Earthquakes
Guidelines on preparing,
responding and recovering

International Federation
of Red Cross and Red Crescent Societies

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Strategy 2020 voices the collective determination of the IFRC to move forward in tackling the major challenges that confront humanity in the next decade. Informed by the needs and vulnerabilities of the diverse communities with whom we work, as well as the basic rights and freedoms to which all are entitled, this strategy seeks to benefit all who look to Red Cross Red Crescent to help to build a more humane, dignified, and peaceful world.

Over the next ten years, the collective focus of the IFRC will be on achieving the following strategic aims:

1. **Save lives, protect livelihoods, and strengthen recovery from disasters and crises**

2. **Enable healthy and safe living**

3. **Promote social inclusion and a culture of non-violence and peace**

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FOREWORD

The context of earthquakes is unique within the natural disaster management domain. This is mainly because earthquakes remain largely unpredictable and have very rapid onsets. The way we approach earthquake preparedness and response differs from how we respond to storms and floods and other large-scale sudden-onset disasters. A major factor determining the impact of an earthquake is the level of human development itself – as earthquakes themselves don't kill people but the collapse of buildings do. Addressing underlying causes of vulnerability to earthquakes requires advocacy and action on appropriate building codes and standards. Rapid and mostly unplanned urban development, particularly in the fast-growing transitional economies of Asia and Latin America, is bringing with it unprecedented levels of risk. This trend requires the global disaster-management community and National Societies to evolve new tools and develop capacities for earthquake risk management.

Our humanitarian response to earthquake disasters has become more successful and significantly more complex over the last decade. Landmark experiences in recent years have included the 2004 Sumatra Earthquake that triggered a tsunami affecting countries across Asia, the Middle East and Africa and the 2005 India-Pakistan Kashmir Earthquake that impacted difficult-to-reach locations along a disputed international border. The 2010 Haiti Earthquake affected over a million people in one densely populated city alone, while the 2011 Japan Earthquake caused a chain of disasters including a devastating tsunami and a nuclear crisis. In each of these contexts, the International Federation of Red Cross and Red Crescent Societies (IFRC) has been at the forefront of providing life-saving and life-restoring rescue, relief and recovery assistance.

The IFRC has developed these earthquake guidelines to establish basic principles of earthquake preparedness, response and recovery for front-line humanitarian workers of National Red Cross and Red Crescent Societies, IFRC staff and other NGOs. The guidelines identify critical action points linking relief, recovery and development approaches, and are accompanied by relevant case studies, checklists, reminders, warnings and resources for further reading, making this a very hands-on and practical tool.

The guidelines will help National Societies in planning and implementing field operations, better positioning them to face the unique challenges of managing earthquake risk in today's world.

Bekele Geleta
Secretary General
International Federation of Red Cross and Red Crescent Societies

EXECUTIVE SUMMARY

Of all large natural disasters, earthquakes and their secondary hazards have claimed the largest number of lives in recent years. Between 2000 and 2008 alone, an average of 50,184 people were killed every year due to seismic events (IFRC, World Disasters Report, 2010). The years 2010 and 2011 have been particularly harsh reminders of this fact with the devastating earthquake in Haiti and the massive earthquake, tsunami and nuclear emergency in Japan. These were just two among a series of other major seismic events across the world.

OBJECTIVES OF THESE GUIDELINES

Despite the many similarities that earthquakes share with other disasters, they differ on many counts. These guidelines aim at drawing on the experiences of members of the International Red Cross and Red Crescent Movement (the Movement) and other humanitarian actors in preparing for, responding to and recovering from earthquakes in the last decade. While directed primarily at members of the Movement, these guidelines would be of relevance to all humanitarian agencies and personnel.

These guidelines are not intended to be a step-by-step guide to preparing for, responding to and recovering from earthquakes. It is assumed that the readers are familiar with the processes and operations involved in a humanitarian response. What this document attempts to do is to highlight issues and aspects that are particular to earthquakes and that need to be taken into consideration. Given the high likelihood of occurrence, the challenges of responding to earthquakes in urban settings have been given particular attention.

METHODOLOGY

These guidelines were developed based on reviews of preparedness measures in areas at risk of earthquakes and reviews and evaluations of response and recovery operations following recent earthquakes. Consultations and interviews with representatives of the IFRC and of National Societies were also carried out to support the preparation of these guidelines. Field visits were made to Japan and Nepal. These included consultations with key stakeholders and interactions with representatives of the Japanese and Nepal Red Cross Societies.

STRUCTURE

These guidelines are divided into three broad sections based on activities related to earthquakes. These are preparing, responding and recovering. While these divisions address major blocks of activities during a specified time, it is important to remain aware that the developmental approach to disaster management links all of these as a continuous process. In addition, this document contains a section on cross-cutting issues. These guidelines are supported with evidence of good practices and examples from across the world.

For the convenience of readers, key actions are summarized in the form of a checklist at the end of each section.

Preparing for earthquakes

Perhaps primary among earthquake differentiating factors is the fact that earthquakes themselves are rarely responsible for any deaths. Rather, most of the deaths and destruction are caused by falling objects and collapsed structures, as well as from the secondary hazards and emergencies that they trigger. As a result, mitigation and risk-reduction efforts for earthquakes, together with preparedness and early warning for secondary hazards such as tsunamis, can save many lives, prevent losses and limit disruptions to livelihoods. This section identifies actions to reduce earthquake risks and enhance preparedness based on the five Priorities for Action outlined under the Hyogo Framework for Action (HFA). These are:

1.1 Advocacy efforts aimed at:

- Establishing building codes and guidelines for earthquake-safe construction and sensitizing key actors and stakeholders in the adoption and implementation of these, particularly for critical infrastructure services and sectors in which the National Society is involved

- Strengthening partnerships, coordination and promoting risk-reduction actions in key sectors.

1.2 Assessment and monitoring of earthquake risks to:

- Map risks from earthquakes at both the national and local level using tools that help increase

community awareness and capacities

- Establish linkages to monitor and disseminate early warnings for secondary hazards following earthquakes.

1.3 Using knowledge, education and awareness for safety and resilience to earthquakes by:

- Adopting a range of approaches and tools to build and sustain awareness of earthquake risks and 'do's and don'ts'

- Using community structures, leadership and traditional knowledge to build and sustain awareness

- Preparing a capacity development plan, including a training plan, that targets key stakeholders including staff and volunteers of the National Society.

1.4 Addressing underlying risks through:

- Strong advocacy on structural and non-structural mitigation measures, particularly in buildings used for mass gatherings and in critical infrastructure facilities.

1.5 Strengthening capacities for earthquake response, including:

- Human, financial and material or logistical response capacities at the community and organizational levels

- Advocacy and strengthening protocols at the national and regional level to facilitate quicker responses

- Legal preparedness measures to facilitate quicker entry and delivery of aid in the event of a major earthquake.

Responding to earthquakes

The most significant considerations in earthquake responses are the importance of communities and local actors as first responders and the critical role of timing in saving lives. Earthquakes in urban settings bring with them their own set of challenges and issues, which need to be accounted for. This section highlights areas and sectors specific to responses, key actions and issues likely to be encountered as a result of an earthquake.

2.1 Search and rescue

- Assessing the costs and benefits of requests for international search-and-rescue teams

2.2 Medical First Response

Key actions here would include:

- addressing the needs of particularly vulnerable groups - children, pregnant women, the elderly and those suffering from chronic ailments

- carrying out epidemiological surveillance, despite low risks of epidemics after an earthquake

- handling dead bodies, which are likely to be in large numbers after an earthquake, in close collaboration with coordinating authorities and in compliance with procedures in place and usual precautions.

2.3 Mental health and psychosocial support

- Integrating the provision of psychosocial support in emergency response

- Using existing community structures and support systems or groups for the provision of psychosocial support

2.4 Restoring Family Links (RFL)

- Providing RFL services from the first phase of emergency response to alleviate suffering and strengthen recovery

- Coordinating with the worldwide Family Links Network of the International Red Cross and Red Crescent Movement to organize RFL operations in the country affected by an earthquake and to address needs identified in other countries

- Using phones and the internet to re-establish contact among family members; focusing on the needs of most vulnerable individuals separated from their families

2.5 Water, sanitation and hygiene needs

- Ensuring a mix of technical skills as well as experience in community mobilization and organization in the the water, sanitation and hygiene promotion (WatSan/HP) teams deployed

- Putting in place contingency plans for rapid scaling up of responses and established modules

- Using all forms of local communication – both traditional and modern – to spread awareness and convey messages related to public health

2.6 Damage assessment

- Planning assessments of structural damages after an earthquake and ensuring adequate personnel, tools (surveys, forms etc.) and resources for this

2.7 Needs assessment

- Coordinating needs assessments and taking into account the risks from secondary hazards such as fires and landslides

2.8 Emergency shelter and settlement

- Exploring all options for shelter (cash, vouchers, provision of materials) in consultation with community members

- Carefully planning and managing camps, where they exist, in coordination with other actors and camp residents

- Supporting relocation with host families wherever possible

- Encouraging families to participate in the repair of their houses through the provision of shelter kits

- Locating temporary shelters as close as possible to the site of damaged or destroyed homes

- Using transitional shelters that are upgradeable, reusable or that can be resold or recycled

2.9 Debris clearance and management

- Using the debris clearance process to engage community members

- Planning for taking into account issues such as the impact on eligibility for compensation and the recovery of personal belongings during clearance

- Exploring options for the salvage and recycling of debris during the reconstruction process

2.10 Earthquakes in urban settings

Some specific considerations on earthquake responses in urban settings are:

- accounting for the possibility of large 'floating' populations and undocumented residents during assessments

- targeting beneficiaries carefully, given the diversity in socio-economic profiles

- prioritizing restoration of existing infrastructure, systems and services to support the emergency response

- tapping into existing skills and capacities, including entrepreneurial skills

- using existing media and communication systems to support the response

- considering cash and/or market-based programming interventions to boost local economic recovery which is particularly important to vulnerable urban families.

Recovering from earthquakes

Past experiences have highlighted the need to prioritize the process of recovery following an earthquake from the very outset. As households begin the task of restoring and reconstructing homes and livelihoods, those responding to earthquakes need to plan for recovery operations and examine the impact that decisions made in the relief phase will have on recovery. Recovery operations are complex and offer an opportunity to also address the underlying vulnerabilities of communities affected by the disaster. Some considerations during recovery operations in an earthquake would be:

- developing a common approach, guidelines and policies for recovery efforts in coordination with other actors

- planning for transition from relief to recovery operations.

3.1 Building back better

Use the recovery process to:

- reduce underlying vulnerabilities by

strengthening the capacities of local governments and their accountability to the community; ensuring adherence to building codes for earthquakes and all other hazards in reconstruction; addressing inequality and social exclusion through the recovery process; and by ensuring that ecologically sustainable processes are introduced

- develop local skills and capacities, particularly marketable skills

- introduce new infrastructure and improvements.

3.2   Shelter and infrastructure reconstruction

Shelter reconstruction is a complex process and should be undertaken after ensuring that adequate skills, experience, resources, capacities and time are available. It is also unique in that:

- Shelter and settlement is linked to several other issues and services, including the safety of families, livelihoods, access to utilities and essential services and the need for them to be environmentally sound.

- The shelter reconstruction process can be used to address underlying vulnerabilities, including the promotion of gender equality, equity and inclusion among social groups.

- Shelter reconstruction should be done after extensive consultation to suit the varying needs and preferences of households and communities.

A number of approaches to shelter reconstruction are possible. These range from owner-driven housing reconstruction to contractor-led reconstruction processes. All options should be thoroughly evaluated before adoption.

As issues related to land titles are likely to arise in the recovery and reconstruction process, it is advisable that land tenure issues be included in assessments. Challenges and disputes with land tenure can be addressed by involving community members in the verification of claims and by using alternative documentation as proof of claims.

3.3   Restoration of livelihoods and economic recovery

While undertaking livelihood recovery measures, it is important to:

- consider all livelihood groups and stages of the livelihood chain

- assess all livelihood options including provision of assets, enabling access to credit, developing skills and capacities (particularly those likely to be in demand during reconstruction), aiding access to markets and advocacy

- diversify livelihoods to protect against future shocks and stresses, but only where long-term support can be ensured.

Cross-cutting issues

The cross-cutting issues, while not specific to earthquakes alone, are critical to the effectiveness of operations and have emerged from past experiences. The integration of cross-cutting issues across operations in all phases – preparing, responding and recovering – as well as within each sector, is of critical importance. The issues identified are:

- participation and promotion of local ownership

- ensuring quality, accountability and transparency in processes

- gender

- addressing specific needs of vulnerable groups

- coordination

- environmental sustainability

- adoption of a conflict-sensitive approach

- flexibility in delivery of aid (cash and aid-in-kind)

- building on local capacities.

ABBREVIATIONS AND ACRONYMS

BPI	Better Programming Initiative
CAP	Community action planning
CBDRR	Community-based disaster risk reduction
CBO	Community-based organization
CDAC	Communicating with Disaster-Affected Communities
DRR	Disaster Risk Reduction
EIS	Emergency Information Service
ERRA	Earthquake Reconstruction and Rehabilitation Authority (Pakistan)
ERU	Emergency Response Unit
HAP	Humanitarian Accountability Partnership
HFA	Hyogo Framework for Action
IDRL	International Disaster Response Laws, Rules and Principles
JICA	Japan International Cooperation Agency
MFI	Microfinance Institution
NGO	Non-governmental organization
ODHR	Owner-driven housing reconstruction
PASSA	The Participatory Approach to Safe Shelter Awareness
PHAST tool	Participatory Hygiene and Sanitation Transformation tool
RCC	Reinforced Cement Concrete
RED cards	Reparacion y Desarrollo (Repair and Development) cards
RFL	Restoring Family Links
RVA	Rapid visual assessment
SMS	Short Messaging Service
TOT	Training of Trainers
VCA	Vulnerability capacity assessment
VDC	Village Development Committee
WatSan/HP	Water, Sanitation and Hygiene Promotion

INTRODUCTION

50 **earthquakes** are now located every day by the National Earthquake Information Center of the US Geological Survey

32 **times** more energy (the best indicator of an earthquake's destructive power) is released by a one-point change in magnitude[1]

8/10 of the world's most populous cities lie on earthquake fault lines[2]

Earthquakes are among the most deadly natural hazards. They accounted for over 60 per cent of the deaths caused by natural disasters in the decade between 2000 and 2009. The year 2010 was particularly challenging, with the devastating earthquake in Haiti. It caused losses and damage in Port-au-Prince and its neighbouring areas on an unprecedented scale, highlighting the challenges posed by an emergency in a densely populated urban area. That was followed by the earthquake in Chile, which remains among the most powerful ever recorded. The massive tsunami and nuclear meltdown triggered by the Great East Japan (Tohoku) Earthquake in March 2011 was a reminder of the complex emergencies that can be triggered by earthquakes.

The challenge is intensified by the fact that some of the world's most earthquake-prone zones are also areas of high population density – including cities in China, India, Indonesia, Japan, Mexico and the United States. The result of large earthquakes in such areas can be catastrophic, with terrible loss of human lives and untold economic costs. This inherent weakness is magnified by vulnerability factors including non-enforcement of building codes, knowledge gaps, urban poverty and poor governance capacity to manage and reduce earthquake risks.

While having the potential to cause considerable devastation, earthquakes also stand out from other hazards in another way. Risk-reduction and mitigation efforts for earthquakes can significantly reduce damage and losses. The number of lives lost in Chile and Japan (where the majority of deaths was caused by the subsequent tsunami) was much lower than in Haiti, despite being far more powerful.

(1) http://earthquake.usgs.gov/earthquakes/eqarchives/year/eqstats.php
(2) www.unisdr.org/archive/12470

Major earthquakes in the recent past

2001
INDIA
26 Jan
7.9 magnitude
20,005 killed

2003
IRAN
26 Dec
6.51 magnitude
26,796 killed

2004
INDONESIA
26 Dec
9.0 magnitude
165,708 killed

2007
PERU
15 Aug
7.0 magnitude
593 killed

2005
PAKISTAN
08 Oct
7.6 magnitude
73,338 killed

2008
CHINA
12 May
8.0 magnitude
87,476 killed

2010
HAITI
12 Jan
7.0 magnitude
222,570 killed

2010
CHILE
27 Feb
8.8 magnitude
562 killed

2011
JAPAN
11 Mar
9.0 magnitude
15,841 killed

HOW EARTHQUAKES DIFFER FROM OTHER DISASTERS[3]

- Earthquakes have a sudden-onset nature and it is difficult to accurately predict the exact time and place.
- Aftershocks and secondary hazards often triggered by earthquakes can be more damaging than the earthquakes themselves.
- Effects are concentrated in a smaller areas.
- Earthquakes have a high mortality and morbidity as compared to other disasters and the nature of injuries from earthquakes is different.
- Large-scale destruction of infrastructure can make access challenging.
- Long gaps between major earthquakes makes it difficult to sustain awareness and risk-reduction efforts.
- Large quantities of rubble are generated following an earthquake.
- Households begin their recovery efforts immediately after an earthquake and there is no time gap between relief and recovery efforts.

(3) ALNAP, 2008 - Lessons from Earthquakes

These guidelines attempt to draw on the considerable experience and lessons that have been learnt by the International Red Cross Red Crescent Movement, as well as by other humanitarian actors, in the course of responses to earthquakes since the turn of the century.

Many of the issues, processes followed and challenges likely to be encountered by an agency or humanitarian worker in an earthquake are similar to those in other hazards and emergencies. However, earthquakes and preparedness, response and recovery measures for them differ from other hazards in numerous ways.

These guidelines highlight the factors that are particular and unique about earthquakes and are not intended as a comprehensive guide on planning a recovery and reconstruction operation.

METHODOLOGY

These guidelines seek to assist the IFRC, International Committee of the Red Cross (ICRC), Red Cross and Red Crescent Societies around the world and their local partners in preparing for, responding to and recovering from earthquakes.

This document draws on current research of earthquake issues, reviews of evaluations and lessons learnt by the IFRC and other organizations from exercises following major earthquakes, as well as on interviews with key informants from the IFRC secretariat in Geneva, regional offices, national delegations and partner National Societies.

© ECHO, Haiti

Country visits were made to Japan to understand the recovery efforts after the March 2011 earthquake and tsunami and the functioning of the Japanese Red Cross; and to Nepal to capture preparing initiatives on the ground there. Interactions took place with a range of stakeholders, including IFRC staff, local government officials, the National Societies and communities with which they were working.

These guidelines use actual cases to highlight some of the key challenges, good practices and programmes of the IFRC and various Red Cross and Red Crescent Societies around the world.

Checklists at the end of each section are provided for a handy review of the core issues. Given the significance of community members and their role as first responders in the aftermath of an earthquake, these guidelines seek to consistently identify and point out community-level actions and issues that need particular attention.

EARTHQUAKE

PREPARING

RESPONDING

RECOVERING

CROSS-CUTTING ISSUE

Advocacy
Risks
kno
U

... and early warnings

...wledge and education

...nderlying risks

...Response capacity

Search and rescue
Medical first response
Psychosocial support
Family links
WatSan/HP
Damage assessment
Needs assessment
Immediate shelter
Dealing with debris
Urban settings

Build back better
Reconstruction
Livelihoods

1 PREPARING

Advocacy

Risks and early warnings

Knowledge and education

Underlying risks

Response capacity
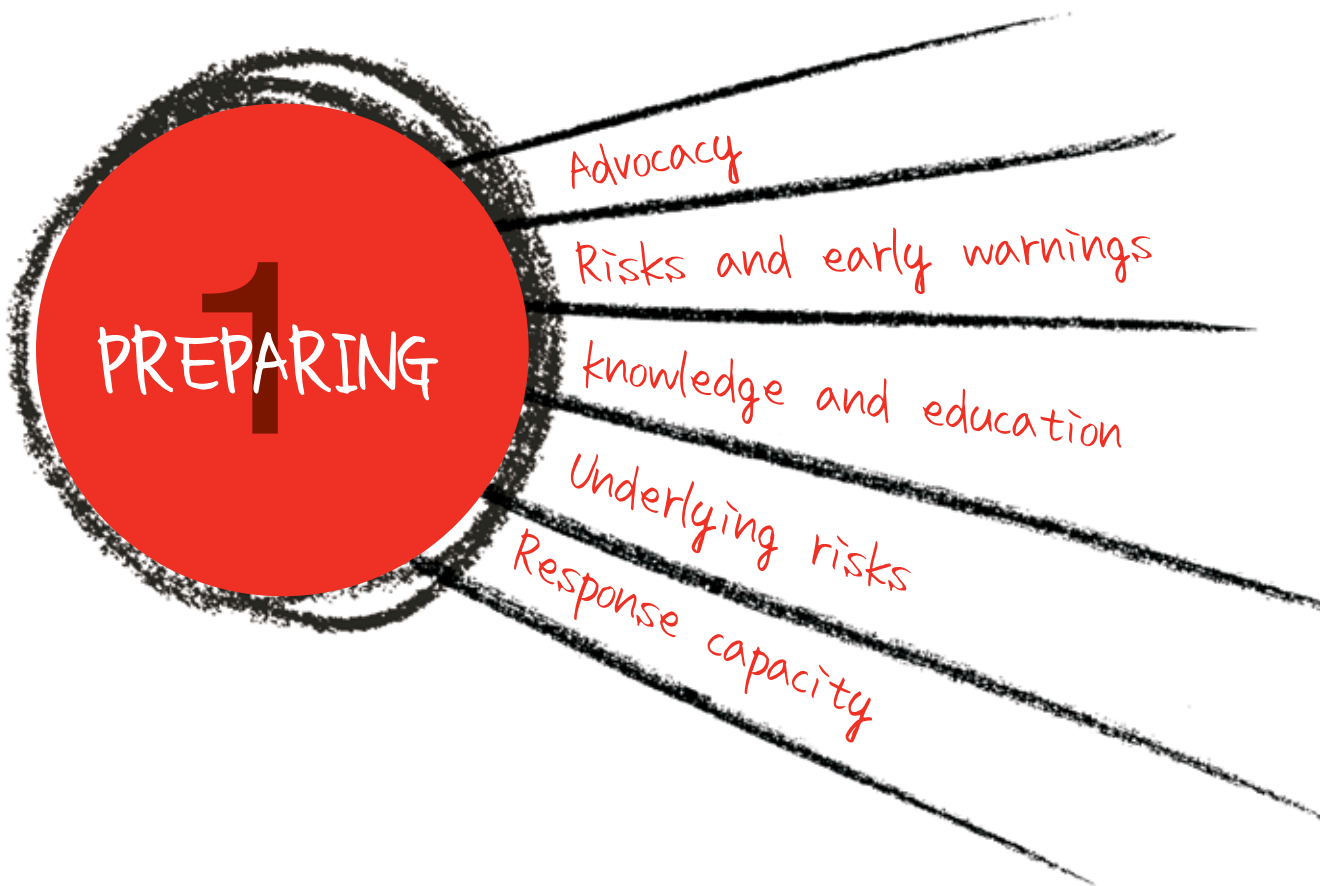
In these guidelines, the term 'preparing' refers to all actions that are taken to reduce earthquake risk to communities, their assets, livelihoods and the environment and that help build resilience to future earthquakes.

This section uses the five Priorities for Action identified within the Hyogo Framework for Action (HFA) as a framework to comprehensively address and reduce risks from earthquakes.

Earthquakes are a unique hazard as all deaths and casualties that result from them are caused by falling structures, objects and secondary hazards that are triggered. Preparedness and mitigation efforts and early warning for secondary hazards can result in significantly reducing loss of lives and damage to assets and livelihoods.

Being sudden-onset disasters, the role of the affected communities themselves as first responders is of paramount importance following an earthquake. Earthquake-preparedness efforts therefore need to pay particular attention to awareness, mitigation and strengthening capacities for first response at the community level.

Advocacy for disaster risk reduction (DRR) cuts across institutional, legislative, policy, planning and implementation dimensions. Particularly in the case of earthquakes, the establishment and adherence to safe building codes, guidelines and planning can protect lives, livelihoods and assets.

The unique position and status enjoyed by National Societies enables them to play a significant role in influencing national governments, decision-makers, key stakeholders and policies in the area of disaster preparedness, mitigation and risk reduction.

The role of National Societies in advocating for safer communities should extend well beyond the preparedness phase and include rehabilitation and reconstruction activities in the aftermath of an earthquake.

National Societies should capitalize on their relationship with key government ministries and the influence they enjoy to encourage the adoption of earthquake-safe codes and guidelines where they don't exist and the implementation of these in places where they do. In addition, periodic review and revision of established codes should also be carried out.

Strengthening institutional frameworks and sensitizing local actors

Through their branches at the provincial and district or local levels, National Societies can play a significant part in sensitizing key stakeholders on the need to comply with established codes and guidelines. Most National Societies focus their activities on specific sectors – such as health or the provision of emergency services.

National Societies can be particularly effective in ensuring adherence and implementation of guidelines and codes in the sectors in which they are involved. They play a part in ensuring that risk-reduction concerns are included in the planning and implementation stages in these sectors.

Strengthening school safety in Armenia

The Armenian Red Cross has been involved in strengthening disaster-preparedness in schools in the country with the support of other partner National Societies and the IFRC. The interventions are largely limited to increasing awareness, education and training. They do not include structural mitigation measures. However, in one village – Lusarat – the Armenian Red Cross, in partnership with the local community and with the support of Japan International Cooperation Agency (JICA), extended its activities to renovating a community middle school for 150 pupils. A disaster-awareness exercise including a vulnerability and capacity assessment (VCA) had previously been carried out in the same school, which proved effective in sensitizing the local community.

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Engaging and partnering with other actors

An important part of preparing is the engagement and strengthening of partnerships with all actors who could be part of future earthquake response or recovery operations. Possible actors could include representatives in nodal government ministries at different levels, representatives of United Nations agencies, non-governmental organizations (NGOs), academic institutions and the private sector, among others.

Past experiences of National Societies indicate that forging and developing relationships with other actors before disasters can help ensure improved response and coordination during times of emergency. It can also help National Societies to positively influence subsequent response and recovery processes.

National Societies should attempt to develop and maintain relationships with key actors involved in the area of earthquake preparedness, response and recovery, with the aim of improving coordination during future earthquakes.

Further reading:
- Changing minds- saving lives, Disaster Risk Reduction: a global advocacy guide, IFRC, Geneva.

Successful advocacy takes into account the three pillars credibility, consistency and coordination
Changing minds saving lives, DRR: a global advocacy guide, IFRC

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The assessment and monitoring of earthquake risks can be carried out at local or community, national or regional levels. However, all assessments must be appropriately linked to community planning processes and systems.

At the community level, VCA is a tool that can be particularly useful. VCA has been developed to help communities grow in awareness of hazards, their vulnerabilities to them and build capacities to address these. The use of the Participatory Approach to Safe Shelter Awareness (PASSA), to help communities identify and address vulnerabilities specific to shelter, could also be considered.

As with other hazards, the vulnerabilities of communities living in areas at risk of earthquakes would be linked to one or several of these areas:

- livelihoods
- well-being
- self-protection
- social protection
- governance.

A VCA will also provide an review of capacities that need to be strengthened to reduce risk to earthquakes.

(Source: How to do a VCA: A practical step-by-step guide for Red Cross Red Crescent staff and volunteers, IFRC, Geneva, 2007)

A guide to identifying and managing risks: The Participatory Approach to Safe Shelter Awareness (PASSA)

PASSA was designed as a way of helping communities take the lead in recognizing, monitoring and addressing shelter risks. PASSA aims at "…promoting a participatory method of awareness raising on safe shelters, suitable for and adapted to various cultural, physical and hazards contexts, as well as on different construction techniques."

It draws on the experience of the Participatory Hygiene and Sanitation Transformation (PHAST) tool developed previously.

Designed for use in situations where shelter has been identified as a priority for risk reduction, the PASSA process is facilitated by volunteers and guides the community through participatory activities to achieving the following:

- developing awareness of shelter safety issues in their community
- identifying hazards and vulnerabilities that create risks related to shelter

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- recognizing and analysing causes of vulnerability due to shelter
- identifying and prioritizing potential stages to improve shelter safety
- planning to put into practice the identified shelter safety activities based on local capacities
- monitorng and evaluating progress.

(Source: PASSA Manual, IFRC 2011)

Use VCA and other approaches at the community level to increase the awareness of households and communities about their earthquake risks and vulnerabilities, as well as to identify and strengthen their capacities to address these.

Mapping earthquake risks

Mapping out zones at risk of earthquakes at the national level, as well as mapping of fault lines and settlements situated on or near these areas, can help increase awareness among governments and stakeholders. It can also be used to support local planning and advocacy efforts.

National Societies should advocate for or support earthquake mapping and zoning efforts in countries where these are yet to be carried out. These maps should be used to increase awareness and strengthen advocacy efforts with local actors.

Secondary hazards

Secondary hazards triggered by earthquakes represent a significant risk. Loss of lives and property from secondary hazards can often exceed that from an earthquake. Some of the secondary hazards that can be caused by earthquakes include tsunamis, landslides, fires and floods due to bursting of dams, among others. Aftershocks following an earthquake also represent a threat and can result in collapse of weakened structures and significant losses.

Taking into account all possible secondary hazards is essential while planning and preparing for earthquakes. Possible redundancies should also be taken into account given the high probability of original plans for safe spaces and evacuation routes becoming unviable. All early warning systems should also be regularly tested and updated.

National Societies should establish linkages with organizations and bodies involved in monitoring hazards at national and regional levels. Linkages between local chapters or branches and the national headquarters to communicate and monitor early warnings should be put in place. Systems and plans for receiving and disseminating early warnings at the community level may be required in places where these do not exist.

Further reading:
- Disaster response and contingency planning guide, IFRC, Geneva, 2007.
- Participatory Approach to Safe Shelter Awareness (PASSA) Manual, IFRC, Geneva, 2011.
- What is VCA: An introduction to vulnerability and capacity assessment, IFRC, Geneva, 2006.
- How to do a VCA: A practical step-by-step guide for Red Cross Red Crescent staff and volunteers, IFRC, Geneva, 2007.

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Knowledge & Education

1.3 | Using knowledge, education and awareness for safety and resilience

There is often a considerable time lag between major earthquakes in a region. This makes building and sustaining awareness among stakeholders on earthquake risks particularly challenging.

The IFRC guide for *Public education and public awareness for disaster risk reduction* suggests four approaches to increasing awareness of disaster risks across various stakeholders. These are:

● **Campaigns**

   Using standardized messages to create an impact on a large scale, including 'do's and don'ts' for before, during and after earthquakes

● **Participatory learning**

   Using a variety of tools, including VCAs, to help people understand risks and vulnerabilities and to articulate ways of addressing these issues

● **Informal education**

   Involving the use of brief moments and encounters to engage people on actions and behaviours that can increase safety and resilience.

● **Formal school-based interventions**

   Including school disaster management and DRR in school curricula.

Following a moderate earthquake, the Kazakh Red Crescent facilitated a newspaper insert illustrating the fundamentals of earthquake-resistant construction. Staff were delighted to discover that grandmothers could be found patrolling construction sites, using the insert to monitor reconstruction.

Source: Public awareness and public education guide, Annexes, IFRC, 2011.

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Increasing awareness and education for risk reduction and resilience

APPROACHES

- Campaigns
- Participatory learning
- Informal education
- Formal school-based interventions

GUIDING PRINCIPLES

- Legitimate and credible
- Consistent
- Scalable
- Sustainable

TOOLS

- Publications
- Games and competitions
- Audio and video materials
- Social media and telephony
- e-Learning
- Curricula, modules and presentations
- Performing arts
- Web pages and activities

ENSURE THAT

- Messages are well crafted
- Powerful images are used
- Approach is engaging and proven
- Adaptation and localization are considered

Adapted from *Public awareness and public education: a guide*, IFRC, 2011.

Japan's Disaster Prevention Day

Every year, on 1 September, Japan gears up for Disaster Prevention Day. The date commemorates the anniversary of the 1923 Great Kanto Earthquake which left more than 100,000 people dead or missing. Since it is also the first day back from summer holidays for most schools, evacuation drills are included as part of the back-to-school ceremony.

Comprehensive simulations are carried out at the national, prefecture and community levels. These include concerted efforts by all participants - the Government and local leaders, the Self-Defense Forces, Japan Coastguard, the police, the fire department, the Japanese Red Cross Society and volunteers from local communities. The 2011 drill, for example, focused on metropolitan scenarios, simulating a 7.3-magnitude earthquake with an epicentre in the Northern Tokyo bay, and included a component of reporting on nuclear facilities.

Such preparations are part of the culture in Japan with disaster training that begins early and can even include sessions in earthquake simulators that mimic the effect of a major quake on a building. However, post the March 2011 disaster, preparedness for tsunamis and secondary disasters is being brought into focus as well.

Research has shown that a number of traditional construction styles incorporate earthquake-safe (as well as other hazards) features. In some areas, such practices have gradually been lost due to changes in tastes, preferences and needs of communities, as well as the costs and availability of traditional materials.

These traditional practices should be studied for transferable principles that can be incorporated into present-day constructions. Traditional practices are also often found to have evolved and adapted to the climatic and ecological conditions of an area.

Traditional knowledge on earthquake safety: Kashmir Earthquake

In parts of Kashmir, traditional half-timbered constructions (known locally as Dhajji or patchwork construction) were found to have been significantly more resilient to the effects of the earthquake in October 2005. The use of wooden frames with weak mortar infill in these constructions considerably reduced the risk of collapse. This made them ideal for the soft soils and high earthquake vulnerability of the region. Recognizing this fact, the Earthquake Reconstruction and Rehabilitation Authority (ERRA), tasked with reconstructing shelters after the earthquake in Pakistan, trained and promoted the construction of houses that incorporated the same principles.

© Meghna Chawla /SWC, Nepal

"After the last earthquake on 19 September 2011, I felt really proud when my students came and thanked me. They felt confident about the actions to be taken. What's more, despite initial scepticism, they had managed to convince their families as well."

Ghanshyam Khadka,
Teacher Sponsor,
Devi Higher Secondary
School, Bhaktapur, Nepal

Empowering local communities through simulations: Nepal Red Cross

The use of simulations and community-based disaster risk reduction (CBDRR) is now prevalent, particularly in regions with high earthquake risk but low occurrence. The Nepal Red Cross is a prime example. Using schools as the entry point, they empower the community to take responsibility and become first responders. This includes simulated drills involving all stakeholders; Village Development Committee (VDC), school and household-level preparedness plans; volunteer mobilization; district disaster-response trainings; formation of Junior Red Cross and first-aid teams; and overall district capacity building. Each sub-chapter also develops trained volunteers to conduct initial structural assessments. Projects try to follow a three-year cycle to ensure tangible impact and a comprehensive exit strategy. This is followed up with Training of Trainers (TOT) refresher trainings at least once every two years.

The local capacity developed from these programmes was reflected in the coordination, first response, initial assessments and relief distribution of all trained CBDRR units during the September 2011 earthquake. Many Junior Red Cross volunteers even took the initiative to collect and contribute assessment information on their own.

However, despite the best efforts and considerable success, challenges remain – in particular, there is one main question: how can you ensure communities are safe without structural safety? While the 2011 earthquake is being termed as a 'wake-up call', enforcement of building codes remains poor, even in government-funded school construction. Misconceptions on costs and glaring gaps in the engineering curriculum only compound the problem. There is a concerted need for advocacy with the government in this area.

Capacity development for earthquake risk reduction should ideally form part of a larger disaster management plan. Training activities are just one part of a capacity development initiative. Training alone will not be enough to develop skills and competencies.

Training activities for earthquake safety could include:

- community-level training for first responders, including National Society staff and volunteers, in evacuation, first aid, provision of basic medical aid and attending to injuries

- training of masons and construction workers in earthquake-safe construction technologies

- training and sensitization of key local government staff and officials on earthquake safety.

© Graham Crouch/IFRC

Training is more than workshops...

"What has proven useful is to set up a structured and planned training strategy integrated in a capacity-building plan, where learning needs and objectives are well identified… [and] include simulations, secondments, exposures, exchange programmes, independent learning, refreshment meetings, coaching, one-to-one training and mentoring, to mention a few."

Source: National Disaster Preparedness and Response Mechanism Guidelines, p. 31 (field-testing version) IFRC, 2007.

© Aayush Goel/SEEDS

As part of its reconstruction efforts following the earthquake in Haiti in 2010, the British Red Cross undertook the construction of five pilot houses. It used the process to train local masons in seismic-resistant construction methods and to build awareness among the local community. The British Red Cross also proposed to hire these masons as it subsequently expanded its reconstruction intervention.

Agencies responding to earthquakes in the past have adopted similar approaches. This includes organizing trained masons into guilds or associations so that their skills can be monitored, updated and marketed better.

Improvements in building materials and construction techniques can significantly reduce earthquake risks faced by communities. Adapting traditional technologies to incorporate such aspects helps to ensure that earthquake-safe technologies are suitable to the geo-climatic conditions of the region and take into account specific tastes and cultural preferences.

- **Adopt a range of approaches and tools to educate, build and sustain public awareness on earthquake risks and vulnerabilities.**

- **Target activities to increase knowledge and awareness on earthquake risks and safety at key stakeholders, particularly those with an ability to influence others. These could include schools, faith groups and gatherings, community-based organizations (CBOs) and local clubs and chapters of the International Red Cross and Red Crescent Movement.**

- **Analyse traditional practices and knowledge to examine how earthquake risks were traditionally dealt with in an area and see how these can be promoted or adapted to present-day contexts and needs.**

- **National Societies should develop a capacity-building plan for earthquake risk reduction which includes a training strategy, is targeted to suit the needs of different stakeholders and which employs a range of methods.**

©IFRC

In Peru, collaboration between the IFRC and Catholic University of Lima has led to the development of shelter response solutions specifically for high-altitude, cold-climate areas.

Further reading:

- *National Disaster Preparedness and Response Mechanisms Guidelines,* (Field-testing version), IFRC, June 2007-June 2008.

- *Public awareness and public education for disaster risk reduction: a guide,* IFRC, Geneva, 2011.

"Earthquakes don't kill people, buildings do," said Charles Richter, inventor of the Richter scale of earthquake magnitude measurement.

Buildings, the objects within them, the infrastructure surrounding them and human behaviour are the major intermediaries of death and destruction due to earthquakes. Addressing some of these prominent underlying risks is a necessary part of earthquake preparedness. In this context, advocacy by National Societies on structural and non-structural safety is critical.

The behaviour of a building during earthquakes depends critically on its overall size, geometry, material usage, design of structural elements and immediate environment. These features can be summarized as the ABCDE of earthquake-resistant construction, as follows:.

- **Anchorage:** Making sure that the foundations are appropriate and the building is stable.

- **Bracing:** Securing the geometry of the building frame so that it does not deform and fail even when shaken.

- **Connections:** Ensuring that walls are well connected to other walls and roofs, and that beams are well connected to columns so that building elements do not disintegrate due to shaking.

- **Ductility and detailing:** Keeping the building structure flexible and creating a 'forgiving' design that has buffers for shaking without breaking.

- **Environment protection:** Ensuring safety in view of immediate environmental characteristics, such as hard or soft soil, ground slopes, adjacent buildings, trees and other physical features.

A - Anchorage

B - Bracing

C - Connections

D - Ductility

E - Environment
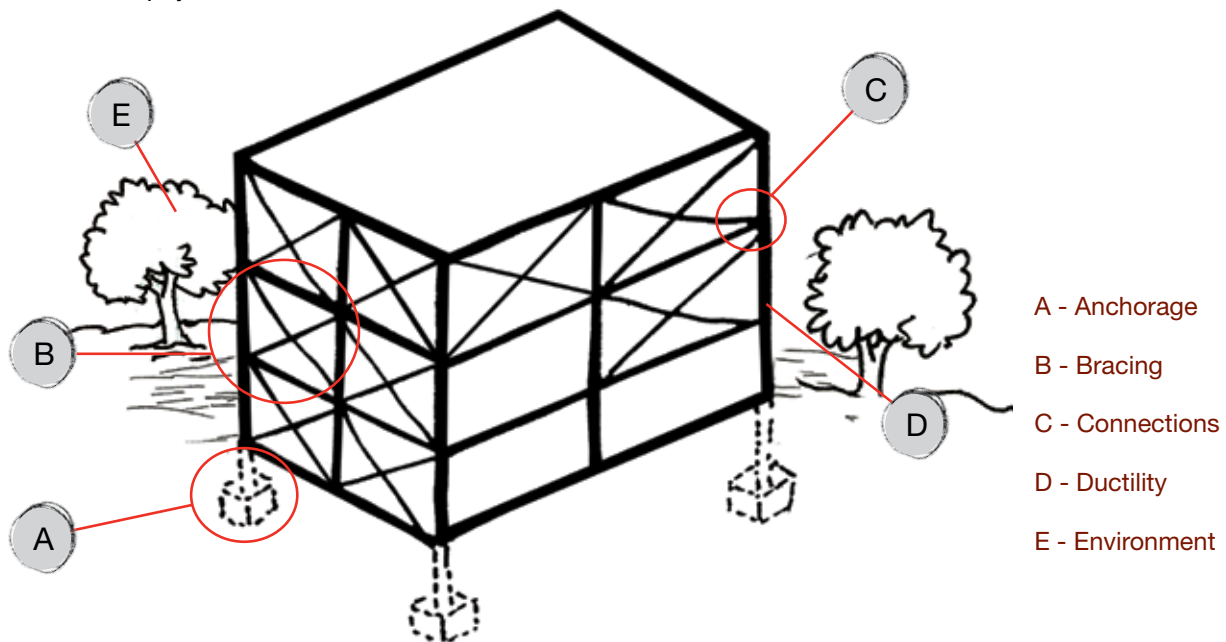
Source: Suresh V., `Promoting Safer Building Construction', Regional Workshop on Best Practices in Disaster Mitigation: Lessons Learned from the Asian Urban Disaster Mitigation Program and other initiatives, 24-26 September 2002, Bali Indonesia, organised by Asian Disaster Preparedness Centre.
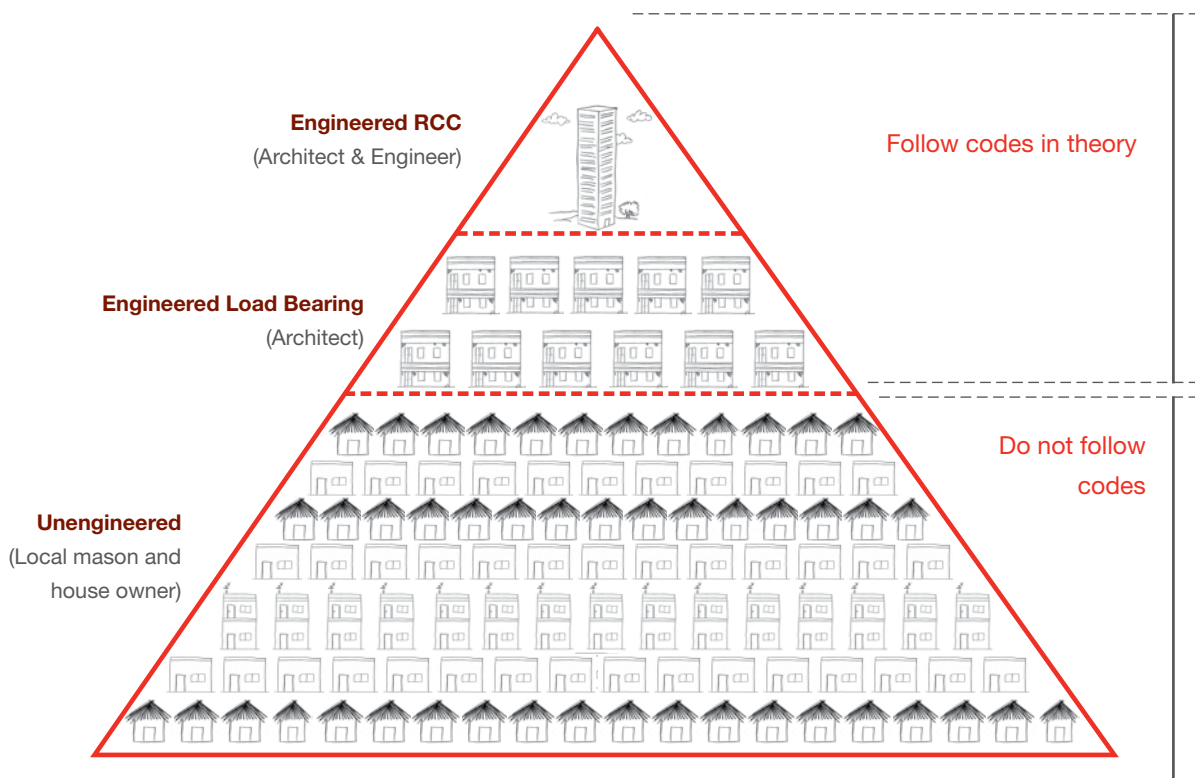
Seismic elements

In addition to the basic features of a building that govern its earthquake resilience, strengthening with specific seismic-resistant features helps make buildings safer. These include seismic bands and bracings that help keep the elements of a building tied together. They help ensure that a building does not not shake too much or is subjected to different amounts of movement in various parts of its construction. Where shaking does occur, it does not lead to damage of critical elements that keep the building standing.

Building codes versus enforcement

National building codes exist in most countries, but the problems lie largely at the implementation level. A large number of buildings in developing countries are designed and constructed by local masons, with no involvement of any architect or engineer. Many of these masons are untrained and cannot even read construction drawings. In such a scenario, buildings follow no regulations or standards.

This is the reason that a large earthquake in the developed world may barely destroy any buildings, but a similar one in a developing country leads to large-scale collapse and loss of life. Advocacy on the enforcement of building codes and training of local masons and construction workers, as well as increased awareness at community level, is needed to address this gap.

- **Structural safety and mitigation issues should receive particular attention in disaster-management and earthquake-risk mitigation plans of National Societies.**

- **Advocacy with key stakeholders to build awareness on structural risk mitigation should be undertaken, with a focus on the vulnerabilities of non-engineered constructions.**

- **National Societies should pay particular attention to structural safety and risk-mitigation measures for lifeline and critical infrastructure buildings such as hospitals, schools and emergency services.**

Engineered RCC
(Architect & Engineer)

Follow codes in theory

Engineered Load Bearing
(Architect)

Unengineered
(Local mason and house owner)

Do not follow codes

Principles of various building types

Indigenous buildings: Indigenous buildings have withstood disasters and fared well over long periods of time. Though usually very specific to local materials and contexts, they are based on sound principles of construction. Often these principles are based around flexibility, forgiving and moving materials as well as good anchorage, tying and bracing of building parts.

Load-bearing structures: Today, there is a drastic shift to using modern materials - cement, steel and concrete-based construction. Unfortunately, in areas of earthquake concern, the informal construction sector often doesn't have the skills required to use these materials. Improper mixes and inadequate curing of cement leads to buildings that look strong, but are inherently weak. The incorrect placement and tying of steel has similar results. Too much reinforcement can actually have the opposite effect and lead to highly unsafe buildings with high dead loads.

Reinforced Cement Concrete (RCC) construction: RCC-framed structures are gaining popularity everywhere. These are quicker to build and appear to be stronger. However, here too, inadequate knowledge of material usage plays havoc with safety levels. RCC structures also require the intervention of qualified engineers for assessment, repairs and retrofitting in a post-earthquake scenario.

Indigenous buildings are based on 'rules of thumb' (on practice rather than theory) and efforts can be made to propagate better building principles at the grass-root level.

Load-bearing structures require advocacy, local training and awareness programmes to promote the enforcement of safe building standards.

RCC structures require engineering inputs.

Indigenous buildings
(Principles)
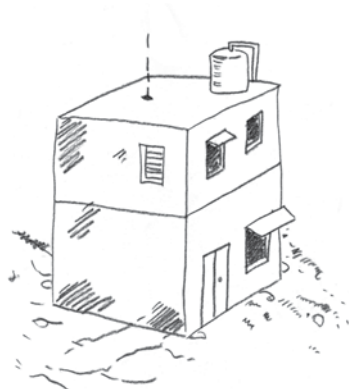
Load-bearing structures
(Standards and codes)

RCC construction
(Codes and high structural engineering)

Taking into account building-use

Building usage determines the investment in earthquake safety measures. Residential buildings, particularly in the lower-income group, cannot be designed using expensive technologies. The performance standard is to ensure that occupants have sufficient time to evacuate, even though the buildings themselves may suffer some damage.

The performance standard of lifeline buildings, such as hospitals, schools and offices of emergency response agencies, must be much higher. These buildings need to be at peak performance after an earthquake and there should be no damage to this infrastructure.

Planning at the settlement level

The same earthquake-safety principles apply at the neighbourhood and village/city scale. Risk identification, capacity assessment and action planning are required at all these levels. VCA and commu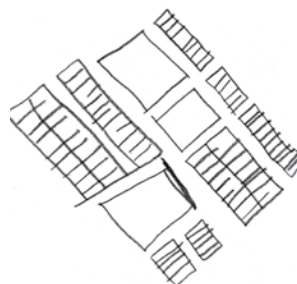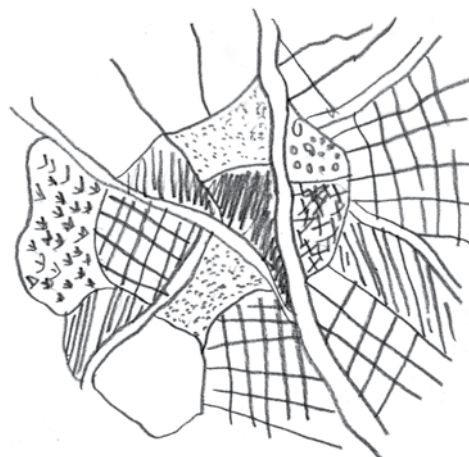nity action planning (CAP) are tools that are useful for such interventions. This type of planning can ensure that no development takes place on hazardous lands; that transportation routes and infrastructure stay resilient; and that plans for urban or industrial area address earthquake risks.

Building　　　　**Neighbourhood/Village**

City

Retrofitting

Seismic retrofitting aims to make existing buildings safer by introducing earthquake-resistant features. Following an earthquake, this ensures that damaged buildings are not merely cosmetically repaired. Seismic retrofitting involves specialized structural interventions and requires appropriate assessments and design by qualified engineers. Costs may vary widely depending on the type of building and damage. In cases where costs are beyond acceptable levels, demolition may be advisable.

Non-structural safety factors

A majority of the earthquake-related injuries - and a large part of the economic damage - is caused by non-structural elements that break, fall or slide. This includes windows, doors, stairs, partition walls, water tanks, equipment, furniture and other falling or sliding hazards. Many injuries can be avoided by securing these elements.

Human behaviour is also a critical part of safety. How people respond when an earthquake strikes can determine their survival. One needs to crouch under a safe place while the shaking is happening and then evacuate to a safe location quickly but safely. These are critical parts of an emergency management plan. Such plans, however, are successful only when the people involved are aware and certain. The human element is therefore a major factor in reducing underlying risks.

Earthquake safety can be ensured only through long-term mitigation efforts that promote safe development and address the underlying structural and non-structural risks. This is true for the damage arising from the earthquakes themselves and also from secondary disasters such as tsunamis, landslides and fires. Mainstreaming of earthquake-specific risk-reduction measures in overall development and disaster-management plans – specifically in building regulations – is required to reduce these underlying risks.

1.5 | Strengthening capacities for earthquake response

The strengthening of capacities for response to earthquakes can be undertaken at the level of individuals or communities, at an organizational level or at a larger national or regional level. The focus and nature of activities that a National Society undertakes may vary at each of these levels. It may move from an increased focus on developing capacities and skills at the individual or community level, to a more pronounced role for advocacy at the national or regional level to facilitate quicker responses.

Strengthening capacities for earthquake response at the community level

While the role of the affected community as a first responder is recognized in most disasters, given the sudden-onset nature of earthquakes, this role takes on an added significance. Experiences in the past have shown that members of the affected communities play a critical role in rescuing and providing first aid to the injured and are far more effective in doing so than national and international teams that reach an affected community much later.

Developing and sustaining capacities at the community level are therefore crucial to strengthening earthquake responses and reducing the vulnerability of communities in earthquake-prone areas.

Strengthening capacities for response at the community level		
Level	**Actors**	**Actions, Activities and Resources**
Individual/ Community	• Community members • Families	• Developing Family Disaster Plans • Training and awareness building on 'do's and don'ts' during and after an earthquake • Training on provision of first aid • Training on handling of fires **Materials:** Preparing and maintaining first-aid kits Preparing family/household evacuation kits with essential supplies
	• Volunteers • Community-based groups • Local governance institutions	• Developing and strengthening local Emergency Committees and Disaster Response Teams • Forming and training task forces for search and rescue, damage and needs assessment and early warning (including warning signals and evacuation routes) • Training in setting up and managing temporary shelters and settlements

Further reading:

• IFRC, Prepared Family, Better be Prepared Series, Regional Centre of Reference in Community-Based Education for the Prevention of Disasters, Costa Rica. Available at: www.cruzroja.org/desastres/redcamp/docs/crrec/modulos/eng/modulo_2en.pdf

• IFRC, Community Disaster Risk Reduction Teams, Better be Prepared Series, Regional Centre of Reference in Community-Based Education for the Prevention of Disasters, Costa Rica. Available at: www.cruzroja.org/desastres/redcamp/docs/crrec/modulos/eng/modulo_14en.pdf

"Our workforce is 97 per cent volunteers, but in times of crisis you can't tell the difference between volunteers and paid staff members because we all receive the same training and assume the same responsibilities under our Disaster Services Human Resources system."

Emily White, Director of Community Preparedness, American Red Cross Bay Area

Despite having nearly 700 chapters across the country, the comprehensive American Red Cross training programme remains consistent across all branches, staff and volunteers. In a method similar to the one followed by the army, each person is then ranked according to their training, education and capacity. This consistency makes it easier for various branches to coordinate and collaborate in case further assistance is required. It also allows for flexibility in assigning roles and tasks among the team.

Strengthening capacities for earthquake response at the organizational level

Level	Actors	Actions, Activities and Resources
Organizational	• Critical infrastructure and emergency facilities	• Developing emergency plans and standard operating procedures to deal with situations and surges after an earthquake • Periodic drills and simulations to test plans and familiarize staff
	• Chapters of the Red Cross and Red Crescent Movement	• Developing human resources and maintaining rosters of emergency personnel for quick deployment after an earthquake • Maintaining stockpiles of equipment • Agreements with vendors • Protocols and systems to raise funds quickly during emergencies • Strengthening platforms and coordination mechanisms within the Red Cross and Red Crescent Movement, with other humanitarian actors and the state

Strengthening capacities for earthquake response at the national and regional level

A timely and effective response requires quick mobilization of personnel, materials and other resources. This needs considerable investment in developing and strengthening capacities, resources and protocols in non-emergency periods.

The creation of back-up and alternative support centres for managing and storing vital information and processes should be considered. Advocacy for this can be an important task undertaken by National Societies to strengthen response capacities and build resilience to earthquakes. Similarly, National Societies should also assess their own headquarters and operational centres for structural vulnerabilities.

Entering into protocols, agreements and creating appropriate structures can aid this task. This includes:

- entering into agreements with national governments or advocating with them to facilitate quicker movement of relief into the country in the aftermath of a disaster
- strengthening platforms and coordination mechanisms with both Partner National Societies and other actors.

Legal preparedness

Good disaster-response laws can help relief agencies save lives. By ensuring that the necessary rules, guidelines and agreements are in place before disasters strike, the entry and provision of humanitarian assistance becomes smoother and greatly improves the effectiveness of a response.

Past earthquakes and disasters have revealed a range of issues that have delayed critical responses. These can be difficult to address in the aftermath of a major disaster when government personnel and resources are already attempting to address the needs in affected areas. Some of the issues that have been encountered include:

- processes for entry and registration of NGOs that want to work in a country following a disaster
- rules to facilitate entry of aid, including emergency medical equipment and medical supplies
- issues related to the appropriateness of aid that is received.

Further reading:

- *Guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance,* IFRC, Geneva, 2007.

Need for legal advocacy: Peru and Indonesia

Following the Peru Earthquake of 2007, foreign governments and international aid groups mobilized to send aid. Unprepared to deal with this influx, legal hassles delayed the entry of vehicles, medicine and even a portable X-ray machine. At the same time, a huge amount of inappropriate and unneeded aid found its way in, with many piles of donated clothes simply discarded as they were dirty, torn or just taking too much time and effort to store and sort. Meanwhile, doctors from the Colombian and Panama Red Cross Societies found that they could not help as they were unable to sign prescriptions because they were not licensed by the health ministry.

A similar problem was faced in Indonesia after the 2004 tsunami, where authorities received several tonnes of expired medicines and food, as well as medicines that were unusable because they were labelled in foreign languages. However, Indonesia is now leading the way in strengthening its laws. Backed by strong support from the International Disaster Response Laws, Rules and Principles (IDRL) programme and PMI (the Indonesian National Society), a comprehensive disaster management law was passed in 2007, which also included some provisions on international relief.

Adapted from: The case for the law in Red Cross Red Crescent Magazine and Disasters in Asia: the Case for Legal Preparedness, IFRC, Geneva, 2010.

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Strengthen capacities for response to earthquakes at the community, organizational, national and regional levels, including human, financial, material and logistical capacities. Pay particular attention to strengthening capacities at the community level and in critical infrastructure and emergency services.

USING LOCAL MATERIALS

While developing contingency stocks, attention should be paid to the local needs, preferences and conditions. For instance, stockpiling tents may be inappropriate in some areas given the climatic conditions and preferences. Materials that are more cost-effective and suited to local conditions are likely to be found in local markets.

© Anshu Sharma/SWC, Japan

Stockpile location matters!

For the Arahama Primary School in Sendai City, Japan, it was the location of their emergency stockpile (including food, relief kits and portable toilets) that saved many lives. Just months before the Japan 2011 disaster, an earthquake in Chile served as the impetus to move the stocks from the stadium – which was completely destroyed – to the third floor of the building. This floor served as an emergency shelter for large numbers of students and parents in the immediate aftermath of the disaster.

CHECKLIST: PREPARING FOR EARTHQUAKES

Cross-cutting issues

- Participation and promotion of local ownership
- Ensuring quality, accountability and transparency in processes
- Gender
- Addressing specific needs of vulnerable groups
- Coordination
- Environmental sustainability
- Adoption of a conflict-sensitive approach
- Flexibility in delivery of aid (cash and aid-in-kind)
- Building on local capacities

1.1   Advocacy

☐   Have earthquake safe-building codes and guidelines been established in the country/state/city? What role is the National Society or its local chapters playing in sensitizing key stakeholders on the adoption and implementation of these?

☐   Has the National Society or its local chapters attempted to promote the adoption and use of guidelines in essential services in which it is involved, such as hospitals and schools?

☐   Have partnerships and networks been developed with other key actors involved in earthquake preparedness, response and recovery with the aim of enhancing coordination during response and recovery efforts in future earthquakes?

1.2   Assessment and monitoring of earthquake risks

☐   Has mapping of seismic-risk zones been carried out at the national/state/city level? Have these been used for strengthening awareness and advocacy efforts with other/local actors?

☐   Are community members aware of the risks they face? Are community members able to identify and address the risks they face from earthquakes?

☐   Do contingency plans for earthquakes (and other hazards) exist? Have they taken into account all possible contingencies, the possibility of redundancies and the need for alternative options? Are these regularly tested and updated?

☐   Have linkages been established with organizations and agencies at the national and regional level to receive early warnings for secondary hazards like tsunamis? Are systems and procedures in place to disseminate these among communities?

1.3   Using knowledge, education and awareness for safety and resilience to earthquakes

☐   What approaches have been adopted for increasing awareness among all stakeholders about the risks they face from earthquakes and secondary hazards?

☐   Does a capacity development plan for earthquake-risk reduction exist? Is this targeted at all key stakeholders including National Society staff and volunteers?

☐   Have traditional construction practices and knowledge been explored to find possible evidence of earthquake-safe construction principles?

☐   Have activities aimed at increasing awareness of earthquake risks and safety measures identified and made use of the ability of local groups, leaders and community-based organizations to influence others?

☐   Have training and capacity-building initiatives been targeted at community members, recognizing their significance as first responders in an earthquake?

☐   Have any training and capacity development initiatives been carried out for local government staff and personnel?

☐   Is there scope for training and developing the skills of masons and construction workers on earthquake-safe construction principles and methods?

☐   Has any research been carried out on how traditional or local practices can be adapted to incorporate principles of earthquake safety?

1.4   Addressing underlying risks

☐   Have any structural risk-mitigation measures for particular vulnerable groups and structures (such as

non-engineered constructions) been carried out?

☐ Have places of mass gatherings and those which play a significant role in a community's life (such as hospitals, schools and community halls) been identified and retrofitted to reduce the risk of collapse in earthquakes?

1.5   Strengthening capacities for earthquake response

☐ What response capacities – human, financial, material or logistical—for responding to earthquakes exist at the community level, in local chapters of the National Society and in local governance institutions? How have these been strengthened or supported?

☐ Are there reserves or contingency stocks, standing agreements with vendors or has mapping of resources that can be mobilized at short notice been carried out?

☐ How have human resources been strengthened at the national level? Are there sufficient trained personnel or volunteers or an ability to meet the need for rapid scaling-up in the event of an earthquake (through rosters etc.)?

☐ Has the National Society worked towards entering into agreements with the national government to facilitate quicker entry of aid in the aftermath of an emergency?

2 RESPONDING

- Search and rescue
- Medical first response
- Psychosocial support
- Family links
- WatSan/HP
- Damage assessment
- Needs assessment
- Immediate shelter
- Dealing with debris
- Urban settings
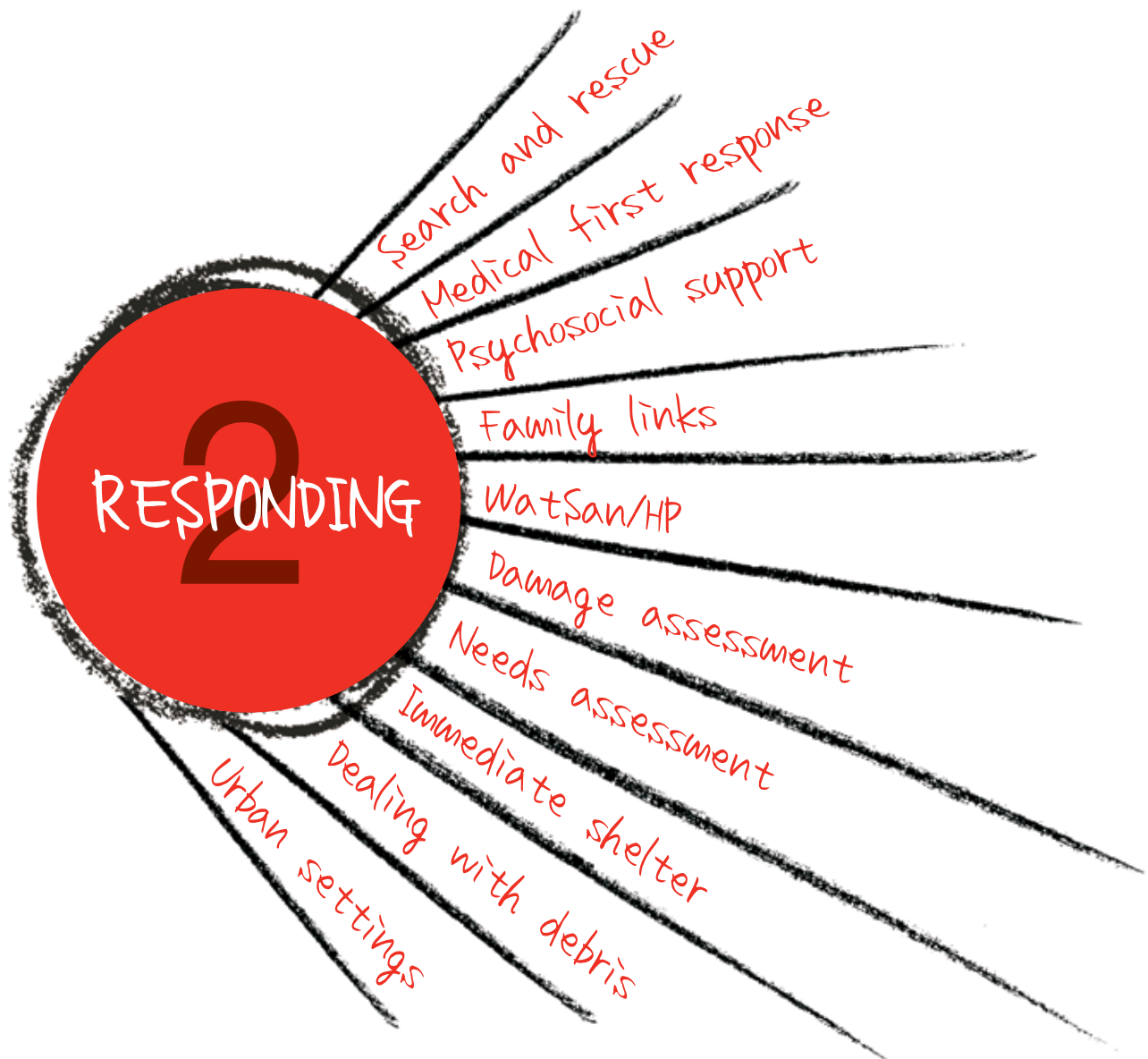
Due to the sudden-onset nature of earthquakes, the role of local communities within the affected region in response is hugely significant. It is vital to provide critical assistance within the first few 'golden hours' as the widespread damage to infrastructure may limit access. Responses to earthquakes also require that emergency operations be limited to the shortest-possible time period and that plans for recovery operations are quickly developed.

This section highlights some of the factors that are likely to be encountered in earthquake response across different sectors. Particular attention has been given to the challenges and issues unique to earthquake response in urban settings.

2.1 | Search and rescue

Given the large number of collapsed structures that can be expected after an earthquake, the deployment of search-and-rescue teams is one of the first responses. These teams typically include technical experts that are assisted by sniffer dogs.

The initial phases of search-and-rescue efforts proceed at a slower pace with limited use of heavy equipment to clear debris. This is in the expectation that survivors may be trapped beneath the rubble. The emphasis in the subsequent phase moves to body recovery. This phase proceeds at a relatively quicker pace and employs heavy equipment to clear the debris.

In a search-and-rescue operation, the majority of lives are saved by local actors who respond in the first 48 hours following an earthquake. Search and rescue efforts are resource intensive and can divert a considerable amount of attention and resources away from other urgent needs, including the care of survivors. It is difficult, however, to clearly define a period within which search-and-rescue efforts should be called off.

Search-and-rescue efforts are best carried out by local actors. The utility of involving highly specialized international search-and-rescue teams, who arrive several days after an earthquake, needs to be carefully considered and weighed against the impact that this would have on the overall response and care for survivors.

© Eric Quintero/IFRC

2.2 | Medical first response

One of the distinguishing characteristics of earthquakes is the high rate of mortality and a high proportion of non-fatal traumatic injuries, caused by falling objects or debris. Secondary hazards such as tsunamis, landslides or fires, among others, often result in greater damage and loss of lives than that caused by the earthquakes themselves. Aftershocks following major earthquakes and delayed collapses of damaged structures are also a source of mortality and morbidity.

Past experience has shown that a significant number of lives can be saved in the aftermath of an earthquake through the provision of immediate first aid within the first few hours.[1]

Experiences also indicate that the greatest medical needs after an earthquake are in the first week.[2]

As the greatest medical needs are within the first two days, immediate medical assistance is best provided by local physicians, medical personnel or community members trained in first aid. These capacities, wherever available, should be supported in the initial medical response.

- **The timing of medical responses is crucial in an earthquake. Field hospitals should be established within the first week after the disaster.**

- **The needs of those suffering from chronic ailments or those dependent on medication must be addressed.**

- **As in most other emergencies, maternal and child health remain among the most significant health concerns.**

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(1) Schultz, C. et al., Feb 1996

(2) Ibid.

- **While disease outbreaks are less frequent after an earthquake as compared to other disasters, epidemiological surveillance should still be a priority.**

© IFRC

The types of injuries and risks common in earthquakes include broken bones and fractures, cuts caused by shattered glass or other debris – and related infections like tetanus, crush injuries including rhabdomyolysis, asphyxiation due to dust inhalation or chest compression and dehydration from being trapped under rubble for an extended length of time.

Management of dead bodies

Mortality rates in an earthquake are typically much higher than in other disasters. Dead bodies are often incorrectly seen as a source of disease and possible outbreaks of epidemics. This in turn leads to hasty responses such as burial in mass graves without following adequate procedure and can be a source of distress for the families of the deceased.

Proper identification of bodies helps families attempting to locate missing relatives. It can also aid both the process of psychological recovery by providing closure as well as assist in addressing legal requirements that the families might need to carry out.

Engaging in the management of dead bodies requires close collaboration with coordinating authorities. Actions need to be in compliance with procedures in place and usual precautions. Different levels of expertise may be needed if the intervention includes body recovery, storage, identification, information, disposal, support for families or logistics.

- **Do not rush to dispose of dead bodies and avoid the use of mass graves. Dead bodies do not spread disease.**

- **Workers handling dead bodies should wear protective equipment. Psychological support should be provided for this difficult task.**

Further reading:
- *Management of Dead Bodies after Disasters: A Field Manual for First Responders,* PAHO, WHO, IFRC, ICRC, Geneva, 2006.

2.3 | Mental health and psychosocial support

The provision of psychosocial support is increasingly seen as an integral part of emergency responses. The sudden-onset nature of earthquakes and their potential for widespread destruction can result in families being separated and can have a severe impact on the mental health and psychosocial well-being of survivors. Given the severe disruptions that earthquakes can cause to daily routines, the provision of psychosocial support is of particular significance to groups such as children and can help promote a sense of security.

It can also play a significant part in aiding the recovery process for survivors, in restoring a sense of normalcy and in helping them to resume their normal lives. As the process of reconstruction and recovery following an earthquake can continue for a considerable length of time, it is important to develop local capacities in the provision of psychosocial support and care.

© Talia Frenkel/American Red Cross

In recognition of these facts, a Psychosocial Support component is now included within the Emergency Response Units (ERUs) of the IFRC.

There are several aspects that should be taken into consideration in the provision of psychosocial support in communities affected by earthquakes.

- **Integrate psychosocial support in response during the acute emergency phase following an earthquake.**

- **Ensure that psychosocial support is provided by experienced personnel, in close coordination with local actors and in a manner that is sensitive to the socio-cultural context of the area (including language).**

- **Use community structures and existing support systems and groups, or train community members and volunteers in the provision of psychosocial support.**

© Anshu Sharma/SWC, Japan

Taking care of the details

In Sendai, Japan, attention was paid to small but vital details. From the army to debris clearing teams, care was taken to save items of intrinsic value to families, such as photographs. Once cleaned and packaged by volunteers, they were displayed in a local community hall for families to collect. Such procedures – as well as attention to sensitive areas like dealing with cemeteries - helped ease the recovery process for survivors.

The sudden-onset nature and destruction of communications and physical infrastructure caused by earthquakes pose a challenge to people establishing and maintaining contact with their families and relatives. People may also be evacuated to reception centres, shelters or hospitals without the opportunity to inform their families. This can cause anguish and insecurity and can have a severe impact on the well-being of survivors, their families and relatives - both within the country or abroad.

Restoring Family Links (RFL) aims at preventing the separation of families, restoring contact among separated family members, reuniting them and clarifying the those people unaccounted for.

The worldwide Family Links Network of the International Red Cross and Red Crescent Movement, which includes the Central Tracing Agency of the ICRC, tracing agencies in ICRC delegations and tracing services of National Societies, is uniquely placed to organize RFL operations in a country affected by an earthquake and to address needs identified in other countries.

The provision of telephone services and the use of websites as tools to assist in the task of establishing contact has been noted in recent disasters including the response to the South Asian tsunami of 2004 and the Haiti Earthquake of 2010.

- **RFL services need to be provided from the first phase of emergency response to alleviate suffering and strengthen recovery.**

- **Close coordination with other members of the Family Links Network of the Red Cross and Red Crescent allows the rapid dispatch of additional experts and resources to the area affected by an earthquake and the handling of RFL needs abroad.**

- **Use of telephone and the internet are fast and effective ways to re-establish contact among family members.**

- **Focus on particularly vulnerable groups such as children, the elderly or injured people may be required.**

© Marko Kokic/ICRC

Further reading:

- Resolution 4, Restoring Family Links Strategy (and Implementation Plan) for the International Red Cross and Red Crescent Movement (2008-2018) Annex: the Restoring Family Links Strategy, Council of Delegates of the International Red Cross Red Crescent Movement, Geneva, 23-24 November 2007.

An earthquake and secondary hazards such as a tsunami that follow can impact water sources, storage and distribution systems in a number of ways. Some of these include:

- Groundwater becoming saline (salty), damage to aquifers and reservoirs or changes in the flow of groundwater.

- Damage to or destruction of household or community wells, bore wells and changes in the water table.

- Contamination of water sources either by debris or by leakages in sewage lines following an earthquake.

- Disruptions in power supply which limit the amount of water that can be pumped for supply.

- Destruction of water storage and distribution systems by an earthquake or by heavy earthmoving equipment used after an earthquake.

(Adapted from *Rapid Needs Assessment for Water, Sanitation and Hygiene,* World Health Organization, Regional Office for South-East Asia, December 2004.)

In addition, earthquakes can severely compound and increase sanitation and hygiene challenges and stretch existing infrastructure in a community.

Given the complex environments within which teams working in WatSan/HP may operate in the aftermath of an earthquake, the significance of periodic community engagement and mobilization right from the outset can be critical to the effectiveness of an intervention. Engagement with a community will help ensure that a water, sanitation or hygiene promotion intervention is able to tailor messages to suit the particular needs and context in which it is operating.

Teams involved in WatSan/HP responses should engage community members from the start and should include volunteers from the community. Teams should be composed of members with an adequate balance of technical expertise, as well as skills and experience in community mobilization and organization.

While standardized modules and kits (such as the Mass Sanitation Module and the Water Supply Modules) exist for WatSan/HP responses, earthquakes in densely populated urban areas— such as the January 2010 earthquake in Port-au-Prince, Haiti— will require these to be used to provide services to numbers far in excess of those for which they were designed.

In such situations, it would be advisable to consider the need to scale up and possibly adapt the resources required in this area, including in the management of human resources.[3] For example, water distribution and storage capacities are often more critical than water treatment capacities (as experienced in Port-au-Prince). Sanitation in areas where it is not possible to dig trenches requires equipment for storage, transport and disposal of excreta.

(3) Fortune, V. and Raval, P., British Red Cross – Mass Sanitation Module Report, 2010 Haiti Earthquake Response, Post-Deployment Evaluation Report, August 2010.

Plan for contingencies when deploying modules and kits in the event that a response needs to be scaled up in a constantly evolving context. Planning should include the additional inputs that would be required, how these will be organized and managed, and adaptations that might be necessary.

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Communication is of critical importance during any emergency. Large-scale earthquakes typically result in a breakdown of transport and communication infrastructure, increasing the number of challenges to overcome. Communication systems can serve as useful channels for obtaining feedback from beneficiaries and monitoring the opinions and experiences about the aid they are receiving.

However, mass communication is only one component of a wider hygiene-promotion communication plan. These channels are essential in the first phase of the emergency. As soon as the emergency stabilizes, interpersonal communication should come to form a central part of the communication strategy

Assessments of the most effective means of communication may vary across countries and situations. In addition to traditional means such as community gatherings, they include awareness campaigns, radio and television, as well as new technologies such as mobile telephones and social networking websites.

- **Use all available means of communication to spread awareness of precautions related to public health, safe water, food and other such information, as well as to receive and monitor feedback from beneficiaries in the initial phase of the emergency. Subsequently, emphasize the need for community mobilization.**

- **Hygiene promotion is not a stand-alone activity. It must be integrated into all water and sanitation activities.**

Restoring communications in Haiti

Despite the scale of the earthquake in Port-au-Prince, Haiti, in January 2010, mobile communication systems were restored fairly quickly. The Haiti Red Cross and the IFRC, in partnership with a local mobile service provider, used text messaging to reach over a million subscribers each day with vital information relating to health, shelter and sanitation. The system also served as a channel through which beneficiaries could share feedback.

Post-earthquake damage assessment has a critical focus on the physical damage to buildings and infrastructure. To create a holistic picture and plan out a timely and appropriate response strategy, this assessment method must incorporate the nature and scale of damage and the immediate needs.

A single 'fit-all' methodology is not suitable to satisfy all short, medium and long-term objectives. For that purpose, a three-pronged earthquake-assessment process is useful.

1) Rapid Visual Assessment (RVA)

- Required for all buildings after an earthquake, it is a preliminary screening process.

- RVA is a visual and largely qualitative method. It helps classify minimally, partially and majorly damaged buildings.

RVA of a building can help in understanding its structure with respect to visible weaknesses. It involves a structured series of technical observations based on visible data. It looks at age, material, technology, form, pattern of openings and signs of structural distress in buildings.

2) Detailed safety assessment

- This is required for all partially and majorly damaged buildings.

- This method is based on very detailed technical observations and helps to identify the broad actions required.

3) Engineering evaluation

- This is required for buildings being considered for engineered rehabilitation or retrofitting.

- It involves non-destructive tests, soil examinations and structural engineering analysis.

- This assessment helps to determine compliance with building code regulations, weaknesses in the construction due to ageing and invisible structural damage caused by the earthquake.

IS IT SAFE TO RETURN?

Be careful about communicating an 'it is safe to return!' message unless houses have been fully inspected and endorsed by both licensed experts and authorities.

Serial no.	Town	Ownership:	
Name of the building:	Contact:	Usage:	
		Number of floors	
		Date of visit	
Damages noted:			
Special remarks		Image of the building	
Suggestions			
Status of the building	Supervision of Engineer	Short note on suggestive measures	Present status of intervention by the owner

On account of the widespread destruction and displacement following a sudden-onset disaster such as an earthquake, carrying out assessments can be a challenging task. Therefore, an assessment needs to quickly ascertain 'where people are, what condition they are in, what they are doing, what their needs and resources are and what services are still available to them' (IFRC, Disaster Needs Assessment Module, June 2000).

Given the possibility of changes, assessment needs to be a continuous process rather than a one-off activity. As timing is critical in the provision of some services (such as search and rescue and emergency medical care), an assessment should also take into consideration the feasibility of providing services within a short span of time. Likely future impacts from secondary hazards triggered by an earthquake should also be taken into account during an assessment.

- **Assessments in earthquakes should be seen as a continuous process, given the possibility of changes in the situation. They should evaluate the possibility and likely impacts of secondary hazards.**

- **Detailed assessments in the aftermath of an earthquake, in addition to the needs in different sectors, should also assess the socio-economic impacts of the earthquake on various groups and attempt to identify issues that need to be prioritized in the recovery process.**

Further reading:
- *Guidelines for assessments in emergencies*, ICRC and IFRC, Geneva, 2008.

Differing impacts on socio-economic groups in Gujarat

While poverty is commonly attributed as the single biggest underlying source of vulnerability, experience from earthquakes has shown that it is not necessarily the most economically disadvantaged sections of a community that are the most vulnerable, but rather middle and lower-middle income groups. The experience during the earthquake in the state of Gujarat, India in 2001 was that households with relatively higher incomes who could afford the more expensive reinforced cement constructions suffered greater losses.

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The preference for reinforced cement brick houses arises partly on account of the prestige associated with these. However, a lack of sound engineering, architecture and masonry make these constructions far riskier than those of traditional single-storeyed mud constructions.

Aa well as suffering greater losses, such families rarely have housing insurance or the means to build again. They often don't qualify for compensation and aid, significantly increasing their vulnerability after an earthquake.

Immediate or emergency shelter responses need to be part of a well-thought-out plan, based on thorough assessments. These need to assess the impact of long-term recovery and reconstruction and the impacts on other aspects such as existing community support structures and family livelihoods.

Immediate shelter options in the aftermath of an earthquake could include a range of activities spanning the provision of tents and tarpaulin sheets; providing shelter kits to help households repair damage to their houses in cases where this is possible; supporting relocation with host families; and supplying of cash grants or vouchers for repair, among others.

Participation by families in the construction of temporary shelter can support livelihoods, the local economy and help with the process of psychosocial recovery.

> **Encourage options that enable families to participate in the construction of transitional or emergency shelters such as the provision of shelter kits and construction materials or through grants or vouchers to purchase such items. Extend necessary technical guidance and support to them wherever needed.**

Camp management

After an earthquake, while households usually prefer staying close to the sites of their damaged houses (to protect their property and belongings, among other reasons), it is possible that in some cases they settle in camps – either planned or spontaneous settlements. There may be some circumstances in which households or some members of households relocate to nearby larger towns and cities. This may be driven by a number of factors, possibly including adverse weather conditions, as was seen in the aftermath of the Pakistan Earthquake in October 2005. There exists a risk of exclusion where camps are unplanned or are made of temporary settlements spread over a large area and in cases where affected households are living with host families.

© Gina Guinta/IFRC

Where they exist, camps need to be carefully planned and managed, in close coordination with all actors and with the participation of the camp residents. These sites should offer families security and protection. Specific needs of households that have been displaced, have relocated and those living with host families should be taken into account.

Flexibility in aid delivery: The use of RED cards in the Chile Earthquake shelter response

The Chile Earthquake of February 2010, which was followed by a tsunami, remains one of the most powerful ever recorded.

With shelter emerging as a key need, the Chilean Red Cross opted for the distribution of debit cards among 8,400 of the most vulnerable families. The cards, known as Tarjetas RED (the Spanish acronym for Reparacion y Desarrollo or 'Repair and Development Cards'), were issued in the name of an individual in a household and were non-transferable. The cards entitled the owners to purchase approximately 350 US dollars worth of construction material and hardware to assist in the repair of damages to their homes.

The cards could be used during a fixed period and only at stores that were part of a particular network comprising over 40 of the largest businesses in the country – the Red Materiales y Soluciones (MTS Network).

© Chile Red Cross

The cards provided households with the flexibility and opportunity to decide and prioritize what materials they wanted to buy, the quantities in which they wished to purchase them and permitted them complete autonomy and independence in the process of repair.

In addition, by sourcing locally, the RED cards also helped support local businesses and reduced costs associated with transportation and warehousing of construction materials and supplies.

Relocation of affected families with relatives and other families willing to host them within the community should be considered as an option. Support can be extended to host families in the form of cash grants, provision of non-food items or assistance in expanding their houses to accommodate the new families.

Consider relocation with host families as an immediate shelter option, as this improves social cohesion and builds social capital, while cash support extended to families can help the local economy.

Settlement planning

Locating emergency shelters close to the site of damaged or destroyed homes can help ensure that:

- households remain close to their sources of livelihood

- land tenure and property disputes are minimized.

Settlements should be carefully planned to incorporate all needs, tastes and preferences of the community and should involve community members at all stages of planning and implementation.

Locate emergency shelters such as tents as close as possible to the site of the damaged or destroyed homes. When planning new temporary settlements ensure that they are put in place after extensive consultation and involvement of community members and address the needs for basic infrastructure, utilities and services.

Transitional shelters: To build or not to build?

As construction of permanent shelters is a process that can take a considerable length of time, agencies sometimes opt to provide transitional shelters as an intermediate solution. Transitional shelters are designed to be more durable than emergency shelter options such as tents and tarpaulins, but are not intended for use as permanent structures.

Some considerations behind agencies choosing to provide transitional shelters include:
- resource constraints or an inability to provide durable shelter to all affected families
- lack of clarity on issues of land titles and property rights
- local markets are unable to immediately meet the increase in demand for construction services
- the urgent need for shelter solutions, on account of climatic conditions in the region or other possible hazards.

However, despite the advantages of adopting a transitional shelter approach, there are some clear limitations associated with it. These include:
- Transitional shelters are resource intensive and divert attention and resources which are better invested in permanent shelter options.
- In urban areas and places where space is a limited, transitional shelters may occupy space that could be used for construction of permanent shelters and impede the reconstruction process.
- Transitional shelters may also reduce the sense of urgency among agencies and authorities to find more permanent shelter solutions.
- As donor interest and financial support decreases in the aftermath of an earthquake, transitional shelters often end up serving as sub-standard permanent shelters even though they were not built to last for more than a few years.

Shelter solutions that offer permanence should be preferred over temporary solutions. Minimize the use of transitional shelters. However in cases where the construction of transitional shelters is unavoidable, attempts should be made to adopt transitional shelter designs that can be[4]:

Upgraded

Where it is possible to make modifications in the materials used in a transitional shelter and convert it into a permanent dwelling.

Reused

Where the transitional shelter is located near the site of future permanent shelters and following the construction of permanent shelter, this can be used by the family for alternative purposes such as for use as a garage, a livestock shelter or as a shop.

Resold

Where parts of the transitional shelter can be dismantled and sold in the local markets once the construction of a permanent shelter has been completed.

Recycled

Where parts of the transitional shelter can be gradually dismantled and reused in the construction of a permanent shelter. Wherever possible, transitional shelters should also be constructed from recycled debris that has been salvaged from the destroyed or damaged house.

(4) Adapted from Collins, S. et al. ALNAP Innovations

Managing large volumes of debris and rubble after a major earthquake can be a challenge. There are a number of options for managing debris and the process can begin engagement with survivors and the process of their rehabilitation.

The options for dealing with debris include:

Salvaging parts of collapsed structures, such as timber or metal sheets, that can be reused in the construction of emergency or transitional as well as permanent shelter. Some materials may also be of significant economic value.

Payments for the clearance of rubble, which can be a source of employment and help infuse cash into the local economy. Rubble can contain hazardous material at times and adequate precautions should be taken by individuals who are involved in handling it.

Sometimes, the eligibility of a home-owner for compensation and grants may be affected if rubble is cleared from the site. Another aspect to consider in debris clearance is the high possibility of recovering personal property in the process, which can be a source of conflict and disputes.

Filling of sites upon which new structures are to be built. However, care should be taken to remove all organic matter which is likely to decay and create gaps , and therefore unstable surfaces, in the future.

Conversion into construction material for the reconstruction process, using machines and technology that is now available. Examples include the conversion of rubble into bricks or construction blocks after crushing and adding other materials. Monitoring the quality of such processes is critical.

> **Use the process of debris clearance and management after an earthquake to engage survivors, generate employment and income opportunities and to support the local economy and rehabilitation process.**

Following the earthquake and tsunami of December 2004 in Aceh, Indonesia, an international NGO responding in the area decided to publish the prices paid for scrap and salvaged material, a practice that proved useful for community members.

© Meghna Chawla/SWC, Japan

IT'S BEYOND THE CAPACITY OF A SINGLE ACTOR

After a major earthquake, removal of debris may be required on a large scale and this may be well beyond the capacity of any single actor. There will be limitations to the roles that individuals, households or communities can play and will require the involvement and engagement of local governments and other actors.

More than half the world's population now resides in urban areas. Responding to humanitarian crises in these areas can be challenging owing to the conditions agencies are confronted with. These include, among others, high population densities, large migrant or floating populations, diverse and often less unified communities, and significant proportions of tenants and informal settlements.

Over the last decade or so, residents in urban areas have witnessed some of the most devastating earthquakes. These include the Izmit or Marmara Earthquake in Turkey in 1999 that claimed close to 17,000 lives; the Bhuj or Gujarat Earthquake in India in 2001 that claimed 20,000 lives; the Bam Earthquake in Iran in 2003; the Sichuan Earthquake of 2008; and most recently the earthquake in Haiti in 2010 that claimed over 220,000 lives and flattened large parts of the capital Port-au-Prince and neighbouring areas.

There is a high probability of a major seismic event in some of the most densely populated and largest cities in the world. These include: Tokyo, Shanghai, Mexico City, Tehran, Jakarta, Mumbai, New Delhi and Kolkata, among others.

Earthquakes in urban areas can challenge humanitarian agencies given that:

- There are high population densities and limited space available for setting up temporary camps and facilities.

- There are large numbers of multi-storeyed constructions which further add to the problem of space and shelter provision.

- There are significant proportions of informal settlements with limited access to infrastructure and facilities even prior to an earthquake.

- An urban earthquake can cause disruptions to the entire economy of a region or country, due to the large number of livelihoods and economic and financial systems concentrated there. In addition, urban settlements often lie at the core of complex systems with linkages to semi-urban and rural areas, all of which can be affected.

- There is a high probability of earthquakes in urban settings triggering secondary hazards such as fires due to ruptures in gas lines or damage to electric supply infrastructure.

Responding to earthquakes in an urban setting

It is necessary to focus on the specific conditions of urban areas and the impact these have on responses to earthquakes centred in these areas. Some of these conditions and challenges are highlighted below.

Urban search and rescue

Search-and-rescue operations in urban areas are a specialized field. These skills can be particularly significant following an earthquake, given the likelihood of a large number of collapsed structures. Access for rescue teams and emergency services can be challenging in areas with narrow streets or where large multi-storeyed structures have collapsed.

Coordination

The need for coordination among agencies working in urban areas is particularly acute given the high likelihood of duplication of relief efforts and exclusion of groups or areas.

The Great Hanshin (Kobe) Earthquake of 1995 caused massive fires because of toppled gas cookers and kerosene stoves. Hundreds of deaths were attributed to these fires and smoke inhalation.

(5) ALNAP – Lessons from Urban Disasters

The possibility of gaps in knowledge in urban areas is very high, making information sharing and exchange critical to effective humanitarian response.

Coordination with local governance structures and authorities should be initiated as early as possible. Given that responsibilities for provision and maintenance of services and infrastructure in urban areas may be spread across multiple agencies and departments, the need for coordination and partnerships is urgent and necessary during a disaster response.

Needs assessment and targeting

Assessment of needs is critical to the effectiveness of a response. However, carrying out assessments in urban areas can be particularly challenging for agencies new to the area. This is due to the large floating populations that are not necessarily reflected in official statistics. The diversity in urban populations with a mix of economic and social classes, all residing within short distances of each other, also make the task of targeting assistance to particular groups a challenge.

A large number of community groups and organizations can be found in urban areas and these should be used to facilitate the process of assessment and targeting during a response. Assessments should also take into consideration the needs of migrants and other groups likely to be encountered in an urban setting.

Safety and security

Deterioration in law-and-order situations are not uncommon after earthquakes. Reports of looting and rioting from shops, establishments and businesses have emerged after some of the earthquakes in the recent past. Though these incidents are typically limited to very small segments of society, they can at times represent threats to the safety and security of humanitarian personnel involved in initial response.

The safety of communities and personnel involved in distributions should therefore also be given due consideration.

Water, sanitation and hygiene promotion needs

Activities in the area of the water, sanitation and hygience promotion (WatSan/HP) in emergencies within urban locations are faced with a unique set of challenges. These include:

- High population densities with limited space for sanitation facilities and more people using a single latrine require increased maintenance activities such as cleaning, desludging and disposal of excreta.

- Limited open spaces and land makes it difficult to obtain permissions to set up facilities and creates challenges for solid waste management and disposal.

- Large paved and concrete areas make drainage and construction a challenge and increase the risk of water accumulation and vector-borne diseases. As a result, alterations in the design of latrines used may also be required, such as the use of raised latrines.

- People belong to diverse backgrounds and social classes, which can be challenging for the tasks of community organization and mobilization.

Urban poor and livelihoods in earthquakes

Livelihoods in urban areas are often complex and will be severely disrupted after an earthquake. As a large number of people are dependent on daily wages, the impact that an earthquake might have on their ability to access food and other basic services needs to be assessed.

Urban poor, who often reside in informal settlements or slums, are a group that need to be given particular attention in the event of an earthquake. They form a significant group, in some cases comprising more than 50 per cent of a city's population. Such groups are often missing from official statistics and are excluded from formal financial systems and banking channels. They are likely to invest and accumulate assets in their homes. For instance, they may add an additional room to their house and rent this out. Earthquakes can destroy these assets, severely weakening their coping capacity. They are also often excluded from government safety nets and social systems due to being undocumented or because of the lack of legal titles.

While addressing livelihood needs in the aftermath of an earthquake, understanding the dynamics of the economic system in an urban area is of great importance. Enabling urban poor to quickly recover should be one of the primary aims of a livelihood response.

Implementing a pro-poor response

- Rapidly assess pre-existing markets.

- Assess supply and value chains.

- Re-establish markets that are critical to the delivery of products and services for affected communities and that underpin development and participation.

- Promote local markets by sourcing locally wherever possible.

(UN HABITAT 2006, cited in ALNAP, 2008)

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Cash transfer programming

Cash transfer programming can be used to address basic needs for food and income and/or to protect, establish or re-establish livelihoods or productive capacity. However, the provision of cash alone is not always sufficient and must be linked to other forms of support. While there is no blueprint for cash transfer programmes and adaptation for different contexts is necessary, various forms of cash-based transfer could include the following:

- Unconditional cash transfers: Often used at the start of an emergency, these are given with no conditions as to how the money should be used. However, it is assumed that the money will be used according to the needs identified in the assessment.

- Conditional cash transfers: These are given to enable recipients to accomplish specific tasks (e.g., rebuild their house, plant seeds, provide labour, establish/re-establish a livelihood).

- Commodity or cash vouchers: These specify the items (and the amount of the cash vouchers) or services for which the recipient can exchange their voucher(s). Cash vouchers have a specific value and can define a service and an item or a range of items for which the voucher can be exchanged. Alternatively the voucher can allow the recipient freedom of choice as to what to purchase with their voucher. Combined vouchers (cash and commodity values) also exist. Vouchers can be exchanged in pre-selected shops, with specified traders and service providers or at specifically organized fairs.

- Cash for work: This is payment for work to improve or rehabilitate community services or infrastructure. Wages should cover basic needs, but be slightly below market levels to avoid competing with the labour market.

- Social assistance transfers: These repeated, unconditional, predictable cash transfers are provided to longer-term vulnerable or poor households or specific individuals (e.g., the elderly, pregnant women). These are preferably implemented in conjunction with government agencies and with requisite political support.

Further reading:
- *Guidelines for Cash Transfer Programming*, ICRC and IFRC, Geneva, 2007.

Shelter and land issues

Among the shelter and settlement issues likely to be encountered by agencies working in urban settings in the aftermath of an earthquake are:

- difficulties in finding land where temporary shelters and settlements can be planned, on account of the paucity of space

- large numbers of tenants, people with no land titles (squatters) and landless households who are in need of assistance

- challenges in verifying inheritance claims

- the loss of documentation, land titles and papers or even demarcations indicating boundaries of properties, which can lead to conflict and disputes.

Minimum standards and indicators in urban earthquakes

Given the immense need, as well as the logistical and infrastructural limitations in urban settings, achieving the indicators suggested in the *Sphere Handbook for Minimum Standards in Humanitarian Response* is not an easy task. Agencies involved in the response in densely populated settings of Port-au-Prince, Haiti, following the earthquake in 2010 were well aware of the limitations they faced in achieving the indicators outlined in the Handbook, particularly those in the areas of water, sanitation, waste management and shelter.

The approach adopted by most agencies in these settings was as follows:

1. To acknowledge the limitations they faced in meeting the Sphere Handbook indicators and the possibility that achieving them would be impossible in the emergency response phase.

2. To adopt a 'good enough' approach in light of the limitations and opt for using alternative indicators that are qualitative instead of quantitative in nature. For instance, indicators for provision of water such as queuing time at water points instead of the recommended indicator of 15 litres per person per day.

3. To continue to emphasize processes and core standards and principles outlined in the Sphere Handbook rather than outputs.

©ICRC/ Marko Kokic
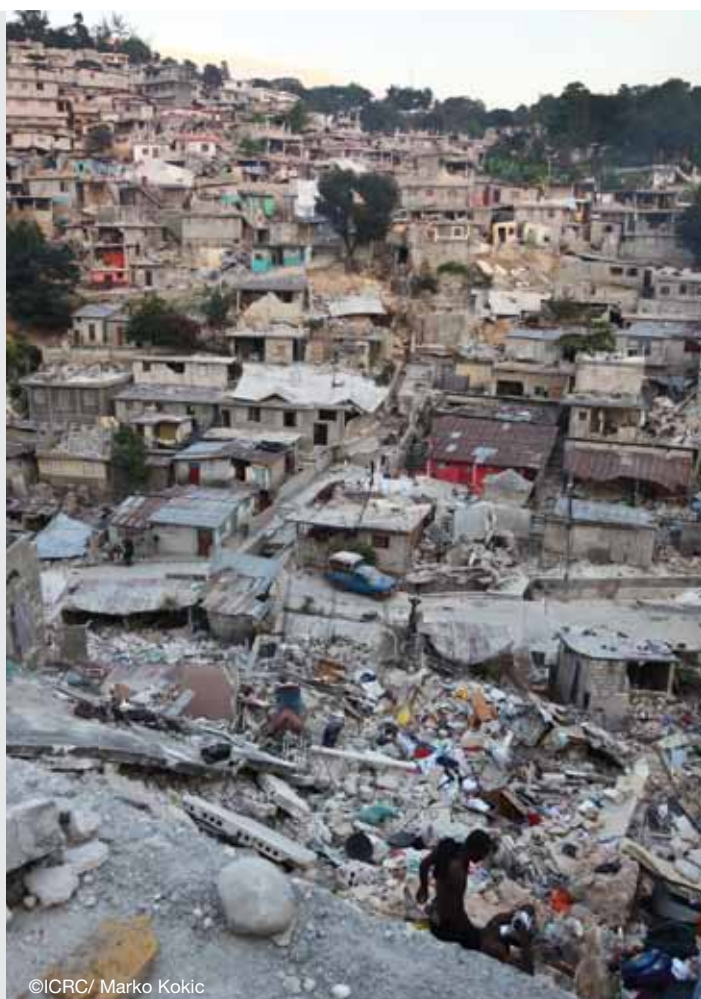
Despite the many limitations and challenges that agencies may face while responding to earthquakes in urban settings, there remain several opportunities which such situations provide and that should be maximized.

- **Stronger local governance structures which are more sensitive to public pressure and that should be used for lobbying and advocacy efforts.**

- **Existing infrastructure, systems and services which should be restored and supported on a priority basis, to be used as part of the emergency response.**

- **Livelihood opportunities, entrepreneurship skills and capacities, markets and networks which should be clearly identified, well promoted and supported as part of the response. Consider cash and/or market-based programming interventions to boost local economic recovery which is particularly important to vulnerable urban families.**

- **Improved means of communication and reach of media which should be used to communicate vital information and messages.**

CHECKLIST: RESPONDING TO EARTHQUAKES

Cross-cutting issues

- Participation and promotion of local ownership
- Ensuring quality, accountability and transparency in processes
- Gender
- Addressing specific needs of vulnerable groups
- Coordination
- Environmental sustainability
- Adoption of a conflict-sensitive approach
- Flexibility in delivery of aid (cash and aid-in-kind)
- Building on local capacities

2.1   Search and Rescue

☐ Are sufficient search-and-rescue capacities available in the affected area or in its vicinity? Have any decisions to request or send international search-and-rescue teams been assessed for their costs and benefits?

2.2   Medical first response

☐ Do local medical personnel, equipment and capacities exist? How can these be supported or strengthened in the initial few days after the earthquake?

☐ Have the needs of particularly vulnerable groups—children, pregnant women and the elderly as well as the needs of those suffering from chronic ailments and dependent on medication—been planned for?

☐ Has epidemiological surveillance been initiated to monitor possible outbreaks and is this being coordinated with assessment and search-and-rescue teams?

☐ Is proper identification and recording of details of dead bodies being carried out, in partnership with coordinating authorities and in accordance with established standards?

2.3   Mental health and psychosocial support

☐ Are there a significant number of cases of people showing signs of trauma and stress? Has the provision of psychosocial support been integrated with the emergency response?

☐ Are there existing community structures and support systems or groups that can be supported and trained further in the provision of psychosocial support?

☐ Are the personnel involved in the provision of psychosocial support working with local actors and familiar with the socio-cultural context of the area?

2.4   Restoring Family Links (RFL)

☐ Have RFL activities been initiated in close coordination with other members of the Family Links Networks of the International Red Cross and Red Crescent Movement from the initial response itself?

☐ Has the potential of the telephone and internet to support RFL activities been explored?

2.5   Water, sanitation and hygiene needs

☐ Do WatSan/HP teams involved in the emergency have an adequate mix of technical skills as well as experience in community mobilization and organization?

☐ Are there contingency plans for the use of established modules in the event that responses need to be scaled up in a major earthquake?

☐ What type of outreach system would work in the given context (volunteers, health clubs, committees etc.) for both immediate and medium-term mobilization?[6]

2.6   Damage assessment

☐ Is there a plan for assessing damage to structures after the earthquake - both public and private and their safety? Are adequate personnel and resources available for this?

2.7   Needs assessment

☐ Has a plan for assessing needs of the affected population been developed and coordinated with other actors and agencies? Have the risks from secondary hazards been taken into account?

☐ Have the assessments been able to capture data on the impacts of the earthquake (and needs) on various groups in a community or area? Have assessments been able to identify issues that need to be prioritized in the recovery process?

2.8   Emergency shelter and settlement

☐ Have the various options for provision of housing support (tents, tarpaulins etc.) and delivery of support (cash, vouchers, materials) been explored and have community members been consulted on this?

☐ Is relocation with host families an option? Can host families be encouraged to support affected families and be supported for this in any way?

☐ How are the issues related to planning and camp management being addressed? Are other actors and camp residents involved in this?

☐ Have options that encourage families to participate in the repair of their houses, such as the provision of shelter kits, or in the construction of transitional or emergency shelters been explored?

☐ Are temporary settlements located as close as possible to the site of damaged or destroyed homes?

(6) Sphere Handbook of Minimum Standards in Humanitarian Response, p. 125

Have their needs for other basic infrastructure, utilities and services been considered?

☐ Where a decision has been made to provide transitional shelters, have efforts been made to ensure that these are upgradeable, reusable, able to be resold or recycled?

2.9 Debris clearance and management

☐ How can affected community members be engaged in the process of debris clearance and management?

☐ Would the clearing of debris have any impact on the eligibility of a household for compensation?

☐ What process is to be followed for private property that might be recovered during the process of debris clearance?

☐ Is there scope for using the process of debris clearance to generate employment and income for affected households?

☐ Are there parts of the rubble that can be salvaged, sold or reused?

☐ Is processing and converting the debris into construction material to be used in the reconstruction a viable option?

2.10 Earthquakes in urban settings

☐ What processes are being followed for assessment in urban areas given the possibility of large floating populations and undocumented residents?

☐ Has any form of coordination been initiated with local governments, councils and authorities? How can they be strengthened or supported in their response?

☐ How is assistance being targeted and delivered to beneficiaries given the diversity in socio-economic profiles that might exist in urban populations?

☐ Has the use of various cash transfer methods been explored?

☐ What existing infrastructure, systems and services can be restored on a priority basis, so that they can support the emergency response?

☐ Are there existing skills, capacities and entrepreneurship abilities that can be tapped to support the response?

☐ Can the improved reach of media and communication systems be utilized to support the response in any way?

3 RECOVERING

Build Back Better

Reconstruction

Livelihoods
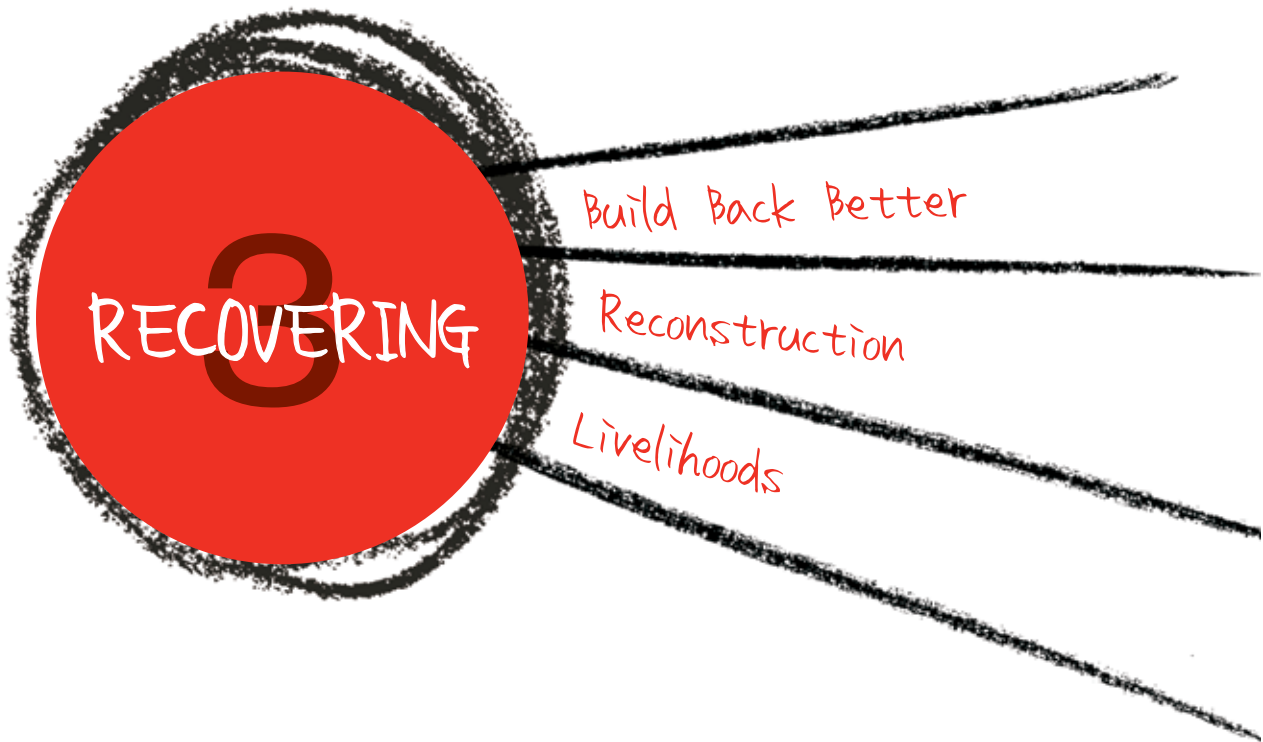
It should be noted that the distinction between response and recovery is an artificial one, which does not exist in practice. Recovery should be viewed as an approach, rather than a phase of programming. It aims at meeting certain objectives of restoration and improvement after or alongside life-saving assistance and meeting the immediate needs of relief. This is particularly true in the case of earthquakes, where affected households and communities almost immediately begin the task of recovery and reconstruction by themselves.

As a good practice in recovery planning based on experiences during past disasters, Red Cross and Red Crescent teams now typically involve personnel who will be involved in future recovery operations with initial response teams. This helps them begin to plan and ensure a smooth transition between relief and recovery operations. Given the scale of destruction typically associated with an earthquake, the recovery process needs to be considered from the very outset.

This section focuses on shelter and livelihoods which are immediate, crucial and unique aspects following an earthquake. However, other sectors including—WatSan/HP and psychosocial support—need to be taken into account.

Limit emergency relief activities to the shortest possible timeframe and begin planning for recovery operations and activities immediately after an earthquake.

Advocacy with local governments and other actors on common approaches, guidelines and policies for the recovery process should be carried out and is critical to the effectiveness of recovery efforts. A common approach to recovery efforts should be encouraged.

Linking relief, rehabilitation and development considerations should be included in earthquake response planning from the start.

The process of recovery and reconstruction following an earthquake offers an opportunity and can serve as a catalyst in addressing underlying vulnerabilities. By keeping an emphasis on participation, capacity building, quality and accountability aspects, it can also bring about significant social and economic transformations.

The recovery and reconstruction process should be used to:

A. Fix the problems that created the disaster in the first place and rebuild with the next disaster(s) in mind by:

- **Working through local governments,** strengthening them and making them more accountable to their people.

  As those who bear the primary responsibility towards their people, governments should take the lead in reconstruction processes and be assisted by external actors in doing so. This also helps ensure that interventions are more sustainable.

- **Introducing building codes and guidelines** for the reconstruction process and advocacy to ensure that these are complied with.

- **Reconstructing multi-hazard-resistant shelters** and structures that take into account all possible hazards for which the region is at risk.

- **Addressing inequality, social exclusion and other sources of underlying vulnerability** which lead to a disproportionate impact of a hazard on certain sections.

  The reconstruction process is an opportunity to engage and involve sections of the community that previously played a limited role in decision-making and influencing outcomes. Examples of such social groups could include women, children, people with disabilities, of a different class or ethnic group, among others.

- **Ensuring ecological sustainability of processes and limiting degradation** by making sure that the reconstruction process does not increase existing environmental challenges and attempts to address the causes for these wherever possible.

  Possible ecologically sustainable approaches include the incorporation of rainwater harvesting facilities in the design of reconstructed shelters and structures in water scarce areas and assisting communities in the development of more sustainable livelihoods.

B. Creating transferable and marketable skills among community members and developing capacities and skills that will remain in the communities

Entrepreneurship skills could provide ways of increasing income-earning opportunities for survivors. For example, by facilitating the formation of credit and savings groups, supporting communities and groups in accessing credit and providing training in skills that will be in demand, such as earthquake-safe masonry.

C. Strengthening and developing capacities of National Societies

National Societies should play a leading role and determine priorities for the reconstruction process, assisted by Partner National Societies and the IFRC. A good

© SEEDS, ODRC
Reconstruction project in Bihar, India

example of this is the case of the Maldivian Red Crescent Society that was created in the year 2009 in the aftermath of the Indian Ocean Tsunami of 2004 and that benefitted from the experience and skills of Partner National Societies stands out as a good example of this.

D. Providing what was needed but didn't exist or was too challenging to implement prior to the earthquake

The reconstruction process can also be an opportunity to initiate improvements and changes that were required prior to the earthquake, but would have been too disruptive or difficult to implement. This could include redevelopment of public infrastructure and revision of urban planning codes to reduce population densities, as was done in the aftermath of the Bhuj Earthquake of January 2001 in India.

Further reading:
- Simple Recovery Guidance, IFRC, Geneva, 2012.

Disseminating information through community radio: Japan

In the city of Natori, a small community radio station — Natori Saigai FM (Nato Raji 801) — is providing information on disasters and warnings, shelter conditions and various lifeline services. Set up during the early recovery phase of the March 2011 twin disasters in Japan, the ease of licensing (the process took just three days) and the central role taken by local women and city officials have made it a critical part of transforming communities. It broadcasts disaster information from 9:00 to 5:00, with extra emergency broadcasts when necessary. The station reaches out to an area comprising 72,000 people and their entertainment content is provided free by a large music company. Not only has it served as an effective system to disseminate information, but local residents feel it has had the effect of bringing together members of the original community, now scattered across disparate shelters.

Twenty-one such FM radio stations were set up across the country, the largest number of local disaster broadcasters established following a major catastrophe since the 1995 Great Hanshin Earthquake.

Globally, as well, local dialect and community radio have proved to be effective mechanisms for information management – a critical component across the preparing, responding and recovering phases.

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The reconstruction of shelter and infrastructure following any major earthquake is one of the biggest and most complex tasks facing governments and agencies. The process is highly resource intensive - human, financial and time - and involves a range of actors and issues.

A shelter reconstruction intervention requires considerable experience and capacities on the part of an implementing agency and should only be undertaken after a careful assessment of capacities, resources, timelines and the operational environment.

Given the linkages that shelter and settlement have with a number of other sectors and factors, the successful completion of a shelter planning and reconstruction process is critical. It aids the effort to bring about significant transformations in the socio-economic situation of communities and to make them more resilient to future shocks and stresses.

Shelter and settlement are at the core of a community (The shelter ecosystem)

Shelter and settlement are linked to a number of other aspects of a household and community. For this reason, shelter rehabilitation and reconstruction needs to be approached as a process and an opportunity, rather than as a single activity.

The shelter and settlement reconstruction process should take the following aspects into account:

- **Ensuring safety and security**

  Shelters need to reduce the vulnerability of households to all future hazards, use material and be constructed in accordance with established quality standards and aim at promoting a sense of security for families occupying them.

- **Environmental and ecological sustainability**

  Materials and natural resources such as timber should be sourced in a sustainable way. Additional facilities such as rainwater harvesting should be included wherever possible.

- **Energy efficiency and appropriateness to climatic conditions**

  Construction materials should be sourced locally as much as possible and materials, as well as the design of the house (lighting, ventilation etc.), should try to minimize the use of energy and be suitable to the climatic conditions of the region.

- **Meeting minimum standards**

  The *Sphere Handbook of Minimum Standards for Humanitarian Response* suggests an indicator of a minimum covered floor area of 3.5 square metres per person.

- **Being appropriate to the needs and preferences of a household**

  Families also have expectations from their houses and the dwelling should be suited to their specific needs and lifestyles.

- **Livelihoods**

  Shelter and livelihood are closely linked. The proximity of the shelters to places of work and markets is a very significant consideration. For some livelihood groups, shelters also double up as places of work.

A shelter reconstruction process can also help to support micro-enterprises that supply materials for construction and assist in training community members in skills, such as masonry, which can be a source of livelihoods in the future.

Utilities and water, sanitation and hygiene needs

The reconstruction process can be an opportunity to introduce infrastructure and sanitation facilities that were previously missing or inadequate, either on a communal or individual basis. The needs of a household in terms of electricity supply, water, sanitation and hygiene should also be taken into account while planning shelter reconstructions. Water and sanitation activities should be carried out by sector specialists. This should include a community mobilization and participation element which considers long-term operation and maintenance needs.

Promoting gender equality

The shelter reconstruction process should involve both women and men in the consultation. In many cultures and societies, women spend a larger amount of time in their houses. Their needs should therefore be given attention in shelter reconstruction.

The reconstruction process is also an opportunity to provide joint land titles — to both women and men — for the newly constructed shelters.

Promoting equity among social, economic and ethnic groups in a community

Selection criteria for provision of shelter should be determined after a process of extensive consultations with the community. These should be clearly defined and communicated to all members of the community to prevent future misunderstandings.

Taking into account socio-cultural preferences

These may include the need for verandahs, which play a significant role in fostering social interactions in some cultures, location of kitchens and bathing facilities and other such aspects.

Being inclusive and sensitive to those with special requirements

Shelter design needs to address the specific needs of people with disabilities and the elderly.

Proximity to essential services

In the event of relocation and creation of new settlements, the proximity of the settlement to services such as health and education facilities needs consideration.

The specific needs of children should also be taken into account when planning shelters.

Focusing on the needs of all groups and forms of tenancy

This should include tenants and people with no formal land titles who make up a significant proportion of urban populations.

Other aspects to be included in shelter rehabilitation and reconstruction:

Minimizing relocation and resettlement

This disrupts established networks, can hinder livelihoods and can badly impact social capital in a community. However, there might be cases in which relocation is unavoidable, including in situations where land is either destroyed on account of a secondary hazard, such as a landslide, or is found to be unsafe, such as buffer zones along the coast. In such instances, this process needs to be carried out in a manner that is appropriate and sensitive.

If communities are being relocated, consider the impact that the reconstruction process will have on existing households in the new site, including issues of equity with communities already present in or near the relocation site and the impact on land values.

Approaches to shelter reconstruction

A number of approaches to the shelter reconstruction process are possible. These differ in terms of the completion time and the extent of engagement and participation of affected families. Possible approaches include:

- **Owner-driven housing reconstruction (ODHR):** Under an ODHR programme, an institution – government, NGO, bank, National Society etc. – provides assistance directly to households for the rebuilding of their damaged homes. In ODHR programmes, the prioritization of needs and the decision-making involved are in the hands of the affected families, giving them ownership of their rehabilitation and developing their skills and self-confidence.[9] Grants in an ODHR approach may be provided to families in instalments, based on the level of completion of the construction and in accordance with agreed criteria.

- **Contractor driven:** In this approach, an agency responsible for the reconstruction of shelters would hire one or more contractors to carry out the task of design and construction. The contractor involved in construction would be accountable to the agency that hired them.

- **Provision of cash grants:** This involves the provision of cash grants to households for the reconstruction of their houses. No technical assistance is typically provided along with the grants.

- **Participatory approach:** Agencies assume a leading role in housing reconstruction, while involving home-owners in the planning, design and reconstruction of the house.[10]

(9) Cordero, C., IFRC, 2010, p. 13
(10) Barenstein, J.D., HPN, 2006, p. 2

Owner driven housing through the Community Recovery and Reconstruction Partnership
© Japanese Red Cross, Sri Lanka

NEGATIVES	POSITIVES

- Risk that some households may spend parts of the grant money on other needs and that this might impact the quality and safety of the construction.

- Controlling quality of constructions and adherence to all standards may be challenging.

- Not all households will be in a position to manage the process on their own and some may require additional individual support.

- Processes can take a considerable length of time to get started.

OWNER-DRIVEN HOUSING RECONSTRUCTION APPROACH

- Increases participation and ownership of the process among households and community members which would typically mean that shelters cater to their specific needs and will result in higher occupancy rates.

- Participation by community members in the reconstruction process can help aid the process of psychosocial recovery and can improve their understanding of risks and vulnerabilities.

- It can significantly boost local businesses, markets and the local economy by increasing the flow of cash.

- The process of community mobilization that accompanies ODHR processes can be adopted for many other community development activities.

- Limited participation and consultation with community members would typically mean less satisfaction and possibly lower occupancy rates.

- Lost opportunities for community mobilization, skill creation and supporting the local economy.

CONTRACTOR DRIVEN

- May involve shorter times for completion.

- Can incorporate risk-reduction features and designs.

- Possibility of quality concerns. Structural vulnerabilities may be rebuilt and earthquake and hazard-safe construction techniques may not be incorporated in the design.

- Likelihood of cash being diverted for other purposes.

- Loss of opportunity to mobilize the community and develop skills.

CASH GRANTS

- Reduces logistical challenges and costs.

- Supports the local economy and livelihoods.

- Permits households to have complete autonomy and flexibility in decision-making.

- Enhances ownership of the process and creates an increased possibility that the shelter solution adopted would suit the needs and preferences of the affected family.

PARTICIPATORY APPROACHES

These would differ based on the exact nature of the method adopted, the level of community participation and the extent to which external actors are involved in the reconstruction. In general, a participatory approach to housing reconstruction would avoid some of the disadvantages of the contractor approach and will likely have higher levels of satisfaction and occupancy among families than the contractor approach.

Land rights and title issues

Access to land and land tenure is critical in facilitating the recovery process after an earthquake, as well as in restoring shelter, livelihoods and in rebuilding a community.

Issues of land tenure that can be expected in the aftermath of an earthquake are particularly challenging due to the destruction of landmarks and indicators showing division of property. Issues include unclear land titles, large numbers of tenants and squatters, inheritance issues and claims by heirs which are difficult to verify. This is further complicated by the destruction of records, papers and documents. In some areas, land titles may be of a traditional and informal nature, which would further compound the task of any agencies involved in recovery. Groups that are traditionally most vulnerable, such as the landless, widows, orphans and people

with disabilities, are also likely to be the most vulnerable in issues related to land tenure and rights.

In the aftermath of an earthquake:

- include issues of land tenure in assessments at the outset and coordinate with all other actors involved in the response and recovery
- involve the community in the process of verification of claims to minimize disputes
- consider alternateive documents as proof of claim to land title, including utility or registration certificates.

Livelihoods

3.3 | Restoration of livelihoods and economic recovery

The restoration of livelihoods is closely linked to shelter rehabilitation and reconstruction efforts and adequate coordination between the two sectors needs to be ensured. Equally, access to other services such as health and WatSan/HP must be considered. The impact of earthquakes on livelihoods is typically seen in the form of:

- destruction or loss of assets

- households forced to resort to harmful coping mechanisms as a result of displacement or to fund recovery activities (e.g. sale of productive assets)

- disruptions in market

- challenges in accessing markets due to damaged infrastructure and communication systems

- limited capacity or inability of households to follow livelihood strategies adopted prior to the earthquake (inability to access credit, the loss of the primary wage earner etc.)

> **When considering support to particular livelihood groups, assess the needs for that group through the entire livelihood chain. This would include replacing or providing assets, accessing credit, developing skills and capacities, accessing markets or advocacy for a more enabling policy environment. This may often mean establishing partnerships with existing Microfinance Institutions (MFI).**

In the course of restoring livelihoods in a community affected by an earthquake, livelihoods of some groups may be given priority to the disadvantage of others and therefore increase inequality and exclusion within a community.

> **Give due consideration to livelihood groups such as the landless, women-headed households, urban poor and petty traders, among others.**

Diversification of livelihoods can help provide protection n against future shocks and stresses.

> **Use the post-earthquake recovery process to help diversify livelihoods and pass on new skills. In the aftermath of an earthquake, construction and masonry skills are likely to be in high demand and these should be developed wherever possible.**

LIVELIHOOD DIVERSIFICATION

Livelihood diversification activities during short-term humanitarian interventions may be counter-productive. These are preferable only during longer-term recovery or developmental programming.

Further reading:
- *IFRC Guidelines for Livelihoods Programming*, IFRC, Geneva, 2010.

Cross-cutting issues

- Participation and promotion of local ownership
- Ensuring quality, accountability and transparency in processes
- Gender
- Addressing specific needs of vulnerable groups
- Coordination
- Environmental sustainability
- Adoption of a conflict-sensitive approach
- Flexibility in delivery of aid (cash and aid-in-kind)
- Building on local capacities

Recovery

☐ Have attempts been made to develop a common approach, guidelines and policies for the recovery efforts in coordination with the local government and other actors?

☐ Are there plans for transition from relief to recovery operations and have these been communicated to the community?

☐ Is recovery programming based on the participation and equal involvement of community members?

☐ Does recovery programming strengthen local capacity without doing harm?

☐ Is recovery programming transparent and accountable to communities?

3.1   Building back better

What opportunities does the recovery process provide to achieve the following and how are these being done?

1. Reduce underlying vulnerabilities by:

☐ A. Working through and with local governments and institutions and strengthening their capacities and accountability to the community

☐ B. Ensuring adherence to building codes and earthquake safe construction methods and taking into account all possible hazards in reconstruction

☐ C. Addressing inequality and social exclusion of different groups

☐ D. Ensuring ecologically sustainable processes and methods are introduced.

☐ 2. Create transferable and marketable skills and developing capacities and skills that will remain within the community.

☐ 3. Strengthen capacities of National Societies.

☐ 4. Introduce new or needed infrastructure and improvements.

3.2   Shelter and infrastructure reconstruction

☐   Given the complexity of shelter reconstruction processes, are adequate skills, resources, capacities and time available to support the shelter reconstruction?

Has the shelter reconstruction process been used to achieve the following:

☐   Ensure housing is appropriate to the needs and preferences of the families?

☐   Incorporate principles of safe construction and provide families a sense of security?

☐   Be sensitive and incorporate aspects of environmental sustainability?

☐   Be energy efficient and appropriate to climatic conditions?

☐   Meet minimum standards and indicators?

☐   Take into account livelihoods and support micro-enterprises centred around the construction process?

☐   Provide and water, sanitation and hygiene needs of the families?

☐   Promote gender equality?

☐   Create equity among social, economic and ethnic groups in the community?

☐   Address particular socio-cultural preferences?

☐   Be inclusive and sensitive to the requirements of those with special needs?

☐   Build close to essential services such as schools and healthcare facilities?

☐   Cater to the needs of all groups and forms of tenancy?

☐   Have the various approaches available for shelter reconstruction been evaluated and taken into account?

Land titles

☐   Have issues of land tenure been included in as part of the assessment process?

☐   Have community members been involved in the process of verification of claims to land?

☐   Are alternative documents being considered as proof of land title?

3.3   Restoration of livelihoods and economic recovery

☐   Before supporting particular livelihood groups, have the needs through the entire livelihood chain been assessed to determine the greatest need?

☐   Have all options for livelihood support been considered, including provision of assets, enabling access to credit, developing skills and capacities, aiding access to markets and advocacy for more favourable policy environments?

☐   Have the needs of all livelihood groups affected by the earthquake been considered including groups such as the landless, women-headed households, urban poor and petty traders? Are particular groups being excluded?

☐   How can the recovery process be used to diversify livelihoods and pass on new skills? What skills are likely to be in demand after an earthquake and how can these be developed in the recovery process? Has long-term support been ensured in these cases?

Cross-cutting Issues

Although there are a number of specific, unique considerations in earthquake response and recovery operations, there remain certain issues that are equally significant in humanitarian interventions in the aftermath of an earthquake, as much as there are in any other disaster. The cross-cutting issues identified below are critical to the successful completion of any earthquake response and recovery operation and several of these would also apply to preparedness activities. They are described as cross-cutting because they need to be integrated horizontally - across the various phases of a disaster cycle (preparing, responding and recovering) - and also vertically, because they need to also be taken into consideration within the various sectors and activities identified under each of the phases.

The cross-cutting issues should not be seen as being secondary to any other, but rather at the very core of an intervention. The ability to organize a successful humanitarian intervention would depend significantly on the extent to which an agency can address these concerns.

Participation and promotion of local ownership

Participation of affected community members in the aftermath of a disaster is often ignored, given the urgency and complexity of managing humanitarian responses. In some cases, it risks being reduced to mere tokenism (the practice of making only a symbolic effort, just to meet the minimum requirements). Seeking and ensuring participation of affected communities acknowledges their right (and arguably duty) in deciding and guiding decisions and processes that will impact them either directly or indirectly.

Participation is key to the sustainability of an intervention and to an effective exit strategy.

Some aspects to be considered while facilitating participation could be:

- *What are the processes and tools being adopted to facilitate participation of affected communities in assessing, planning, implementing and monitoring an intervention?*

- *Do the processes and tools take into account existing inequalities and social structures in the community and ensure that this does not cause exclusion of particular groups?*

- *Which groups (gender, livelihood, class) or individuals are being consulted and taking decisions in the community? Are particular social, economic or other groups controlling the processes?*

Communication: a critical element of effective emergency responses

Communication during an emergency is vital to the effectiveness of a response and impacts a range of actors, including beneficiaries, donors, governments and the public, among others.

Facilitating a two-way communication process is part of the process of enhancing quality and accountability of humanitarian interventions. Apart from methods such as consultations and focus group discussions to gather feedback from communities, newer technologies have allowed the use of other innovative methods.

These include the use of radio to communicate messages and gather feedback and the setting up of toll-free help lines. These were both used in the response to the Haiti Earthquake in 2010 and enabled affected communities to call and provide feedback on services they were receiving.

In Haiti, the IFRC, in partnership with Communicating with Disaster Affected Communities (CDAC), pioneered the use of an Emergency Information Service (EIS). This combined Short Messaging Service (SMS) with geo-mapping technologies to facilitate communication between communities and agencies, helping increase the accountability and effectiveness of interventions.

Also, social media websites and services can be a useful source of information, a tool for advocacy and can be used to support fundraising activities.

Further reading:

• Communicating in emergencies – Guidelines, IFRC, Geneva, 2009.

Ensuring quality, accountability and transparency in processes

The need for enhancing quality and accountability of humanitarian interventions has been at the centre of several tools developed in recent years. These include the *Sphere Handbook of Minimum Standards for Humanitarian Response*, the *Humanitarian Accountability Partnership (HAP) Benchmarks* and the *Good Enough Guide of the Emergency Capacity Building (ECB) Project*.

The *Sphere Handbook of Minimum Standards for Humanitarian Response* along with the *Humanitarian Charter and the Code of Conduct for the International Red Cross and Red Crescent Movement and NGO's in Disaster Relief,* provide a comprehensive guide to agencies about ways of enhancing the quality of their interventions and upholding the dignity of communities with whom they are working.

Some methods for minimizing leakages and enhancing accountability to beneficiaries could be:

• instituting community feedback mechanisms, maintaining and following up on these on an ongoing basis.

• having a clear communication strategy, in a locally appropriate language, to inform and update community members about the intervention being undertaken.

> Humanitarian responses are more effective when they are based on an understanding of the different needs, vulnerabilities, interests, capacities and coping strategies of women and men, girls and boys of all ages and the differing impacts of disaster or conflict upon them.
> - Sphere Handbook p. 15

Gender

The impacts of a disaster are not the same across all groups. Some are affected more than others, due to their increased vulnerabilities and reduced ability to recover.

Gender is a consideration that is particularly important when considering the differing impacts of disasters. With women in many socio-cultural contexts spending more time

in home-based activities, their vulnerability to earthquakes can be significantly higher than men's.

Interventions should take into account the unpaid work carried out by women in and outside households. The specific needs of women and men should also be taken into account while planning activities.

It is important to understand the socio-cultural context within which an intervention is being carried out and to assess the possible impact of decisions an agency makes on existing vulnerabilities, coping mechanisms and social structures.

Addressing specific needs of vulnerable groups

Some groups can be less visible than others and as a result risk exclusion and increased vulnerability. These include the elderly and people with disabilities. The limitations in mobility of these two groups can increase their vulnerability in an earthquake or in secondary hazards triggered by an earthquake. They also risk being excluded from relief distributions and other subsequent processes. Earthquakes can also result in significant increases in cases of impairment and disability.

It is important to identify groups that are particularly vulnerable, assess their skills, capacities, needs and sources of vulnerability and take these into account during an intervention.

Coordination

Wherever effectively carried out, coordination helps minimize duplication, avoid exclusion and gaps in coverage and enables all actors to better balance their efforts.

The lack of coordination among actors has been repeatedly identified as a weakness in evaluations of recent responses and has become a key component of reform in the humanitarian sector.

Coordination in an emergency should be ensured:

- among the members of the International Red Cross and Red Crescent Movement – the National Society and Partner National Societies involved in a country

- with the government or local governance structures, to support their efforts and strengthen their capacities

- between the various agencies involved in a response.

Coordination needs to be strengthened beyond information sharing and exchange. It needs to cover assessments, planning and response operations through participation and engagement with clusters or coordination mechanisms in a country. Increased coordination during non-emergency times can help improve management of support and resources in the aftermath of an emergency.

Environmental sustainability

Relief and recovery operations should be sensitive to local environmental concerns. Disasters and the subsequent response and recovery period can increase pressure on natural resources and the local environment.

Efforts should be made to minimize the impact of relief and recovery efforts on the environment and to support its preservation.

Some of the possible ways of doing so are:

- minimizing the impact of relief materials on the local environment (e.g,. by limiting the provision of non-biodegradable materials like plastics, limiting the need for cooking fuel in camps etc.)

- sourcing local materials to minimize transportation costs and impacts and to support the local economy and livelihoods

- ensuring that materials used in reconstruction are sourced in sustainable ways

- incorporating environmentally-friendly materials (low carbon footprint and high thermal efficiency) and practices such as rainwater harvesting in relief and reconstruction efforts.

Adoption of a conflict-sensitive approach

Experience has shown that humanitarian aid can be a significant factor in increasing or decreasing existing conflict in a community. In the case of disasters that occur in places already in the midst of armed conflict, agencies should be particularly conscious and careful of the effects that their approach and the assistance being provided are having on the conflict and the actors involved.

Considerations to evaluate the impact that humanitarian aid is having on a community include:

- analyse beneficiary selection criteria to examine whether a particular group or groups are benefitting more than others and the consequences

- assess local staff recruitment criteria to see whether staff members belong to particular groups and the impact this is likely to have on the conflict

- examine the background, motivation and interest of agencies or groups that are being partnered in implementation

- whether through engaging one party to the conflict, legitimacy is being given to them and their actions.

The IFRC has evolved an impact assessment tool known as the Better Programming Initiative (BPI) with the aim of supporting local capacities for recovery and reconciliation in aid programmes in violence-affected communities.

Further reading:

- *Aid: supporting or undermining recovery? Lessons from the Better Programming Initiative*, IFRC, Geneva, 2003.

Flexibility in delivery of aid (cash and aid-in-kind)

There has been considerable debate on the issue of providing assistance in the form of cash or kind. The benefits of providing assistance in the form of cash include:

- It helps save on logistical costs of transporting materials and, being less visible, may reduce the risk of theft or looting during transportation.

- It gives households autonomy and control over deciding their priorities and needs.

- It can have forward linkage effects, help support the local economy and generate employment.

The disadvantages, specifically with cash (not necessarily with vouchers), are that there is a risk of misuse. It is more likely to be controlled by males in a household and spent on priorities decided by them. It also has the possibility of driving up prices in local markets due to a sudden increase in demand.

A flexible approach to the delivery of aid should be adopted. Given the advantages, assistance in the form of grants, cash or vouchers should be given preference wherever possible, provided adequate capacities to implement and monitor this process are in place.

Building on local capacities

Affected communities have skills, knowledge and capacities that are important to identify, develop and use in the course of an intervention. These may be at the individual level or seen in the form of local structures, networks, groups and institutions.

Supporting local capacities and developing local skills in the aftermath of a disaster can be an effective way of helping affected communities recover, supporting local livelihoods and markets and in addressing underlying vulnerabilities and building resilience to future hazards.

Building on local skills and capacities

In Port-au-Prince and the surrounding areas in Haiti, it was noted that a number of private healthcare providers went bankrupt after the earthquake of January 2010. This was attributed to the influx of a large number of humanitarian agencies that were providing free healthcare services. The collapse of private healthcare services would be felt by the local population once the humanitarian response ended.

Needs of some sections of the local community in the area of water and sanitation were also partly met by private service providers prior to the earthquake, through (paid) water kiosks and pay-and-use toilets. While a number of agencies ignored these existing capacities, others chose to support them by subsidizing their services and incorporating them into the emergency response.

In doing so, they ensured that these structures remain after the provision of international aid has ended and, at the same time, also helped in strengthening the local economy and generating employment.

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The Fundamental Principles of the International Red Cross and Red Crescent Movement

Humanity The International Red Cross and Red Crescent Movement, born of a desire to bring assistance without discrimination to the wounded on the battlefield, endeavours, in its international and national capacity, to prevent and alleviate human suffering wherever it may be found. Its purpose is to protect life and health and to ensure respect for the human being. It promotes mutual understanding, friendship, cooperation and lasting peace amongst all peoples.

Impartiality It makes no discrimination as to nationality, race, religious beliefs, class or political opinions. It endeavours to relieve the suffering of individuals, being guided solely by their needs, and to give priority to the most urgent cases of distress.

Neutrality In order to enjoy the confidence of all, the Movement may not take sides in hostilities or engage at any time in controversies of a political, racial, religious or ideological nature.

Independence The Movement is independent. The National Societies, while auxiliaries in the humanitarian services of their governments and subject to the laws of their respective countries, must always maintain their autonomy so that they may be able at all times to act in accordance with the principles of the Movement.

Voluntary service It is a voluntary relief movement not prompted in any manner by desire for gain.

Unity There can be only one Red Cross or Red Crescent Society in any one country. It must be open to all. It must carry on its humanitarian work throughout its territory.

Universality The International Red Cross and Red Crescent Movement, in which all societies have equal status and share equal responsibilities and duties in helping each other, is worldwide.

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