3: Key components of campaigns and variations

KEY COMPONENTS	VARIATIONS
Message	• One message or several • All together or separately
Audience	• National • District • Local
Strategy	• Launch • Focal days, such as an anniversary or memorial day • A national preparedness day or week • A Red Cross Red Crescent day or week • International Disaster Reduction Day (in October) • Weekly or monthly events or activities • Awards or competitions • Demonstrations
Timing	• Length: short term or long term • Duration: year round or seasonal • Frequency: one off or recurring

The usual pattern is that 'early adopters' (such as National Societies) lead the way, using their enthusiasm and energy to convince the 'early majority' (the deliberate and sceptical masses) to join them. Gradually, as public support and voluntary compliance builds, public policy change becomes easier to implement. Rules and incentives can help to bring the 'late majority' in. Finally, there will be 'stragglers', who may resist until there are penalties.

Most successful campaigns require a sustained, repeated and consistent thematic set of messages repeated over a long period of time, through activities in the public, education, private and civic sectors. These are often built by a unifying coalition under a single umbrella. Some recur seasonally (for example, in the case of hurricane season). Others are ongoing, and select an annually changing sub-theme, or a monthly calendar with 10–12 messages per year.

The strongest, and most memorable, campaigns have been built around a single unifying and enduring slogan expressed and delivered in a multitude of creative ways through both predictable and recurring outlets as well as new surprises.

Table 4: Advantages and disadvantages of the of the campaign approach

ADVANTAGES	DISADVANTAGES
• Reaches the largest numbers of people with standard messages • Attract mass media attention • Builds on strengths of all partners	• Must be carefully planned and thought through • Require excellent organization • Requires strong support of partners • Stamina is required: campaigns should not end until they succeed

6.2 PARTICIPATORY LEARNING

People are especially motivated by approaches in which they themselves participate in a solution, and especially when they believe it is their own idea. The focus of participatory learning is to engage people in discovery and problem solving for disaster risk reduction. At the heart of all of these activities is the community's own experience of empowerment.

This involves using language, stories, songs and traditions to strengthen the emerging culture of prevention. Typically accomplished through tools such as:

- action-oriented research such as vulnerability and capacity assessment
- disaster management planning
- implementing risk reduction measures
- monitoring and improving on plans through drills and simulations

These four elements of participatory learning can be applied at three levels:

- The organizational level – headquarters, branches, schools, businesses, workplaces, homes
- The community level – being scaled up to reach villages, towns, cities, school systems, and regions
- The population level – being expanded to incorporate entire urban populations, by taking advantage of internet-based tools and social media.

Parallel tools specifically for use with children and for marginalized populations can be valuable as well.

Specific tools within this approach include:

- publications such as booklets
- curricula, modules and presentations
- participatory activities such as transect walk, risk and asset mapping, seasonal calendar, group discussion, drills, simulations and table top exercises
- audio and video materials, including videos, audio clips and songs or other music
- web pages and activities such as workspaces
- social media and telephone-based initiatives, such as text messaging and polling

6.2.1 Vulnerability and capacity assessment

More than 60 National Societies have some experience with vulnerability and capacity assessment (VCA) approaches, using traditional tools incorporated into facilitator training modules and supplementary toolkits for application in rural communities. These include:

- transect walk
- community risk and capacity mapping
- seasonal calendar
- focus-group discussions

In VCA, the focus of the learning is identifying and prioritizing threats and hazards, recognizing and mobilizing resources and capacities, and beginning disaster reduction action planning. This process may result in the community doing one of the following:

- fulfilling the task themselves and making their community safer (change)
- enlisting support from the municipality or other organizations (advocate for or in influence change)
- acknowledge that the solution is very complex and will require a longer-term process (transform). This may also lead to legislative advocacy

6.2.2 Participatory disaster management planning

Participatory disaster management planning takes the VCA approach forward one more step by establishing a model for the long-term ongoing process of planning for risk reduction and response.

Step-by-step guide: Planning participatory disaster management

Step 1: Develop guidance and training materials

Guidance and training materials are needed for the following reasons:

- to evaluate and apply appropriate physical and/or environmental protection measures
- for risk reduction
- to develop disaster response skills

Step 2: Learn and practise skills

Participatory learning takes place as skills are learned and practised, for example, in the following areas:

- evacuation route planning
- cyclone and flood shelter construction and maintenance
- creating rainwater drainage channels and harvesting rainwater
- fastening furnishing and equipment against earthquake shaking
- response simulation drills

Step 3: Provide training

The need for disaster response skills may be met through training in:

- community first aid
- mass casualty triage
- response organization
- light search and rescue
- fire suppression
- emergency communications
- psychosocial support
- family reunification

Step 4: Carry out drills and simulations

At their best, drills and simulations provide much more than simply an occasion for professional responders to practise their skills and monitor their plans. They also offer an opportunity for the public to do some reality testing, allowing lessons to be learned in advance of hazard impacts.

The most important part of the drill is the full participation of the communities, and the reflection and renewed round of action planning that occurs after the drill, which leads to the plan being modified. Large-scale annual community-wide drills can sustain public awareness and ongoing learning by doing.

Table 5: Advantages and disadvantages of the of the participatory learning approach

ADVANTAGES	DISADVANTAGES
• This approach begins with communities' self-identified threats and vulnerabilities, developing strong risk awareness • Identifying resources and capacities leads to greater confidence and self-sufficiency • Builds local and personal ownership • Provides opportunity to integrate disaster reduction, health, water and sanitation, livelihood protection and climate-change adaptation • Requires participant communities to own their own data and plans • Enables National Societies and branches to work with people rather than for them	• Identifying risk without carrying out other activities does not lead automatically to knowledge of solutions • It can be labour intensive to create impact on small population • Facilitators need substantial training in participatory research methods, culture and cultural sensitivity, team building, group dynamics, recording and interpreting data • Comprehensive VCA processes require significant time commitment from volunteers and community participants • Solutions may be complex • Adaptations are required for urban applications • Community needs and priorities may go beyond donor priorities and regional committees' ability to support

• Attracts social volunteers, building organizational capacity and improving relationships among all partners • Can draw on the wide range of community risk assessment tools available for adaptation • Possible for schoolchildren and youth to participate in similar processes	• Mitigation activities require a range of high-quality guidance materials and training programmes • Advocacy actions that are called for may encounter resistance and need additional skills and support

6.3 INFORMAL EDUCATION

The focus of informal education is taking advantage of brief moments and encounters to stimulate thinking and engage people in discovery of actions and behaviours to increase safety and resilience. Informal education in communities and schools is the most flexible of all approaches with respect to setting, audience and timeframe. Table 6 shows the various types of informal education available

Table 6: Types of informal education

Public	Group	Solitary
Home	School	Work
Television	Radio	Internet
A few minutes	A couple of hours	A day or two
Specially planned	Infused into ongoing projects	Spontaneous or viral elements

Specific tools that can be used for informal education include:

- **Publications** – posters, guidelines, flyers, brochures, booklets, activity books, paper models, comic books, story books, colouring books, assembly kits and teacher resources
- **Curricula, modules and presentations** – teacher briefings and community training
- **E-learning** – self-study curricula
- **Performing and cultural arts** – plays, dances, poems, songs, street theatre, puppet theatre
- **Games and competitions** – card games, board games, cooperative, activities role play, drawing competitions, writing competitions, tournaments, radio quizzes
- **Audio and video materials** – short videos, radio programmes, television programmes
- **Web pages and activities** – web sites, online games, online quizzes
- **Social media and telecommunications** – SMS, early warning

Informal education involves disseminating standard messaging but with the flexibility to accommodate the needs and concerns of specific local audiences. This is particularly effective because peer information, social proof and social support are vital to shifting human behaviour.

Volunteers are leaders and role models that offer powerful examples as they engage the wider public. Tools focused on stimulating discovery and problem solving allow scope for endless creative activities and materials to appeal to various target-audience segments.

Table 7: Advantages and disadvantages of the informal education approach

ADVANTAGES	DISADVANTAGES
• Fun for volunteers • Fun for participants • Can support and strengthen wider campaigns • Takes full advantage of volunteer strengths and skills • Includes younger children • Schools can be hub for attracting parents • Young children can involve parents • Youth can involve one another • Activities can be designed to reach women and men, boys and girls, people with disabilities, and many language groups • Informal education in schools can be a stepping stone to formal introduction into curriculum	• Variable penetration across geography and time • Planning for scale and sustainability are challenging • Should not attempt involvement in school disaster management or school curriculum without education authorities' consent • Where other organizations provide similar school-based programmes, consistency requires inter-agency coordination • Special outreach may be needed to reach children and youth not in school

6.4 FORMAL SCHOOL-BASE INTERVENTIONS

The focus of formal school-based interventions covers two areas: school disaster management and disaster risk reduction in school curricula. These are considered to be formal because accountability and responsibility for school safety and curricula belong exclusively to education authorities, so they require support for long-term planning and capacity building. Whether there is one such authority, many, or seemingly none, the same issues of caution remain.

Unless efforts are being officially and systematically piloted or tested, inconsistency may undermine rather than support the goal. No matter how schools are organized, where possible a proper approach should begin with a group of interested NGOs and intergovernmental organizations that approach school authorities in a spirit of collaboration, in order to offer support and identify a single focal point within the system. Expecting schools to contend separately, with multiple uncoordinated projects and programmes, places a burden on school authorities and is ultimately unproductive. The goal is not to run a parallel system, but to support and help develop capacity within existing public education systems. The team should also approach and involve national disaster management authorities.

6.4.1 School disaster management

The primary goals of school disaster management are to ensure the safety of students and staff, and for education to continue. Sustained school disaster management requires the familiar participatory and ongoing process of identification of hazards and risks, mitigation and reduction of risks, and developing response capacity. In order to be effective, these need to be led by school staff and supported by consistent policies throughout the jurisdiction.

6.4.2 School drills

School drills form a vital part of the school disaster management process and provide an intensive learning experience. They should be followed by reflection and assessment by all members of the school community. Lessons learned are incorporated into the school disaster management plan, and goals set for improvement next time. Depending on hazards faced, there several major types of drills that can be practised:

- building evacuation (if the building is unsafe)
- site evacuation (if the site is unsafe)
- shelter in place (a procedure for taking shelter if the outdoors is unsafe)
- lockdown (keeping students inside in case of violent attack)

6.4.3 Curriculum work

School-based curriculum work in disaster reduction takes three main forms, each appropriate to different contexts:

- standalone courses
- integrating short modules (specific subjects and grade levels)
- infusion throughout the curriculum (multi-subject, using readings, examples, problems and activities)

Tools in this area fall into the category of curricula, modules and presentations, including:

- textbooks
- modules
- case studies
- exercises
- hands-on learning materials
- informal education tools

Standalone courses are much easier for ‘outsiders’ to contribute to, but much harder to incorporate into the available time in the curriculum. All forms require roughly the same sequence of steps and leadership from skilled curriculum experts, as described below.

Step-by-step guide: Developing a standalone course

Step 1: Identify public education curriculum development focal points and content experts with whom you can work in partnership

Step 2: Familiarize yourself with, or audit, the existing school curriculum to find out where disaster reduction and climate adaptation and mitigation issues are already being addressed, and where they can be enhanced or introduced
Step 3: Articulate and agree on the scope and sequence of competency outcomes
Step 4: Develop content for students
Step 5: Develop support materials and/or training for teachers (self-study, in- service, and/or training through teacher-training colleges or universities)

Table 8: Advantages and disadvantages of the of the curriculum approach

ADVANTAGES	DISADVANTAGES
• Integrating disaster reduction into the curriculum assures sustained learning across generations • Articulated subject matter leaves no room for doubt about its importance • Entry points into curricula are fairly easily identified within existing curricula at all grade levels, and in many different subjects, including natural sciences, environment, geography, history, social studies, language and literature, health and safety, and civics • Module materials can be developed relatively easily • Without adding to the curriculum, disaster reduction examples can be used to support objectives in literacy, writing, numeracy, critical thinking, problem solving and cooperative learning • Infusion into the curriculum requires less capacity building as the content is introduced subtly through many subjects	• Education authorities and teachers may feel that they cannot add one more thing to an already full curriculum • Standalone courses may be offered only as electives, and modules may be used only on a voluntary basis by interested teachers • Teachers may not feel capable of teaching unfamiliar material, and may require extensive support • Working with education authorities in the context of curriculum adoption cycles requires a long-term commitment by professional educators and content experts • Once infusion is accomplished, it can be difficult to discern and point to

7. EARLY WARNING

Early warning is a major element of disaster risk reduction

It prevents loss of life and reduces the economic and material impact of disasters. To be effective, early warning systems need to actively involve the communities at risk, facilitate public education and awareness of risks, effectively disseminate messages and warnings and ensure there is constant state of preparedness.

7.1 KEY ELEMENTS

A brief section on the four elements of early warning: risk knowledge; technical monitoring and warning service; communication and dissemination of warnings; and community response capability is included to emphasize the major components that comprise an effective people-centred early warning system, and why each is important.

In addition to the four elements, a number of crosscutting issues that are critical to the development and sustainability of effective early warning systems have been outlined. These include effective governance and institutional arrangements, a multi-hazard approach to early warning, involvement of local communities and consideration of gender perspective and cultural diversity. An explanation of the main actors involved in early warning activities, and their roles and responsibilities, is included to provide some context and further background to the list of key actors presented at the beginning of each of the checklists.

This Framework call municipalities for a people-centred early warning system (PCEWS)

The objective of people-centred early warning systems is to empower individuals and communities threatened by hazards to act in sufficient time and in an appropriate manner to reduce the possibility of personal injury, loss of life and damage to property and the environment. A complete and effective early warning system comprises four inter-related elements, spanning knowledge of hazards and vulnerabilities through to preparedness and capacity to respond. Best practice early warning systems also have strong inter-linkages and effective communication channels between all of the elements.

7.1.1 Risk Knowledge

The objective of people-centred early warning systems is to empower individuals and communities threatened by hazards to act in sufficient time and in an appropriate manner to reduce the possibility of personal injury, loss of life and damage to property and the environment. A complete and effective early warning system comprises four inter-related elements, spanning knowledge of hazards and vulnerabilities through to preparedness and capacity to respond. Best practice early warning systems also have strong inter-linkages and effective communication channels between all of the elements.

7.1.2 Monitoring and Warning Service

Warning services lie at the core of the system. There must be a sound scientific basis for predicting and forecasting hazards and a reliable forecasting and warning system that operates 24 hours a day. Continuous monitoring of hazard parameters and precursors is essential to generate accurate warnings in a timely fashion. Warning services for different hazards should be coordinated where possible to gain the benefit of shared institutional, procedural and communication.

7.1.3 Dissemination and Communication

Warnings must reach those at risk. Clear messages containing simple, useful information are critical to enable proper responses that will help safeguard lives and livelihoods. Regional, national and community level communication systems must be pre-identified and appropriate authoritative voices established. The use of multiple communication channels is necessary to ensure as many people as possible are warned, to avoid failure of any one channel, and to reinforce the warning message.

7.1.4 Response Capability

It is essential that communities understand their risks; respect the warning service and know how to react. Education and preparedness programmes play a key role. It is also essential that disaster management plans be in place, well practiced and tested. The community should be well informed on options for safe behaviour, available escape routes, and how best to avoid damage and loss to property.

Figure 10: Four Elements of People-centred Early Warning Systems

7.2 CROSS-CUTTING ISSUES

There is a range of overarching issues that should be taken into account when designing and maintaining effective early warning systems.

7.2.1 Effective Governance and Institutional Arrangements

Well-developed governance and institutional arrangements support the successful development and sustainability of sound early warning systems. They are the foundations upon which the previously outlined four elements of early warning are built, strengthened and maintained.

Good governance is encouraged by robust legal and regulatory frameworks and supported by long-term political commitment and effective institutional arrangements. Effective governance arrangements should encourage local decision-making and participation which are supported by broader administrative and resource capabilities at the national or regional level.

Vertical and horizontal communication and coordination between early warning stakeholders should also be established.

7.2.2 A Multi-Hazard Approach

Where possible, early warning systems should link all hazard-based systems. Economies of scale, sustainability and efficiency can be enhanced if systems and operational activities are established and maintained within a multi- purpose framework that considers all hazards and end user needs.

Multi-hazard early warning systems will also be activated more often than a single-hazard warning system, and therefore should provide better functionality and reliability for dangerous high intensity events, such as tsunamis, that occur infrequently. Multi-hazard systems also help the public better understand the range of risks they face and reinforce desired preparedness actions and warning response behaviours.

7.2.3 Involvement of Local Communities

People-centred early warning systems rely on the direct participation of those most likely to be exposed to hazards. Without the involvement of local authorities and communities at risk, government and institutional interventions and responses to hazard events are likely to be inadequate.

A local, ‘bottom-up’ approach to early warning, with the active participation of local communities, enables a multi-dimensional response to problems and needs. In this way, local communities, civic groups and traditional structures can contribute to the reduction of vulnerability and to the strengthening of local capacities.

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7.3 KEY ACTORS

Developing and implementing an effective early warning system requires the contribution and coordination of a diverse range of individuals and groups. The following list provides a brief explanation of the types of organizations and groups that should be involved in early warning systems and their functions and responsibilities.

Communities, particularly those most vulnerable, are fundamental to people-centred early warning systems. They should be actively involved in all aspects of the establishment and operation of early warning systems; be aware of the hazards and potential impacts to which they are exposed; and be able to take actions to minimize the threat of loss or damage.

Local governments, like communities and individuals, are at the centre of effective early warning systems. They should be empowered by national governments, have considerable knowledge of the hazards to which their communities are exposed and be actively involved in the design and maintenance of early warning systems. They must understand advisory information received and be able to advise, instruct and engage the local population in a manner that increases public safety and reduces the possible loss of resources on which the community depends.

National governments are responsible for high-level policies and frameworks that facilitate early warning and for the technical systems that predict and issue national hazard warnings. National governments should interact with regional and international governments and agencies to strengthen early warning capacities and ensure that warnings and related responses are directed towards the most vulnerable populations. The provision of support to local communities and governments to develop operational capabilities is also an essential function.

Regional institutions and organizations play a role in providing specialized knowledge and advice which supports national efforts to develop and sustain early warning in countries that share a common geographical environment. In addition, they encourage linkages with international organizations and facilitate effective early warning practices among adjacent countries.

International bodies can provide international coordination, standardization, and support for national early warning activities and foster the exchange of data and knowledge between individual countries and regions. Support may include the provision of advisory information, technical assistance, and policy and organizational support necessary to aid the development and operational capabilities of national authorities or agencies.

Non-governmental organisations play a role in raising awareness among individuals, communities and organizations involved in early warning, particularly at the community level. They can also assist with implementing early warning systems and in preparing communities

for natural disasters. In addition, they can play an important advocacy role to help ensure that early warning stays on the agenda of government policy makers.

The private sector has a diverse role to play in early warning, including developing early warning capabilities in their own organizations. The media plays a vital role in improving the disaster consciousness of the general population and disseminating early warnings. The private sector also has a large untapped potential to help provide skilled services in form of technical manpower, expertise or donations (in-kind and cash) of goods or services.

The science and academic community has a critical role in providing specialized scientific and technical input to assist governments and communities in developing early warning systems. Their expertise is central to analysing natural hazard risks facing communities, supporting the design of scientific and systematic monitoring and warning services, supporting data exchange, translating scientific or technical information into comprehensible messages, and to the dissemination of understandable warnings to those at risk.

7.4 KEY ELEMENTS

The following are key elements for a successful PCEWS;

7.4.1 Risk Knowledge

Aim: Establish a systematic, standardized process to collect, assess and share data, maps and trends on hazards and vulnerabilities.

Key Factors

International, national and local disaster management agencies; meteorological and hydrological organizations; geophysical experts; social scientists; engineers; land use and urban planners; researchers and academics; organizations and community representatives involved in disaster management

7.4.2 Monitoring and Warning Service

Aim: Establish an effective hazard monitoring and warning service with a sound scientific and technological basis.

International, national and local disaster management agencies; meteorological and hydrological organizations; geophysical experts; social scientists; engineers; land use and urban planners; researchers and academics; organizations and community representatives involved in disaster management

7.4.3 Dissemination and Communication

Aim: Develop communication and dissemination systems to ensure people and communities are warned in advance of impending natural hazard events and facilitate national and regional coordination and information exchange

International, national and local disaster management agencies; national meteorological and hydrological services; military and civil authorities; media organizations (print, television, radio and on- line); businesses in vulnerable sectors (e.g. tourism, aged care facilities, marine vessels); community- based and grassroots organizations

7.4.4 Response Capability

Aim: Strengthen the ability of communities to respond to natural disasters through enhanced education of natural hazard risks, community participation and disaster preparedness

Community-based and grassroots organizations; schools; universities; informal education sector; media (print, radio, television, on-line); technical agencies with specialised knowledge of hazards; international; national and local disaster management agencies; regional disaster management agencies

7.4.5 Governance and Institutional arrangements

Aim: Develop institutional, legislative and policy frameworks that support the implementation and maintenance of effective early warning systems

Political leaders; policy makers (e.g. environment, development and planning departments); international, national and local disaster management agencies; meteorological and hydrological organizations; researchers and academics; non-government organizations