

TOPIC GUIDE :

Effective Post-disaster Reconstruction Programmes



Tony Lloyd-Jones, Ian Davis and
Andre Steele

August 2016

About Evidence on Demand and Professional Development

Evidence on Demand supports the professional development of Climate, Environment, Infrastructure and Livelihoods Advisers at DFID. Technical Competency Frameworks for the advisory groups guide the support provided. Evidence on Demand also supports cross-cutting or development competencies which cover areas of technical knowledge and skills needed by advisers to effectively deploy their core technical skills and knowledge in development policy and operations.

The Evidence on Demand team is led by a DAI (which incorporates HTSPE Limited) and IMC Worldwide Limited Joint Venture. Both firms are established development consultancies with considerable experience in managing resource centres. The Joint Venture is backed by a core consortium of specialist organisations. The consortium provides technical support for developing quality assured resources, answering helpdesk enquiries and supporting consultancy services. Please go to the Evidence on Demand website (www.evidenceondemand.info) for further details.

Disclaimer

This Topic Guide has been produced by Evidence on Demand with the assistance of the UK Department for International Development (DFID) contracted through the Climate, Environment, Infrastructure and Livelihoods Professional Evidence and Applied Knowledge Services (CEIL PEAKS) programme, jointly managed by DAI (which incorporates HTSPE Limited) and IMC Worldwide Limited.

The views expressed in the Topic Guide are entirely those of the authors and do not necessarily represent DFID's own views or policies, or those of Evidence on Demand. Comments and discussion on items related to content and opinion should be addressed to the author, via enquiries@evidenceondemand.org.

Your feedback helps us ensure the quality and usefulness of all knowledge products. Please email enquiries@evidenceondemand.org and let us know whether or not you have found this material useful; in what ways it has helped build your knowledge base and informed your work; or how it could be improved.

DOI: http://dx.doi.org/10.12774/eod_tg.august2016.lloyd-jonestetal

First published August 2016
© CROWN COPYRIGHT

Contents

About Topic Guides.....	iv
Tips for using Topic Guides.....	v
Executive summary.....	vi
Knowledge gaps and further research.....	x
Definitions.....	xii
SECTION 1.....	1
Introduction.....	1
1.1 Natural disasters.....	1
1.1.1 The disaster management process.....	1
1.2 Disaster recovery management.....	5
1.3 Frameworks for disaster recovery.....	7
1.3.1 Sendai Framework for disaster risk reduction 2015-2030.....	7
1.3.2 Guide to developing disaster recovery frameworks Sendai conference version, March 2015.....	9
SECTION 2.....	11
Key contextual and institutional factors affecting reconstruction.....	11
2.1 National stakeholders and actors.....	11
2.1.1 National governments.....	11
2.1.2 Affected communities – survivors.....	13
2.1.3 Role of the private sector.....	14
2.2 Policy and governance.....	16
2.2.1 Legislation and government systems.....	16
2.3 Codes, standards and regulations.....	17
2.3.1 General requirements for improving use of codes.....	18
SECTION 3.....	20
Enabling reconstruction to enhance resilience.....	20
3.1 Building resilience.....	20
3.2 The role of infrastructure.....	22
3.3 Critical infrastructure.....	24
3.3.1 Interdependence of systems and critical infrastructure.....	24
3.3.2 Housing and community infrastructure.....	26
3.4 Climate change and environmentally resilient reconstruction.....	29
3.5 Needs assessments.....	32

3.5.1	The post-disaster needs assessment.....	33
3.6	Enabling appropriate reconstruction	35
3.6.1	The sequence of reconstruction.....	37
3.7	Managing the cost of reconstruction	38
3.8	Finance and funding reconstruction.....	40
3.8.1	The funding gap	40
3.8.2	Channelling funding	41
3.8.3	Aligning and disbursing funds for reconstruction.....	41
3.8.4	Challenges of the current funding approach	43
3.9	The role of insurance	43
3.9.1	Micro-insurance schemes	44
3.9.2	National insurance programmes	44
3.9.3	Insurance for governments	45
3.10	Disaster reconstruction and recovery principles	45
3.10.1	Priority concerns for reconstruction managers.....	47
3.11	Durable solutions for displaced people	49
3.11.1	Underlying challenges to supporting displaced people	49
3.11.2	Basic concepts of durable solutions	50
3.11.3	Achieving durable solutions	52
3.11.4	Framework for durable solutions	54
SECTION 4	57
Conclusions	57
References	60
Bibliography of key resources	67

List of Figures

Figure 1.1:	The disaster cycle (adapted from Lloyd-Jones, 2009).....	2
Figure 1.2:	The spectrum of assistance for sheltering and housing	4
Figure 1.3:	Progress with recovery (Davis and Alexander, 2015)	5
Figure 1.4:	Recovery sectors (Davis and Alexander, 2015).....	6
Figure 2.1:	Alternative models of government recovery organisation (Davis and Alexander, 2015)	12
Figure 2.2:	Tenancy status of affected households (Source: Recovery shelter guidelines, Shelter Cluster, Philippines).....	14
Figure 3.1:	Development recovery quality and elapsed time model (Source: Davis and Alexander, 2015)	21
Figure 3.2:	Resilient communities and settlements (Source: Davis and Alexander, 2015).....	23
Figure 3.3:	Priorities related to effort in the protection of critical infrastructure (Source: Jha et al., 2010)	25

Figure 3.4 ‘Build back better’ based on Bill Clinton’s 10 propositions (adapted from Mannakkara and Wilkinson (2013)	36
Figure 3.5: Project planning and implementation model: providing the framework for the principles of recovery from disaster (Source: Davis and Alexander, 2016, Model 14).....	46
Figure 3.6: Comparison of recovery management approaches (Comerio, 2013).....	47

List of Tables

Table 1.1: Typical roles of assisting bodies	4
Table 1.2: Targets and Priorities for Action under the Sendai Framework for Disaster Risk Reduction, 2015-2030	8
Table 2.1: Comparative advantages and disadvantages of the two options for recovery organisations	13
Table 2.2: Extent of damage to building stock and seismic codes (adapted from Nienhuys, 2015).....	18
Table 3.1: Critical buildings (adapted from Jha et al., 2010).....	24
Table 3.2: Critical requirements of infrastructure in different hazard contexts. (Source: adapted from Jha et al., 2010)	25
Table 3.3: Recovery: principles for DRR and CCA mainstreaming (source: adapted from IFRC, 2013)..	31
Table 3.4: Assessment types and definitions (adapted from Jha et al., 2010).....	32
Table 3.5: Risks to price escalation during the reconstruction of Christchurch	39
Table 3.6: Comparison of insured and uninsured economic loss in the five most expensive disasters of the last 10 years (Source: adapted by Authors from OneBrief, 2015).....	43
Table 3.7: Underlying principles of recovery (source: Davis and Alexander, 2016).....	46
Table 3.8: Principles of recovery	48
Table 3.9: Guiding principles for durable solutions (adapted from IASC, 2010).....	52
Table 3.10: Non-exhaustive list of key rights and protection needs (adapted from GPCWG, 2010)	53

List of Annexes

Annex 1 Existing disaster recovery frameworks	73
Annex 2 Priority 4 of Sendai Framework for Disaster Risk Reduction	74
Annex 3 Guide to development disaster recovery frameworks (GFDRR 2015)	76

About Topic Guides

Welcome to the Evidence on Demand series of Topic Guides. The guides are produced for Climate, Environment, Infrastructure and Livelihoods Advisers in the UK Department for International Development (DFID). There will be up to 40 Topic Guides produced 2013-2016.

The purpose of the Topic Guides is to provide resources to support professional development. Each Topic Guide is written by an expert. Topic Guides:

- Provide an overview of a topic;
- Present the issues and arguments relating to a topic;
- Are illustrated with examples and case studies;
- Stimulate thinking and questioning;
- Provide links to current best 'reads' in an annotated reading list;
- Provide signposts to detailed evidence and further information;
- Provide a glossary of terms for a topic.

Topic Guides are intended to get you started on an unfamiliar subject. If you are already familiar with a topic then you may still find a guide useful. Authors and editors of the guides have put together the best of current thinking and the main issues of debate.

Topic Guides are, above all, designed to be useful to development professionals. You may want to get up to speed on a particular topic in preparation for taking up a new position, or you may want to learn about a topic that has cropped up in your work. Whether you are a DFID Climate, Environment, Infrastructure or Livelihoods Adviser, an adviser in another professional group, a member of a development agency or non-governmental organisation, a student, or a researcher we hope that you will find Topic Guides useful.

Tips for using Topic Guides

I am going to be under the spotlight. How can a Topic Guide help?

The Topic Guides, and key texts referred to in the guides, cover the latest thinking on subject areas. If you think that a specific issue might be raised when you are under the spotlight, you can scan a Topic Guide dealing with that issue to get up to speed.

I have just joined as an adviser. Where should I start?

Topic Guides are peer reviewed and formally approved by DFID. They are a good starting point for getting an overview of topics that concern DFID. You can opt to be alerted to new Topic Guides posted on the Evidence on Demand website through Facebook, Twitter or LinkedIn. New publications of interest to advisers will also be announced in Evidence on Demand quarterly ebulletins.

I don't have much time. How long should I set aside for reading a Topic Guide?

The main text of a Topic Guide takes around three hours to read. To get a good understanding of the topic allow up to three hours to get to grips with the main points. Allow additional time to follow links and read some of the resources.

I need to keep up my professional development. How can Topic Guides help with this?

Topic Guides, while providing an overview and making key resources easy to access, are also meant to be stretching and stimulating. The annotated reading lists point to material that you can draw on to get a more in-depth understanding of issues. The Topic Guides can also be useful as aide mémoires because they highlight the key issues in a subject area. The guides also include glossaries of key words and phrases.

I would like to read items in the reading list. Where can I access them?

Most resources mentioned in the Topic Guides are readily available in the public domain. Where subscriptions to journals or permissions to access to specialist libraries are required, these are highlighted.

I have a comment on a guide. How can I provide feedback?

Evidence on Demand is keen to hear your thoughts and impressions on the Topic Guides. Your feedback is very welcome and will be used to improve new and future editions of Topic Guides. There are a number of ways you can provide feedback:

- Use the Have Your Say section on the Evidence on Demand website (www.evidenceondemand.info). Here you can email our team with your thoughts on a guide. You can also submit documents that you think may enhance a Topic Guide. If you find Topic Guides useful for your professional development, please share your experiences here.
- Send an email to the Evidence on Demand Editor at enquiries@evidenceondemand.org with your recommendations for other Topic Guides.

Executive summary

This Topic Guide is a review of the state of play in post-disaster reconstruction. It builds on extensive research, literature and experience to date, most recently considering outputs from the 2015 Sendai Conference on Disaster Risk Reduction (DRR). It considers the status quo and puts forward alternative positions for facilitating effective reconstruction through a more seamless and re-planned approach.

There has been extensive progress in recent decades following a series of major disasters that stretched the capacity of the entire global humanitarian response – the South Asia tsunami of 2004, as well as massive earthquakes in Pakistan (2005), Haiti (2010) and Nepal (2015), and the 2014 typhoon Haiyan in the Philippines. A number of key lessons have been learned from the response to these and more minor disasters as well as others affecting the wealthier regions of the world (hurricane Katrina in New Orleans in 2005, the Christchurch earthquake in 2011 and the Tōhoku earthquake, tsunami and nuclear disaster in Japan in the same year).

Approaches to ‘Building Back Better’ to improve disaster resilience were put into practice in Aceh following the 2004 earthquake and tsunami. However, despite considerable inflows of external aid, and the later targeting of the World Bank’s Multi-Donor Fund for Aceh and Nias through the Government of Indonesia’s Aceh-Nias Rehabilitation and Reconstruction Agency, an early lack of a coordinated effort meant that reconstruction was delayed and was not always done to best effect.

The response to the earthquake in northern Pakistan in 2005 was in some ways a model of good practice, with effective and strong leadership and a semi-spontaneous piloting of the UN cluster system that proved effective in coordinating and giving local support to the efforts of the multiple players in the reconstruction and recovery process. Nevertheless, there was a major shortfall in the funding of the huge reconstruction demands or the tremendous pre-existing development needs. Moreover, while the Earthquake Reconstruction and Rehabilitation Agency (ERRA), the national agency responsible for the reconstruction process, was effective, it largely drew on officials seconded from central government, with no institutional continuity at the local level. Floods in 2006 and 2010 were less effectively dealt with, with the government slow to respond to long-term recovery needs.

‘Build Back Better’, promoted by Bill Clinton, was a central theme of the recovery process in Haiti after the earthquake in 2010, but it failed to a large extent in practice because of a weak central government that itself was devastated by the earthquake. Despite major fundraising efforts, not enough money was available to fully support reconstruction and not enough of it found its way to support local reconstruction and development efforts. Similar stories emerge from recovery efforts in the Philippines and may become evident in the reconstruction efforts in Nepal.

The events in the United States, New Zealand and Japan show that even the richest and most well prepared nations have not given sufficient attention to assessing and mitigating disaster risks and recovery planning. Though the disaster impacts, devastating as they were in each case, would have been far worse in a poor developing country, they demonstrate that residual disaster risk is always likely to exist and needs to be planned for. In the case of hurricane Katrina, the recovery process was hampered by lack of coordination between the different levels of government – federal, state and city. In northern Japan, despite major investment in structural defences, these were insufficient to deal with the scale of the event, or the cascading impacts at the Fukushima nuclear plant. And despite having the

institutional, financial and private sector resources for an effective recovery response, both Christchurch and the cities of northern Japan, still faced challenges of long-term disaster reconstruction.

The Hyogo Framework for Action (2005-2015) represents efforts by the international community to create a comprehensive strategy for mitigating disaster risk. However, it pays less attention to disaster recovery in general, or reconstruction in particular. Recent major disasters, including those in rich countries, convincingly demonstrated that disaster risk cannot be eliminated and that residual risk and recovery, and reconstruction need to be planned for. The Hyogo Framework was revisited in Sendai Japan in 2015, but the new Sendai Framework still only mainly considers disaster recovery as it relates to risk reduction. As part of the Hyogo Framework for Action, the World Bank established the Global Facility for Disaster Reduction and Recovery (GFDRR), which includes 'Preparedness' and 'Resilient recovery' as two of its five pillars. There is certainly a growing emphasis on resilience (both disaster and climate change resilience) and building back better in the reconstruction process, which is reflected in this guide. However, this is only part of the solution as major hazards can strike places that have not been previously affected and retrofitting is equally, if not more important to mitigate future risk.

International efforts to synthesize and learn from disaster experiences are ongoing, but gaps remain in the collective response to natural disasters (and related knowledge and communication gaps). In particular, the gaps are in areas such as financing, the ongoing institutional gap between humanitarian disaster relief and longer-term recovery efforts, and in the overall coordination and continuity of efforts of the many parties to the recovery process. A number of lessons remain to be taken fully on board.

(i) Creating a framework for sustainable recovery: Disaster reconstruction sits within a wider process of recovery that is complex, untidy and often prolonged. It is multi-sectoral and multi-faceted, involving entire communities, encompassing households, local institutions, all levels of government, the private sector and diverse international, national and local assisting groups. It is therefore critical to set in motion a continuous, coordinated, timely and cost-effective process of reconstruction and recovery with a clear understanding and fine-tuning of the roles and efforts of each actor. Section 1 of the guide discusses these issues in general terms while Section 3.10 considers the principles for sustainable recovery. Section 3.11 considers those principles within the context of displaced persons.

(ii) Reconstruction is an integral part of pre-disaster planning: Reconstruction is part of a wider development, disaster recovery and disaster risk management (DRM), which should all be included within an integrated, coordinated and continuous process of sustainable development. This process should mitigate risk and build resilience in the face of increasing population, urbanization and climate change. As part of this, reconstruction should fully consider the roles and responsibilities of stakeholders and the critical relationships necessary to facilitate the post-disaster enabling environment. National governments will need to put in place appropriate institutions and policies that can deliver reconstruction either through dedicated recovery organisations or through existing line ministries. The case of Haiti, where only a small component of support was channelled through formal governmental systems, should be recognised and avoided. Pre-disaster planning of reconstruction is challenging given the uncertainties of disaster impacts and remains a gap in knowledge and practice.

(iii) Recognising the leading role of governments and addressing their needs: To be effective, reconstruction must be led by national governments, with support from external actors, to promote sustainable interventions. To enable this, national and local governments require the necessary support to develop appropriate institutions and policies beforehand and to recover after. Support should relate to the losses they may have sustained, including:

temporary staffing support, finance, temporary accommodation for government, etc. It is critical that assisting groups avoid recruiting government employees at inflated wage levels, which will only further weaken depleted government systems. A contextual understanding of the key stakeholders and institutional factors affecting reconstruction is presented in Section 2. This includes appropriate legislative and regulatory frameworks, as well as governance mechanisms. Building codes and regulations play a key role, and it can be said with some certainty that the impact of a disaster will be related to the quality of codes and standards and demonstrate the extent of enforcement and compliance. A stark comparison is made between Haiti, Nepal and Chile to this effect. Section 2.2 explores the role of codes, standards and regulations.

(iv) Reconstruction must deliver enhanced disaster resilience: The overall framework for action should be based on developing resilience to future shocks and stresses. Three concepts apply; the ability to absorb shocks, the capacity to bounce back rapidly and the ability to adapt and change during the demanding recovery process. These apply equally to institutions, economies, communities, buildings and infrastructure. For reconstruction purposes, disasters are an opportunity to drive resilience initiatives, with examples including not only new or improved infrastructure, built environment and restored natural environment, but also stronger institutions, enhanced safety, better integration of related sectors, improved operation and maintenance strategies, and the application of appropriate financing mechanisms.

Each situation and location will suffer a unique impact from a range of hazards, so reconstruction should be tailored to the particular circumstances. Good local knowledge of both damage and needs is essential, but damage and needs assessments are often bundled together, even though they require different actors. The needs of surviving families, linked to cash grants, can best be undertaken by self-assessment, since they are best positioned to know precisely what they need. However, damage assessment of buildings and infrastructure requires advanced engineering/ architectural skills, as such assessments relate to the structural safety and integrity of damaged buildings and their potential for repair and strengthening. Section 3.1 sets out the challenges for enabling reconstruction to enhance resilience.

(v) Prioritising the interdependencies of infrastructure and enhanced protection of critical infrastructure: It is critical to address the interdependencies of infrastructure and the risk of cascading impacts, such as fires after earthquakes, which can be more significant than the direct impacts of the disasters themselves, particularly in terms of the economic consequences. Efforts need to be tailored towards particular hazards and directed towards ensuring that critical infrastructure, including essential life-saving infrastructure, services and resources, is strengthened pre-disaster, and included in contingency planning and prioritised in reconstruction. Sections 3.2 and 3.3 focus on the place of infrastructure in the reconstruction process.

(vi) Delivering climate change adaptation and enhancing environmental system recovery: Aligned with the concept of development recovery is the potential to enhance resilience by promoting cross-cutting agendas, not least climate change, recognising that a disaster may offer a platform on which to push otherwise non-viable interventions. This could include infrastructure designed to cope with expected impacts from climate change as well as ensure practices and approaches to reconstruction that prevent further environmental damage, such as mandating the use of sustainable building materials. Section 3.4 considers climate change and environmentally resilient reconstruction.

(vii) Recognising disasters as development opportunities: While any major disaster event could be said to be a failure of development, disaster recovery is best regarded as a 'development opportunity'. This should be addressed through planning for 'development

recovery'. A key message is the need from the outset, not to rebuild the vulnerable pre-disaster built environment that gave rise to the disaster impact, but rather to plan to create a safer environment through enhanced resilience. Section 1 looks at some of the issues around the concept of 'Build Back Better' and Section 3.5 takes a wider view of needs assessment in the light of potential development opportunities.

(viii) Assistance as support for local communities and the private sector, not as a replacement: Sections 1 and 3.6 of the guide discuss the mechanisms for enabling appropriate reconstruction. The aim is to move away from solely welfare approaches, seeing disaster 'victims' as helpless, and recognise active 'survivors' managing their own recovery. A key element is recognising that effective DRM requires vision and leadership, resources, active participation and ownership by the surviving population. Local stakeholders will not wait on external actors, but will progress with recovery at whatever rate they can. External assistance should support this, providing social, technical and financial support, but not full provision. It is noted though that reconstruction of critical or large infrastructure may require extensive assistance or full provision when local capacity is insufficient.

(viii) Exploring a fresh approach to funding and financing reconstruction and recovery: The traditional humanitarian funding model is still the only one in place and contributes to the 'humanitarian gap'. A new approach is required recognising a seamless transition from emergency sheltering to permanent reconstruction, with the removal of the artificial recovery 'phases' (i.e. 'relief', 'rehabilitation' and 'recovery'). Funding should be less tied to specific immediate actions by specific agencies, but should be more flexible and aligned with longer-term development goals.

Moreover, the traditional funding model pushes disaster-affected countries towards loan finance to meet apparent reconstruction needs. Solving short-term recovery through long-term financial commitment is unlikely to be a sustainable solution for developing countries; reconstruction should not lead to greater national debt. Other options for the domestic market and for the protection of national assets should be explored, such as through insurance schemes, facilitation of remittances for the domestic housing market and repayment of loans tied to growth in national gross domestic product (GDP), using finance for economically viable projects to develop local supply chains and create jobs. Finance could also play a role in tackling corruption by tying technical and financial assistance to political, social, ethical and practical counter-measures. Sections 3.7, 3.8 and 3.9 address the issues of financing reconstruction and disaster recovery.

Knowledge gaps and further research

The disaster reconstruction and management field is awash with reviews of existing practice, case studies, recommendations for good practice and policy guidance, with few very evident gaps. Lessons learned have been numerous and are generally rapidly taken up and absorbed into policy guidance that is continuously updated, as seen with the International Federation of Red Cross and Red Crescent Societies' (IFRC) Annual World Disaster Report (IFRC, 2015).

The Sendai Framework touches on disaster recovery, where it relates to risk reduction, and is the only internationally agreed framework on disaster recovery. It provides a range of useful items, but is by no means a comprehensive policy guidance framework for reconstruction. For disaster reconstruction as part of recovery planning, the GFDRR Guide to Developing Disaster Recovery Frameworks Sendai Conference Version (2015) is useful as it is comprehensive in outlining good practice. However, it is not based on any international agreement and is essentially advisory, being based on the wide experience of the World Bank. It is likely that any future guidance on recovery planning will gain from the detailed content of this document. In the meantime, problems remain with the communication and coordination of all the available information and implementation of guidance. It is a case, not so much of noticeable gaps in analysis, as a lack of synthesis. Areas that could benefit from further research and targeted guidance include:

1. **Integrated performance of infrastructure systems:** There are evidence gaps around the integrated performance of infrastructure systems (how to design, prioritise, fund, plan, etc.). There are a few case studies that cover these latter points, but nothing bringing these together and few guidelines at present. This is discussed in section 0.
2. **Early or pre-disaster infrastructure and settlement planning:** Whereas some guidance exists and developed countries often have contingency plans in place, there is a limit to what can be foreseen and planned in advance. To plan in advance means collecting data, especially spatial data, on risk, exposure and vulnerability. Such data can be extremely useful in contingency planning in the immediate aftermath of a disaster and in early longer-term recovery planning. Damage assessments are necessary, but could be much better informed by existing datasets.
3. **Mainstreaming DRM into urban planning including future risks and contingency plans:** As well as improved and better-enforced building codes as discussed in Section 0, DRM needs to be mainstreamed into urban planning, to plan for future risk reduction (including climate change) and to include local contingency planning to deal with residual hazard risks (IFRC, 2012).
4. **Wider guidance on opportunities to 'Build Back Better':** This is increasingly being taken advantage of, but existing guidance is still too sectorial with little reference to the wider spatial location, community and urban and infrastructure issues. As such, major opportunities for 'development from disasters' are still being missed in the post-disaster context.
5. **Training:** Capacity to plan and manage development on the ground in most developing countries is woefully lacking, so support for relevant professional capacity building is critical. Similarly, training in appropriate construction skills and enforcement of standards also needs to be more widespread and institutionalised.
6. **Models for recovery management:** Detailed research is needed to establish the relative advantages and disadvantages of having a dedicated agency to oversee disaster recovery or whether to retain recovery operations within existing line ministries (See Figure 2.1).

7. **Finance for reconstruction:** With few exceptions, finance for reconstruction remains relatively neglected, compared to the admittedly far smaller and more readily met demands generated by the media-focused disaster relief efforts. Japan offers a model of good practice to draw upon but contingency funding for reconstruction seldom exists and there are considerable opportunities for improving existing insurance arrangements

Definitions

Agency-driven reconstruction *in situ*: An agency-led reconstruction approach in which damaged houses are rebuilt, generally by a construction company, in pre-disaster locations (Jha et al., 2010).

'Build Back Better': An approach to reconstruction that aims to reduce vulnerability and improve living conditions, while also promoting a more effective reconstruction process (Jha et al., 2010).

Cash approach: Unconditional financial assistance for housing reconstruction without technical support (Jha et al., 2010).

Cash transfers: Direct payments or vouchers to provide resources to affected populations to carry out housing reconstruction in exchange for work on infrastructure projects, or for other purposes (Jha et al., 2010).

Contingency planning: A management tool used to ensure that adequate arrangements are made in anticipation of a crisis. This is achieved primarily through engagement in a planning process leading to a plan of action, together with follow-up actions (ReliefWeb, 2008).

Damage assessment/structural assessment: A process used to determine the magnitude and type of damage caused by a disaster or emergency event. This form of assessment requires high levels of skill and experience, and, in the case of damage to buildings or infrastructure, it requires well-qualified architects and/or engineers (adapted from Jha et al., 2010).

Damage classification: Evaluation and recording of damage to structures, facilities or infrastructure according to three or more categories:

1. severe damage, which precludes further use of the structure, facility, or object for its intended purpose
2. moderate damage, which precludes further use of the structure, facility, or object for its intended purpose, unless major repairs are made short of complete reconstruction
3. light damage, such as broken windows, minor damage to roofing and siding, interior partitions blown down, or cracked walls, where the damage is not severe enough to preclude use for its intended purpose (Relief Web, 2008).

Disaster: A sudden, calamitous event that seriously disrupts the function of a community or society and causes human, material and economic or environmental losses that exceeds the community's or society's ability to cope using its own resources (IFRC, 2016a).

Disaster risk: The magnitude of potential disaster losses (in lives, health status, livelihoods, assets and services) in a particular community or group over some time period arising from its exposure to possible hazard events and its vulnerabilities to these hazards (Jha et al., 2010).

Disaster risk management (DRM): The systematic process of using administrative directives, organisations and operational skills and capacities to implement strategies, policies and coping capacities of society and communities to lessen the adverse impacts of hazards and the possibility of disaster (Jha et al., 2010).

Durable solutions: Achieved when displaced persons no longer have any specific assistance and protection needs linked to their displacement and enjoy their human rights without discrimination on account of their displacement.

Early recovery: Actions taken at the earliest opportunity to strengthen local capacity and restore services (ECHO, 2016).

Global Facility for Disaster Reduction and Recovery (GFDRR): A global partnership, managed by the World Bank, intended to help developing countries better understand and reduce their vulnerabilities to natural hazards and adapt to climate change.

Global Shelter Cluster: The global mechanism for coordinating a shelter response in large-scale or complex emergencies. Clusters are groups of UN and non-UN humanitarian organisations working in the main sectors of humanitarian action. The Shelter Cluster is co-chaired at the global level by the International Federation of Red Cross and Red Crescent Societies (IFRC) and the United Nations High Commissioner for Refugees (UNHCR) (ECHO, 2016).

Hazard: The potential occurrence of a natural or human-induced physical event that may cause loss of life, injury or other health impacts as well as damage to and loss of property, infrastructure, livelihoods, service provision and environmental resources (IPPC, 2012).

Host community/host families: A community or single family that hosts displaced persons, typically in camps, collective centres, informal settlements or directly into households. In disaster situations, host families are often relatives or close friends of displaced families (adapted from UNHCR, 2016).

Humanitarian crisis: An event or series of events that represent a critical threat to the health, safety, security or well-being of a community or other large group of people, usually over a wide area. A humanitarian crisis can have natural or man-made causes, can have a rapid or slow onset and can be short or protracted in length (ECHO, 2016).

In-kind distribution: Distribution of non-cash assistance, such as food, tents, tarpaulins, building tools or other materials (ECHO, 2016).

Owner-driven reconstruction: A reconstruction approach in which the homeowner undertakes rebuilding with or without external financial, material and technical assistance (Jha et al., 2010).

Participatory assessment: An approach to assessment that combines participatory tools with conventional statistical approaches intended to measure the impact of humanitarian assistance and development projects on people's lives (Jha et al., 2010).

Reconstruction: The restoration and improvement, where possible, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors. It is focused primarily on the construction or replacement of damaged physical structures and the restoration of local services and infrastructure (Jha et al., 2010).

Recovery: Decisions and actions taken after a disaster to restore or improve the pre-disaster living conditions of the affected communities while encouraging and facilitating the necessary adjustments to reduce disaster risk. It is focused not only on physical reconstruction, but also on the revitalization of the economy, and the restoration of social and cultural life (Jha et al., 2010).

Resilience: The ability of a system and its component parts to anticipate, absorb, accommodate or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration or improvement of its essential basic structures and functions (IPPC, 2012).

Rental and/or utility subsidies: Rental support addresses the need for housing between the emergency phase and long-term recovery efforts. Typically, a cash grant equivalent to one year's rent is provided to a family to facilitate their relocation from camps or temporary housing while they secure a permanent housing solution. A utility subsidy is provided to support the costs of vital services such as water and electricity (personal communication Lloyd-Jones and Davis, consultants, 2016).

Vulnerability: The characteristic of a person or group and their situation that influences their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (Wisner et al., 2004)

SECTION 1

Introduction

1.1 Natural disasters

Natural hazards create conditions for disaster when combined with human development and settlement, including, increasingly, climate change and exposure to hazard, risk and vulnerability. A disaster, as defined by the International Federation of the Red Cross and Red Crescent Societies (IFRC), is:

A sudden, calamitous event that seriously disrupts the function of a community or society and causes human, material and economic or environmental losses that exceed the community's or society's ability to cope using its own resources.” (IFRC, 2016a)

While disasters may or may not be rapid onset, this international classification includes major *geophysical, hydrological and meteorological* hazards with potentially devastating impacts on infrastructure and the built environment. The incidence of natural disaster impacts is growing; EM-DAT data from 1973 to 2003 shows there has been a sevenfold increase in natural disaster events (Mitchell, 2010).

1.1.1 The disaster management process

Disaster management refers to the wider process of planning and preparing for and responding to disasters and the management of the consequences of disasters as illustrated in Figure 1.1. Disaster risk management (DRM) encompasses a broad range of activities to prevent the loss of lives, minimise human suffering, property damage and economic loss, and speed up the process of recovery.

Most frameworks for disaster recovery and risk mitigation assume a phased approach and the process is often presented as a ‘disaster cycle’ rather than a linear process. However, in practice, there are seldom any clear boundaries between such phases, which vary greatly in duration and can frequently take place at the same time, overlap or be separated by unplanned gaps (Lloyd-Jones, 2009). There can be a lack of a joined up approach and complete stages in the process may be absent. Within any disaster-prone or affected region, different projects and programmes, engaging different actors, may be occurring in different phases at the same time. Thus any framework needs to be used flexibly and with close attention to the real situation on the ground, and with the overall aim a taking a holistic, seamless approach.

The cycle concept has two inferences. The first is that the outputs and experience of disaster recovery should feed back into improving the resilience of vulnerable communities and inform the disaster management process to reduce future risks. ‘Building back better’ and ‘doing no harm’ are critical aspects of this, with the main aim being to prevent any future hazard turning into a disaster. A second inference is that many of the natural hazards that cause disasters re-occur periodically in the same location, most notably floods and weather related events.

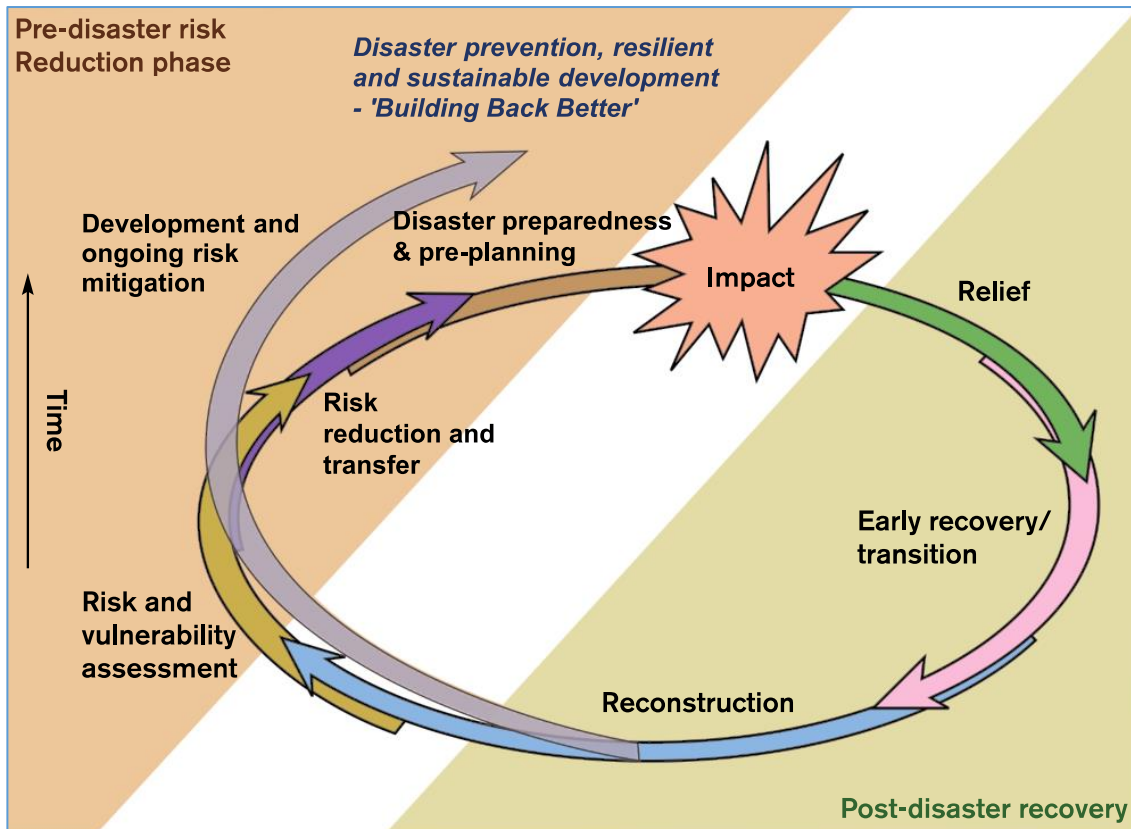


Figure 1.1: The disaster cycle (adapted from Lloyd-Jones, 2009)

It should be noted, that some geophysical disasters such as earthquakes, seldom occur in exactly the same place twice in quick succession since they are usually the result of the release of particular geological stresses. Landslides, to which many mountainous and coastal regions are particularly vulnerable, however, can and do occur in the same location. Landslides can create conditions that make a location more susceptible to repeat landslides, such as ground tears and cracking that accelerate subsequent ground saturation during heavy rainfall – such as the annual monsoon cycle – and mobilise ground movement (Lee and Jones, 2013; Landslides at the BGS, no date). Miyagi et al. (2004) point to Chisapani, Nepal, where reactivated landslide areas have been reported over a number of years from the 1950s. The occurrence of a landslide will also lead to alteration of the stresses in the adjoining portions of a slope, heightening the risk of lateral or up-slope propagation of the landslide, or activation of new landslides in the vicinity. This is an important issue to consider when siting new development, including infrastructure and buildings. Engineering works can themselves reactivate historical landslides where earthmoving either loads the upper portion or unloads the lower portion of the landslide (personal communication, J. Palmer, consultant, Clarkebond, 2016).

A spiral diagram combines the idea of reoccurring events (within a given region if not in the same place) and progress in the response and planning. Figure 1.1 shows the cycle unfolding over time and offering the opportunity of achieving sustainable development in the disaster management process. Increasing sustainability is achieved by improving on pre-disaster conditions, including enhancing the living conditions and livelihoods of poor communities, reducing risk and vulnerability, and increasing the resilience of local communities towards the goal of disaster prevention.

Most attention and investment in disaster management is given to the relief phase. There has been extensive progress in recent decades within the international community following

a period of lesson learning. In particular, there is now a better understanding of the risks associated with traditional funding and relief approaches. This has led to the development of new forms of humanitarian assistance, such as cash grants, rental support, assistance to host families, providing finance through insurance schemes and national disaster management authorities. Early recovery strategies are becoming better at considering long-term reconstruction, with a number of concepts developed to link relief and reconstruction, including *linking relief, rehabilitation and development, developmental relief* and *development-relief*. These approaches highlight three common aspects i) the application of development principles early in the emergency setting to prepare for reconstruction; ii) ensuring a smooth transition and continuity in support; and iii) supporting prevention and DRR through the developmental support (Steets, 2011).

However, when seen from the standpoint of disaster survivors, the process of relief, recovery and development is seamless (Davis, 2011). The breakdown of the recovery process has been artificially created by external assisting agencies, (rarely by host governments) in order to categorise or even legitimise their support. These sequential phases imply a logical linear progression of a given community of survivors, for instance from sheltering under plastic sheeting towards permanent housing. However, the reality on the ground is that while some families are living in tents, others will be repairing their own dwellings, some may be renting undamaged buildings, with some having relocated and others are reconstructing or inhabiting permanent dwellings (Quarantelli, 1982).

Box 1.1: Case study on disaster response phases as a humanitarian construct

Understanding the origin of the disaster response and recovery phases

In undertaking the revision of *'Shelter after Disaster (Second Edition)'* (2015) the editor, Ian Davis, interviewed a number of agency staff with responsibilities for shelter. It became abundantly clear that with the exception of very few international non-governmental agencies (NGOs), such as CARE, IFRC and Habitat for Humanity, there was no desire to become involved with the provision of permanent safe housing reconstruction. This reluctance is mirrored in the majority of donor governments and UN Agencies. Many reasons were offered that focused on their own internal requirements, including the high costs involved with housing and settlements; the extended time needed for design, approvals, and construction of housing and settlements; a reluctance to be drawn into governmental arenas, with strong political pressures; and a concern or fear about the legal liabilities in the event of possible future housing failures. Thus, where agencies have had designated funds for sheltering they have often sought to use the money on immediate shelter or transitional shelters.

Source: Davis, 2015

The roles of external groups, including agencies and governments, in the shelter and housing sector can best be regarded when presented as a spectrum as seen in Figure 1.2. This illustrates that external interventions can range from **support** at one end, designed to deliver '**outcomes**', to **provision** at the other extreme leading to tangible '**outputs**'. What should be recognised across this spectrum is the varying role of the external group, NGO, donor, etc. At the **support** end of the spectrum, interventions require the active role of the **survivors**, which builds **self-reliance**. Conversely, with an approach of total **provision**, affected communities can be pushed into a legacy of **passive dependency**. Haiti is perhaps one of the most recognised outcomes of the provision approach, captured in the recent documentary by Smeets and Biegmann (2014)¹.

1

<http://www.aidependence.com/home.html>



Figure 1.2: The spectrum of assistance for sheltering and housing²

The guiding principle in determining which actions to undertake is to base support or provision on strong developmental commitment by avoiding any duplication of tasks that the survivors can undertake themselves. Figure 1.2 indicates the range of typical roles of assisting bodies. These are expanded in the list presented in Table 1.1.

Table 1.1: Typical roles of assisting bodies

Support roles – (leading to outcomes)	Provision roles – (leading to outputs)
<p>Technical support: advice on the safe siting of new dwellings or of local relocation where land has been lost due to flood erosion, landslides, etc., damage assessments, guidance on strengthening building codes or land-use planning controls, training courses in building crafts</p> <p>Legal support: advice concerning secure tenure titles to property</p> <p>Transportation support: assistance in travelling to stay with host families</p> <p>Social support: community level guidance on sheltering options, psychosocial support to bereaved or injured families, advocacy</p> <p>Financial support: establishing local banking systems, guidance in entering the banking sector to gain access to loans and grants, livelihood grants, livelihood creation projects, cash grants or vouchers as rental support (World Bank, 2014) grants or loans to purchase shelter and housing materials and tools, housing grants, assistance to host families, assistance to governments, credit and micro-credit</p>	<p>Sheltering and occupation materials: tool, tents, plastic sheeting, blankets, bedding, utensil, cooking stoves, heaters, etc.</p> <p>Demolition/debris collection and removal</p> <p>Building materials: timber, concrete, roofing materials, etc.</p> <p>Labour: building trades</p> <p>Delivery of temporary and permanent houses in settlements: buildings, services, infrastructure</p> <p>Delivery of community facilities: schools, medical centres, etc.</p> <p>Environmental recovery actions, replanting trees, mangrove plantations, beach replenishment, etc.</p>

² This diagram has been modified from a concept developed by Maggie Stephenson for ECHO, 2016 (forthcoming)

1.2 Disaster recovery management

DRM stresses a proactive disaster management response of *risk prevention, mitigation and preparedness*. Activities around risk prevention and mitigation are usually referred to as disaster risk reduction (DRR). DRM is critical in determining both the probability of disasters occurring and the conditions in which successful disaster recovery and reconstruction can be achieved. Risk identification, mitigation and transfer (e.g. through insurance) are all essential to successful disaster risk reduction and making recovery from disasters easier to manage. They form part of the DRM spiral aimed at increasing resilience and sustainability, as shown in Figure 1.1 (Lloyd-Jones, 2009).

Disaster recovery, as well as DRM is complex, untidy and often prolonged over many years. While it only took a rapid 4-5 years to rebuild Kobe, Japan after the 1995 earthquake, it is estimated that it will take at least 10 years to recover from the 2005 hurricane Katrina in the USA; duration is closely related to levels of political commitment and development expectations (Norling, 2013). Effectiveness requires a minimum of four essentials: **vision and leadership**, a massive flow of human, financial and material **resources**, the active **participation and ownership** of the process by the surviving population and a highly effective **organisation**.

Reconstruction should be recognised as an integral part of pre-disaster recovery planning, considering the roles and responsibilities of stakeholders and critical relationships to facilitate the post-disaster enabling environment. The ability to respond appropriately also depends on appropriate legislative and regulatory frameworks, as well as governance mechanisms. Key in this is the role of appropriate building codes and regulations, and it can be said with some certainty that the impact of a disaster will be related to the quality of codes and standards and demonstrate the extent of enforcement and compliance. A stark comparison is made between Haiti, Nepal and Chile to this effect. Pre-disaster planning of reconstruction is challenging given the uncertainties of disaster impacts and remains something of a gap in knowledge and practice. Section 2.3 explores the role of codes, standards and regulations.

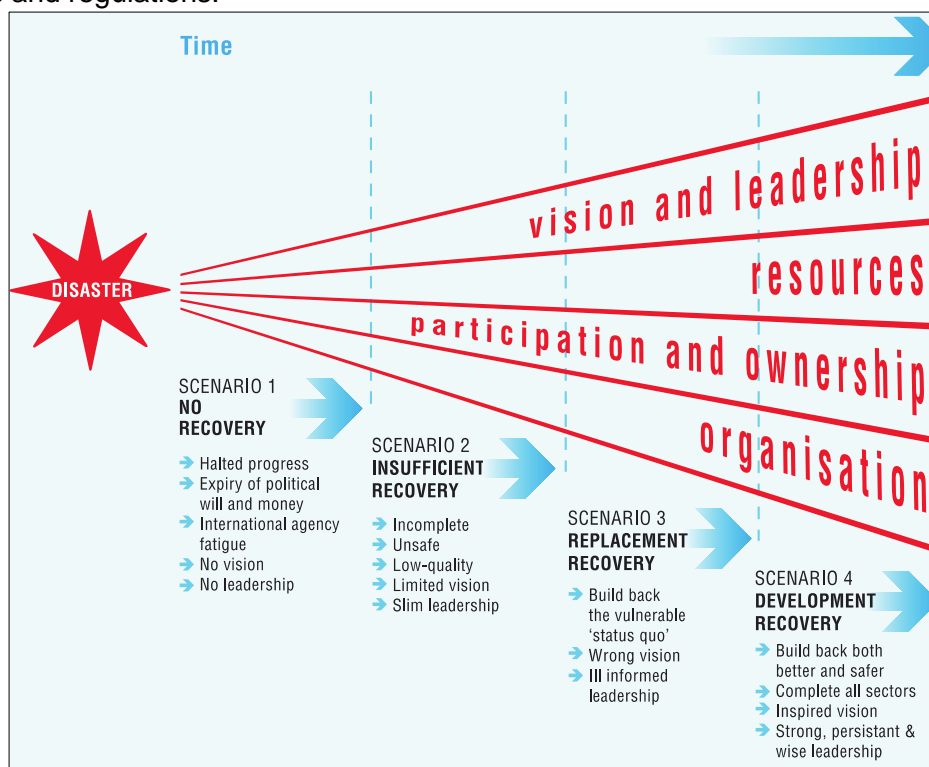


Figure 1.3: Progress with recovery (Davis and Alexander, 2015)

Successful recovery is summarised in Figure 1.3, which highlights four recovery scenarios, each of which has occurred in the past. The most common is ‘Scenario 3’ where there is a strong desire to restore normality, perhaps without recognising that this was also the ‘vulnerability’ that gave rise to the disaster impact in the first place. This inadequate aim led to the familiar ‘Build Back Better’ saying, coined by Bill Clinton (Clinton, 2006). Thus the aim of all recovery operations has to be nothing less than a concerted advance in ‘**development recovery**’, encompassed by Scenario 4.

Recovery is a multi-sectoral and multi-faceted process that can involve the full spectrum of any given society. Figure 1.4 presents five closely related sectors that are likely the most common recovery sectors; but more could be added, including agriculture, education and public health. The close operational links between sectors are vital, but are often overlooked due to the isolated silos of government line ministries as well as traditional boundaries in the professions that serve them.

An example of integration would be for physical reconstruction adopting user-build housing approaches, undertaken by trained survivors, thus creating livelihood opportunities. The injection of finance into local economies recovering from disasters can be significant in boosting local livelihood creation, as well as providing vital psychosocial work therapy for individuals who have suffered trauma or family losses in the disaster. The selection of building materials needs to be made on environmental grounds to assist in the recovery of the damaged natural environment. The management of such recovery programmes will inevitably be determined by the recovery of local governmental capacity responsible for coordination.

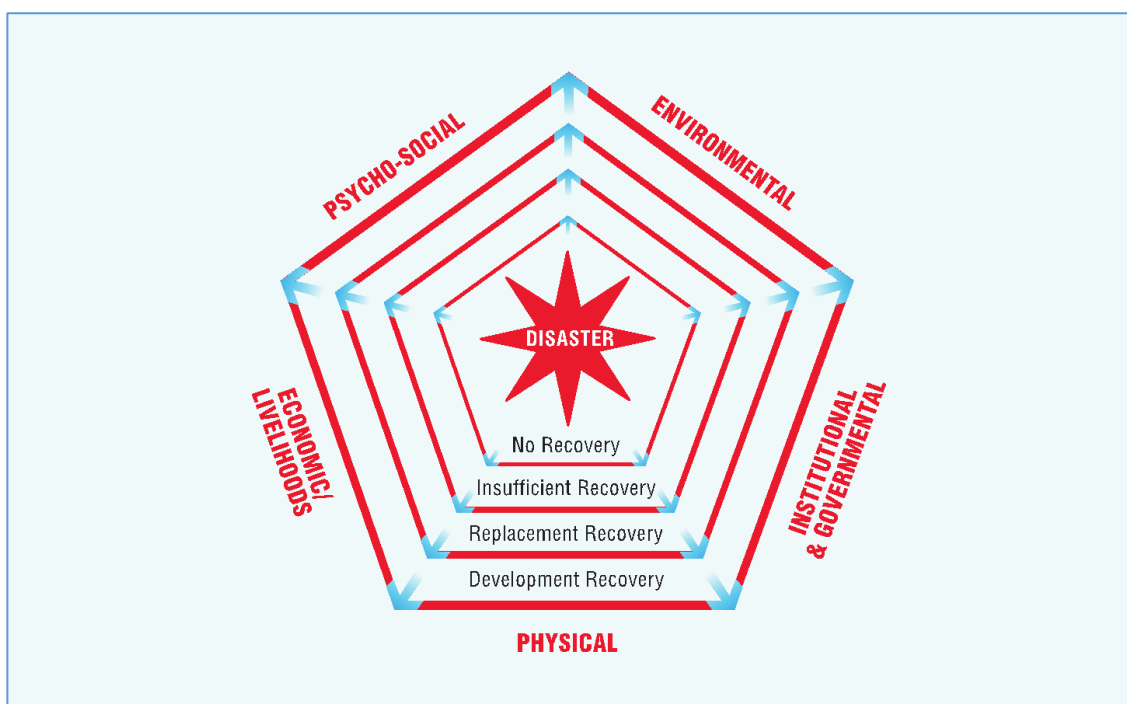


Figure 1.4: Recovery sectors (Davis and Alexander, 2015)

Recovery can involve an entire affected community, encompassing many households, local institutions, every level of government, the private sector and diverse international, national and local assisting groups. While any major disaster event is a failure of development, disaster recovery is best regarded as a ‘**development opportunity**’. The implication of this approach is to move away from past welfare approaches, based on false assumptions of the

widespread needs of helpless, **passive ‘victims’** awaiting help, and recognise that the affected population are **active ‘survivors’** and are the primary force in the management of their own recovery (Schilderman and Parker, 2014).

This was recognised in the WFP 2016 report, *A World at Risk*, on the state of the global humanitarian response, produced by a consortium of eight US based NGOs and UN Agencies:

“Vulnerable people must have more say and control in shaping assistance to their needs and local contexts and established channels to provide feedback on assistance and protection provision” (WFP, 2016).

Thus the overriding aim is to enable a damaged society to become more resilient by rebuilding lives and livelihoods, enabling communities to 'build back better', strengthening public and private institutions, and by taking positive steps to reduce future risks.

It is critical to set in motion a continuous, timely and cost-effective process of reconstruction and recovery with a clear understanding of the roles and efforts of each actor, defined by national government and linked across the multitude of areas of disaster recovery.

1.3 Frameworks for disaster recovery

There are a number of documents that provide useful ‘frameworks’ for reconstruction, although in most cases they are parts of large recovery or disaster risk reduction and recovery frameworks, rather than specifically addressing reconstruction. International frameworks take on various forms, including:

1. **Operational patterns or structures** (such as the varied Humanitarian Clusters that include shelter, water and sanitation and early recovery); or
2. **An agreed set of policy intentions** (such as UN Frameworks, devised to guide the policies and plans of member nations), or
3. **Commitments for a given subject including proposals from international agencies** that they wish to see adopted by national governments and international agencies, (such as publications from the GFDRR).

Some of these have been written by independent authors while others have been developed by official organisations. Annex 1 Existing disaster recovery frameworks

, lists a number of these. There are two documents that are particularly relevant to this discussion, both of which relate to the World Conference on Disaster Reduction held in Sendai, Japan, in March 2015.

1.3.1 Sendai Framework for disaster risk reduction 2015-2030

It covers five ‘pillars of action’; Risk identification, Risk reduction, Preparedness, Financial protection and Resilient recovery. The **Sendai Framework for Disaster Risk Reduction, 2015-2030** is a 15 year, voluntary, non-binding agreement to reduce disaster risk aiming for:

The substantial reduction of disaster risk and losses in lives, livelihoods and health and in economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries

The framework is a successor to the Hyogo Framework, 2005-2015 to build the resilience of nations and communities to disasters. The Sendai Framework has seven global targets and four priorities for action, as detailed in UNISDR 2015 and presented here in Table 1.2. None of the seven targets is specifically directed to recovery management, other than in Global target (d) where the need to identify areas that ‘*damage needs to be reduced to critical infrastructure and basic services including health and educational facilities.*’

Within this framework it may be useful to highlight certain matters relating to this project:

- Hyogo Framework for Action: lessons learned, gaps identified and future challenges: Item 6. *“It is necessary to continue strengthening good governance in disaster risk reduction strategies at the national, regional and global levels and improving preparedness and national coordination for disaster response, rehabilitation and reconstruction, and to use post-disaster recovery and reconstruction to “Build Back Better”, supported by strengthened modalities of international cooperation.”*
- Guiding principles item 19 (k). *“In the post-disaster recovery, rehabilitation and reconstruction phase, it is critical to prevent the creation of and to reduce disaster risks by ‘building back better’ and increasing public education and awareness of disaster risk.”*

Priority 4 of the Sendai Framework relates to the recovery and reconstruction context. This is of particular importance to this Topic Guide and the full text of Priority 4 is included in Annex 2 Priority 4 of Sendai Framework for Disaster Risk Reduction . In Priority 4, Item 32 notes ‘*Disasters have demonstrated that the recovery, rehabilitation and recovery phase, which needs to be prepared ahead of a disaster, is a critical opportunity to ‘Build back Better’ including through integrating disaster risk reduction into development measures, making nations and communities resilient to disasters.*’

Table 1.2: Targets and Priorities for Action under the Sendai Framework for Disaster Risk Reduction, 2015-2030

Targets						
Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared to 2005-2015	Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared to 2005-2015	Reduce direct disaster economic loss in relations to global gross domestic product (GDP) by 2030	Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030	Substantially increase the number of national and local disaster risk reduction strategies by 2020	Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030	Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030
Priorities for Action						
There is need for focused action within and across sectors by States at local, national, regional and global levels in the following four priority areas						
Priority 1	Priority 2	Priority 3	Priority 4			
Understanding disaster risk	Strengthening disaster risk governance to manage disaster risk	Investing in disaster risk reduction for resilience	Enhancing disaster preparedness for effective response, and to <Build Back Better> in recovery, rehabilitation and reconstruction			

And item 33: National and local levels. To achieve this, it is important:

(g) *'To ensure to continuity of operations and planning, including social and economic recovery, and the provision of basic services in the post-disaster phase.'*

(i) *'To promote the cooperation of diverse institutions, multiple authorities and related stakeholders at all levels, including affected communities and business, in view of the complex and costly nature of post-disaster reconstruction, under the coordination of national authorities.'*

(j) *'To promote the incorporation of disaster risk management into post-disaster recovery and rehabilitation processes, facilitate the link between relief, rehabilitation and development, use opportunities during the recovery phase to develop capacities that reduce disaster risk in the short, medium and long term, including through the development of measures such as land-use planning, structural standards improvement and the sharing of expertise, knowledge, post-disaster reviews and lessons learned and integrate post-disaster reconstruction into the economic and social sustainable development of affected areas. This should also apply to temporary settlements for persons displaced by disasters.'*

(k) *'To develop guidance for preparedness for disaster reconstruction, such as on land-use planning and structural standards improvement, including by learning from the recovery and reconstruction programmes over the decade since the adoption of the Hyogo Framework for Action, and exchanging experiences, knowledge and lessons learned.'*

(l) *'To consider the relocation of public facilities and infrastructures to areas outside the risk range, wherever possible, in the post-disaster reconstruction process, in consultation with the people concerned, as appropriate.'*

(o) *'To enhance recovery schemes to provide psychosocial support and mental health services for all people in need.'*

The Sendai Framework can be found at: www.unisdr.org/we/coordinate/sendai-framework.

1.3.2 Guide to developing disaster recovery frameworks Sendai conference version, March 2015

The other key document is the **GFDRR Guide to developing disaster recovery frameworks Sendai version 2015**. This is a comprehensive and integrated framework for disaster recovery, initially developed by the GFDRR in 2014 and revised for the Sendai World Conference on Disaster Reduction, in a collaborative exercise with the European Union and UNDP. The intention was to produce a *'...practice-based, results-based tool to assist governments and partners in planning resilient post-disaster recovery.'* (GFDRR, 2015, p.viii).

The guide seeks to assist policy makers and other stakeholders in formulating a framework for recovery. The following intentions are stated:

'...articulating the recovery vision; defining the recovery strategy; prioritizing actions; fine-tuning planning; and providing guidance on financing, implementing, and monitoring the recovery. The framework also is a tool that helps in learning and self-evaluation, leading to continuous improvements over the course of the recovery implementation.' (GFDRR, 2015, p.viii)

The framework proposes that governments create recovery focal points in national governments, which is in line with the previous recommendation concerning the World Bank's desire to deal with a single entity in governments over recovery coordination and planning as stated in *'Safer Homes, Stronger Communities: A Handbook for Reconstructing after Natural Disasters'* (Jha et al., 2010). Their rationale is as follows:

"The preferable arrangement for post disaster recovery is to have a pre-existing entity for the core recovery planning and oversight functions required to meet recovery objectives. In the absence of such arrangements it is critical to designate an agency to take the lead role in coordinating or planning recovery. A lead recovery agency should be designated early into the recovery process. This guide elaborates

a multitude of possible institutional arrangements for recovery implementation. However, the key elements of an effective lead recovery agency are that it should have a clear mandate and that it should be backed by effective political and technical leadership.”

The guide complements the post-disaster needs assessment (PDNA) process to help prioritise recovery through detailed planning, implementation and monitoring. The contents of this framework are reproduced in Annex 3 Guide to development disaster recovery frameworks (GFDRR 2015)

.The guide to developing disaster recovery frameworks, Sendai version can be found at: www.gfdr.org/recovery-framework-0.

As the only internationally agreed framework on disaster recovery, the Sendai Framework provides a range of useful items that need to be built into recovery strategies. The GFDRR guidance document is useful to countries as well as international agencies, since it is comprehensive in outlining good practice. However, it is not based on any international agreement and is essentially advisory based on the wide experience of the World Bank. It is likely that any future guidance notes on recovery planning will gain from the detailed content of this document.

SECTION 2

Key contextual and institutional factors affecting reconstruction

2.1 National stakeholders and actors

2.1.1 National governments

National governments affected by natural disasters become the 'host government', with responsibilities, enshrined under UN Resolution 46/182. Harvey (2009) refers to three potential situations that international actors may face, from i) proactive states, where there is a strong social contract with citizens; ii) states with limited capacity and resources to meet their responsibilities; and iii) states that lack the will to negotiate a resilient social contract, including assisting and protecting their citizens in the face of disasters. As the capacity of the host government diminishes, the international response may take on greater responsibility.

In many disasters local governments are one of most affected sectors, with the loss of personnel, buildings, vital records, etc. Thus financial and material support to get governments back on their feet after a disaster is frequently neglected, or worse, undermined. After the 2004 tsunami devastation in Aceh, Indonesia, a number of international NGOs recruited local government employees at inflated wage levels to assist their own operations with language skills and local knowledge. This significantly weakened local governments at the precise time when massive demands were being placed upon them (Davis and Alexander, 2015). Governmental recovery needs to be set alongside other related recovery sectors, with support tailored to needs – temporary staffing support, where their own staff have been killed or injured, finance, temporary accommodation for government, etc. The approach to support needs to recognise the long-term capacity of host governments, with a provision approach leaving the host government with little added capacity or national ownership of reconstruction strategies (Sanderson and Ramalingam, 2015).

The 2010 response to the Haiti earthquake is indicative of this issue, with only 9% of all official international assistance channelled through government systems. There was a lack of confidence in the host government's financial capacity to manage the high cash and resource flows for relief and reconstruction (OSEH, 2012). Fengler et al. (2008) point to three key actions for host governments to demonstrate the credibility and accountability necessary to be trusted: i) the establishment of special institutions to manage reconstruction; ii) the selection of a public financial management systems bridge between country systems, external support and implementing partners; and iii) appropriate monitoring and evaluation systems.

National coordination bodies

A key trend has been the proliferation of national disaster management authorities (NDMAs), autonomous and constitutionally established national authorities mandated to formulate and enforce national disaster policies and to lead and coordinate responses. Typically, the system can draw on cross-government services, such as the military and civil defence

forces, as well as local emergency response institutions³. An NDMA can provide a crucial role, but, as a government agency, it may be subject to internal political issues, the challenges of constrained resources, limited influence and short-term political horizons. Such issues may be crippling pre-event, where the lack of a disaster undermines the NDMA's existence and leads to further reputational damage post-event, when it does not have the capacity to manage. In this respect disaster events may offer a window of opportunity to promote institutional or legislative change, presenting a platform for discussion when there is greater willingness to participate (Featherstone, 2014).

For recovery, the main approaches are i) to create a dedicated disaster recovery agency, directly responsible to the cabinet office or Prime Minister, as seen in India and Pakistan or ii) to manage the recovery operation through existing line departments as is the case in Mozambique and Chile. The pros and cons of each are complex and some countries adopt hybrid options that combine elements of both approaches. Figure 2.1, together with Table 2.2, present the advantages and disadvantages of both.

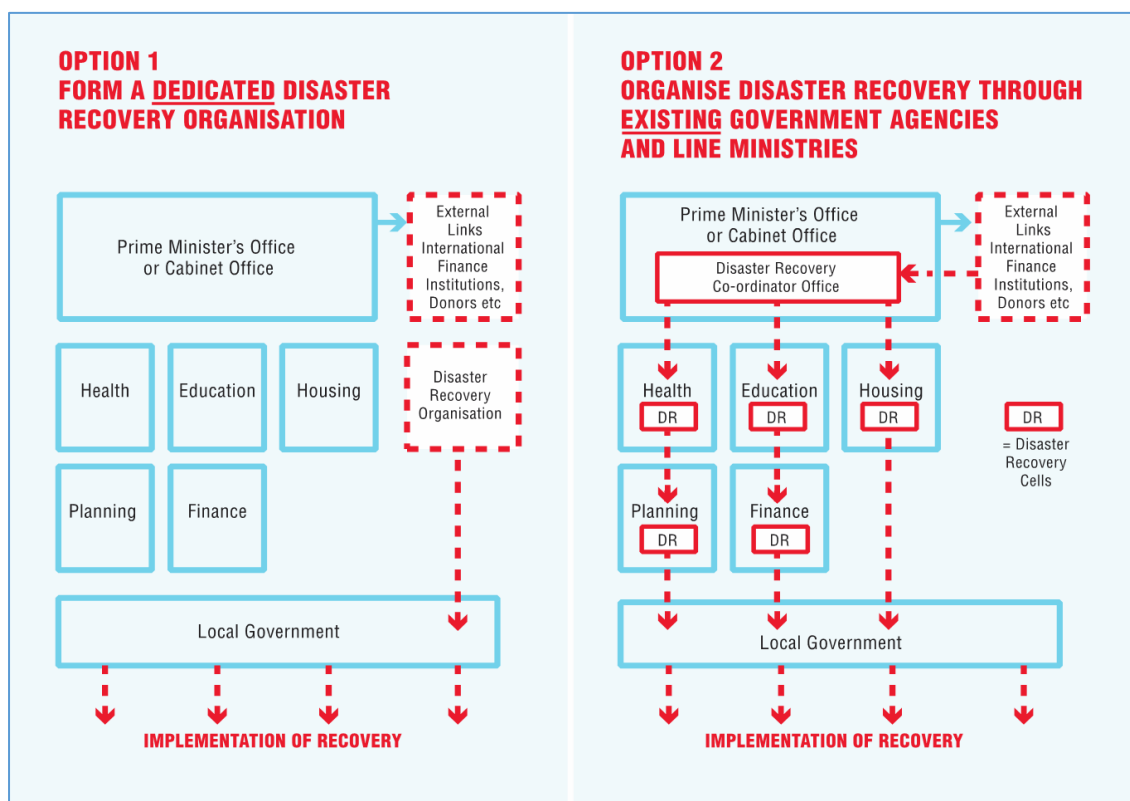


Figure 2.1: Alternative models of government recovery organisation (Davis and Alexander, 2015)

³ A comprehensive list of NDMA's has been compiled by ReliefWeb and can be found at: <http://reliefweb.int/topics/ndm-authorities>

Table 2.1: Comparative advantages and disadvantages of the two options for recovery organisations

Option	Advantages	Disadvantages
1	<ul style="list-style-type: none"> • A single point of entry for foreign donors, international finance institutions, etc. • Clearly defined authority and accountability • The recovery tasks are massive, requiring resources beyond the capacity of existing line departments (Disaster recovery framework, 2014) 	<ul style="list-style-type: none"> • Expensive option requiring dedicated accommodation, vehicles, high salaried staff, etc. over at least 5 to 10 years • The dedicated body will have responsibility for all sectors, and risks removing responsibility from natural 'homes' (i.e. the health ministry would no longer have responsibility for reconstructing safe hospitals, etc.) • The staffing is drawn from existing ministries, reducing their capacity • Experience in certain contexts indicates that such bodies become powerful and take on a life of their own, and when recovery is complete, they are not easily dissolved
2	<ul style="list-style-type: none"> • Responsibility remains within each line department, which is a vital aspect of 'mainstreaming DRR' • Cheaper than creating a new body • Recovery becomes 'normalised' within the established life and culture of government and it is not extracted with special status, thus enabling an easy transition from recovery back into eventual normality • Clearly defined authority and accountability 	<ul style="list-style-type: none"> • External donors and international finance institutions dislike having to deal with multiple ministries • Existing ministries will not be able to cope with the additional demands of recovery over and above their ongoing normal functions unless they are allocated extra resources

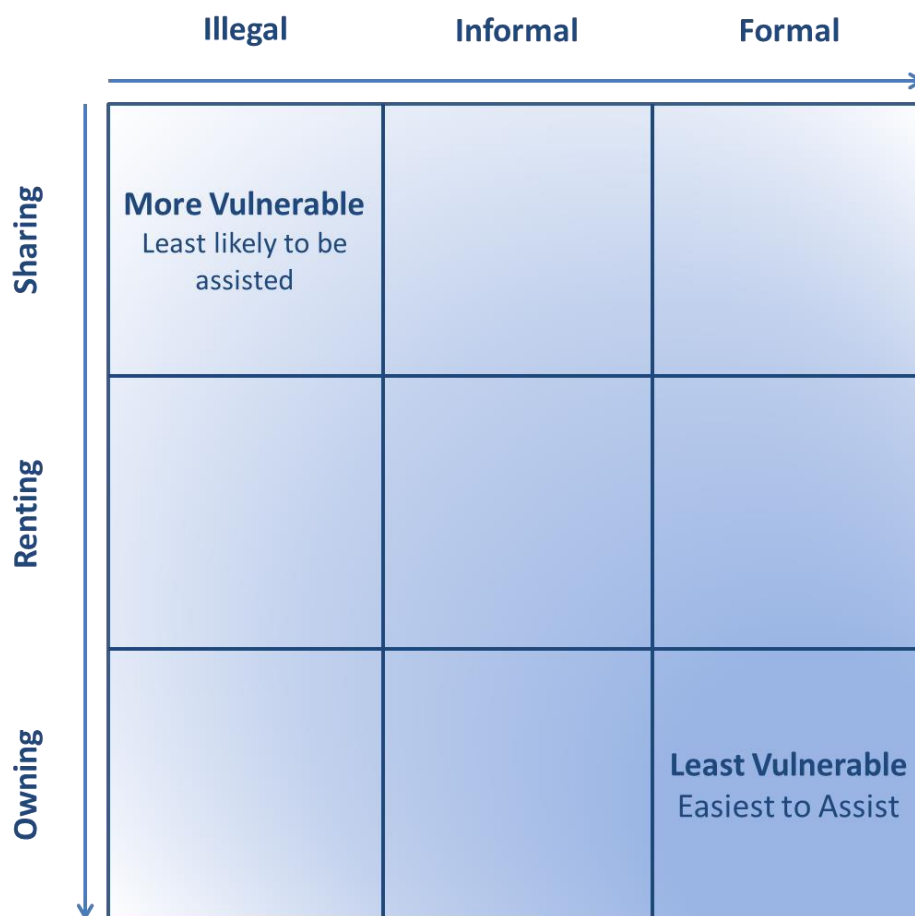
2.1.2 Affected communities – survivors

Affected communities are the primary stakeholders in post-disaster reconstruction; they are the end user of much of the infrastructure that has been damaged and are the survivors of the disaster itself. They need to be integrated into planning and decision-making and should be recognised not as victims, but rather as key stakeholders with a meaningful voice. There are particular challenges to achieving this with communities that are likely diverse, widespread and with varying cultural or social norms. It is also complicated by the approach of the humanitarian sector, as discussed previously in Section 0.

The status of the affected communities has particular importance; low-income urban communities may be the worst affected by natural disasters and the least able to cope. They may also be the least likely to receive assistance, be lowest on the priority list of the host government and, most likely, to be relocated as part of a wider reconstruction planning process (see Figure 2.2). The NGO sector is generally good at building community participation into programme design and can provide a mechanism for integrating community voices into a wide reconstruction process.

For rural communities, the wider infrastructure network, namely roads, will have key relevance where livelihoods may rely on access to markets. Re-establishing communication links, including roads and bridges will have an impact on the recovery of these communities. In the wake of the Nepal earthquake in 2015 landslides triggered by the earthquake and aftershocks, compounded by pre-monsoon rains, hindered access to many districts (OSOCC, 2015).

Reconstruction of shelter and livelihoods will be the key focus of all affected communities and, in urban environments, shelter can present particular challenges. Depending on economic status, employment and pre-event accommodation, tenure arrangements for urban households will be highly complex (Nougaret and Danuwar, 2016; Oxfam International, 2016). Experience in the Philippines after typhoon Haiyan indicated that resolving tenure issues is a lengthy legal process, with different arrangements for the building the families are living in and the land on which the building is located. This is further complicated when the buildings are shared, owned or rented, formally or informally (Davis, 2015).



Note: The tenancy status may be different for a family's housing situation and for the land on which they stand.

Figure 2.2: Tenancy status of affected households (Source: Recovery shelter guidelines, Shelter Cluster, Philippines)

2.1.3 Role of the private sector

The private sector plays a key role in both supplying services and contracting, as well-being an affected stakeholder with critical understanding of the context on the ground. There are two aspects to private sector involvement in reconstruction that should be considered, small-scale domestic providers and large-scale infrastructure corporations (GFDRR, 2015).

Large-scale private sector

Large-scale private enterprises are likely to be established, professional organisations with the expertise and resources that can be built into the planning process. In these cases, it can be useful to establish public-private partnerships to facilitate post-disaster activities:

- Enhancing resilience of both government and the private sector to financial loss, loss of market share and damage to assets. By sharing the risk, there is a vested interest by both partners to manage resources for recovery
- Promoting compliance with regulatory and safety requirements, including helping to reduce corruption risks by spreading responsibility and enhancing transparency
- Developing closer ties between communities, government and businesses
- Cross-agency reconstruction bodies also facilitate data sharing, funding and harmonisation of the reconstruction process (Fengler et al., 2008).

Large-scale private sector involvement can also be important to source expert advice for reconstruction. Professional institutions have a role to play here as well, as they often represent forefront knowledge and can guide reconstruction planning towards more sustainable outcomes. Professional bodies and industry associations may also have familiarity with contractors and can support in evaluating tenders and in negotiating collaborative approaches between the private sector and government departments (GFDRR, 2015).

Box 2.1: Case study on the Stronger Christchurch Infrastructure Rebuild Team (SCIRT)

The Stronger Christchurch Infrastructure Rebuild Team (SCIRT)

The Stronger Christchurch Infrastructure Rebuild Team (SCIRT) is a temporary public-private alliance established in the wake of the series of earthquakes that hit Canterbury, New Zealand, in 2010 and 2011. They are tasked with the reconstruction of horizontal infrastructure, including below ground services, roads, etc. Importantly, they self-recognise that they are responsible to the people of Christchurch and New Zealand, and the alliance is 'owned' by public bodies, including the Canterbury Earthquake Recovery Authority (CERA), Christchurch City Council and NZ Transport Agency. They are funded through the Christchurch City Council and the wider New Zealand Government.



The initiative was a solution for accelerating critical repair in an environment where the scope is uncertain and the risk cannot be clearly defined. Following the Canterbury earthquake, SCIRT used a one-stop interactive digital map to collate information from all its partners. Agreements were established with energy companies to hold their asset data and represent it on the map (SCIRT, 2012). This process of obtaining critical information early is a precondition of a successful recovery effort.

Source: <http://strongerchristchurch.govt.nz/>

Domestic private sector

The domestic private sector refers to small-scale contractors and the informal building sector. They will likely be key suppliers in the reconstruction of domestic housing, with blurred lines between owner construction and suppliers. These entities are unlikely to be represented by a formal organisation and are not going to wait on decision-making by authorities before progressing with reconstruction. They are going to be greatly affected by any escalation in the price of materials, which may represent the key constraint to wholesale reconstruction of informal housing. Furthermore, they will be key actors engaged by NGOs, who work at a community level shelter sector.

There is a general recognition that approaches to shelter support should shift towards supporting shelter rather than providing shelter, facilitating households to upgrade their own housing situation. This includes supporting access to improved land, finance, services, materials, skills and labour (Maynard and Barritt, 2015) and recognising the individuality of the domestic market and the general desire to have more than an emergency shelter. It also recognises that the domestic market will progress at whatever rate it can, often to the detriment of structural safety. To manage this requires recognition of the challenges and constraints on the domestic market and that households may not view resilience as a priority when managing their resources with re-establishing livelihoods (Maynard and Barritt, 2015).

The NGO sector is particularly relevant in post-disaster shelter reconstruction when looking to mainstream a 'build back better' approach, or 'build back safer' as advocated by CARE (Hall et al., 2014). The wider role of NGOs is discussed along with housing issues in 0. There are a number of investigative reports available that explore the role and future of NGOs in humanitarian response, given global transformations in access, security, funding and other actors. Of these, the following are of note:

- The Humanitarian Futures Programmes report on *The Future of Non-governmental Organisations in the Humanitarian Sector* (Kent et al., 2013)⁴
- *The State of the Humanitarian System*⁵ (ALNAP, 2015)
- *Too Important to Fail*⁶ (UN, 2016)

2.2 Policy and governance

The governance of post-disaster reconstruction is a complex issue; rebuilding after an extensive loss of social and economic infrastructure in an environment that has affected a wide range of stakeholders. Every social actor within an affected area is involved – individuals, households, communities as well as businesses, voluntary organisations and public institutions. The extent to which host governments are likely to lead or hinder progress will depend greatly on existing governance systems, legislation, policy and experience.

National government is mandated to coordinate external assistance and set the regulatory and legal frameworks for assistance. Harvey (2009) points to complications resulting from a lack of capacity, understanding, unwillingness to lose face or because the state itself may be responsible for the creation or perpetuation of the emergency. In the wake of cyclone Nargis in 2008, there was intense pressure on the Myanmar government to allow access to those affected by the disaster. This included a number of high-level announcements by France, the EU and the UK of an intention to deliver aid without consent. While pressure was driven primarily by a desire to assist disaster-affected people, the implications are wider and can affect downstream collaborative efforts to reconstruct.

2.2.1 Legislation and government systems

In an emergency response and subsequent reconstruction, national governments can play a role that may normally be the responsibility of local authorities. Where sub-national governments are strong, or normally play a key role in infrastructure, this can lead to coordination issues and 'conflict'; the response to hurricane Katrina in 2009 in the US was severely hampered by a lack of communication and coordination between federal, state and

⁴ <http://www.humanitarianfutures.org/publications/the-future-of-humanitarian-ngos/>

⁵ <http://sohs.alnap.org/>

⁶

<https://consultations.worldhumanitariansummit.org/bitcache/eb90a59ea8f1c6a87f2c410c1102e286544dabbb?vid=566924&disposition=inline&op=view>.

municipal agencies (Moynihan 2009). This is a recurring theme – national policy and legislation will influence response and reconstruction, requiring interaction with national government. However, effective working relationships with local and regional institutions is critical for progress (Harvey, 2009). Humanitarian actors faced this issue in the Pakistan 2005 earthquake, which effectively disrupted existing governmental and non-governmental machinery (Mughal et al., 2015). In response, the centrally controlled Earthquake Reconstruction and Rehabilitation Authority (ERRA) was created. However, the directors of ERRA were aware of the risk of bypassing local structures and undermining local authorities.

Effective legislation can be used to accelerate reconstruction by facilitating or ensuring compliance (Mannakkara and Wilkinson, 2014). Legislation for compliance refers to using the legislative tool to force adoption of recovery and reconstruction principles, such as build back better. This is generally insufficient unless supported with effective regulation and enforcement, as discussed in Section 0. Legislation to facilitate reconstruction refers to the relaxation of controls to simplify, assist and accelerate recovery. If legislation is considered in its customary role of protecting stakeholders (i.e. end user, environment, client, etc.) then the imposed processes and safety controls can constrain recovery, with time consuming procedures, at a time when resources may be limited. Facilitation legislation can allow for a relaxation of procedures and processes either by national decree post-event or by building in relevant clauses when circumstances are deemed exceptional.

Changing legislation needs to be done within a collaborative framework, whereby key stakeholders are aware of the changes and the implications, and are given the opportunity to influence them. Legislation in Sri Lanka after the 2004 Indian Ocean tsunami led to the resettlement of coast communities with the loss of traditional livelihoods (Mannakkara and Wilkinson, 2013a). Furthermore, unless effectively communicated, a lack of awareness and understanding of new legislation can lead to non-compliance by default. The IFRC International Disaster Relief Law programme is exploring the impact of legislation on DRR, particularly at the community level (IFRC, 2016b). They have developed the Checklist on Law and DRR (IFRC, 2015), which can be used in considering how support should be provided for reconstruction programmes.

2.3 Codes, standards and regulations

Codes, standards and regulations are a set of rules that establish a minimum performance standard, providing the basis for ensuring confidence in infrastructure assets for all stakeholders, including asset owners, users, investors, etc. Without compliance, there can be little confidence in how an asset may perform under normal or extreme loading. In a natural disaster, this can lead to catastrophic failure with the loss of the asset, the asset value and life.

With recent earthquakes around the world attention has been paid to the presence and effectiveness of seismic codes. A loose correlation can be drawn between the presence and enforcement of seismic codes with the extent of damage from an earthquake event, as shown in Table 2.2. Codes are used to specify the performance of structures under extreme loading for a variety of different scenarios, including flooding, wind, temperature and use. These should all be reviewed when considering the resilience of structures. It should be noted, though, that the true extent of compliance may not become apparent until after the disaster event.

Table 2.2: Extent of damage to building stock and seismic codes (adapted from Nienhuys, 2015)

Year of earthquake	Country	Magnitude (Mw)	Peak ground acceleration (PGA) (g)	Buildings collapsed/destroyed	Deaths per 1000 collapsed buildings	Year of publication of seismic code	Evidence of seismic code applied
1995	Kobe, Japan	6.9	0.80	80,000	80	1950	Yes
2005	Pakistan, Kashmir	7.6	0.23	400,000 (est.)	220	1986	No
2007	Pisco, Peru	8.0	0.49	33,000	16	1970	Yes
2008	Sichuan, China	7.9	0.23	1000,000 (est.)	87	1959	No
2010	Chile	8.8	0.65	81,000	6.5	1972	Yes
2010	Léogâne, Haiti	7.0	0.44	105,000	2120	n/a	n/a
2011	Christchurch NZ	6.3	1.88	2	0	1976	Yes
2011	Tōhoku, Japan	9.0	2.99	100,000	280	1950	Yes
2015	Nepal	7.8	~0.25	605,253	14.5	1994	No
2015	Illapel, Chile	8.3	0.25	270	0	1972	Yes

2.3.1 General requirements for improving use of codes

Experience has shown that creating, promoting and regulating a system of building codes requires a careful balance of specifications, enforcement, incentives and integration with other sectors. Leniency can lead to poor structural performance, but being too demanding can force people away from the formal sector. The continued proliferation of informal properties in Turkey is a result of owners seeing greater benefit in remaining outside the formal sector and avoiding the tax system (Peppercorn, 2016). Promoting the uptake of building codes during reconstruction should consider the following:

- **Appropriate codes:** Codes, standards, regulations and enforcement need to be available, accessible, understandable and affordable
- **Codes for the informal sector:** A pragmatic view is to tailor design requirements to rapid tools to ensure incorporation of basic design strengthening features
- **Linking training with materials and micro-finance:** Micro-finance can offer a means for improving access to insurance and promoting safer construction. Tying access to training in improved construction methods could improve building performance
- **Integrating formal systems with key stakeholders:** Building accountability within implementation and enforcement is needed to promote compliance with regulations. For example, liability periods for construction; linking finance to insurance; and limiting the potential for key individuals to hold the balance of power over a system
- **Tailored systems for housing and infrastructure:** There is a difference between the capacity to build to code for residential and non-residential structures. Approximately 80% of housing is built by individuals, with reduced capacity and willingness to comply when compared with a commercial developer or by a governmental entity (Peppercorn, 2016).

Box 2.2: Case study on codes and regulations are not enough

Comparing the experience of the adoption of seismic codes in Nepal and Chile

Table 2.2 illustrates a noticeable difference in the performance of buildings between Nepal and Chile in recent earthquakes, despite both being lower-income countries at risk of seismic events. Nepal experienced an earthquake in 1988 which damaged over 50,000 buildings and Chile experienced two, one in 1960 measuring 9.5 and another in 1985.

Nepal approved the national seismic building code, issued by the Department for Urban Development and Building Construction, in 2003 and made it mandatory in all municipalities in 2006. However, a deadline for implementation was never established, and the code was not extended to rural Village Development Committees. Thus, when the earthquake struck in 2015, the seismic code had not had been universal adopted. In contrast, Chile embarked on a process of institutionalising a seismic approach across both the construction and building finance sectors. The official code, NCh433.Of96: Earthquake Resistant Design of Buildings was adopted in 1996. The code was integrated into Chile's building permit system, requiring a builder to acquire a permit prior to construction, which in turn required an independent structural and seismic review of the design. Building drawings had to be submitted and became part of the public record; a process that was the responsibility of the builder. The builder was then subject to a 10-year liability period for all structural elements and 5 years for non-structural elements (Lew et al., 2010). The institutionalisation of the seismic code extended beyond the building sector, with earthquake insurance compulsory for access to mortgages. In Chile, this insurance is a hybrid between mortgage insurance and disaster insurance, where in the event of a claim, funds up to the value of the mortgage go to the lender, and not the insurance holder.

It is worth noting the particular features, including: a) a registered building industry that is held to account; b) a strong financial sector, with Chile being ranked fifth in the world in 2010 for the soundness of its banks (WEF, 2010); c) housing market driven by access to available, affordable and accessible finance, with some limited government support for lower-income households; and d) regulation that binds the lenders into the process of insurance and building design. These features would be a challenge for Nepal, where housing finance is generally not available – the total mortgage portfolio in 2013 was only USD 769 million, or USD 28 per capita. Furthermore, it is typically only available for those with formal documented incomes, when only 16% of the population have a formal salaried employment (Peppercorn, 2016). A further issue was noted by a New York Times article; that of a “*system of government enforcement rotted by corruption and indifference*” (Buckley, 2015).

SECTION 3

Enabling reconstruction to enhance resilience

3.1 Building resilience

In recent years the term ‘resilience’ has become ubiquitous, but used by different groups in different ways to describe different situations. One commonly accepted definition, focusing on capacity of a system or social body to recover, is:

“The ability of a system, community or society potentially exposed to hazards to resist, absorb, adapt to and recover from the stresses of a hazard event, including the preservation and restoration of its essential basic structures and functions.”

(Jha et al., 2010).

Another definition places a crucial emphasis on *anticipation* of threats:

“Resilience refers to the capacity of an individual, household, population group or system to anticipate, absorb and recover from hazards and/or the effects of climate change and other shocks or stresses without compromising (and potentially enhancing) its long term prospects.”

(Turnbull et al., 2013)

DFID has adopted a working definition of disaster resilience as:

“...the ability of countries, communities and households to manage change, by maintaining or transforming living standards in the face of shocks or stresses – such as earthquakes, drought or violent conflict – without compromising their long-term prospects.”

(DFID, 2011))

The notion of ‘adaptive capacity’ within government and the wider society is central to the concept of resilience, whether in relation to the ability to respond to the short-term impacts of natural hazards, or in relation to managing longer-term environmental stresses, notably climate change (Janssen and Ostrom, 2006). The concept of resilience was mainstreamed into international development policy frameworks in the disaster risk management context in the Hyogo Framework for Action (UNISDR, 2005). According to Warmsler (2007), resilience is the opposite/antithesis of vulnerability. More precisely it reflects a functioning disaster risk management system that works before, during and after disaster resilience suggests a proactive stance towards risk.

Climate change is already seen by some as affecting the incidence and severity of hydro-meteorological disasters (Turnbull et al., 2013; Loftis and Randy Lee, 2015). The growing emphasis on climate change adaptation alongside mitigation has brought ‘climate change resilience’ to the fore with an increasing linkage of the two agendas. The wide-ranging concept of resilience applies to all pre- and post-disaster needs, concerning the ability, or capacity of a system, network or structure to:

1. **Absorb shocks** from the extreme hazard forces of earthquake ground shaking, the impact of hurricane force winds and the velocity and duration of floodwaters. (*This context relates to disaster risk reduction (DRR)*)
2. **Bounce back** following disaster impact. (*This context relates to emergency management and effective preparedness planning*)

3. **Adapt and change** during the process of disaster recovery. This is needed to enable significant changes to be introduced to achieve enhanced safety, better quality, etc. *(This context particularly relates to the short- and long-term recovery phase).*

Figure 3.1 visualises these three resilience elements in a given pre- and post-disaster recovery situation, which is of moderate quality as indicated on the vertical axis. The third component of recovery is seen as the erratic path towards the 'Recovery aim', which is to rise above the normal anticipated development trajectory and avoid rebuilding vulnerability. This is essentially the sentiment captured in the words of Bill Clinton to **'Build Back Better'** (Clinton, 2006). The capacity to absorb, recover or adapt applies across three closely linked environments:

- *The social/economic environment* that concerns governance, social organisation, financial services, communities and families who are vulnerable to disasters
- *The natural environment* including watercourses, soils, landforms, plants, trees, crops, livestock, fisheries, coral reefs, mangrove plantations, etc.
- *The built environment* consists of structures, buildings, services, commerce, industry, infrastructure, etc. (Twigg, 2009).

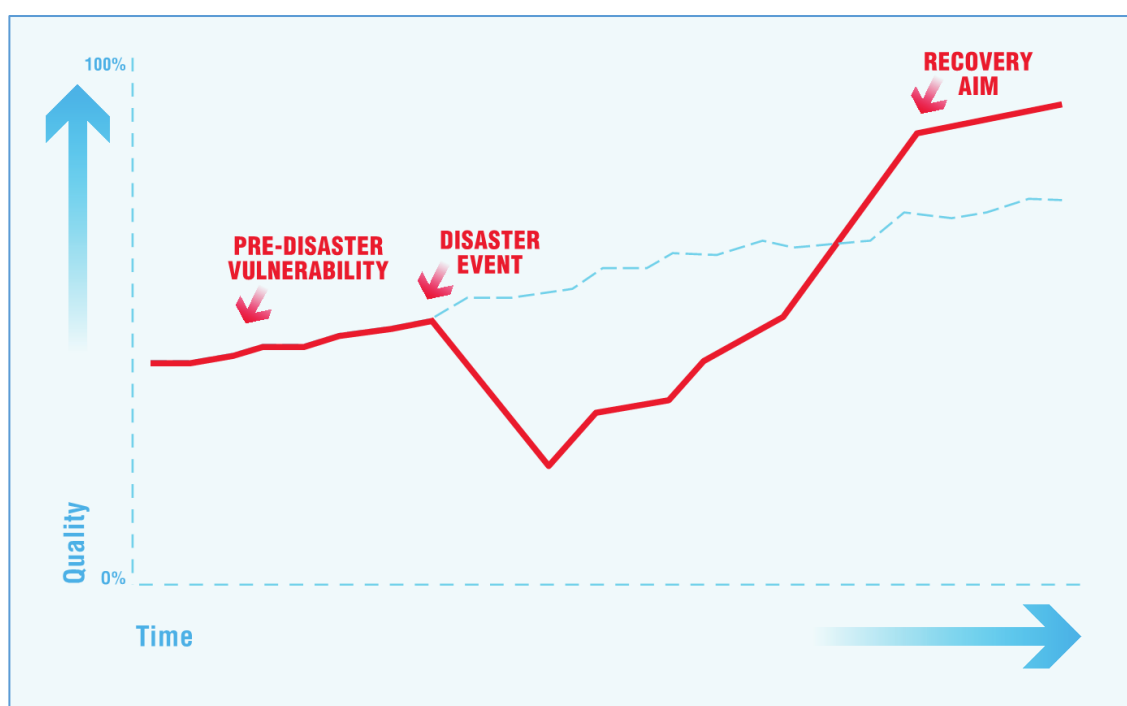


Figure 3.1: Development recovery quality and elapsed time model (Source: Davis and Alexander, 2015)

These environments are interwoven aspects of any society, whether rich or poor, urban or rural, yet they are often segregated, and protected, in 'silos', falling under the remit of different professions and departments of government. ***This separation may account for repeated failures to achieve the rich benefits of integrated recovery plans, projects and programmes.***

As with the rest of the DRM process, reconstruction cannot be delivered with an ad-hoc approach. It requires detailed work in planning, establishment of goals and objectives, prioritisation and coordination between stakeholders. The most robust frameworks for disaster response and recovery, as discussed in Section 0, adopt an inclusive and integrated approach encompassing the social, economic and natural environments as well

as the built environment and the cross linkages between these different spheres. Thus, although resilience describes the ability of systems or networks to cope with extreme loading, it is also needed to withstand routine organisational pressures, such as official neglect, organisational change, political instability, changing governmental or donor priorities, etc. A commonly experienced ‘organisational pressure’, is the absence of any maintenance budget to continually repair and upgrade infrastructure. Wise project managers and responsible political leaders will link capital expenditure for new infrastructure with commitments and budgets for ongoing maintenance of these resources.

Resilience is the subject of a recent Topic Guide titled Infrastructure Resilience, where more detailed information on mainstreaming resilience in programmes can be found⁷.

3.2 The role of infrastructure

This Topic Guide is focused on the reconstruction of infrastructure and the built environment following a natural disaster. Infrastructure can be defined as:

“Systems and networks by which public services are delivered, including: water supply and sanitation; energy and other utility networks and transportation networks for all modes of travel, including roads and other access lines.”

(Jha et al., 2010)

In this sense the ‘built environment’ broadly equates to physical infrastructure in its widest sense, including networked infrastructure and buildings, but it also includes housing (‘shelter’); often the most challenging aspect of physical recovery and reconstruction, along with the local infrastructure that ties communities together. A subset of infrastructure systems is ‘critical infrastructure’ referring to the networks and buildings that must be prioritised in reconstruction for the safety, stability, recovery and protection of society.

The basic role of infrastructure in relation to disasters, is to survive the impact intact so that they continue to function as required, to reduce secondary risks (such as the fires that often follow earthquakes, or the contamination of water supplies by sewage), to facilitate life-saving relief actions and to accelerate recovery of society as a whole. To enable infrastructure to do this, it needs to have been either originally designed and constructed to high safety standards, or retrofitted to bring it up to an adequate level of performance. The reality in most contexts is a mixture of older systems, constructed with lower or missing safety standards, and more recent work constructed to more exacting standards of protection. Retrofitting, of say water supply networks, is rarely a feasible undertaking in pre-disaster contexts since it is formidably expensive, potentially costing as much as full replacement. Therefore, disaster reconstruction provides a unique opportunity to upgrade the resilience of infrastructure, when there is often a high level of political commitment as well as well a higher availability of funds than in normal contexts.

⁷

Pending publication

Box 3.1: Case study introducing the four R's of resilience

The four R's of resilience

In delivering resilience in infrastructure, the engineering profession now regularly adopts the 'four R's of resilience' as characteristics of effective resilience:

- *Robustness* ensures sufficient strength to cope with extreme hazards and organisational pressures
- *Rapidity* describes delivery on-time when it is needed
- *Resourcefulness* concerns the need for creative approaches
- *Redundancy* responds to the need for 'back-up' provision and duplication so that critical facilities are maintained without interruption in the event of a disaster (Bruneau et al., 2003).

These are represented as the foundation blocks in Figure 3.2, as it relates to communities and settlements.

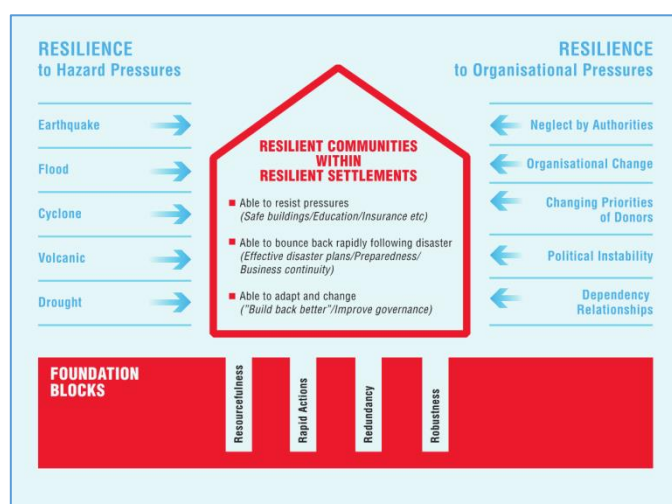


Figure 3.2: Resilient communities and settlements (Source: Davis and Alexander, 2015).

Robustness: Examples of a lack of robust critical infrastructure include hurricane Katrina in 2005 when levees broke causing widespread urban flooding; the 2008 Sichuan earthquake, which damaged or destroyed 11,000 hospitals and the 2010 flood in Pakistan, which resulted in infrastructural losses and damages of USD 4 billion.

Rapidity: Delivery on-time when it is needed, rather than after protracted delays that have characterised so many reconstruction programmes, such as the painfully slow progress of house building following the 2010 Haiti earthquake.

Resourcefulness: When cyclone Winston devastated Fiji in Feb. 2016, there was a low number of casualties despite one of the worst storms on record. In part this was due to an effective cyclone warning system and evacuation planning with 62,400 people, 7.2% of the island country's population, occupying 875 evacuation centres.

Redundancy: An example of a lack of redundancy occurred in the 9/11 disaster when a critical facility, the New York City Emergency Operating Centre (EOC) was destroyed as a tower collapsed and there was no substitute EOC in place to manage emergency planning.

Figure 3.2 highlights a further aspect of resilience. As well as any community or settlement needing to become resilient to hazard pressures (as indicated on the left-hand-side of the diagram), they also need to withstand routine organisational pressures (as indicated on the right-hand side of the diagram) If a community and settlement develops the 4 R's to such routine frequent non-hazard pressures it is likely they will be better able to cope with the far more powerful, but less frequent hazard forces that may occur.

Source: Davis and Alexander, 2015.

3.3 Critical infrastructure

Critical infrastructure are those elements given the highest priority in the immediate post-disaster context, such as transport, power, water and sanitation. The Overseas Development Institute (ODI) defines critical infrastructure as:

“Critical facilities are the primary physical structures, technical facilities and systems which are socially, economically or operationally essential to the functioning of a society or community, both in routine circumstances and in the extreme circumstances of an emergency.”

(UNISDR, 2009)

Table 3.1 provides some examples of critical building infrastructure that play a key role during and after a disaster. This does not consider critical transport, power or service infrastructure.

Table 3.1: Critical buildings (adapted from Jha et al., 2010)

Structure	Example	Purpose
Multiple assembly buildings	Cinemas, mosques, churches, sports stadia, etc.	to reduce mass deaths and injuries during a disaster
Education facilities	School buildings	Protection of children during disasters. Schools also provide vital evacuation centres for displaced communities
Buildings that fulfil vital emergency functions	Medical facilities, government offices, TV stations and media providers of public information, power stations, governmental record archives, military bases, etc.	Maintain basic social functioning, stability and law enforcement
Cultural and historical monuments	historical buildings and sites, libraries, art galleries, etc.	Preserve national pride and cultural heritage

The agencies (public or private) that manage the delivery of this infrastructure can also be deemed as critical ‘social’ or ‘soft infrastructure’ and, therefore, this definition can be expanded to include commercial resources providing essential critical services.

3.3.1 Interdependence of systems and critical infrastructure

Since the failure of New Orleans’ hurricane protection system in 2005 there has been a greater focus on adopting, planning and designing methodologies that examine the integrated performance of the infrastructure system and its interdependencies rather than just that of its components (USACE, 2006; Nakat, 2015). Although there is a growing area of academic research there are few practical guidelines, particularly during a post-disaster reconstruction context. The interdependencies between public and commercial assets need particular attention. Specific modelling and analytical studies have been used, although they are complex and rely on sufficient data being available (NIST, 2014). The UK Collaboratorium for Research in Infrastructure & Cities (UKCRIC) represents an initiative actively researching this area that seeks to “...understand how to make the system of systems that constitutes the nation’s infrastructure more resilient to extreme events and more adaptable to changing circumstances and contexts, and how it can provide services that are more affordable, accessible and useable to the whole population.” (UKCRIC, 2016).

The magnitude of anticipated losses varies according to the nature of each hazard where a severe, moderate or minimal effect is indicated. **Error! Reference source not found.** lists in the vertical axis eight key risks to a country's infrastructure. The likely impact from typical disaster hazards are noted on the horizontal axis. This can be used in conjunction with an understanding of the effort required in protection, as seen in Figure 3.3, from the World Bank Reconstruction Guidelines, adapted from the Federal Emergency Management Agency (FEMA).

Table 3.2: Critical requirements of infrastructure in different hazard contexts. (Source: adapted from Jha et al., 2010)

	Earthquake	Volcano	Landslide	Hurricane	Flood	Drought
Structural damage to system infrastructure	✓✓✓	✓	✓✓✓	✓✓✓	✓✓✓	✓
Rupture of mains and pipes	✓✓✓	✓	✓✓✓	✓✓	✓✓✓	✓
Obstruction in intake points, intake screens, treatment plants and transmission pipes	✓	✓✓✓	✓✓	✓✓	✓✓✓	✓
Pathogenic contamination and chemical pollution of water supply	✓✓	✓✓✓	✓	✓✓✓	✓✓✓	✓
Water shortages	✓✓	✓✓	✓	✓	✓	✓✓✓
Disruption of power communications and road systems	✓✓✓	✓	✓✓	✓✓✓	✓✓	✓✓
Shortage of personnel	✓✓✓	✓✓	✓✓	✓✓	✓✓	✓
Lack of equipment, spare parts and materials	✓✓✓	✓	✓✓	✓✓✓	✓✓✓	✓
✓ - Minimal effect, ✓✓ - Moderate effect, ✓✓✓ - Severe effect						

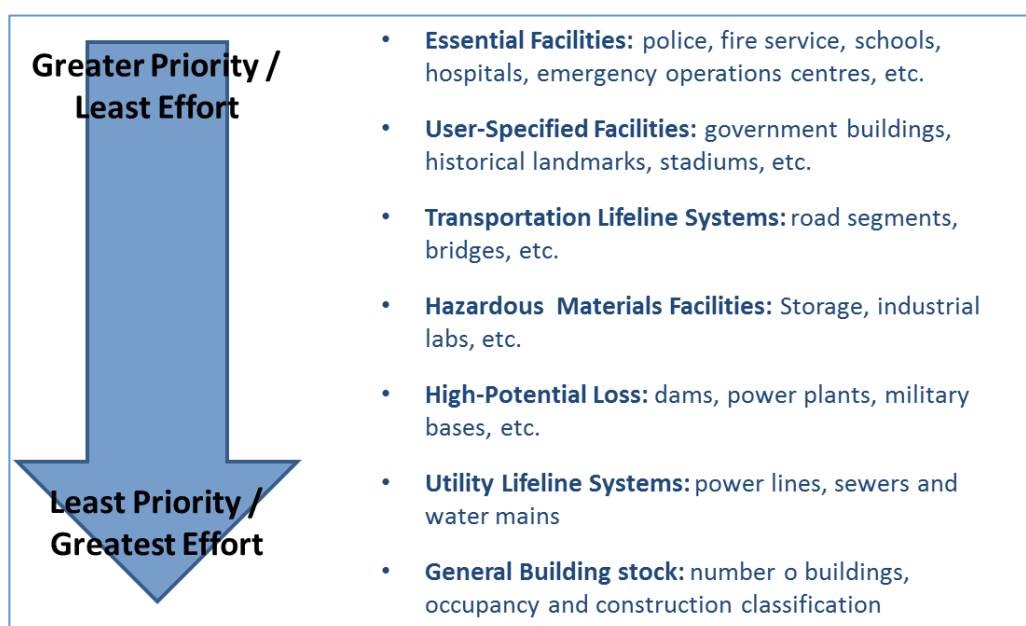


Figure 3.3: Priorities related to effort in the protection of critical infrastructure (Source: Jha et al., 2010)

For reconstruction, an integrated and systematic approach rests on strong early coordination of efforts, considering the requirements of critical infrastructure in different natural hazard contexts and establishing priorities in terms of actions, impacts and efforts. The Early Recovery Cluster led by the UNDP leads the coordinated response where international agencies are involved, although often it is only the local military that has the capacity to respond to the immediate needs following the disaster event.

Box 3.2: Case study on SCIRT adopting a cross-utility reconstruction approach

SCIRT – shifting from asset replacement to cross-utility reconstruction

A number of authorities are developing resilience plans that include actual and desired service performance targets for their infrastructure systems, including Oregon (OSSPAC, 2013) and Christchurch. SCIRT has adopted a cross-utility approach to rebuilding infrastructure that requires an understanding of interdependencies and identifying ‘pinch points’ (areas with limited access and capacity) as well as critical hotspots (areas with multiple co-located assets) (Ladbrook, 2013). SCIRT shifted from a damage-based approach for decision-making to a service-based approach, allowing more flexibility in prioritisation and selection, compared to one-for-one replacement. Multi-criteria analysis was adopted using criteria related to the condition/remaining estimated life, serviceability, criticality and maintenance costs or proposed repair/replacement. Projects were grouped according to system interdependencies and criteria, including interdependence and construction impacts, were also considered. Priorities were then updated quarterly (Miles et al., 2014). This is noted as being similar to the Royal Engineer’s critical infrastructure assessment process. A comparison between these and other assessment methodologies may be worthwhile.

3.3.2 Housing and community infrastructure

Rehousing and repairing the housing of affected communities is nearly always the largest and most-costly part of reconstruction. Around 50% of the cost of the recent earthquake in Nepal is attributed to meeting the cost of housing damaged or destroyed by the disaster (NPC, 2015). Shelter and housing of affected communities is a relatively well-understood sector, with extensive literature and increasingly well-informed guidance for policy and practice in housing reconstruction. It is discussed here as it is an area that should be considered and planned for under the rubric of ‘rebuilding communities, not just housing’.

In contrast to ‘shelter’, community infrastructure remains a relatively neglected area. In the aftermath of a disaster, with the ensuing traumas associated with the loss of family and friends, injuries and disruption to daily economic, educational and social life, preserving and restoring social capital and infrastructure, and building on the mutual solidarity of communities can be critical factors in the recovery process. This is a factor that is often overlooked in the rush to meet the immediate challenges of rehousing the disaster victims. Community infrastructure projects, such as rebuilding clinics and schools, are often reconstruction efforts undertaken by humanitarian agencies, in many cases implemented on an individual basis, separate from other recovery efforts and rarely as part of an integrated programme. This approach of discrete projects under distinct and separate humanitarian sectors can exacerbate the disconnectedness and inhibit a common approach to community and settlement post-disaster planning (IFRC, 2012).

Detailed information on shelter after a disaster can be found in *Shelter after Disaster*⁸. Historically and conventionally, rehousing after disasters has been treated in three phases, i) **emergency shelter**, including plastic sheeting and tents; ii) **transitional housing**, providing more robust and better-serviced shelter; and iii) **permanent housing**, with construction of

⁸ http://www.ifrc.org/Global/Documents/Secretariat/201506/Shelter_After_Disaster_2nd_Edition.pdf

permanent structures. This approach is in line with the humanitarian response phases and facilitates donor and institutional management. In reality, post-disaster shelter and housing is not so easily separable. Many of those displaced by disasters will be absorbed by 'host families', usually friends and family, which is of an extensive, if hidden, value to the recovery effort; host families seldom receive any support or financial assistance. It is estimated, that up to 17% of the families affected by the Kobe earthquake in 1995 were 'hosted'. Another issue is the 'permanence' of temporary shelter; experience has shown that affected populations can end up living in transitional shelter for extended periods of time, which frequently become permanent. There are people still using temporary structures in Montserrat in 2015, which were built in 2010 after the eruption of Soufriere Hills volcano⁹.

Despite the growing preference to move directly to more permanent shelter solutions as part of a seamless process, transitional shelter continues to be seen as a solution to the permanence of temporary shelter, offering advantages, including: (1) upgrading into part of a permanent house; (2) reuse for another purpose; (3) relocation to a permanent location; (4) resold when no longer needed; and (5) reused/recycled. This argues against prefabricated solutions that are parachuted in and promotes the use of local materials and lightweight construction to facilitate transport. Reclaiming and reusing materials can help enable incremental building and upgrading, which is of particular importance in remote locations. It is also argued that an intermediate solution allows time for the resolution of land rights issues. The Shelter Centre contends that it can take from two to fifteen years to resolve land rights and tenure issues post-disaster. Transitional shelter can provide a cost effective, flexible option with an incremental rather than three phased approach. However, evidence from the Haiti earthquake reconstruction process suggests that land rights issues may be resolved more quickly using a 'triangulation' method developed by UN-Habitat (2010). The land-tenure argument aside, any form of durable shelter normally requires building permission to be obtained from local authorities (assuming that building control is effective). More emphasis now is placed on finding permanent shelter solutions and passing over the transitional housing phase. This is seldom straightforward and assumes there is land readily available in safe locations on which permanent housing can be built. This approach requires pre-planning, foresight and control over land ownership that seldom exists and can result in families spending extended periods living in tents or under plastic.

Criticism of the traditional approaches to transitional housing has prompted new approaches to be developed. One option is an incremental process, giving flexibility for people to move site and take their shelter with them, or to remain, gradually extend and consolidate their dwellings into more permanent structures. Another approach is the temporary rehousing of people on the site of their existing homes while these are rebuilt, but this requires early investment in site clearance and funding to support self-build. Given the expense associated with building whole houses, governments typically aim to provide sites and services or core-housing units that can be extended on a self-build basis.

In practice, although permanent housing is seldom to any scale and, given the scale of the task and costs involved, most long-term housing provision is managed by individuals and communities through a self-help approach (Shelter Centre, 2012). It is estimated by UN-Habitat, that barely 20% of those whose homes are destroyed or damaged by natural disasters receive any support (presentation to the Shelter Workshop, London, November 2015). Providing support and assistance to this self-help approach, through access to materials and guidance and/or training in construction techniques, can greatly help improve the effectiveness of reconstruction. The IFRC promotes an owner-driven housing reconstruction approach (IFRC, 2010) where assistance is provided direct to affected households, but the prioritisation of needs, decision-making and ownership of reconstruction sits with the owner.

⁹ <http://america.aljazeera.com/articles/2016/2/14/two-decades-after-volcano-eruption-many.html>

A highly experienced shelter specialist, Maggie Stephenson, who has worked in complex recovery situations in Pakistan, Syria, Lebanon, Haiti and Nepal for the UN and various national governments proposes that, 'whenever possible, people should build permanent houses from the start, rather than improvising temporary shelter and then trying to improve it later. That approach rarely yields structures with integrity.' (Sinha, 2015).

For construction methods to be sustainable, the use of locally sourced materials and local construction skills is preferred to imported solutions, though there can be challenges with price escalation (see Section 0). Quick fix solutions that rely on imported technologies are seldom effective in the longer term. Vernacular building methods are preferred as they are more likely to be environmentally sustainable, result in lower in-use energy, and are generally better adapted to local climatic conditions. The worst impacts result from the collapse of poorly engineered or constructed modern forms of construction, such as unreinforced concrete block walls, or poorly reinforced concrete construction. In the Haiti earthquake of 2010 some of the worst losses were in the lower middle class areas of Port-au-Prince, and not the lightly constructed hillside low-income communities. This was a consequence of the 'pancaking' of poorly constructed multi-storey dwellings (Marshall and Baldrige, 2011). This is a massive risk across the world in rapidly growing urban areas in seismic zones and highlights the urgency and importance of adopting and enforcing appropriate building codes, as discussed in Section 0.

Box 3.3: Case study on Housing lessons from Aceh and Nias

Reconstruction and rehabilitation of housing after the 2004 Indian Ocean tsunami

Reconstruction and rehabilitation of housing in Aceh and Nias, Indonesia following the disaster on 26 December 2004 involved a large number of international and Indonesian organisations. An unprecedented wave of financial support was made available, and numerous agencies were involved in the reconstruction, some of them without prior experience in housing construction. Bottlenecks impeded progress, but as the speed of implementation picked up, there was growing concern for integration of housing with local infrastructure and for additional livelihood support. The experiences of Aceh and Nias were a testing ground for community-driven development. Alongside the government's policy of building back better, aid agencies stressed the need to "build communities, not just houses". Every family was given options: to rebuild their house where the old one was or to move to a new community on new land provided by the government, ensuring communities were at the heart of decision-making (Rowson, 2010; Steinberg, 2007).

According to Jha (2014) 'Aceh's story is also one where a large disaster has become an opportunity to rebuild communities in a safer and resilient way, not only to face future natural hazards, but also to reduce risk of violent conflict and the impact of external shocks.' Through the Multi-Donor Fund for Aceh and Nias and the Government of Indonesia's Aceh-Nias Rehabilitation and Reconstruction Agency, USD 655 million was used to rebuild 20,000 earthquake-resistant homes, 3,850 km of roads, 1,600 km of irrigation canals, schools, town halls, 72 clinics, 8 wells and clean water source and sanitation units. Three key lesson learned related to the importance of:

1. Investing in hazard mitigation and emergency preparedness
2. Building strong institutional coordination and adequate financing mechanisms
3. Putting communities at the centre of the reconstruction process.

3.4 Climate change and environmentally resilient reconstruction

The changing climate is both a hazard in itself and a factor that can exacerbate the impact of non-climate related disasters. It is generally accepted that the earth is going through a process of climate change, with increased frequency, intensity and uncertainty of extreme weather events and more gradual regional climatic variation. This is a result of human activity. Climate change mitigation and climate change adaptation (CCA) are equally important for reducing the impact of climate change and enhancing resilience (Turnbull et al., 2013).

Recognising the opportunities that post-disaster environments can offer for enhancing the quality, sustainability and resilience of infrastructure during reconstruction, there is a strong case for promoting environmental concerns as part of the strategic planning of reconstruction. The UNEP 2007 report, *Environment and Reconstruction in Aceh*, highlights the need for environmental concerns to be incorporated into the strategic planning of reconstruction to avoid further environmental degradation. It links poor spatial planning, environmental impact assessment, monitoring and coordination with the degradation of coastal environments and water and soil resources through the impacts of reconstruction activities, including quarrying, sourcing building materials, poor waste and resource management, and inadequate provision of water, sanitation and hygiene (WASH) and housing services. These lessons remain to be widely adopted in post-disaster reconstruction. To prevent reconstruction increasing the burden on ecosystem services requires understanding of the health of ecosystems and biodiversity and incorporation of environmental aspects into planning, along with providing the institutional capacity to enable it to be delivered. 'Build back better' can be used as an opportunity to address wider

environmental issues, such as air pollution, sustainable fishery management and ecosystem restoration. Box3.4 illustrates a possibly missed opportunity of this nature.

Turnball et al. (2013) present a guide to incorporating climate change adaptation into DRR¹⁰, titled *Towards resilience: a guide to disaster risk reduction and climate change adaptation*. This provides the evidence and argument for considering CCA in DRR and advocates a route for ensuring suitable measures are built into developmental and humanitarian interventions. Similarly, the IFRC have a practitioner's guide to mainstreaming DRR and CCA in programmes. While this covers the entire humanitarian cycle, it includes useful checklists and advice for recovery, as illustrated in **Error! Reference source not found.** Other examples of considering CCA in DRR include:

- *Climate change adaptation and disaster risk reduction institutional and policy landscape in Asia and Pacific* (UNISDR, 2010)¹¹
- *The challenge of integrating climate change adaptation and disaster risk management: lessons from bushfire and flood inquiries in an Australian context* (Howes et al., 2012)¹²
- *Integrating community based disaster risk reduction and climate change adaptation: examples from the Pacific* (Gero et al., 2011)¹³.

Box3.4: Case study on Missed opportunity from disaster; Christchurch mass transport?

Christchurch mass transport: a missed opportunity?



In the wake of the 2010 and 2011 Christchurch earthquakes, the need for massive rebuilding of the central business district (CBD), along with a significant resettlement of affected households led to a much larger proportion of the city's population commuting on a daily basis often from concentrated satellite suburbs. This evolution has not been matched with a comparable mass transport system, but rather the pre-earthquake dependence on

private vehicles has been retained. The Christchurch rebuild plan identifies a number of transport projects under the auspices of *An Accessible City*, but all of these focus on the management of vehicle-based systems, predominantly cars, but also buses and cycles as well (CCC, 2016). While the plan recognises that there were approximately 350,000 daily trips into the CBD area before the earthquake and that there needs to be an equivalent movement of people for regeneration purposes (CERA, 2013), it appears not to question the vehicle dependency of the city's population. While it can be argued that with New Zealand's low population and access to land, there is not the need for the transport management of an urban population as seen elsewhere (Rebuilding Christchurch, 2014)¹⁴, this position fails to recognise the opportunity for climate change mitigation or how the purpose of the city may change, with larger satellite suburbs and towns, as seen with developments in Rolleston, Lincoln and others. In this instance, it could be said that the opportunity to move towards a more environmentally friendly transport system has been missed.

Climate change mitigation in DRR is a less covered topic. The Sustainable Development Goals (SDGs) could provide a platform to bring together the Sendai Framework for action on

¹⁰ <http://reliefweb.int/sites/reliefweb.int/files/resources/ECB-toward-resilience-Disaster-risk-reduction-Climate-Change-Adaptation-guide-english.pdf>
¹¹ http://www.unisdr.org/files/17250_t0236000045500climatechangeadaptati.pdf
¹² https://www.griffith.edu.au/_data/assets/pdf_file/0008/475442/URP-IP-17-Howes-EtAl-Sept-2012.pdf
¹³ <http://www.nat-hazards-earth-syst-sci.net/11/101/2011/nhess-11-101-2011.pdf>
¹⁴ <https://rebuildingchristchurch.wordpress.com/tag/david-killick/>

DRR with international commitments to address climate change (Le Blanc, 2015). Le Blanc (2015) argues that the SDGs present a more integrated system that can facilitate policy integration across sectors, not least the biophysical, economic and social dimensions that are not explicitly reflected in the SDG text. Strategic and spatial planning is the key bridging mechanism for the post-disaster recovery context (Kazuyuki et al., 2014), which points back to greater institutional capacity at a local and national level to both prepare for disasters and lead post-disaster recovery.

Table 3.3: Recovery: principles for DRR and CCA mainstreaming (source: adapted from IFRC, 2013)

Recovery: principles for DRR and CCA mainstreaming	
A. Assess risks, vulnerability and capacity	<ul style="list-style-type: none"> • Use post-disaster assessment methods that identify exposure, vulnerabilities and capacities to build resilience in addition to humanitarian needs • Conduct rapid and detailed assessments of disaster risk and potential future climate change impacts and use the results to inform or re-orient the recovery programme design • Consult local government pre-disaster risk maps, contingency plans and disaster risk management plans for information that will enable programmes to target vulnerable groups and build upon traditional coping mechanisms and local capacities
B. Take risk reduction and adaptation measures	<ul style="list-style-type: none"> • Design recovery programme in line with the National Society's or IFRC's longer-term strategic plans and capacities and with due consideration of the needs to be met through its short-term recovery operations and through its longer-term core programmes. • Provide adequate information about risk and risk reduction options to the affected population to enable them to make choices in their recovery process that increase their resilience. • Strengthen local and national capacity and build resilience to future disasters.
C. Do no harm	<ul style="list-style-type: none"> • Ensure that recovery programming does no harm either socially, economically or environmentally. • Analyse proposed interventions in terms of their potential impact on disaster and climate change risk (current and future) and to make the results available to affected and at-risk populations.
D. Raise awareness, seek partnerships and advocate	<ul style="list-style-type: none"> • Leverage the heightened awareness of risk following the recent disaster to initiate or update mapping of all relevant hazards and effects of climate change. • Raise awareness of the need for recovery and reconstruction programmes to be based on a sound assessment of current and future risk. • Advocate for recovery and reconstruction plans to address conditions and causes of vulnerability, including structural issues of land tenure, poverty and exclusion. • Work with all stakeholders for better understanding of the need for longer-term strategies and for close coordination in recovery.

Recovery will not be sustainable unless it encompasses all of society in a way that promotes a better future. WWF (2015) and van Eaden (2013) refer to the need for ecosystem DRR, which includes consideration of natural biodiversity and resources as part of land-use planning in post-disaster responses. Integrating long-term resilience through building back better after disasters requires an approach that includes building climate resilience that curbs greenhouse gas emissions alongside adapting to climate impacts. This is advocated by the Global Commission on the Economy and Climate in the New Climate Economy (2014), which presents a potential model for the future global economy, but which may or may not be enough to mitigate climate change.

Box3.5: Case study on the New Climate Economy

An alternative way: the New Climate Economy

The Global Commission on the Economy and Climate is a major international initiative to examine how countries can achieve economic growth while dealing with the risks posed by climate change. It is chaired by the former President of Mexico, Felipe Calderón, and comprises former heads of government, finance ministers and leaders in the fields of economics and business. The New Climate Economy is the flagship project, providing independent and authoritative evidence on the relationship between actions that can strengthen economic performance and those which reduce the risk of dangerous climate change.

The New Climate Economy promotes a new pathway for integrating global growth with a low carbon economy, it proposes the integration of climate action and risk management in strategic economic decision-making. This is consistent with the Build Back Better approach, but with a wider vision that promotes sustainable ecosystems as fundamental to DRR and resilient human life.

Source: <http://newclimateeconomy.net/>

3.5 Needs assessments

Needs assessments are key to understanding the extent of damage, loss and needs in a post-disaster context, and are an essential first step in the reconstruction process, leading to clarity in objectives, stakeholder roles and responsibilities, funding/financing needs and identifying gaps in resources. There are, however, a multitude of needs assessments with different terminologies, methodologies and platforms (Jha et al., 2010). They come in many forms and for varying purposes, as seen in Table 3.4, but, ultimately, all are designed to contribute to understanding the impact and the need.

Table 3.4: Assessment types and definitions (adapted from Jha et al., 2010)

Type	Definition
Damage assessment	Assessment of the destruction of physical assets, including physical units, and replacement costs
Loss assessment	Analysis of the changes in economic flows that occur following a disaster and over time, valued at current prices
Needs assessment	Assessment of financial, technical and resource needs for recovery, reconstruction and risk management
Rights-based assessment	Evaluation of basic human rights, typically in line with the UN Universal Declaration of Human Rights
Rapid assessment	Provides information on immediate needs, possible interventions and resource requirements, typically within two weeks of the event, multi- or sector specific
Detailed assessment	Assessment to provide more reliable detailed information for planning purposes, often sector specific, and requiring greater time to complete
Housing damage assessment	Focuses on the impact on residential communities, land use and living conditions
Housing sector assessment	Assessment of the housing policy framework, post-disaster housing assistance strategy and capacity of actors to deliver it
Communication-based assessment (CBA)	Assessment aimed at understanding how communication with the affected communities and the context will influence the reconstruction effort, including political risk analysis, stakeholder analysis, media, local capacity, etc.

Standardised methodologies and joint assessment initiatives pay dividends in efficiency, quality and consistency in understanding a context. The affected communities play an essential role in needs assessments, even in rapid-onset emergencies, and there are arguments that communities should have a greater role (Jha et al., 2010). Damage and

needs assessments are often set side by side in recovery management, but recent insights have emphasised their differences and the need for each process to have different actors, including:

- **Assessment of the needs of surviving families:** affected families are best positioned to know what they need and, therefore, they should lead in the needs assessment process. This was the conclusion reached by de Ville de Goyet and Morinière (2006) after the 2004 tsunami; needs assessments should be linked with cash grant allocations, enabling survivors:

“ ... to assess and prioritise their own welfare needs by using cash subsidies whenever possible....The need for thematic assessments would be considerably reduced if, when possible, the affected people were given the financial means to decide whether they want a better shelter, a boat, food or any other welfare item brought at high cost by expatriates. This approach would go a long way towards compliance with the Sphere principle of ‘respecting the dignity of victims’ in countries with active market economies...”

Source: de Ville de Goyet and Morinière, 2006

- **Damage assessments of dwellings:** this requires engineering and architectural skills, with assessments related to the structural safety and integrity of damaged buildings and their potential for repair and strengthening.

The Office for Coordination of Humanitarian Affairs’ (UNOCHA) Assessment and Classification of Emergencies mapped the various assessment initiatives, to try to develop an overarching approach for assessment and analysis. It found that there was good synergy between the various tools and approaches, with the potential for standardisation to facilitate shared understanding through core indicators, implementation timelines, impact ranking, etc. Though the exercise did not include a number of proprietary tools, it led to the Needs Assessment Task Force (NATF) being established to promote greater coordination and sharing of information (Inter-Agency Standing Committee, 2016). The current status of the NATF is now unclear, but, its *raison d’être* is entirely relevant for the reconstruction process: i) development of a consolidated needs assessment tool box; ii) improved data management and minimising duplication; iii) development of a core set of indicators; and iv) provision of multi-sectoral tools to collect common data for decision-making (Jha et al., 2010). The PDNA process encapsulates some of these aims.

3.5.1 The post-disaster needs assessment

The post-disaster needs assessment (PDNA) is a government-led process designed to provide an information base for recovery and reconstruction plans (UNDP, 2015). It integrates the assessment methods used by international financial institutions (IFIs) with those used by the humanitarian clusters, to provide linkages between the humanitarian need and the macro-economics (GFDRR, 2016). The PDNA approach likely represents the key tool currently available for planning reconstruction.

International funding in support of long-term recovery and reconstruction is contingent on a PDNA. The process can be slow to get off the ground, with the PDNA being published 10 weeks after the earthquake struck in Haiti. This can result in delays in the release of funding and constrain recovery. For Nepal, the PDNA was only the beginning, with the estimated damages and losses totalling USD 7 billion as seen above, a significant gap existed between funding need and supply. DFID’s total global budget for overseas programmes in 2014 was GBP 11.7 billion (USD 18.1 billion). Even for the World Bank, which committed nearly USD 60 billion in 2015, of which USD 11 billion was solely in South Asia, meeting this level of demand is unrealistic (World Bank, 2015). This is especially so considering the frequency of major natural disasters. In light of this, it is typical that the affected population is thrown back largely on its own resources.

Box 3.6: Case study on Post-disaster needs assessment for Nepal

Post-disaster needs assessment (PDNA) for the Nepal earthquake

On Saturday, 25 April 2015, an earthquake of magnitude 7.6 struck Barpak in the historic district of Gorkha, about 76 km northwest of Kathmandu. As of June 2015, it was estimated that there were over 8,790 casualties and 22,300 injuries. Approximately one-third of the population of Nepal, or 8 million people, had been affected, spread across 31 of the country's 75 districts, 14 of which were declared 'crisis-hit'.

The PDNA process was conducted within three days of the earthquake, under the leadership of the Nepali National Planning Council (NPC), to assess the disaster impact and define a recovery strategy. A two-day workshop led to the PDNA scope and methodology, including i) collection of pre-disaster baseline data, ii) evaluation of disaster effects and impacts; iii) prioritisation of recovery needs and iv) development of an appropriate recovery strategy. Two hundred and fifty officials from government and 30 development partners were grouped into 23 thematic groups, each undertaking an intensive exercise of data collection, field visits and verification. Over three weeks, the 31 affected districts were assessed, with the findings presented on 25 June 2015.

Sectors	Disaster effects (NPR million)			Distribution of disaster effects (NPR million)	
	Damages	Losses	Total	Private	Public
Social	355,028	53,597	408,625	363,248	45,377
Productive	58,074	120,046	178,121	158,079	20,043
Infrastructure	52,460	14,323	66,783	17,281	49,502
Cross-cutting issues	51,872	1,061	52,933	1,755	51,178
Total (NPR million)	517,434	189,027	706,461	540,362	166,100
Total (USD million)	5,174	1,890	7,065	5,404	1,661

Importantly, the PDNA recognised the limited pre-earthquake priority given to DRR and identified key short-term and long-term priorities to be implemented to enhance the resilience of Nepal.

Towards resilience: disaster risk reduction and Build Back Better

Short-term priorities

- Reconstruction of damaged DRR assets and improvements on the build back better principle
- Measures to improve preparedness, response, relief and logistics systems
- Measures to strengthen information and communication capacities for relief, response and recover
- Measures to enhance multi-hazard risk monitoring, vulnerability assessment, risk information dissemination and awareness

Medium to long-term priorities

- Improvements in legal and institutional arrangements
- Measures to mainstream DRR into the developmental sector, particularly housing, private and public infrastructure, social sectors, and livelihoods
- Measures to improve integration of climate change adaptation and DRR

Source: Nepal earthquake 2015 Post disaster needs assessment Vol. A: Key findings

3.6 Enabling appropriate reconstruction

A key issue for officials directing disaster reconstruction that meets the demanding physical, social, cultural and economic needs of the surviving population concerns the words 'relevant', 'appropriate' or 'sustainable'. How can they devise strategies, propose tactics and enable multiple stakeholders to ensure that what they provide satisfies these crucial requirements? The starting point is a detailed damage assessment, so that there is an understanding of what failed and why. This task will require skilled work by engineers, architects, urban planners and building contractors, but is essential to avoid reconstructing vulnerability. Allied with this task are the needs assessments of the surviving communities of house renters and owners, commercial and industrial managers and employees, local community leaders, local government officials, etc. Through these assessments they are enabled to describe their specific short- and long-term needs and preferences. This has led some to question an externally-led assessment process (Jha et al., 2010).

Appropriate reconstruction should enable successful recovery, but the most common approach remains the desire to restore normality, perhaps without recognising that this was also the 'vulnerability' that gave rise to the disaster impact in the first place. All good practice is now directed towards encompassing the various dimensions of resilience – so called 'Build back Better' illustrated in Figure 3.4 – and all reconstruction efforts should encompass 'development recovery'.

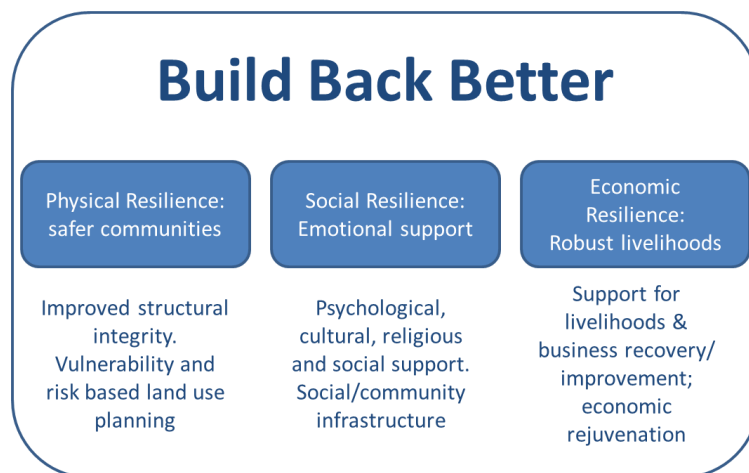


Figure 3.4 ‘Build back better’ based on Bill Clinton’s 10 propositions (adapted from Mannakkara and Wilkinson (2013))

There are numerous considerations to be taken into account in enabling appropriate reconstruction, but the following items can serve as an initial checklist that highlight some of the most critical issues that should be considered.

Culture and building traditions

Reconstruction should consider the local building and settlement patterns. This includes use of sustainable building materials and interpreting the design and construction traditions of both engineered and non-engineered buildings, shapes, sizes, details, historical heritage, climatic and energy design, road and building layouts, etc. (Langenbach, 2009). ‘Hybrids’ of traditional and modern approaches may prove to be the most sustainable and can go some way to overcoming the demand for modern, but less sustainable or appropriate, designs and construction methods

Critical infrastructure

This was explored in detail in Section 0

The ‘regulator environment’

Damage surveys will indicate the nature and extent of building and infrastructure failures under extreme hazard loads. From this data the effectiveness of past land-use planning controls and building regulations can be reviewed, as well as past construction supervision and enforcement of legal requirements. This will help determine whether building codes and regulations, along with land-use planning requirements, need to be up-graded (Krimgold, 2011). It may be possible to adopt a ‘fast-track’ approach by initiating reconstruction planning in parallel with such regulatory reviews to avoid protracted delays.

Designing and planning for safety

Damage surveys will reveal all manner of weaknesses in the layouts, design and construction of buildings. These will also indicate a wide range of unsafe practices that will need to change. The dilemma posed for officials is that these changes may often require re-education and re-training of professional architects, engineers and builders, as well as users and occupants. These are inevitably long-term processes, particularly challenging during reconstruction (Davis and Alexander, 2015).

Cost effectiveness

With multiple agencies involved in reconstruction, public officials will need to establish cost levels per square meter for dwellings, building heights, road widths, etc. This is needed to use the limited available funds wisely, maintain equity and avoid public angst over preferential treatment being given to different communities. A key consideration is to examine the escalating costs of reconstruction in relation to the unit costs of a permanent dwelling as compared to the much lower costs of emergency shelter units (see **Figure 3.**).

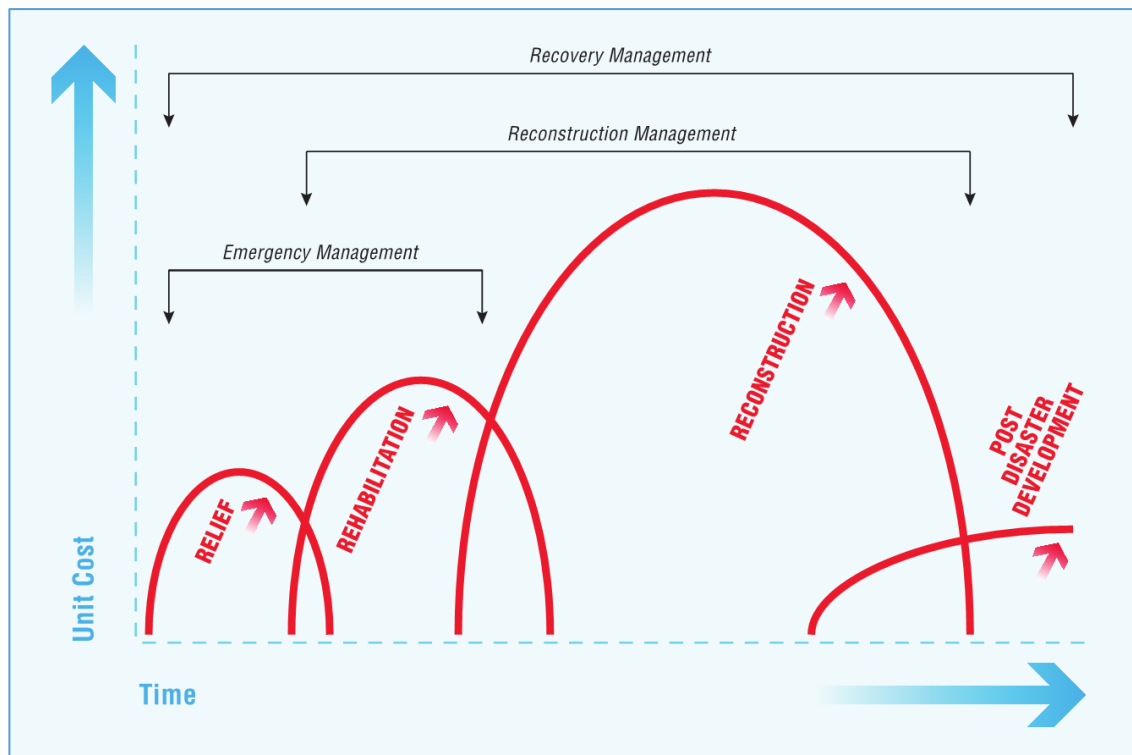


Figure 3.7: Cost effectiveness unit cost (Source: Davis and Alexander, 2015, p.72, Model 7).

Figure 3.7 shows the escalating unit costs from relief to reconstruction over time. However, there is a paradox in that as the unit costs expand there may be a corresponding decline in financial outlay. This decline may be because of the massive expenditure on initial relief as well as declining levels of political commitment.

3.6.1 The sequence of reconstruction

A number of critical variables determine the sequence, duration and quality of reconstruction. Primary factors are the level of development of the affected society, the availability of resources and the degree of organisation. The impact of these elements was first explored in 1977 by two American geographers: Robert Kates and David Pijawka (Kates and Pijawka, 1977). In their elegant study of the sequence of reconstruction following three earthquakes, they identified four periods – ‘emergency’, ‘restoration’ and two stages of ‘reconstruction’.

Their simple model was later qualified with additional factors affecting the sequence, such as the geographical and political connectedness of each settlement under reconstruction (Hogg, 1980). Insights from later reconstruction processes indicated that the periods, or stages, are not tidy discrete stages, as suggested in the 1977 model, rather they continually overlap. For example, within a given settlement a family may be living under plastic sheeting, while others will be completing the reconstruction of their permanent dwellings (Davis and Alexander, 2015).

A further critique of the model concerns the expectation of conclusion. The notion that a typical reconstruction enterprise has clear-cut starting and finishing dates is a far cry from observed reality. Countless examples, such as reconstruction in Nicaragua after the 1972 earthquake, or following hurricane Mitch in 1998, can be cited where reconstruction was stalled for many years or never completed on account of a lack of resources, land-tenure disputes, organisational fatigue or decline in political commitment and funding by the national government and foreign donors (Davis and Alexander, 2015).

A considerable amount of planning needs to be put into the organisation of reconstruction. Multiple decisions that are needed and should consider:

- Who is best suited or qualified to plan and manage the reconstruction process?
- Is it more effective to create a dedicated agency for the reconstruction task or work through existing line departments?
- Should the process look to repair or reconstruct?
- Should a two or three stage reconstruction strategy be adopted?
 - Two stage: emergency accommodation to a permanent dwelling, or
 - Three stage: emergency accommodation to transition dwellings to a permanent dwelling
- What are the best roles for local and national governments in reconstruction?
- Should a user-build approach for dwellings be adopted rather than using building contractors?
- Where on the spectrum of interventions, as illustrated in Figure 1.2, should efforts be focused; 'enabling' at one end to 'providing' at the other?

3.7 Managing the cost of reconstruction

A key issue in the wake of a disaster is the market response to the volume of work required. A disaster on the scale of the Nepal earthquake in 2015 or typhoon Haiyan in 2014, can result in an extensive demand on resources. One of the key impacts is the social-economic displacement created from a subsequent construction boom and massive resource demand in the short term, resulting in inflationary chaos and cost surges. This undermines the real value of aid funds, but also constrains government fiscal capacity and impacts on reconstruction (Chang et al. pending publication). Price escalation is a natural market response to an increased demand combined with limited resources. This was recognised in New Zealand after the 2010/2011 earthquakes and a key role of SCIRT was to manage this risk. SCIRT identified the key components to be materials and services. The shortage in materials arose from limitations in existing stock piles and supply chain dynamics. The shortage in services was largely because of the limitations in human resources. Figure 3.8 illustrates the perceived risk of cost of materials and services after the Christchurch earthquake in 2011 with and without control measures.

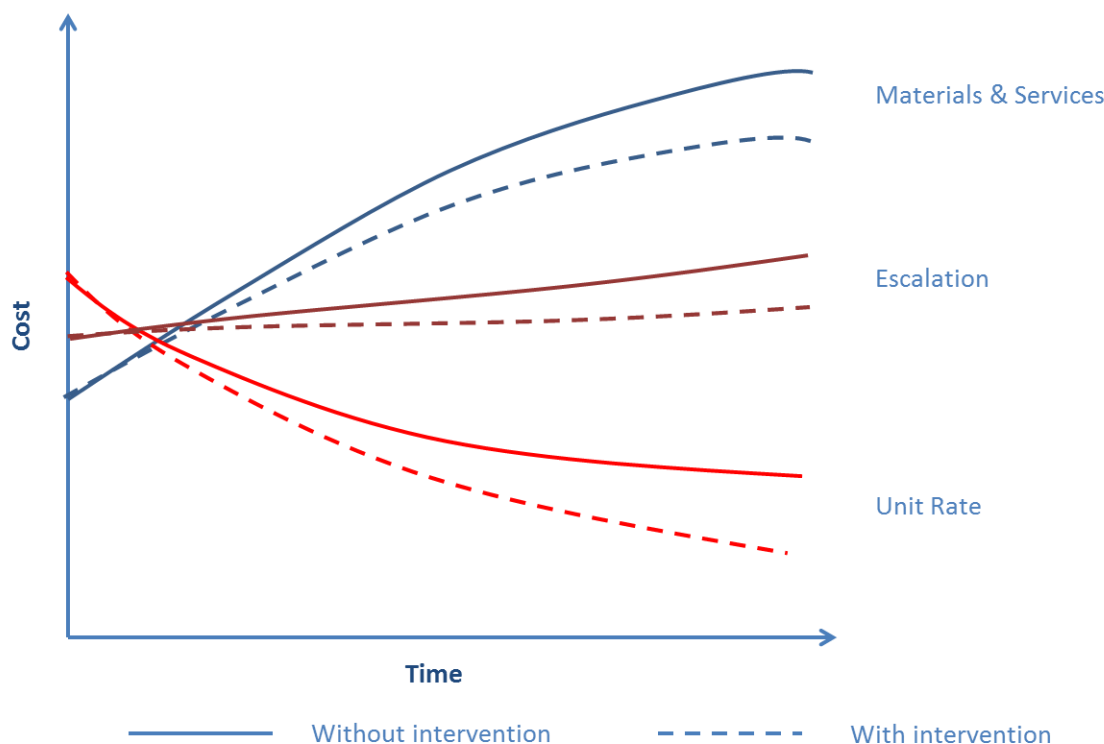


Figure 3.8: Predicted price escalation trends in Christchurch after the 2011 earthquake (Source: Adapted from Chang et al., 2016 (pending publication)).

It is useful to consider the cost components for construction in conjunction with the risk and control measures adopted, explored further in Table 3.5.

Table 3.5: Risks to price escalation during the reconstruction of Christchurch

Component	Risk	Control
Labour	Cost of labour is at risk of increasing at unsustainable rates as the volume of work grows	Influence the local industry Work with training providers to strengthen the labour pool
Plant (construction equipment)	Ready availability of plant and equipment within the market suggests escalation is unlikely	No intervention required
Materials	Competition is strong across the market with suppliers indicating an ability to increase production to meet the needs of SCIRT. Delivery teams are creating additional competition through direct negotiation at project level	Work with suppliers to develop and secure a pipeline of materials Bulk purchasing across available suppliers
Subcontractors	Level of work in Christchurch expected to attract external contracts, with additional costs from travel and accommodation	It is expected that competition between delivery teams and desire of contractors to secure work will contain unwarranted escalation

A common thread in the control measures identified in Table 3.5 is supply chain management and control of resourcing, referring to the range of activities associated with planning, preparedness, procurement, delivery and development of alternative sources. Chang et al. (2012) identify four main approaches to resource control post disaster:

- Government driven resourcing: whereby government entities take control of resources procurement for reconstruction

- Donor-driven resourcing, whereby donors play a dominant role in resourcing
- Market driven resourcing, whereby market instruments, forces and rules within the construction industry influence the availability of resources
- Owner-driven resourcing, whereby private household owners are the key, driven by having to resource their own materials for reconstruction with limited external financial, technical or material assistance.

3.8 Finance and funding reconstruction

The annual global budget for humanitarian assistance is approximately USD 25 billion. It is estimated that there is a gap of USD 15 billion between the need for humanitarian assistance and the supply of action (UN, 2016). This is the ‘funding gap’ that was focused on in the run up to the first World Humanitarian Summit in May 2016. This Topic Guide, though, considers reconstruction and is not an exploration of the relief sector.

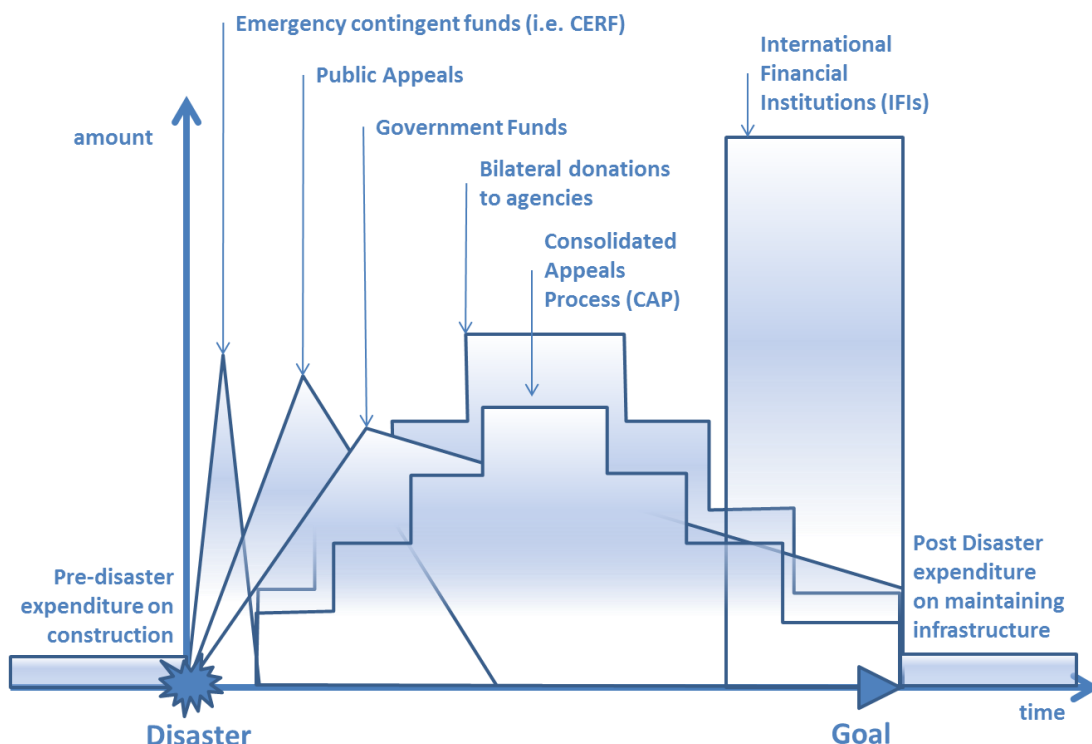


Figure 3.9: The funding gap? Funding sources over the life of a disaster response (Source: adapted from Jha et al, 2010)

Figure 0.9 illustrates the more traditional funding gap, referring to gaps in funding streams, which bring uncertainty and risk into longer-term delivery. This is relevant to this discussion as reconstruction will require long-term, multi-year commitments that do not easily sit within the current construct of a three-phase response mechanism. This Topic Guide explores this funding gap and suggests some actions that could be taken by donors to address it.

3.8.1 The funding gap

The traditional humanitarian gap concept refers to the gap between relief and reconstruction, referring to different forms of assistance, with the term ‘gap’ indicating a ‘time window’, as activities shift between phases or change within the context of the event. According to Steets (2011), there is little evidence to support this classic gap concept. Rather, there is a

seamless transition from relief to recovery, as the affected population generally progresses as quickly as possible with re-establishing their lives. The natural progression from relief to reconstruction, however, is broken down and compartmentalised to accommodate external funding and implementation partners. After a disaster, a substantial amount of money is often allocated for relief and recovery, in a short period of time. The pressure to disburse funds and meet demands for accountability mean that donors set short timetables for spending (ALNAP, 2005). Rather, then, there is a disconnect between the humanitarian and development approaches (Steets, 2011), which is an underlying cause for failures in post-disaster reconstruction, creating a short-term focus on humanitarian assistance and leading to complexity in attempting to use multiple funds to support ongoing interventions. Key obstacles to bridging this disconnect include:

- **Conceptual issues:** it remains unclear how response and reconstruction approaches differ, and what the various linkages are between them
- **Institutional divisions:** many donors have internal structural separations between their humanitarian and development branches
- **Operational differences:** humanitarian and developmental actors operate in fundamentally different ways, even within the same organisation
- **Expertise and capacity:** implementing partners may not have the expertise or capacity to respond as required to link relief and development or coordinate effectively with counterpart organisations in different phases (Steets, 2011).

3.8.2 Channelling funding

The international community allocated USD 13.34 billion for relief and recovery in Haiti from 2010-2020. By 2012 a total of USD 9.49 billion had been disbursed, of which USD 3.06 billion was in resources through the NGO community. In total, this was approximately three times the revenue of the Government of Haiti (GoH) for the same period (OSEH, 2012). Of the USD 6.43 billion disbursed as funds, USD 2.41 billion was allocated for humanitarian purposes and USD 4.01 billion for recovery. Only 9% was channelled through the GoH (OSEH, 2012). Even recognising the particular weakness of the Haitian national institutions in the wake of the devastating earthquake, this overwhelming focus on non-government channels would have significantly side-lined the national authority and undermined its ability to manage reconstruction. This is further apparent when considering donor commitments in comparison to the GoH action plan for recovery and development, as illustrated in Figure 3.

3.8.3 Aligning and disbursing funds for reconstruction

There are a number of global mechanisms designed to expedite normal decision-making for disbursement of funding. The UN Central Emergency Response Fund is perhaps the largest, with a rapid response window of up to USD 30 million for any one emergency¹⁵, funding activities that must be completed within six months. A similar approach is taken by a number of multi- and bilateral- donors. The Start Fund¹⁶, supported by DFID and Irish Aid, provides up to USD 49 million over three years, with direct disbursement to NGOs to be allocated within 72 hours of an event and to be spent within 45 days.

¹⁵ <http://www.unocha.org/cerf/>

¹⁶ <http://www.start-network.org/how/start-fund/#.Vt-saPI97IU>

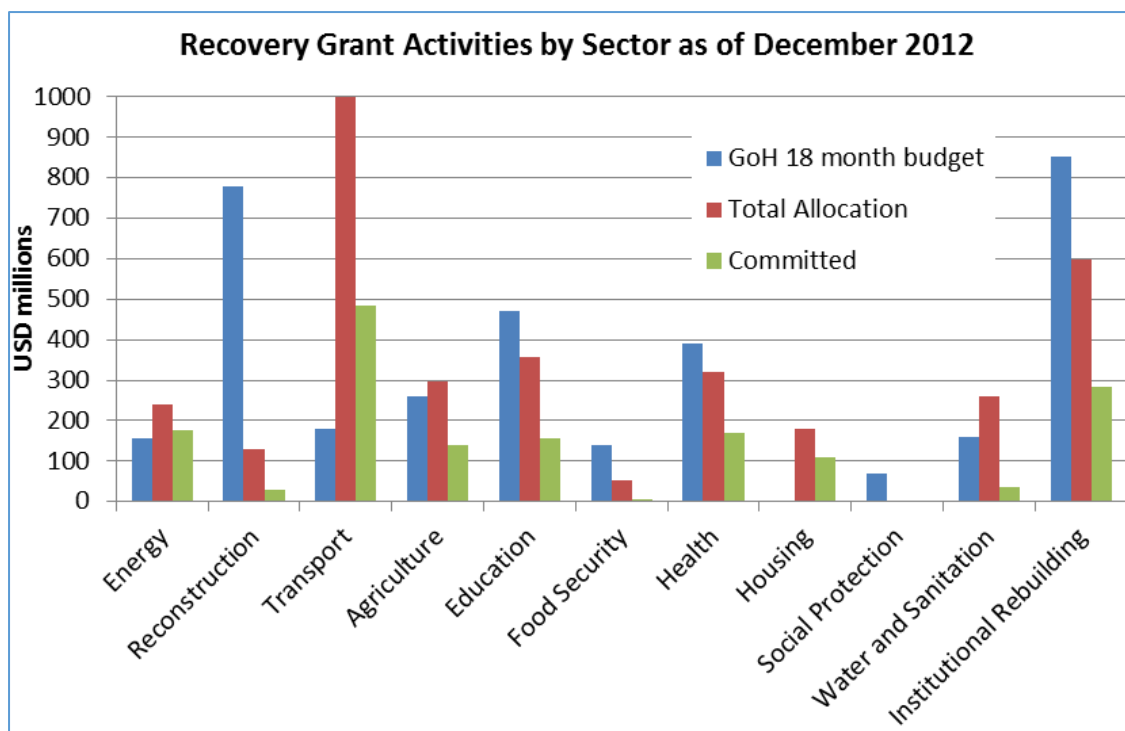


Figure 3.10: Government priorities compared with donor pledges and disbursement (USD millions) (OSEH, 2012)

These funding approaches lead to a spike in the cash inflow with intense pressure to spend in a short period of time, to the detriment of post-disaster reconstruction. The relief phase should lay the foundation for recovery and development, pointing to consistency between phases and establishing long-term actionable objectives within the initial response. In principle, this requires institutional financing mechanisms, which in turn points to multi-donor coordination, consistency in reporting formats and flexibility in the pool of funding. In addition, mechanisms are needed to allow funding to flow more freely down to the local level, where there is a better understanding of communities' needs, and mechanisms for tracking and monitoring multiple streams of funding at sector and project level (GFDRR, 2015). Strategies to address these issues, include: i) creating specialised funds or budget lines; ii) pooling funding lines or increasing flexibility in existing lines; and iii) earmarking specific shares of funding to recovery.

The World Bank multi-donor trust fund model (World Bank, 2009) is likely the best mechanism currently available for funding reconstruction costs associated with major disasters. Multi-donor trust funds (MDTFs) provide a common funding vehicle for partnership programmes, allowing the World Bank and key stakeholders to tackle specific challenges. The combined funding can help leverage funding for programmes, particularly for post-disaster reconstruction and help to maximise coordinated action (World Bank, 2009). However, the MDTF process is usually slow, taking time to set up and for solutions to emerge. As tools to support global public good (i.e. the Fund for Gender Equality) they have distinct value, but are less effective when used to supplement existing development efforts (Miller, undated). The benefit lies in bringing different donors together, aligning objectives and coordinating funding, however, they represent another funding mechanism that itself needs to be coordinated with other mechanisms and actors. Furthermore, they are not suitable for addressing the disconnect between response and reconstruction, as they are generally established sometime after the event.

It therefore remains necessary for the international community to do more to establish funding arrangements that address longer-term reconstruction as well as the immediate relief needs; to enhance value for money and accelerate post-disaster reconstruction. There needs to be a paradigm shift in the traditional funding model for emergency relief and reconstruction, in order to avoid disaster-affected countries signing up to loan finance (and the consequent debt) to meet apparent gigantic reconstruction needs in an often inappropriate way.

3.8.4 Challenges of the current funding approach

Recent concern has been expressed about the effectiveness of UK aid channelled to humanitarian efforts through (uncoordinated) UN bodies. The UK Multilateral Aid Review identified concern over the performance and effectiveness of UN humanitarian agencies plus other international bodies such as the IFRC and the International Committee of the Red Cross (Scott, 2005). Activities of other international finance institutions can equally be criticised, particularly over the pressure they exert on already indebted developing countries. Typhoon Haiyan was estimated to have caused up to USD 12 billion in damages (UN, 2014). The Philippines was already debt burdened prior to the typhoon, and it was noted by the UN human rights expert, Mr Lumina, that within five months after the typhoon struck, USD 3 billion had left the country to service debts; this is in comparison to the just USD 417 million received in support of the Philippines strategic response plan. As of December 2013, approximately 20% of this debt was owned to the World Bank and the Asian Development Bank (UN, 2014). Donor governments, such as DFID, with a responsibility to tax payers and aid beneficiaries, have the capacity to influence this potential cycle of increasing debt and vulnerability. Initiatives, such as the Multilateral Effectiveness Framework provide a mechanism to monitor the effectiveness of all supported agencies (Scott, 2005) and reward those that are performing well.

International experience, suggests more funding should be made available to develop government capacity, as discussed in Sections 0 and 0, and also to make better use of local resources and communities. **A shift is required towards greater attention on strengthening local capacity for both governmental and non-governmental agencies, such that there is an enhanced legacy of DRR and resilience from disaster response and recovery.** Care needs to be exercised in diverting funding from other agencies that receive existing funding. Recommendations as to the appropriate balance of funding of the different elements and different agencies involved in disaster recovery should be based on an in-depth and comprehensive review of recent post-disaster experiences, as part of a wider review of the current disaster recovery frameworks outside of this document.

3.9 The role of insurance

Since 2005, there has been an annual average of 260 major natural disasters, with an average annual economic loss of USD 211 billion, of which approximately 30% was insured (OneBrief, 2015). Underinsurance is a key issue, even in developed nations, as illustrated in Table 3.6. Generally, the rate of insurance penetration increases with economic development, but where there is low penetration, and a lack of risk awareness, governments become reactive, leading to appropriation of domestic budgets and greater dependence on international assistance.

Table 3.6: Comparison of insured and uninsured economic loss in the five most expensive disasters of the last 10 years (Source: adapted by Authors from OneBrief, 2015)

Rank	Insured loss (USD billion)	Uninsured loss (USD billion)	Disaster	Year	Location
1	36.9	184.7	Tōhoku earthquake and	2011	Japan

			tsunami		
2	104.9	104.4	Atlantic hurricane season	2005	US, Mexico, Caribbean, Bahamas
3	0.4	92.1	Sichuan earthquake	2008	China
4	30.8	42.2	Hurricane Sandy	2012	US, Caribbean, Bahamas
5	16.2	30.8	Floods	2011	Thailand

Creating insurance markets for disaster related products takes a multi-faceted effort. Insurance is often complicated and difficult to understand¹⁷. For the domestic market, underinsurance is a key result of affordability. In Nepal, 80% of residential structures are built by their owners, generally incrementally (WEF, 2015), with people building a portion of the structure, which is then added to as they save money to buy materials and have the time to build. The 2015 Nepal earthquake caused 498,852 homes to be destroyed and an additional 256,697 damaged. The total amount of insurance premiums collected by Nepal's insurance companies in 2013 was approximately USD 277 million; the majority of this was for life insurance, with the rate of penetration of non-life insurance at 1.84% in 2009/2010 (Abraham, 2015). The situation in Nepal is typical of the developing world and, when it is considered that it is the lower-income communities that are most vulnerable to natural disasters, a vicious circle can be seen, whereby households cannot afford to insure themselves against the risks to which they are the most vulnerable.

3.9.1 Micro-insurance schemes

Micro-insurance is intended to service low-income markets with limited coverage and minimal transaction costs (Mechler et.al., 2006). There are various innovative programmes designed to provide micro-insurance, with the support of governments, NGOs, and international donors. Micro-finance schemes can offer good options for enhancing insurance penetration and is a topic that has received attention. Further information can be found in Linnerooth-Bayer and Mechler (2006)¹⁸.

3.9.2 National insurance programmes

The challenge of micro-insurance schemes is achieving the coverage necessary to significantly reduce the economic burden on the domestic market post disaster. As a scheme widens the variation within the risk increases, which increases the risk to the insurer and subsequently drives up premiums and reduces affordability. The need for the insurer to retain large capital reserves presents a challenge to insurance for natural disasters, given the potential widespread impact and simultaneous losses. To address this, many countries have underwritten national insurance schemes to cover the domestic market. There are a number of examples available of different post-disaster insurance schemes, including the Earthquake Commission in New Zealand and the California Earthquake Authority in the United States. The Turkish Catastrophic Insurance Pool is designed to reduce the government's post-disaster liabilities by building up a capital reserve in an insurance pool through affordable private contributions, while simultaneously retrofitting private structures and reducing risk. This example demonstrates the importance of the role played by governments, establishing the legal framework; developing the legal and regulatory basis for the insurance pool; creating the governance structure; and designing and managing the institutional structures and relationships including establishing the roles for all involved parties (Gurenko et al., 2006). The scheme has not been entirely successful, with

¹⁷ For detailed information on insurance, see: Peppercorn, White and Mahul (2011) *Post Disaster Assistance for Indebted and Uninsured Populations: A Study of International Experience*, Washington, DC: GFDRR, World Bank

¹⁸ http://www.un.org/en/development/desa/policy/wess/wess_bg_papers/bp_wess2008_mechler.pdf

penetration approximately 20% in 2008 after being launched in 2000. Despite this and other concerns over the size of the capital reserves (Mechler et.al., 2006), the scheme remains an example of an effective model for reducing the post-disaster liability for reconstruction of the domestic housing market.

3.9.3 Insurance for governments

Traditionally, governments do not insure public assets. It is argued that if the risk is spread over a nation's citizens through taxation, the expected loss to each individual taxpayer is minimal and is offset by the size of the population and the typically diverse portfolio of assets held. This argument does not hold true for small, low-income and exposed countries (Mechler et.al., 2006). The small population size means a high per capita liability, which with modest fiscal revenues results in insufficient financial reserves, often exacerbated by geographic location which places them at higher risk. This situation is often compounded by high levels of national debt, limiting their ability to access credit. Sovereign insurance is a method for reducing fiscal liability post disaster. Mexico became the first emerging nation to transfer its public sector disaster risk to international re-insurance in 2005, under the catastrophe reserve fund, FONDEN. This effectively means the liability is held by an independent agent on the international market, which has the benefit of not being at risk of appropriation for other programmes or political gain (Linnerooth-Bayer and Mechler, 2008).

Box 3.7: Case study on the Caribbean catastrophe risk insurance facility

Regional insurance – the Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF-SPC)

The concept of insuring public liability goes beyond national boundaries to regional initiatives; the Caribbean Catastrophe Risk Insurance Facility (CCRIF) was formed in 2007 to provide a multi-country risk pool to limit the financial impact of natural disasters on Caribbean nations. CCRIF is a catastrophe fund supporting 16 Caribbean island nations, allowing them to transfer a portion of their hurricane, earthquake and excess rainfall risk to the facility for a lower price than on the international insurance market.

In 2014, the facility was restructured into a segregated portfolio company (SPC) to facilitate expansion into new products and geographic areas by fully segregating risk. This has allowed expansion into Central American countries.

CCRIF supports short-term cash flow problems through rapid pay outs to members. Since it was created it has made 13 pay outs to 8 member governments totalling approximately USD 38 million.

Source: <http://www.ccrif.org/>

Disaster risk insurance has the added advantage of reducing reliance on reconstruction loans from IFIs, which can impact on long-term fiscal independence and resilience (World Bank, 2012). However, although there is progress being made in the area of post-disaster insurance, there is little coordination or attention, as with other aspects of disaster risk management. A key role of the donor could be to promote exploration of similar initiatives, especially at the sub-national level.

3.10 Disaster reconstruction and recovery principles

More specifically related to recovery and reconstruction, the following twenty principles are an edited extract from Chapter 13, Davis and Alexander (2016). The various case studies cited throughout Davis and Alexander (2016) can be assessed and compared according to

the useful matrix (Figure 3.6) devised by Comerio (2013) to indicate the levels of effective community participation and the government’s role from weak to strong. The following principles are grouped according to the scheme shown in Figure 3.5.

Table 3.7: Underlying principles of recovery (source: Davis and Alexander, 2016)

Underlying Principles	
1.	While all disasters are different in scale, nature, impact and recovery actions, critical lessons can be deduced from past experience. They should be shared widely and applied in such a way as to help ensure effective recovery.
2.	Authorities need to devise their own sets of guiding principles in order to support their recovery tasks. The principles should cover five levels that relate closely to the prevailing culture and system of governance, namely core ethical values, strategies, tactics, implementation and monitoring, and evaluation. While core ethical values, strategic principles and evaluations can be shared widely across cultures and continents, tactical and implementation principles vary from case to case and are specific to local contexts. Therefore, at the outset of recovery, wise recovery managers will seek to develop appropriate principles to guide tactics and applications.

Figure 3.5: Project planning and implementation model: providing the framework for the principles of recovery from disaster (Source: Davis and Alexander, 2016, Model 14).

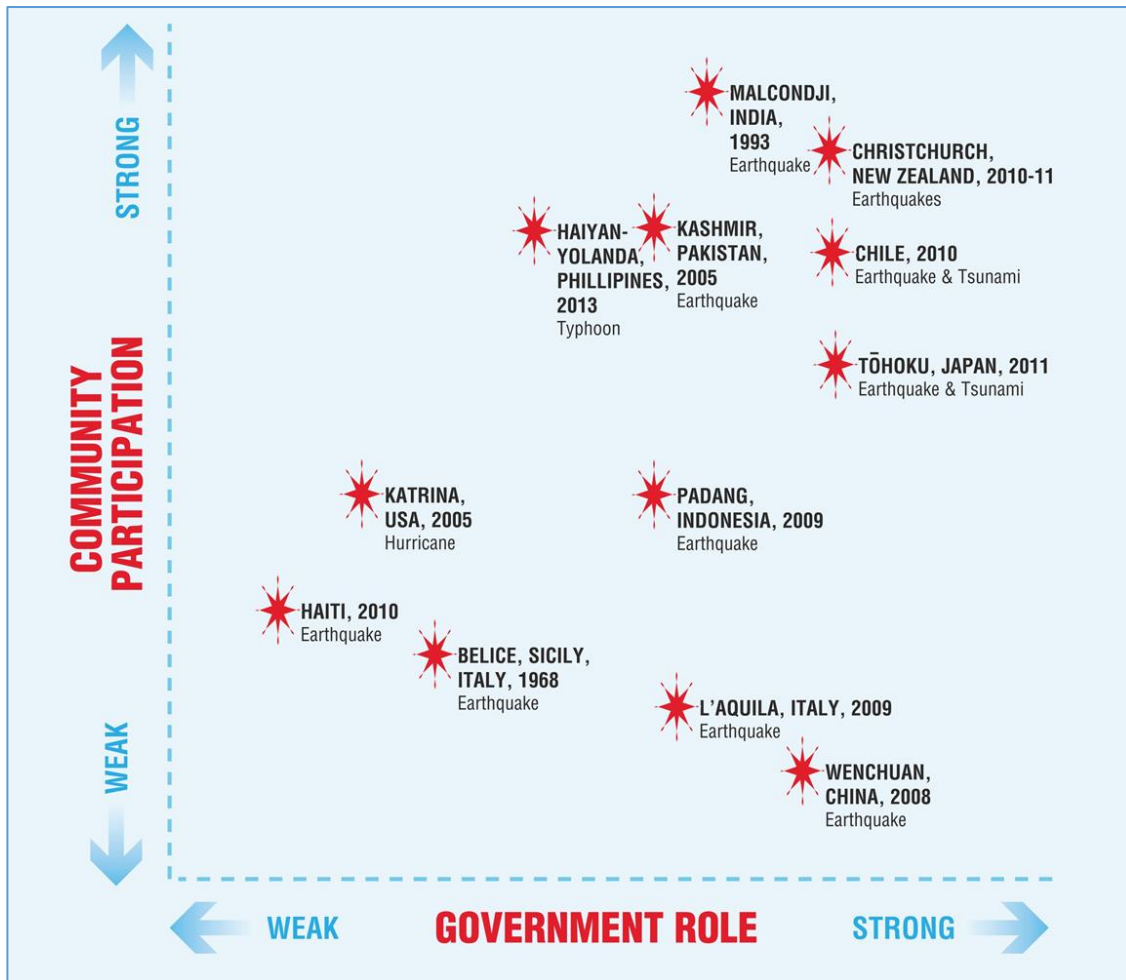


Figure 3.6: Comparison of recovery management approaches (Comerio, 2013)¹⁹

3.10.1 Priority concerns for reconstruction managers

Multi-sectoral recovery

A pre-requisite of effective recovery is the need for well integrated structures, programmes and policies that link physical reconstruction to related sectors: psychosocial recovery, economic/livelihood recovery, natural environment recovery and the recovery of governmental functions.

Resolving dilemmas

Officials leading reconstruction are beset by complex dilemmas that must be resolved. These include the following debates:

1. Speed of reconstruction versus safety/participation/careful planning, etc.
2. Reform versus restoration of the pre-disaster status quo
3. Establish a new lead recovery organisation or use existing government line agencies
4. Long-term planning versus short-term political span of governments, hence the need for strong political consensus in reconstruction
5. Centralised versus decentralised decision-making
6. Allocating massive resources for immediate relief versus retaining finance for the long and expensive haul of reconstruction
7. Adopting a process (or outcome) focus versus a product delivery focus (on outputs)

¹⁹ The model relates to the case studies of recovery cited in Davis and Alexander, 2016

8. Housing reconstruction through owner-build versus contractor build
9. Balancing reconstruction through effective participation or strong decisive government.

Table 3.8: Principles of recovery

Level 1: Core ethical values	
1.	The equitable distribution of resources should be based on the needs, rather than status. For those affected by recovery, fundamental rights should be established and secure tenure of property should be guaranteed.
2.	Anti-corruption measures should be devised and applied in order to ensure that resources flow to meet vital needs and do not corrupt those who handle them.
3.	The survivors lie at the heart of all effective recovery operations; a good recovery policy helps reactivate communities and empowers people to contribute to rebuilding their homes, lives, livelihoods and environment. The leaders and managers of recovery need to be accountable to the disaster survivors.
Level 2: Strategic principles	
4.	Policies and plans for recovery should be financially realistic, recognising that, as the political commitment to recovery declines over time, so budgets will also decline. Thus, there is a need for pragmatism to ensure rapid recovery by generating and maintaining a political consensus and by dedicating funds to the process.
5.	Except where specialised coordination of complex, cross-disciplinary matters is needed, existing ministries and institutions should be used to facilitate and manage recovery.
6.	Relocation disrupts lives and is rarely effective. It should be used as little as possible .
7.	To ensure that recovery is effective, every effort must be made to strengthen government and governance .
8.	To contribute to long-term development, recovery must move beyond the vulnerable 'status quo' situation that gave rise to the disaster and provide a safer, better and more sustainable built environment .
9.	Reconstruction is an opportunity to plan for the future and conserve the past.
10.	Pre-disaster planning should be used to prepare for disaster events and subsequent recovery.
Level 3: Tactical principles	
11.	Effective disaster recovery requires strong community participation . Management structures must empower local people and ensure harmonisation with higher levels of government. Strong community participation needs to be balanced with a strong governmental role, both being essential ingredients for effective recovery.
12.	In a major disaster, there must be central control of resource flows and international liaison , but ensure sufficient autonomy of local government to manage the recovery at the local level.
13.	Due to the dynamic, rapidly evolving situation after a disaster, the process of planning recovery is more cyclical than linear. The tactical sequence involves assessing needs, planning, testing the plan, implementation, monitoring and evaluation, then reassessment, planning, testing, and so on.
Level 4: Implementation principles	
14.	Humanitarian assistance imported into a disaster area should augment, complement and reinforce local initiatives, not supplant or duplicate them.
15.	Successful implementation is based on timely accurate information , including quantitative and qualitative data . Both sets of information need to be merged and communicated to operational staff in government and civil society.
16.	The key resources for implementation are organisation, leadership, authority, cash, flexible plans, overall commitment to the task at all levels and a clear vision .
Level 5: Monitoring and evaluation principles	
17.	The process of building resilience by evaluating progress against agreed benchmarks should be monitored and evaluated no less frequently than every
	The following elements should be evaluated <ul style="list-style-type: none"> • Reconstruction goals • Dedicated budgets

-
- six months.**
18. It is necessary to devise ways to ensure that **lessons** about how to promote resilience in recovery operations have been **learned, documented, stored, disseminated and acted upon.**
- Accountability to avoid corruption
 - Staff training
 - Protection of critical facilities
 - How to build redundancy into DRM systems
 - Disaster risk reduction
 - How to strengthen emergency services?
-

3.11 Durable solutions for displaced people

“States Parties shall seek lasting solutions to the problem of displacement by promoting and creating satisfactory conditions for voluntary return, local integration or relocation on a sustainable basis and in circumstances of safety and dignity.”

Source: *Article 11 of the African Union Convention for the Protection and Assistance of Internally Displaced Persons in Africa*

An internally displaced person (IDP) is someone who has been forced to flee their home, but who remains within the borders of their country. As they have not crossed an internationally recognised border they are not refugees and remain the responsibility of their national government. A refugee is a displaced person who has crossed an international border and who has protection under international law. For refugees and IDPs, achieving a lasting, sustainable and safe solution that allows them to recover and develop is that much more challenging.

In 2014, there were an estimated 38 million people displaced by conflicts and violence and 36 million displaced by disasters. The Internal Displacement Monitoring Centre (IDMC) notes that the number of people displaced by infrastructure and development projects is unknown, but suggests it is a number greater again than either conflicts or natural disasters (IDMC, 2015). Note this Topic Guide does not focus on man-made disasters or conflicts.

Reconstruction, as it has been discussed in this Topic Guide, has been written on the premise that the affected communities are largely within the areas of their pre-disaster homes. This leads to an initial perception that reconstruction is oriented towards supporting the re-establishment of the affected society. However, when considering displaced peoples, both IDPs and refugees, it should be recognised that they may well be creating a new society or integrating into an existing one. This may require many of the principles, perceptions and issues discussed here to be viewed through a different lens, including that of the receiving community and authorities not directly affected by the disaster.

3.11.1 Underlying challenges to supporting displaced people

The initial image of displaced populations may well be snaking lines of people on the move or large camps of temporary shelters. This perception is not entirely accurate; it is likely that the majority of displaced persons are not living in camps. The IDMC estimates that 80% of those displaced by conflict in 2014 were not living in camps (IDMC, 2015). As of December 2015, there were approximately 1.1 million registered Syrian refugees in Lebanon; of this number, approximately 83% were paying rent (UN-Habitat and AUB, 2015). Lebanon has largely rejected the camp solution, with most refugees living distributed within host communities in temporary housing, either hosted by local households, often family, or in rental accommodation. In rural areas, displaced people are often dispersed in remote or inaccessible places. The challenge then becomes identifying these displaced people, ascertaining their needs and then providing assistance and recovery initiatives that support durable solutions without exacerbating the likely already present tensions between the host communities and the displaced people.

The Guiding Principles on Internal Displacement (OCHA, 2001), recognises that competent authorities have the primary responsibility to facilitate displaced persons in choosing their long-term solutions (IASC, 2010). The 1951 Refugee Convention places particular responsibility for refugees on the recipient government, not least to provide access for humanitarian agencies (UNHCR, 2016). While it should be recognised that resolving displacement is in the state's best interest, as long-term marginalisation of displaced persons can be an obstacle to long-term peace, stability and recovery, it may be difficult for the state to deliver on this, given that it, too, is likely to be struggling with development issues, public opinion and budgetary issues (IASC, 2010). Even well developed nations, such as those of the European Union²⁰, struggle to find lasting and durable solutions for large numbers of displaced people.

3.11.2 Basic concepts of durable solutions

This section has largely been adapted from the UN Inter-Agency Standing Committee (IASC) Framework on Durable Solutions (IASC, 2010). Achieving durable solutions for displaced people is in the best interest of all those involved. A durable solution is achieved when IDPs:

- No longer have specific assistance and protection needs linked to their displacement
- Can exercise their human rights without discrimination resulting from their displacement.

There are three basic options for establishing a durable solution for displaced people, including:

1. Returning to their homes after the disaster has passed
2. Integrating into the new community to which they have moved
3. Resettling somewhere else.

All three options have their advantages and disadvantages, challenges and opportunities, which will vary depending on the perspective from which the issue is viewed. For instance, resettlement may be an attractive option for the current host community, but not necessarily for the displaced population who face the additional trauma of relocation or, potentially, for the new host families.

The selection of a specific option is not a durable solution in itself, but rather presents the context within which the durable solution must be developed, such that the displaced person can exercise their basic human right without discrimination and no longer requires external support, as outlined in Box 3.8. Furthermore, their needs may continue well beyond the implementation of a chosen option. In general, support is required in four basic areas, including i) that needed as a result of the event causing displacement, such as loss of key documents during evacuation; ii) that needed as a result of the displaced person's absence from their home, such as food aid as they re-establish crops; iii) that needed because of the condition of the location that they are moving or returning to is not suitable or poses further challenges, as seen with the need for services and livelihood opportunities when IDPs move to a remote, unpopulated areas; or iv) that needed to address issues that disproportionately affect the displaced, such as discrimination by host communities.

²⁰

<http://www.bbc.com/news/world-europe-24583286>

Box 3.8: Case study on displacement in Chad

Durable solutions for IDPs: challenges in Chad

A combination of regional conflict and national insecurity led to the internal displacement of approximately 180,000 people in eastern Chad. While the situation in 2016 has changed, these people remain displaced. IDPs have three choices, to which they are free to self-determine depending on their own wishes, including voluntary return to their home village, local integration or relocation. However, despite the causes of the initial displacement having been contained, there remain significant challenges to achieving lasting solutions.

The Chadian government has acknowledged its responsibility, but it has yet to establish an appropriate framework for durable solutions and has made little effort to realise this outcome. Crime is a particular challenge, leading to withdrawal of humanitarian organisations and increased concern on the part of affected communities. There is an overall lack of coordination between humanitarian actors, with challenges in understanding and analysing the current situation, with local and regional tensions. The humanitarian effort is, therefore, struggling to establish programmes that meet needs and strengthen the resilience of communities. This is challenged further by a greater awareness of basic human rights, limited funding and poor local development capacity. As such, though the three options are available for IDPs to decide their future, they by no means offer a durable solution at this time.

Source: <https://www.oxfam.org/en/research/durable-solutions-internally-displaced-persons>

Achieving a durable solution for displaced persons is a gradual and complex process that has to address multiple challenges, and requires collaborative efforts on the part of stakeholders (IASC, 2010). Therefore, once a decision has been made to return, integrate or resettle, a process is required for recovery and reconstruction, similar to that delivered through the principles of Build Back Better and as discussed in this report. Key challenges to durable solutions will likely include:

- Human rights, which includes security, property, housing, education, health and livelihoods. Assistance may be needed to secure the right to reparation, justice, truth and closure, especially where conflict has been a cause in displacement
- There will be continuing humanitarian need, including temporary shelter, health support or other needs, such as WASH, food and potentially cash to enable displaced persons to survive until such time that they no longer need assistance
- Beyond the humanitarian need, displaced persons will require developmental support to secure long-term access to livelihoods, education and health care, either in the areas to which they move or return, or indeed within the community in which they integrate
- Where overcoming the development challenge requires large-scale reconstruction of affected infrastructure, there will be reconstruction needs.

The guiding principles for durable solutions are considered below in Table 3.7.

Table 3.9: Guiding principles for durable solutions (adapted from IASC, 2010)

Key principles of durable solutions
Primary responsibility sits with national authorities
National authorities need to ensure, as a minimum, that the legal and policy frameworks are in place to secure the rights of IDPs, to establish effective government structures to coordinate response, to facilitate provision of assistance and to ensure adequate funding is allocated to support the process
Rights, needs and legitimate interests of IDPs should be the guiding considerations
Durable solutions, though linked to issues of territorial integrity, sovereignty and security, should be guided in principle by the needs and vulnerabilities of the IDPs and informed by international humanitarian standards
IDPs should be enabled to make an informed and voluntary decisions about their future
IDPs should have the right to determine whether they wish to integrate locally, resettle elsewhere or return to their homes and they should have the right to make this decision free from coercion or persecution. The support for durable solutions should be tailored around this decision, supporting meaningful and realistic outcomes
Choosing local integration or resettlement does not eliminate the right to later return home
The decision to integrate locally or resettle elsewhere in their country does not preclude the freedom to later choose to move elsewhere, or to return home.
IDPs should not be encouraged or compelled to return or relocate to areas where their life, liberty or health would be at risk
Even when the option chosen by an IDP has been made on a voluntary basis, care should be taken to ensure there is an understanding of the risks associated with that choice. This requires monitoring in both return and relocation areas, but also at the site of displacement, that might push IDPs to accept unsafe return. Under certain circumstances, temporary premature return or relocation may be encouraged without the prospect of a durable solution, where that option poses a lesser risk than continued presence at their current site
IDPs must not be subject to discrimination, irrespective of their decision
Specifically, IDPs should not suffer discrimination on the basis of their displacement, nor also as a result of their ethnicity, religion, gender, language, political or other opinion, national or social origin, disability, age, marital and family status, nationality or other status
The needs, rights and legitimate interests of those communities and populations that receive IDPs may be comparable and should not be neglected
A community-based approach that addresses the needs of the IDPs and the hosting communities is important to mitigate risk of tensions and support a more effective integration or re-integration of IDPs
IDPs should continue to be protected by national and international human rights and law beyond the establishment of a durable solution

3.11.3 Achieving durable solutions

There are no set timeframes for implementing durable solutions, but they can never begin too early. Delay in pushing for durable solutions prolongs the period in which displaced persons live with uncertainty, dependency on external support and, potentially, with compromised rights. With this in mind, promoting durable solutions is important to recovery, even if it is expected that the solution chosen will not be final (GPCWG, 2010).

Achieving durable solutions for displaced persons requires early promotion of solutions based on contextual understanding of the situation, strong collaboration with stakeholders, including national authorities and development partners and the displaced population themselves. It also requires good understanding and focus on the realisation of rights for the displaced (IDMC, 2015). Adopting a rights-based approach is in line with the responsibility of all humanitarian and development actors, but means that developing and implementing durable solutions is designed around realisation of the recipients' human rights (GPCWG, 2010).

Table 3.10: Non-exhaustive list of key rights and protection needs (adapted from GPCWG, 2010)

Right to physical security and integrity	Right to basic necessities
Protection from: effects of natural disasters; physical violence and abuse; cruel, inhumane and degrading treatment; arbitrary arrest and detention; illegal guardianship and adoption; trafficking; sexual abuse, violence and exploitation; forced recruitment; forced labour; forced marriage; domestic violence; freedom of movement and residence*; arbitrary displacement; family separation Right to access to justice, protection activities for children and restoring family separation	Right to: adequate shelter; adequate food and water; adequate education; adequate health services Psychosocial support programmes Non-discrimination in provision and access to basic services; protection against abuse linked to services Protection from corruption and aid diversion Dignified burial and storage of dead bodies with adequate identification systems
Other economic, social and cultural rights	Other civil and political rights
Right to work; access to livelihoods; right to participation in cultural life and right to form community-based organisations	Protection of housing and property rights; access to housing, land and property restitution; access to housing for non-proprietary rights' holders (renters, squatters and the homeless); protection from involuntary or unsafe return or resettlement Right to recognition as a person before the law; right to documentation; freedom of association and expression; right to participate in electoral processes; freedom of religion; access to personal documentation and birth registration Access to information pertaining to natural disasters and protection

Profiling displacement

The first step in developing a durable solution is to understand the context within which displaced people are living. This requires data collection and analysis, referred to by the IDMC as profiling displacement; a data collection exercise designed to identify displaced groups or individuals, to enable action to be taken to advocate on their behalf, providing assistance and protection and to support the development of a durable solution to their displacement. The outcome of a profiling exercise should be an evidence base, disaggregated by age, gender and diversity that allows a thematic analysis to determine needs, vulnerabilities and intentions (IDMC, 2015).

Profiling needs to pay attention to the context, ensuring that development of durable solutions is aware of the key contextual issues, including the cause of displacement, length of displacement, the setting in which the displaced are living and the impact that displacement is having on different groups within the displaced population (GPCWG, 2010).

The UNDG (2004) points to four areas of understanding necessary to support developing durable solutions:

1. Demographic data; to establish the profile of the displaced population and host community, to help identify the vulnerability of the population and priorities of the displaced and host communities
2. Socio-economic data: to consider livelihoods, and assess and prioritise the needs of the host community with respect to access to land and natural resources, skills, income generating opportunities, environmental protection, housing, etc.
3. Protection data: to identify protection needs for safety and human rights, and establish root causes and measures to address them

4. Institutional data: to consider the capacity of local and national authorities and civil society to implement durable solutions and establish what additional support may be necessary.

Collaborative process

The process should be collaborative, to ensure a consensus is developed across key actors, not least the responsible authorities, where ownership of developmental plans and active engagement by local and national governments is essential to delivering durable solutions.

Achieving a durable solution will likely require coherent, inter-agency collaboration across the various active humanitarian and development actors working towards a set of agreed outcomes. As identified earlier, those outcomes should deliver durable solutions for displaced persons, resulting in a situation where there is no longer a need for external support for the displaced and who have basic human rights. Delivering these durable solutions requires a participatory process, whereby displaced persons and the host communities are involved in decision-making, and are supported with the tools necessary to make those decisions. Likewise, the process should be community based, ensuring there is recognition of the needs of the community as a whole and there is a sharing of responsibility for hosting and integrating displaced people. This will help to reduce the stigma of the displaced person (UNDG, 2004). Where the proportion of displaced people is high in comparison to the hosting community, it may be important to take a whole community development approach, delivering services and support to the community as a whole.

Investment in early recovery expedites durable solutions, contributing to local recovery activities, including within host communities. Key to this is the re-establishment of local governance structures, protection institutions and basic services. Achieving this requires development actors to collaborate in pushing recovery agendas. Box 3. 9 presents a case study on the current approach to durable solutions in Lebanon.

However, for the affected populations, both the displaced and the host, it is important to promote self-reliance and reduce their dependency on external assistance. This approach will promote greater community resilience, encouraging greater use of community technical, entrepreneurial and organisational skills to resolve challenges and promote recovery and integration (UNDG, 2004).

Measuring progress

It should be recognised that achieving a durable solution will be an extended process, dependent on a complex process of addressing a series of challenges, as discussed above. There is a need therefore by which to assess the degree to which a durable solution has been achieved.

3.11.4 Framework for durable solutions

In 2007, the Inter-Agency Standing Committee developed the Framework on Durable Solutions for Internally Displaced Persons, which was revised and updated in 2010. It is developed around Principles 28-30 of the Guiding Principles for Internal Displacement, that displaced persons have the right to a durable solution. The framework aims to provide clarity on the concept of a durable solution and provide general guidance on how to achieve it as well as assist in determining to what extent a durable solution has been achieved. The IASC Framework can be found at: <http://www.unhcr.org/50f94cd49.pdf>

The Handbook for the Protection of Internally Displaced Persons (GPCWG, 2010) builds on the IASC Framework and summarises the criteria and benchmarks to assist decision-making with respect to designing programmes that can support durable solutions. These are identified and discussed in detail in Part VI of the handbook, pages 458-467 of the 2010

version. This can be found at: <http://www.unhcr.org/protection/idps/4c2355229/handbook-protection-internally-displaced-persons.html>.

Box 3.9: Case study on Lebanon crisis response to Syrian conflict

Lebanon crisis – managing displaced Syrian refugees in Lebanon

In 2015, Lebanon was hosting approximately 1.1 million registered displaced Syrians. The majority of these were living in harsh conditions with shrinking opportunities for income generation and the overwhelming numbers has had a dramatic impact on access to low-cost housing. Though the ultimate cause of the situation is the Syrian conflict, now into its fifth year, the Lebanon crisis is resulting in a second humanitarian situation, whereby shelter support is required for vulnerable Lebanese, Lebanese returning from Syria, Palestinian refugees from Syria and Palestinian refugees already in Lebanon, as well as Syrian refugees from Syria.

A large proportion has been forced to resort to residing in overcrowded or substandard shelter conditions, such as garages, worksites, unfinished buildings and collective shelters

Category	Total population in need	Targeted		
		Total	Male	Female
Displaced Syrians	625,372	519,567	261,147	258,420
Palestine Refugees from Syria	42,325	20,158	9,657	10,501
Palestine Refugees in Lebanon	75,000	75,000	37,125	37,875
Vulnerable Lebanese	1,399,350	203,221	102,144	101,077
Total	2,142,047	817,946	403,493	414,453
Institutions				
Municipality				200

There are approximately 30 agencies active in the shelter sector in Lebanon, with efforts to strengthen this number through collaboration with national NGOs and neighbourhood organisations. The overall strategy is now focused on implementing initiatives to benefit all those living in Lebanon who are affected by the Syrian crisis, without discrimination based on nationality, to meet basic minimum standards. Assistance will be based on the number, type and condition of substandard shelters, with assistance prioritised according to the security of tenure and socio-economic vulnerabilities of households.

The Lebanon Crisis Response Plan 2016 for the shelter sector is based on 16 activities to deliver a single all-inclusive output for three targeted outcomes. The outcomes include: 1) access to adequate shelter where the shelter is insured, maintained or improved; 2) improved living conditions within temporary settlements and poor urban areas; and 3) Lebanese public and private institutions are aware of and responsive to the shelter situation of displaced populations and other vulnerable groups.

The outcomes are reported based on a single indicator, the number of Individuals (by cohort) that benefit from the specific activity associated with each outcome, with four priority interventions, including: 1) upgrading shelters through minor repairs or adequate rehabilitation, in exchange for

affordable occupancy; 2) assist in providing makeshift shelters in informal settlements to maintain capacity to withstand adverse weather conditions; 3) upgrade, through a bottom-up holistic approach, highly affected neighbourhoods through shelter and basic infrastructure; and 4) enhance technical capacity of public and private local institutions to participate and support shelter assistance activities.

The shelter sector in Lebanon is actively engaging in the development of durable solutions with the premise that the displaced population from Syria will be in-country for some time. Given the extent of the refugee population, they have shifted from an approach focusing on refugees to all vulnerable groups, irrespective of nationality, thereby hopefully reducing conflict within Lebanon. Activities are focused around ensuring basic rights for shelter and looking to address the basic challenge of housing for all vulnerable people in Lebanon for a prolonged period by collaborating across agencies, both international and national. It provides a good example of a programme attempting to deliver a durable solution for displaced people.

Source: Shelter Working Group, Lebanon Crisis Response Plan 2015-2016

SECTION 4

Conclusions

Disaster recovery is complex, untidy and often prolonged over many years. It is a multi-sectoral and multi-faceted process involving an entire affected community, encompassing many local, national and international stakeholders. While any major disaster event is a failure of development, disaster recovery is best regarded as a 'development opportunity' and the implication is to move away from providing welfare to providing support. A clearly defined aim is needed to plan for 'development recovery', creating a safer and better natural and built environment to that which it replaces.

What is critical to set in motion is a continuous, timely and cost-effective process of reconstruction and recovery after a disaster with a clear understanding and fine-tuning of the roles and efforts to be contributed by the diversity of actors. Whether in restoring critical infrastructure systems, where public sector supported engineering provision is required, or in housing reconstruction, where self-help, technical assistance and cash support may be more appropriate, the role of each actor needs to be defined by national governments and linked across the multitude of areas of disaster recovery.

There has been extensive progress in recent decades but serious gaps remain in the collective response to natural disasters, in particular the ongoing institutional gap between humanitarian disaster relief and longer-term recovery efforts. All pre- and post-disaster efforts have to be seen as part of an interrelated, coordinated and continuous process of sustainable development and building resilience. The overall framework for actions must be based on developing resilience to future shocks. Reconstruction should be seen as an integral part of pre-disaster planning and should be based on good local knowledge of both the damage and the needs.

Support to enable national and local governments to get back on their feet after disaster is frequently neglected. This support needs to relate to whatever losses they may have sustained: temporary staffing support, where their own staff may have been killed or injured, finance, temporary accommodation for government functions, etc. Any attempt by international NGOs to recruit government employees at inflated wage levels to assist their own operations must be resisted since this further weakens a depleted government capacity.

Disasters cannot be eliminated. However, disasters present unique opportunities, not only for new or improved infrastructure, but also to improve the built environment and restore the natural environment as well as to strengthen institutions, promote safety, integrate related sectors, improve operation and maintenance, and apply appropriate financing mechanisms.

Disaster risk management involves making difficult decisions concerning what to protect. Critical facilities will always merit enhanced protection and efforts should be directed towards ensuring that essential infrastructure (transport, roads, power and water), life-saving buildings and services, resources needed for emergency management and essential cultural assets are strengthened (retrofitted) pre-disaster and given priority protection in reconstruction. Moreover, reconstruction should be specific and tailored to relevant hazards, such that there is appropriate seismic design for earthquake zones, sustainable flood management, where required, etc. Existing guidance is available, but could be easier to access and better targeted.

Cascade and indirect impacts can be more significant than the direct ones of the disasters themselves, particularly in terms of the economic consequences. Pre-disaster (contingency) planning and reconstruction should give special attention to considering the indirect, knock-on and cascading impacts, such as fires after earthquakes.

External assistance should avoid creating dependency, by not undertaking any task that can be accomplished by the affected communities or their representatives. Thus, many of the sheltering/housing roles may need social, technical and financial support, but not full provision. In contrast, survivors may not be able to repair or reconstruct critical facilities and infrastructure, which will require mandatory powers, extensive assistance or full provision. Rebuilding homes and livelihoods is a shared process and not just a series of products to be delivered. This is best regarded as a spectrum from 'support' to 'provision'. Following from this, damage and needs assessments are essential for planning reconstruction, but consideration should be given to those best able to lead and feed into the assessments. The traditional funding model requires a new approach based both on a seamless transition from emergency shelter to permanent reconstruction and the availability of funding. It needs to be less tied to specific actions by specific agencies for immediate needs. Rather, an approach is needed that is more flexible and more in line with actions that accelerate longer-term development goals.

Reconstruction should not contribute to further national debt. The traditional funding model for emergency relief and reconstruction sees massive resources allocated for relief and affected countries signing up to loan finance to meet apparent gigantic reconstruction needs. In the past many countries have sought and received grants and loans from international finance institutions to fund their massive reconstruction needs. However, solving short-term recovery needs by creating long-term indebtedness is rarely an appropriate or sustainable option for developing countries. Thus innovative financial models are needed where essential finance can be provided from external sources without creating a negative long-term dependency problem that sets back development goals. An example would be where loan finance is used for economically viable projects where loans can be repaid through GDP growth.

There are many disparate initiatives forming an intricate maze of knowledge resources in the 'disaster resilient recovery' field. DRR work is going on under many auspices and in many different institutions, often simultaneously in multiple initiatives, as seen with the World Bank Infrastructure Resilience Group and GFDRR. There are similar instances in the Asian Development Bank and the other regional banks, as well as the European Commission Humanitarian Aid department's Disaster Preparedness Programme (DiPECHO), DFID, UNDP, UNOPS, UNISDR, and Capacity for Disaster Reduction Initiative.

The problem of knowledge coordination and communication arises in part from the large number of major players in post-disaster recovery and their associated networks and platforms. It also derives from ongoing institutional gaps between short-term relief organisations and longer-term recovery and reconstruction organisations (Lloyd-Jones, 2006). Some blurring of the boundaries has occurred, for example, following the earthquake and tsunami in Aceh in 2004, when international humanitarian organisations became involved in housing reconstruction. However, as discussed in this Topic Guide, there remains a distinct, artificial division between the different phases of the DRM cycle, which inevitably leads to gaps. The UN cluster system has gone some way to addressing these concerns, but this is still sectorial and lacks linkages at the meta level. For example, the Early Recovery Cluster, led by the UNDP, leads immediate critical infrastructure concerns, yet shelter is separate under the Shelter Cluster, led by IFRC. Neither is specifically tasked with long-term recovery and reconstruction and there is currently no UN Inter-Agency Standing Committee (IASC) cluster dedicated to this. As such, there remains a gap. This is

perhaps understandable as only a few agencies, such as the UNDP or UN-Habitat, aim to be in place well beyond the early recovery period. As such, there remains a priority to develop an integrated framework covering the full post-disaster response and recovery system, through which all relevant tools and resources could be exchanged, disseminated, monitored and implemented, especially at the local level.

References

- Abraham (2015) Earthquake and Underinsurance: Twin Scourges of Nepal,” Willis Wire
- Active Learning Network for Accountability and Performance (ALNAP) (2015) The state of the humanitarian system, ODI, London
- Active Learning Network for Accountability and Performance (ALNAP) (2005) http://www.alnap.org/publications/pdfs/ALNAP-ProVention_SAsia_Quake_Lessonsa.pdf
- Bruneau, M., Chang, S., O’Rourke. T., Reinhorn, A., Shinozuka, M., Tierney, K., Wallace, W., and von Winterfeldt, D. 2003 A Framework to Quantitatively Assess and Enhance the Seismic Resilience of Communities. Earthquake Spectra Vol.19 No.4 pp 733-752 Nov.2003. mceer.buffalo.edu/research/resilience/Resilience%20Bibs.pdf
- Buckley, C. (2015), “Nepal’s Fast Urbanization and Lax Enforcement Add to Quake’s Toll,” New York Times, May 1, 2015
- Canterbury Earthquake Recovery Authority (CERA) (2013) Christchurch Central Recovery Plan (Te Mahere ‘Maraka Ōtautahi’), an Accessible City (He Taone Wātea), CERA
- Chang et al. (2012) Resourcing for a resilient post-disaster reconstruction environment, <http://www.resorgs.org.nz/images/stories/pdfs/disaster%20resilience%20in%20the%20built%20environment%20paper.pdf>
- Chang et al. (pend. Pub.) Resources and capacity: lessons learned from post-disaster reconstruction resourcing in Indonesia, China and Australia, <http://www.resorgs.org.nz/images/stories/pdfs/cobra%20conference%20paper.pdf>
- Christchurch City Council (CCC) (2016) Goals for an accessible city, Christchurch City Council website, <http://www.ccc.govt.nz/transport/improvements-and-planning/road-improvement-projects/aactransportprojects/aac-goals/> last accessed 08/05/2016
- Clinton, W., (2006) Lessons learned from tsunami recovery. Key propositions for building back better. A report by the UN Secretary-General’s Special Envoy for Tsunami Recovery. New York: United Nations
- Comerio, M. (2013). *Housing Recovery in Chile: A Qualitative Mid-Program Review*. PEER Report No. 2013/01, February 2013. Berkeley, California: Pacific Earthquake Engineering Research Center, University of California at Berkeley
- Davis, I. (2011) What have we learned from 40 years’ experience of Disaster Shelter? *Environmental Hazards* 10 (2011) 193-212
- Davis, I. (ed.) 2015 *Shelter after Disaster*, Second Edition Geneva: IFRC
- Davis, I., and Alexander, D. (2015) *Recovery from Disaster* pp.43-47 Abingdon: Routledge
- Department for International Development (DFID) (2011) *Defining Disaster Resilience: A DFID Approach Paper*. London, DFID https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/186874/defining-disaster-resilience-approach-paper.pdf
- de Ville de Goyet, C. and Morinière, L. (2006) *The Role of Needs Assessment in the Tsunami Response* London: Tsunami Evaluation Coalition ODI <http://www.alnap.org/resource/3531>
- Disaster Recovery Framework (2014) *Pakistan Earthquake 2005 The Case for Centralized Recovery Planning and Decentralized Implementation* Country Case Study Series Disaster Recovery Framework Guide Washington DC: World Bank. <http://reliefweb.int/report/pakistan/pakistan-earthquake-2005-case-centralized-recovery-planning-and-decentralized>
- European Community Humanitarian Office (ECHO) (2016 forthcoming) *Shelter and Settlement Guidelines*, Lead Consultants: Ian Davis and Maggie Stephenson. Brussels, ECHO
- Featherstone (2014) *Learning from disaster: how governments gain insight and how regional and international bodies can help*, ALNAP Study, London, ALNAP/ODI

- Fengler et al. (2008) Managing post-disaster reconstruction finance, Policy Research Working Paper 4475, World Bank, link: www.wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2008/02/11/000158349_20080211083440/Rendered/PDF/wps4475.pdf
- Gero et al. (2011) Integrating community based disaster risk reduction and climate change adaptation: examples from the Pacific, <http://www.nat-hazards-earth-syst-sci.net/11/101/2011/nhess-11-101-2011.pdf>
- Global Fund for Disaster Risk Reduction (GFDRR) (2015) Guide to developing disaster recovery frameworks, Sendai conference version, March 2015, GFDRR, World Bank
- Global Fund for Disaster Risk Reduction (GFDRR) (2016) Post Disaster Needs Assessments, GFDRR website, <https://www.gfdr.org/post-disaster-needs-assessments> last accessed 08/05/2016
- Global Protection Cluster Working Group (GPCWG) (2010) Handbook for the Protection of Internally Displaced Persons, GPCWG, <http://www.unhcr.org/protection/idps/4c2355229/handbook-protection-internally-displaced-persons.html>
- Gurenko, Lester, Mahul, and Galulal, (2006) Earthquake Insurance in Turkey: History of the Turkish Catastrophic Insurance Pool, World Bank, Washington, DC
- Hall et al. (2014) Ten months after Typhoon Haiyan: lessons from the response and how to prepare for the future, ODI Public Event, 12 September 2014, <http://www.odi.org/events/4008-ten-months-after-typhoon-haiyan-lessons-response-prepare-future>
- Harvey (2009) Towards good humanitarian government: the role of the affected state in disaster response, Humanitarian Outcomes, ODI, London
- Hogg, S.J. 1980. *Reconstruction following seismic disaster in Venzone, Friuli*. Disasters. 4 (2), 173-85
- Howes et al. (2012) The challenge of integrating climate change adaptation and disaster risk management: lessons from bushfire and flood inquiries in an Australian context, https://www.griffith.edu.au/data/assets/pdf_file/0008/475442/URP-IP-17-Howes-EtAl-Sept-2012.pdf
- Inter-Agency Standing Committee (IASC) (2010) Framework on Durable Solutions for Internally Displaced Persons, IASC, The Brookings Institution, University of Bern, www.unhcr.org/50f94cd49.pdf
- Inter-Agency Standing Committee (IASC) (2016) Inter-Agency Standing Committee, <https://interagencystandingcommittee.org/> (accessed 25/03/2016)
- Internal displacement Monitoring Centre (IDMC) (2015) Durable solutions for IDPs: Challenges and way forward, IDMC, <http://www.internal-displacement.org/publications/2015/durable-solutions-for-idps-challenges-and-way-forward>
- International Federation of Red Cross and Red Crescent Societies (IFRC) (2010) Owner-driven housing reconstruction guidelines, IFRC <http://www.ifrc.org/PageFiles/95526/publications/E.02.06.%20ODHR%20Guidelines.pdf>
- International Federation of Red Cross and Red Crescent Societies (IFRC) (2012) Post-disaster community infrastructure rehabilitation and (re)construction guidelines; IFRC http://www.ifrc.org/PageFiles/71111/PostDisaster_Infrastructure-Guidelines.pdf
- International Federation of Red Cross and Red Crescent Societies (IFRC) (2013) A guide to mainstreaming disaster risk reduction and climate change adaptation, IFRC
- International Federation of Red Cross and Red Crescent Societies (IFRC) (2015) The Checklist on Law and Disaster Risk Reduction, an annotated outline, IFRC, United Nations Development Programme
- International Federation of Red Cross and Red Crescent Societies (IFRC) (2016a) What is a disaster, <http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/> (accessed 25/03/2016)

- International Federation of Red Cross and Red Crescent Societies (IFRC) (2016b)
<http://www.ifrc.org/en/what-we-do/idrl/>
- IPPC, 2012 *Managing the risks of Extreme Events and Disasters to Advance Climate Change Adaptation* A special report of Working Groups 1 and 11 of the Intergovernmental Panel on Climate Change, edited by C. Field et al. Cambridge, UK and New York: Cambridge University Press
- Janssen and Ostrom (2006) Resilience, Vulnerability, and Adaptation: A Cross-Cutting Theme of the International Human Dimensions Programme on Global Environmental Change, Resilience, Vulnerability, and Adaptation, Global Environmental Change Volume 16, Issue 3, Pages 235-316
- Jha, Abas (2014) – 3 key lessons from the 2004 Tsunami.
<http://blogs.worldbank.org/eastasiapacific/three-key-lessons-2004-tsunami>
- Jha et al. (2010) Safer homes, stronger communities: a hand book for reconstructing after natural disasters. The World Bank, Washington, DC
- Kates, R.W. and Pijawka, K.D.1977. *From rubble to monument: the pace of reconstruction*. In Haas, J. E., Kates, R. W. and Bowden, M. J. (eds), *Reconstruction Following Disaster*. Cambridge, MA: MIT Press pp. 1-23
- Kazuyuki, Ito and Managi (2014) *Public and private mitigation for natural disasters in Japan*, International Journal of Disaster Risk Reduction, Vol 7 March 2014, pp39-50
- Kent, et al. (2013) The future of non-governmental organisations in the humanitarian sector, Humanitarian Futures Programme, Kings College London
- Kringold (2011) Disaster risk reduction and the evolution of physical development regulation. *Environmental Hazards* 10 (2011) 53-58
- Ladbrook (2013) Infrastructure Resilience: What does it mean for my agency/organisation? Version 2.2 15 March 2013.
https://www.waternz.org.nz/Folder?Action=View%20File&Folder_id=99&File=Infrastructure_Resilience_Ver2.2.pdf, [last accessed: 29/09/2015]
- Landslides at the BGS. British Geological Society
<http://www.bgs.ac.uk/research/engineeringGeology/shallowGeohazardsAndRisks/landslides/home.html>
- Langenbach, (2009) "Understanding What Works: Learning from Earthquake Resistant Traditional Construction." *Heritage at Risk* (2015): 87-98. <http://journals.ub.uni-heidelberg.de/index.php/heritage/article/download/23256/17014>
- Le Blanc, David. "Towards Integration at Last? The Sustainable Development Goals as a Network of Targets." *Sustainable Development* (2015)
- Lee E M and Jones D, (2013) *Landslide Risk Assessment*, ICE publication, Thomas Telford
- Lew, et al. "An Overview of Building Codes and Standards in Chile at the Time of the 27 February 2010 Offshore Maule, Chile Earthquake," in *The Structural Design of Tall and Special Buildings*, John Wiley and Sons, 2010
- Linnerooth-Bayer and Mechler (2008) Insurance against losses from natural disasters in developing countries, Background paper for UN World Economic and Social Survey, http://www.un.org/en/development/desa/policy/wess/wess_bg_papers/bp_wess2008_mechler.pdf
- Lloyd-Jones (2006) Mind the Gap, Post disaster reconstruction and the transition from humanitarian relief, Max Lock Centre, University of Westminster,
http://www.preventionweb.net/files/9080_MindtheGapFullreport1.pdf
- Lloyd-Jones (2009) *The built environment professions in disaster risk reduction and response: a guide for humanitarian agencies*, London, MLC Press
- Loftis and Randy Lee (2015) 'Half of Weather Disasters Linked to Climate Change: Human-caused changes in climate played a role in 14 of 28 storms, droughts, and other 2014 extreme weather events investigated by global scientists.' *National Geographic*, November 5. <http://news.nationalgeographic.com/2015/11/151105-climate-weather-disasters-drought-storms/>

- Mannakkara and Wilkinson (2013a) Build Back Better: Lessons from Sri Lanka's recovery from the 2004 Indian Ocean Tsunami, *International Journal of Architectural Research*, Vol 7, Is 3 (108-121)
- Mannakkara and Wilkinson (2013b) Build Back Better Principles for Land-use Planning (PDF Download Available). Proceedings of the Institution of Civil Engineers, *Urban Design and Planning* 166 October 2013 Issue DP5: 288–295
https://www.researchgate.net/publication/268210483_Build_Back_Better_Principles_for_Land-use_Planning [accessed May 19, 2016]
- Mannakkara and Wilkinson (2014) Re-conceptualising “Building Back Better” to improve Post-Disaster Recovery, *International Journal of Managing Projects in Business*, Vol. 7, Is. 3
- Marshall and Baldrige (2011) Recipe for Disaster: Construction Methods, Materials, and Building Performance in the January 2010 Haiti Earthquake, *Earthquake Spectra*, Volume 27, No. S1, pages S323–S343, October; VC 2011, Earthquake Engineering Research Institute
- Maynard and Barritt (2015) Supporting shelter self-recovery: field experience following Typhoon Haiyan, Humanitarian Partnership Network, ODI,
<http://odihpn.org/magazine/supporting-shelter-self-recovery-field-experience-following-typhoon-haiyan/>
- Mechler et al. (2006) Micro-insurance for Natural Disasters in Developing Countries: Benefits, Limitations and Viability, ProVention Consortium, Geneva
http://www.proventionconsortium.org/themes/default/pdfs/Microinsurance_study_July_06.pdf
- Miles et al. (2014) Building Back Better; Case Study of the 2010-2011 Canterbury, New Zealand Earthquake Sequence, A learning from earthquakes report,
https://www.eeri.org/wp-content/uploads/EERI_GFDRR_NZ_BBB.pdf
- Miller (undated) Multi-donor trust funds at the United Nations: transforming development aid or business as usual, Reconsidering Development,
<http://reconsideringdevelopment.org/wp-content/uploads/2014/03/Multi-Donor-Trust-Funds-Kellea-Miller.pdf>
- Mitchell, D. (2010) Assessing and Responding to Land Tenure Issues in Disaster Risk Management, Training Manual, FAO. www.fao.org/3/a-i2115e.pdf (accessed: 25/03/2016)
- Miyagi et al. (2004) Landslide Risk Evaluation and Mapping: manual of aerial photo interpretation for landslide topography and risk management, Report of the National Research Institute for Earth Science and Disaster Prevention, No. 66, September 2004
- Moynihan (2009) The Katrina Breakdown, <http://www.governing.com/topics/economic-dev/The-Katrina-Breakdown.htm>
- Mughal, H. et al. (2015) Kashmir Earthquake 2005 Learning from the Shelter Response and Rural Housing Response Geneva: International Organization for Migration, Shelter Cluster
- Nakat (2015) Disaster Risk Management in the Transport Sector: A Review of Concepts and International Case Studies. Published by the World Bank at http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2015/07/23/090224b08301eaae/1_0/Rendered/PDF/DisasterRisk00ational0case0studies.pdf
- New Climate Economy (2014) *Better growth, better climate: charting a new path for low-carbon growth and a safer climate*, The Global Commission on the Economy and Climate, http://2014.newclimateeconomy.report/wp-content/uploads/2014/08/NCE-Global-Report_web.pdf
- Nienhuys (2015) Seismic building codes: global and regional overview, Evidence on Demand, DFID
- National Institute of Standards and Technology (NIST) (2014) Draft Disaster Resilience Chapter 4: Interdependencies Cascading Effects. NIST,

- http://www.nist.gov/el/resilience/upload/Disaster_Resilience_Chapter_4_Interdependencies_Cascading-Effects_50-Draft_102014.pdf [Last accessed 29/09/2015]
- Norling, B. (2013) Effective time management in post-disaster reconstruction Australia and New Zealand Post Disaster Management Conference 29 May 2013
- National Planning Commission (NPC) (2015) Nepal Earthquake 2015: Post Disaster Needs Assessment, NPC, Government of Nepal
http://icnr2015.mof.gov.np/page/post_disaster_needs_assessment
- Nougaret, A. and Danuwar, R. (2016) *Housing, land and property issues in Nepal and their consequences for the post reconstruction process*. Kathmandu: CARE, Nepal
http://www.recoveryplatform.org/assets/publication/NepalEarthquake2015/care_housing-land-property-issues-in-nepal_feb-2016.pdf
- Office for Coordination of Humanitarian Affairs (OCHA) (2001) Guiding Principles on Internal Displacement, United Nations OCHA, www.unhcr.org/protection/idps/.../guiding-principles-internal-displacement.html
- Office of the Special Envoy for Haiti (OSEH) (2012) International assistance to Haiti: Key facts as of December 2012, OSEH,
http://www.lessonsfromhaiti.org/download/International_Assistance/1-overall-key-facts.pdf
- OneBrief, (2015) The impact of natural disasters on the global economy, Risk and Innovation, published 8/9/2015 <http://www.theonebrief.com/the-impact-of-natural-disasters-on-the-global-economy/>
- On-site Operations Coordination Centre (OSOCC) (2015) Situation Analysis Nepal Earthquake, OSOCC Assessment Cell,
- Oregon Seismic Safety Policy Advisory Commission (OSSPAC) (2013) The Oregon Resilience Plan: Reducing risk and improving recovery for the next Cascadia earthquake and tsunami, Report to the 77th Legislative Assembly, Oregon
http://www.oregon.gov/OMD/OEM/ospac/docs/Oregon_Resilience_Plan_draft_Executive_Summary.pdf
- Oxfam (2012) Durable Solutions for Internally Displaced Persons: Challenges in Eastern Chad, Joint Briefing Paper: Acted, APLFT, Premier Urgence, INTERSOS, Oxfam,
<https://www.oxfam.org/en/research/durable-solutions-internally-displaced-persons>
- Oxfam International (2016) *Build back Right. Ensuring equity in land rights and reconstruction in Nepal* Kathmandu: Oxfam International <http://policy-practice.oxfam.org.uk/publications/building-back-right-ensuring-equality-in-land-rights-and-reconstruction-in-nepal-606028>
- Peppercorn (2016) Building better and safely: stimulating the private sector for sustainable solutions in Nepal, Evidence on Demand, DFID
- Quarantelli, E.L. (1982) General and particular observations on sheltering and housing in American disasters. *Disasters* 6 (4), 277-81
- Rebuilding Christchurch (2014) Killick in the name of...; Rebuilding Christchurch: one brick, one word, one city, 9 January 2014,
<https://rebuildingchristchurch.wordpress.com/tag/david-killick/> last accessed 08/05/2016
- ReliefWeb (2008) Glossary of Humanitarian Terms. Date accessed 23 July 2016, .
<http://www.who.int/hac/about/reliefweb-aug2008.pdf>
- Rowson (2010) Rebuilding communities after the tsunami, *New Civil Engineer*,
<http://www.nce.co.uk/rebuilding-communities-after-the-tsunami/5212565>.article [last accessed: 29/09/2015]
- Sanderson, D. and Ramalingam, B. (2015) *Nepal Earthquake Response: Lessons for operational agencies*. London: ALNAP and ODI www.alnap.org/pool/files/nepal-earthquake-response-lessons-paper.pdf
- Schilderman, T., and Parker, E. eds. (2014) *Still Standing? Looking back at Reconstruction and Disaster Risk Reduction in Housing Rugby*, UK: Practical Action Publishing
- Scott (2005) DFID's Assessment of Multilateral Organisational Effectiveness: An Overview of Results,

<http://webarchive.nationalarchives.gov.uk/+www.dfid.gov.uk/pubs/files/meff-results.pdf>

- Stronger Christchurch Infrastructure Rebuild Team (SCIRT) (2012) Productivity improvements and escalation intervention plan, 10001-SC-DE-BR-0001_A, SCIRT Shelter Centre (2012) *Shelter after Disaster, Strategies for transitional settlement and reconstruction*, DFID, OCHA and Shelter Centre
- Shelter Working Group Lebanon (2016) Lebanon Crisis Response Plan 2016, Syria Regional Refugee Response, <http://data.unhcr.org/syrianrefugees/download.php?id=11097>
- Sinha, S. (2015) 'How to rebuild after an earthquake like Nepal's' *New York Times* 14 May 2015
- Smeets and Biegmann (2014) AIDependence, <http://www.aidependence.com/home.html>, Last accessed: 09/05/2016
- Steets, J. (2011) Donor strategies for addressing the transition gap and linking humanitarian and development assistance, Global Public Policy Institute (GPPi)
- Steinberg (2007) 'Housing reconstruction and rehabilitation in Aceh and Nias, Indonesia—Rebuilding lives'. *Habitat International* 31 (2007) 150–166
- Turnbull, Sterrett and Hilleboe (2013) *Toward Resilience: a guide to disaster risk reduction and climate change adaptation*, Practical Action, <http://reliefweb.int/sites/reliefweb.int/files/resources/ECB-toward-resilience-Disaster-risk-reduction-Climate-Change-Adaptation-guide-english.pdf>
- Twigg (2009) Characteristics of a Disaster Resilience community, A guidance note, Ver 2 United Kingdom Collaboratorium for Research in Infrastructure & Cities (UKCRIC) (2016) UKCRIC, ukcric.co.uk, last accessed 09/05/2016
- United Nations (UN) (2014) Philippines' debt must be cancelled to support typhoon recovery effort – UN expert, UN News Centre <http://www.un.org/apps/news/story.asp?NewsID=47524#.Vyw0WYR9600> [accessed 06/05/2016]
- United Nations (UN) (2016) Too Important to Fail – Addressing the Humanitarian Financing Gap; High-Level Panel on Humanitarian Financing, report to the United Nations Secretary-General
- United Nations Development Group (UNDG) (2004) UNDG Guidance Note on Durable Solutions for Displaced Persons (refugees, internally displaced persons and returnees), UNDG Programme Group, New York, www.refworld.org/pdfid/4a54bbf4d.pdf
- United Nations Development Programme (UNDP) (2015) UNDP and EU partnership for resilient recovery, UNDP, http://www.undp.org/content/brussels/en/home/partnerships_initiatives/results/EU-UNDP-PDNA.html
- United Nations Environmental Programme (UNEP) (2007) *Environment and Reconstruction in Aceh Two years after the tsunami*, United Nations Environment Programme, http://postconflict.unep.ch/publications/dmb_aceh.pdf
- UN-Habitat (2010) Count me in: Surveying for tenure security and urban land management, UN-Habitat and Global Land Tool Network; https://www.citiesalliance.org/sites/citiesalliance.org/files/CA_Images/Enumerations_count%20me%20in_compressed.pdf
- UN-Habitat and the American University of Beirut (UN-Habitat and AUB) (2015) No place to stay? Reflections on the Syrian Refugee Shelter Policy in Lebanon, UN-Habitat and AUB
- United Nations High Commissioner for Refugees (UNHCR) (2016) 1951 UN Refugee Convention, <http://www.unhcr.org/1951-refugee-convention.html>
- United Nations High Commissioner for Refugees and United Nations Development Programme (UNHCR & UNDP) (2015) Impact of humanitarian aid on the Lebanese economy, United Nations High Commission for Refugees and United Nations Development Programme

- United Nations Office for Disaster Risk Reduction (UNISDR) (2005) Hyogo Framework for Action 2005-2015, Building the Resilience of Nations and Communities to Disaster, Access 23 July 2016, <https://www.unisdr.org/we/coordinate/hfa> ,
- United Nations Office for Disaster Risk Reduction (UNISDR) (2009) Terminology on DRR, accessed 23 July 2016, <https://www.unisdr.org/we/inform/terminology>
- United Nations Office for Disaster Risk Reduction (UNISDR) (2010) climate Change Adaptation and Disaster Risk Reduction Institutional and Policy Landscape in Asia and Pacific, http://www.unisdr.org/files/17250_t0236000045500climatechangeadaptati.pdf
- United Nations Office for Disaster Risk Reduction (UNISDR) (2015) *Sendai Framework for Disaster Risk Reduction*. Geneva, UNISDR. Available at http://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf
- United States Army Corps of Engineers (USACE) (2006) Performance Evaluation of the New Orleans and Southeast Louisiana Hurricane Protection System: Draft Final Report of the Interagency Performance Evaluation Task Force Volume I – Executive Summary and Overview, 1 June 2006. http://www.nytimes.com/packages/pdf/national/20060601_ARMYCORPS_SUMM.pdf , [accessed: 08/04/2014]
- van Eaden (2013) The Vital Role of Ecosystems in Reducing Risk from Disasters, Climate and Development Knowledge Network <http://cdkn.org/2013/06/feature-the-vital-role-of-ecosystems-in-reducing-risk-from-disasters/>
- Warmser (2007) *Managing Urban Disaster Risk: Analysis and Adaptation Frameworks for Integrated Settlement Development Programming for the Urban Poor*, Faculty of Engineering, Lund University, Sweden
- Wisner, B., Blaikie, P., Cannon, T. and Davis, I. 2004 *'At Risk' Natural Hazards People's Vulnerability and Disasters. 2nd Edition* London: Routledge
- World Economic Forum (WEF) (2010) Global Competitiveness Report, WEF
- World Economic Forum (WEF) (2015) Building Resilience in Nepal through Public-Private Partnerships, WEF
- World Food Programme (WFP) (2016) Report: A World at Risk. Human Response at a Crossroads. Report by CARE, International Rescue Committee, Mercy Corps, Oxfam America, Save the Children U.S., U.S. Fund for UNICEF, the U.S. Institute of Peace and World Food Program USA. Washington DC: WFP
- World Bank (2009) Trust Funds at the World Bank: a guide for donors and partners, Concessional finance and global partnerships, World Bank
- World Bank, (2012) Caribbean catastrophe risk insurance facility, Implementation, completion and results report, http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2012/07/31/000386194_20120731012634/Rendered/PDF/ICR23320P1080500disclosure070270120.pdf
- World Bank (2014) *Rental Support Cash Grant Program Operational Manual*, Haiti Case Study pp 59-73 Washington DC: World Bank
- World Bank (2015) Annual Report 2015, World Bank, <http://www.worldbank.org/en/about/annual-report>
- World Wide Fund for Nature (WWF) (2015) Disaster Risk Reduction (webpage) Accessed October, 2015. [http://wwf.panda.org/what we do/how we work/people and conservation/our work/disaster risk reduction/](http://wwf.panda.org/what_we_do/how_we_work/people_and_conservation/our_work/disaster_risk_reduction/)

Bibliography of key resources

Sources of definitions

ALNAP. Edwards, M. and Hulme, D. 1995 Nongovernmental organisations: performance and accountability. Beyond the magic bullet. London: Earthscan/ALNAP Glossary 249-250

ECHO. (Forthcoming) 2016 Policy Guidelines: Shelter and Settlements Issues Brussels: European Community Humanitarian Office (ECHO)

GFDRR: Jha, A.K. et al., 2010. *Safer Homes, Stronger Communities. A Handbook for Reconstructing after Natural Disasters*. Glossary pp. 361-366 Washington DC: World Bank

IASC (2010) Framework on Durable Solutions for Internally Displaced Persons, Inter-Agency Standing Committee, The Brookings Institution, University of Bern

IPPC, 2012 *Managing the risks of Extreme Events and Disasters to Advance Climate Change Adaptation* A special report of Working Groups 1 and 11 of the Intergovernmental Panel on Climate Change, edited by C. Field et al. Cambridge, UK and New York: Cambridge University Press

ReliefWeb 2008 *Glossary of Humanitarian Terms*. <http://www.who.int/hac/about/reliefweb-aug2008.pdf>

Turnbull, M., Sterrett, C., and Hilleboe, A. 2013 *Towards Resilience: A Guide to Disaster Risk Reduction and Climate Change Adaptation*. Glossary: pp. 154- 164 London: Practical Action

UNHCR (2015) *UNHCR Master Glossary of Terms* Geneva: UN High Commissioner for Refugees

United Nations International Strategy for Disaster Reduction (UNISDR), 2009 *2009 UNISDR Terminology on Disaster Risk Reduction*, Geneva: UNISDR

United Nations International Strategy for Disaster Reduction (UNISDR), 2015 *Sendai Framework for Disaster Risk Reduction 2015-2030*, Geneva: UNISDR

Wisner, B., Blaikie, P., Cannon, T. and Davis, I. 2004 *'At Risk' Natural Hazards People's Vulnerability and Disasters. 2nd Edition* London: Routledge

Section 2: Enabling reconstruction to enhance resilience

Building resilience

Turnbull, M., Sterrett, C. and Hilleboe, A. (2013) *Towards Resilience. A Guide to Disaster Risk Reduction and Climate Change Adaptation*. Chapter 5.3 Urban Contexts pp. 104-110 Rugby: Practical Action Publishing.

<http://reliefweb.int/sites/reliefweb.int/files/resources/ECB-toward-resilience-Disaster-risk-reduction-Climate-Change-Adaptation-guide-english.pdf>

BRR, (2009) *10 Management Lessons for Host Governments Coordinating Post-disaster Reconstruction*, Executing Agency for Rehabilitation and Reconstruction (BRR) of Aceh-Nias 2005–2009. Aceh: Executing Agency for Rehabilitation and Reconstruction (BRR).

<http://www.recoveryplatform.org/assets/publication/BRR%2010%20Management%20Lessons%20for%20Host%20Governments.pdf>

Warmstler, C. (2007) *Managing Urban Disaster Risk*, Lund: Housing Development and Management (HDM), Architecture and Built Environment, Lund University.

www.lth.se/.../Wamstler_Managing_Urban_Disaster_Risk.PhD.2007.pdf

Loftis and Randy Lee (2015) 'Half of Weather Disasters Linked to Climate Change: Human-caused changes in climate played a role in 14 of 28 storms, droughts, and other

2014 extreme weather events investigated by global scientists.' *National Geographic*, November 5. <http://news.nationalgeographic.com/2015/11/151105-climate-weather-disasters-drought-storms/>

Marco A. Janssen and Elinor Ostrom (Eds) (2006) Resilience, Vulnerability, and Adaptation: A Cross-Cutting Theme of the International Human Dimensions Programme on Global Environmental Change, Resilience, Vulnerability, and Adaptation: A Cross-Cutting Theme of the International Human Dimensions Programme on Global Environmental Change, *Global Environmental Change* Volume 16, Issue 3, Pages 235-316 (August 2006)

The role of infrastructure

Bruneau, M., Chang, S., O'Rourke, T., Reinhorn, A., Shinozuka, M., Tierney, K., Wallace, W., and von Winterfeldt, D. 2003 A Framework to Quantitatively Assess and Enhance the Seismic Resilience of Communities. *Earthquake Spectra* Vol.19 No.4 pp 733-752 Nov.2003. mceer.buffalo.edu/research/resilience/Resilience%20Bibs.pdf

Disaster Research Centre, University of Delaware, *Disaster recovery, theory, practice and case studies*. <http://drc.udel.edu/>

Global Facility for Disaster Reduction and Recovery (GFDRR), World Bank, *Reconstruction planning, economic recovery, housing reconstruction* <https://www.gfdr.org/>

i-Rec information and research for reconstruction, University of Montreal, *International network*. www.grif.umontreal.ca/i-rec.htm

International Recovery Platform (IRP), *Recovery background and strategies*. www.recoveryplatform.org/

Jha, A., K., et al. (2010) *Safer Homes, Stronger Communities. A Handbook for Reconstructing after Natural Disasters*. Infrastructure and Services Delivery, pp.131-141. Washington DC: Global Facility for Disaster Reduction and Recovery (GFDRR), World Bank. www.preventionweb.net/files/12229_gfdr.pdf

Natural Hazards Center, University of Colorado at Boulder, *Studies of recovery and reconstruction; case histories*. www.colorado.edu/hazards/

Œuvre durable, University of Montreal, *Disaster resilience and sustainable reconstruction research alliance*. www.grif.umontreal.ca/observatoire/index_EN.html

Shelter Case Studies.org, *Initiative funded by the UN High Commission for Refugees, International Federation of Red Cross and Red Crescent Societies, and UN-Habitat*. www.ShelterCaseStudies.org

Twigg, J. (2009) *Characteristics of a Disaster Resilient Community. A Guidance Note*. Version 2. Nov. 2009 London: University College London <http://www.preventionweb.net/publications/view/2310>

UN-Habitat, *the lead agency within the United Nations system for coordinating activities in the field of human settlements*. <http://unhabitat.org/urban-themes/reconstruction/>

UNEP's guidelines for sustainable reconstruction (2012) were originally produced following the Indian Ocean tsunami but have been later updated into more generic guidelines. This integrates principles of 'building back safer' with the aim to shift buildings and structures to ones that mitigate the impacts of climate change

United Nations Environment Programme, *Post-crisis environmental recovery methods* www.unep.org/disastersandconflicts/

WHO. (2005) *Technical Notes for Emergencies*. Geneva: World Health Organization: http://www.who.int/water_sanitation_health/hygiene/envsan/technotes/en/index.html

World Bank. (2008) *World Bank Good Practice Note on Overall Reconstruction: Design, Implementation and Management*. Washington DC: World Bank <http://siteresources.worldbank.org/CHINAEXTN/>

World Bank. (2008) *World Bank Good Practice Note: General Considerations for Infrastructure Planning*. Washington DC: World Bank http://siteresources.worldbank.org/CHINAEXTN/Resources/318949-1217387111415/Infrastructure_Planning_en.pdf

Critical infrastructure

Lovell, E, and Mitchell, T. (2015) *Briefing Target 4. Disaster damage to critical infrastructure and basic service provision* P.1. London: ODI.

<http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9472.pdf>

PAHO. (2002) *Emergencies and Disasters in Drinking Water Supply and Sewerage Systems: Guidelines for Effective Response*. Washington. DC.: Pan-American Health Organization. [http://www.reliefweb.int/rw/lib.nsf/db900sid/LGEL-5S6BNE/\\$file/paho-sew-02.pdf?openelement](http://www.reliefweb.int/rw/lib.nsf/db900sid/LGEL-5S6BNE/$file/paho-sew-02.pdf?openelement)

A number of frameworks to assess infrastructure resilience and promote a systems approach to project identification, prioritisation and selection exist outside DRR ODI have recently released guidance on 'disaster damage to critical infrastructure and basic service' (ODI, 2015)

Roeger et al. (2014) developed a resilience matrix to enable policymakers to coordinate solutions across different domains and across the DRM cycle and Hughes and Healy (2014) recently developed a resilience assessment framework for New Zealand's Transport Authority

Montgomery et al. (2012) also developed for Halcrow, a toolkit called HalSTAR, which is a systems based approach to designing, constructing and maintaining infrastructure systems

Useful reports have been written on the 2010 Canterbury Earthquake, including the report by Miles et al. (2014) exploring the engineering, economic and social impacts of building back better decisions and a report by Ladbrook (2013) on the lessons learned from Christchurch around decision-making processes, organisational performance, technical learning, and regulation

Shelter, sheltering, housing and community infrastructure

(Reports marked * contain specific policy guidance, those marked ** contain general policy guidance based on reviews of recent evidence)

*AIDMI (2015) *Rebuilding Nepal by Implementing the Sendai Framework for Disaster Risk Reduction*. *Southasiadisasters.net* Issue No.134 July 2015

<http://www.evidenceaid.org/wp-content/uploads/2013/02/134-Snet-Rebuilding-Nepal.pdf>

Carter, B. (2015) *Lessons learned for national state entities for recovery and reconstruction*. (GSDRC Helpdesk Research Report 1254). Birmingham, UK: Governance and Social Development Resource Centre, University of Birmingham,

<http://r4d.dfid.gov.uk/Output/201743/>

*Da Silva, J. (2010) *Lessons from Aceh: Key Considerations in Post-Disaster Reconstruction* Rugby UK: Practical Action Publishing

<http://www.dec.org.uk/sites/default/files/pdf/lessons-from-aceh.pdf>

**Davis, I., (ed.) (2015) *Shelter after Disaster*. Second Edition, Geneva: International Federation of Red Cross Societies (IFRC). The UN OCHA and IFRC's Shelter After Disaster (2015) offers state-of-the-art guidance on all aspects of shelter provision.

http://www.ifrc.org/Global/Documents/Secretariat/201506/Shelter_After_Disaster_2nd_Edition.pdf

Davis, I., and Alexander, D. (2016) *Recovery from Disaster* Chapters 3 and 4: Models of Recovery pp 46-120 Abingdon: Routledge.

<https://www.routledge.com/products/9780415611770>

*Disaster Recovery Framework (2014) *Pakistan Earthquake 2005 The Case for Centralized Recovery Planning and Decentralized Implementation* Country Case Study Series Disaster Recovery Framework Guide Washington DC: World Bank

<http://reliefweb.int/report/pakistan/pakistan-earthquake-2005-case-centralized-recovery-planning-and-decentralized>

- Federal Emergency Management Agency (FEMA), (2000) *Rebuilding for a More Sustainable Future: An Operational Framework* Washington DC: FEMA www.fema.gov/media-library-data/20130726-1444.../fema365_1.txt
- GFDRR (2015) *Resilient Recovery: An Imperative for Sustainable Development*, Washington: The World Bank. <https://www.gfdr.org/sites/gfdr/files/publication/Resilient-Recovery-An-Imperative-for-Sustainable-Development.pdf>
- ** GFDRR (2015) *Guide to Developing Disaster Recovery Frameworks. Sendai Conference Version* Washington DC: Global Facility for Disaster Reduction and Recovery (GFDRR), World Bank Group and UNDP <https://www.gfdr.org/sites/gfdr/files/publication/DRF-Guide.pdf>
- *Global Shelter Cluster (2015) *Position Paper: Cash and Markets in the Shelter Sector*. Geneva: International Federation of Red Cross and Red Crescent Societies (IFRC) https://www.sheltercluster.org/.../gsc_position_paper_cash_and_markets
- Global Shelter Cluster (2014) *Shelter Case Studies. Shelter Projects 2013-14* Geneva: International Federation of Red Cross and Red Crescent Societies (IFRC) http://www.sheltercasestudies.org/shelterprojects2013-2014/Shelterprojects_2013-14_Lowres_WEB.pdf
- ** Gray, B. and Bayley, S. (2015) *Case Study: Shelter Innovation Ecosystem* London: DFID and UK Aid Network http://r4d.dfid.gov.uk/pdf/outputs/Hum_Response/Shelter-innovation-ecosystem_Case-study-MIHIS-project-FINAL
- Jha, A., K., et al. (2010) *Safer Homes, Stronger Communities. A Handbook for Reconstructing after Natural Disasters*. Infrastructure and Services Delivery, pp.131-141. Washington DC: Global Facility for Disaster Reduction and Recovery (GFDRR), World Bank. www.preventionweb.net/files/12229_gfdr.pdf
- International Federation of Red Cross and Red Crescent Societies (IFRC). *Global shelter cluster; shelters and settlements*. www.ifrc.org/what-we-do/disaster-management/responding/services-for-the-disaster-affected/shelter-and-settlement/
- * *Mughal, H. et al. (2015) *Learning from the Shelter Response and Rural Housing Recovery* Geneva: IOM and Shelter Cluster https://www.sheltercluster.org/.../shelter_in_recovery_kashmir_eq_2005
- *Nougaret, A. and Danuwar, R. (2016) *Housing, land and property issues in Nepal and their consequences for the post reconstruction process*. Kathmandu: CARE, Nepal http://www.recoveryplatform.org/assets/publication/NepalEarthquake2015/care_housing-land-property-issues-in-nepal_feb-2016.pdf
- *Oxfam International (2016) *Build back Right. Ensuring equity in land rights and reconstruction in Nepal* Kathmandu: Oxfam International <http://policy-practice.oxfam.org.uk/publications/building-back-right-ensuring-equality-in-land-rights-and-reconstruction-in-nepal-606028>
- **Sanderson, D. and Ramalingam, B. (2015) *Nepal Earthquake Response 2015 Lessons for Operational Agencies* London: ALNAP/ODI www.alnap.org/pool/files/nepal-earthquake-response-lessons-paper.pdf
- Shelter Cluster (2016) *Shelter Cluster: "Assist and Assess" Damage Assessment Form* Geneva: Shelter Cluster sheltercluster.org
- Shreya, S. (2015) 'How to rebuild after an earthquake like Nepal's' Interviews with Maggie Stephenson (UN-Habitat) and Bijay Kristna Upandhyay (National Centre for Earthquake Technology) *New York Times* 14 May 2015 <http://www.nytimes.com/interactive/2015/05/14/world/asia/nepal-rebuild-earthquake-tips.html>
- Spangle, W. and Associates. (1991) *Rebuilding after Earthquakes: Lessons from Planners*. Portola Valley, California: William Spangle and Associates
- **UNDP (2008) *Guidance Note on Early Recovery*, Cluster Working Group on Early Recovery, Geneva: Bureau for Crisis Prevention and Recovery, UNDP <http://www.undp.org/content/undp/en/home/librarypage/crisis-prevention-and-recovery/guidance-note-on-early-recovery-cwger-april-2008.html>

- **UNDP (2011) Methodological guide for post-disaster recovery planning processes: guidelines and actions for national, regional and local governments, Ginebra: UNDP. http://www.preventionweb.net/files/32306_32306quametodoljicaparaprosesdepl.pdf
- *UNISDR, (2015) *Sendai Framework for Disaster Risk Reduction 2015-2030* Geneva: United Nations Disaster Risk Reduction. <http://www.unisdr.org/we/inform/publications/43291>
- World Bank (2016) *Nepal – Rural Housing Reconstruction Overview* Washington. DC: World Bank Group <http://documents.worldbank.org/curated/en/2016/01/25835866.rural-housing-reconstruction-program-program-overview>

Enabling appropriate reconstruction

- Davis, I., and Alexander, D. (2016) *Recovery from Disaster*. Abingdon: Routledge. <https://www.routledge.com/products/9780415611770>
- Jha, A., K., et al. (2010) *Safer Homes, Stronger Communities. A Handbook for Reconstructing after Natural Disasters*. Infrastructure and Services Delivery, pp.131-141. Washington DC: Global Facility for Disaster Reduction and Recovery (GFDRR), World Bank. www.preventionweb.net/files/12229_gfdr.pdf
- ECHO (forthcoming 2016) *Guidelines on Shelter and Settlements*. DG ECHO Brussels: ECHO
- International Federation of Red Cross Societies (IFRC) (2014) Culture risk and the built environment, Chapter 5 pp.121-151, in *World Disasters Report: Focus on Culture and Risk*. Geneva: International Federation of Red Cross and Red Crescent Societies (IFRC) http://www.ifrc.org/Global/Photos/Asia%20Pacific/Pacific_SLCM_38thEd_Oct-Nov2013.pdf
- Krimgold, F. (2011) Disaster risk reduction and the evolution of physical development regulation. *Environmental Hazards* 10 (2011) 53-58
- Langenbach. R. (2009) Don't Tear It Down! Preserving the Earthquake Resistant Vernacular Architecture of Kashmir New Delhi: UNESCO. <http://www.traditional-is-modern.net>
- Lloyd-Jones, T. (ed.) (2009) *The Built Environment Professions in Disaster Risk Reduction and Response: A guide for humanitarian agencies*. London: Max Lock Centre, University of Westminster
- Kates, R.W. and Pijawka, K.D.1977. *From rubble to monument: the pace of reconstruction*. In Haas, J. E., Kates, R. W. and Bowden, M. J. (eds), *Reconstruction Following Disaster*. Cambridge, MA: MIT Press pp. 1-23

Key texts on enabling reconstruction to enhance resilience

- Ashmore, J., ed. 2013. *Shelter projects 2011-2012*. Geneva: International Federation of Red Cross and Red Crescent Societies, UN-Habitat and UN High Commission for Refugees
- Charlesworth, E., 2014. *Humanitarian architecture: fifteen stories of architects working after natural disasters*. Abingdon, UK: Routledge
- Charlesworth, E., and Ahmed, I., 2015. *Sustainable housing reconstruction: designing resilient housing after natural disasters*. Abingdon, UK: Routledge
- Da Silva, J., 2010. *Lessons from Aceh: key considerations in post-disaster reconstruction*. Rugby, UK: Practical Action Publishing**
- Davis, I., and Alexander, D. 2016 *Recovery from Disaster*. Abingdon, UK: Routledge
- Davis, I., ed., 2015. *Shelter after disaster, guidelines for assistance (Second edition)*. Geneva: UN Office for the Coordination of Humanitarian Affairs, UN-Habitat, and International Federation of Red Cross and Red Crescent Societies**
- ECHO 2016 (forthcoming) *Shelter and Settlement Guidelines* Lead Consultants: Ian Davis and Maggie Stephenson. Brussels: European Community Humanitarian Office (ECHO)**

- GFDRR, 2015 *Guide to Developing Disaster Recovery Frameworks Sendai Version* 2015. Washington DC: The Global Facility for Disaster Reduction and Recovery (GFDRR), World Bank
- GPCWG (2010) *Handbook for the Protection of Internally Displaced Persons*, Global Protection Cluster Working Group
- IASC (2010) *Framework on Durable Solutions for Internally Displaced Persons*, Inter-Agency Standing Committee, The Brookings Institution, University of Bern
- Jha, A., Duyne Barenstein, J., Phelps, P. M., Pittet, D., and Sena, S., 2010. *Safer homes, stronger communities: a handbook for reconstructing after natural disasters*. Washington, DC: Global Facility for Disaster Risk Reduction, World Bank.
- Lloyd-Jones, T. (ed.) 2009. *The Built Environment Professions in Disaster Risk Reduction and Response. A guide for humanitarian agencies*. London: Max Lock Centre, University of Westminster
- Schilderman, T., Lyons, M., and Boano, C., 2010. *Building back better: delivering people-centred housing reconstruction at scale*. Rugby, UK: Practical Action Publishing.
- Schilderman, T., and Parker, E., eds. 2014. *Still standing? Looking back at reconstruction and disaster risk reduction in housing*. Rugby, UK: Practical Action Publishing.
- Turnbull, M., Sterrett, C., and Hilleboe, A. 2013 *Toward Resilience. A Guide to Disaster Risk Reduction and Climate Change Adaptation* Rugby, UK: Practical Action Publishing
- UNDG 2004 UNDG Guidance Note on Durable Solutions for Displaced Persons (refugees, internally displaced persons and returnees), UNDGR Programme Group, New York
- UNISDR 2015 *Sendai Framework for Disaster Risk Reduction 2015-2030* Geneva: United Nations Strategy for Disaster Reduction (UNISDR)

Selected websites

- Disaster Research Centre, University of Delaware. *Disaster recovery, theory, practice and case studies*. <http://drc.udel.edu/>
- Global Facility for Disaster Reduction and Recovery, World Bank. *Reconstruction planning, economic recovery, housing reconstruction*. <https://www.gfdrr.org/>
- International Federation of Red Cross and Red Crescent Societies. *Global shelter cluster; shelters and settlements*. <http://www.ifrc.org/what-we-do/disaster-management/responding/services-for-the-disaster-affected/shelter-and-settlement/>
- International Recovery Platform. *Recovery background and strategies* <http://www.recoveryplatform.org/>
- i-Rec information and research for reconstruction, University of Montreal. *International network*. www.grif.umontreal.ca/i-rec
- œuvre durable, University of Montreal. *Disaster resilience and sustainable reconstruction research alliance*. http://www.grif.umontreal.ca/observatoire/index_EN
- Natural Hazards Center, University of Colorado at Boulder. *Studies of recovery and reconstruction; case histories*. <http://www.colorado.edu/hazards/>
- Shelter Case Studies.org. *UN High Commission for Refugees, International Federation of Red Cross and Red Crescent Societies, UN-Habitat*. <http://www.ShelterCaseStudies.org>
- UN-Habitat. *The lead agency within the United Nations system for coordinating activities in the field of human settlements*. <http://unhabitat.org/urban-themes/reconstruction/>
- United Nations Environment Programme. *Post-crisis environmental recovery methods*. <http://www.unep.org/disastersandconflicts/>

Annex 1 Existing disaster recovery frameworks

Disaster recovery framework proposed by Mary Commerio

Commerio, M. (1998) *Disaster Hits Home: New Policy for Urban Housing Recovery* Berkeley, California: University of California Press
peer.berkeley.edu/publications/peer.../webPEER-2013-01-Comerio.pdf

Commerio, M. (2014) Disaster Recovery and community renewal: housing approaches. *Cityscape*, 16 (2), 51-68

Disaster recovery framework proposed by Ian Davis and David Alexander

Davis, I. and Alexander, D. (2015) *Recovery from Disaster*. Abingdon: Routledge
<https://www.routledge.com/products/9780415611770>

Disaster recovery framework proposed by Eugene Hass, Robert Kates and Mark Bowden

Haas, J. E., Kates, R., Bowden, M. (eds) (1977) *Reconstruction following disaster* Cambridge, MA: MIT Press

Earthquake recovery framework proposed by William Spangle and Associates

Spangle, W. and Associates (1991) *Rebuilding after Earthquakes: Lessons from Planners* Portola Valley, California: William Spangle and Associates

FEMA recovery guidelines

FEMA, (2000) *Rebuilding for a More Sustainable Future: An Operational Framework*. Washington DC: US Federal Emergency Management Agency (FEMA)

FEMA, (2009) *Disaster Assistance. A Guide to Recovery Programs* Washington DC.: US Federal Emergency Management Agency -229 (FEMA) Homeland Security (DHS)
<https://www.fema.gov/media-library/assets/documents/6341>

UNISDR and IRP recovery framework

UNISDR and IRP (2015) *Guidance Notes on Recovery. Pre-Disaster Recovery Planning*. Geneva and Kobe: United Nations Office for Disaster Risk Reduction (UNISDR) and the International Recovery Platform (IRP). <http://www.recoveryplatform.org>

World Bank recovery framework

Jha, A., K., et al. (2010) *Safer Homes, Stronger Communities. A Handbook for Reconstructing after Natural Disasters*. Washington DC.: Global Facility for Disaster Reduction and Recovery (GFDRR), World Bank.
www.preventionweb.net/files/12229_gfdr.pdf

GFDRR, (2015) *Guide to Developing Disaster Recovery Frameworks Sendai Version 2015* Washington DC.: Global Facility for Disaster Reduction and Recovery (GFDRR), World Bank
www.gfdr.org/sites/default/files/publication/DRF-Guide.pdf

GFDRR, (2015) *Resilient Recovery: An Imperative for Sustainable Development. The Way Forward for Strengthening Recovery Systems and Integrating Disaster Risk Reduction into Post-Disaster Recovery* Washington DC.: World Bank, Global Facility for Disaster Reduction and Recovery (GFDRR). <https://www.gfdr.org/.../gfdr/.../Resilient-Recovery-An-Imperative-for-Sustainable-Development>

Sendai Framework for Disaster Risk Reduction 2015 - 2030



Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

32. The steady growth of disaster risk, including the increase of people and assets exposure, combined with the lessons learned from past disasters, indicates the need to further strengthen disaster preparedness for response, take action in anticipation of events, integrate disaster risk reduction in response preparedness and ensure that capacities are in place for effective response and recovery at all levels. Empowering women and persons with disabilities to publicly lead and promote gender equitable and universally accessible response, recovery, rehabilitation and reconstruction approaches is key. Disasters have demonstrated that the recovery, rehabilitation and reconstruction phase, which needs to be prepared ahead of a disaster, is a critical opportunity to "Build Back Better", including through integrating disaster risk reduction into development measures, making nations and communities resilient to disasters.

National and local levels

33. To achieve this, it is important:

- (a) To prepare or review and periodically update disaster preparedness and contingency policies, plans and programmes with the involvement of the relevant institutions, considering climate change scenarios and their impact on disaster risk, and facilitating, as appropriate, the participation of all sectors and relevant stakeholders;
- (b) To invest in, develop, maintain and strengthen people-centred multi-hazard, multisectoral forecasting and early warning systems, disaster risk and emergency communications mechanisms, social technologies and hazard-monitoring telecommunications systems; develop such systems through a participatory process; tailor them to the needs of users, including social and cultural requirements, in particular gender; promote the application of simple and low-cost early warning equipment and facilities; and broaden release channels for natural disaster early warning information;
- (c) To promote the resilience of new and existing critical infrastructure, including water, transportation and telecommunications infrastructure, educational facilities, hospitals and other health facilities, to ensure that they remain safe, effective and operational during and after disasters in order to provide life-saving and essential services;
- (d) To establish community centres for the promotion of public awareness and the stockpiling of necessary materials to implement rescue and relief activities;
- (e) To adopt public policies and actions that support the role of public service workers to establish or strengthen coordination and funding mechanisms and procedures for relief assistance and plan and prepare for post-disaster recovery and reconstruction;
- (f) To train the existing workforce and voluntary workers in disaster response and strengthen technical and logistical capacities to ensure better response in emergencies;
- (g) To ensure the continuity of operations and planning, including social and economic recovery, and the provision of basic services in the post-disaster phase;
- (h) To promote regular disaster preparedness, response and recovery exercises, including evacuation drills, training and the establishment of area-based support systems, with a view to ensuring rapid and effective response to disasters and related displacement, including access to safe shelter, essential food and non-food relief supplies, as appropriate to local needs;
- (i) To promote the cooperation of diverse institutions, multiple authorities and related stakeholders at all levels, including affected communities and business, in view of the complex and costly nature of post-disaster reconstruction, under the coordination of national authorities;
- (j) To promote the incorporation of disaster risk management into post-disaster recovery and rehabilitation processes, facilitate the link between relief, rehabilitation and development, use opportunities during the recovery phase to develop capacities that reduce disaster risk in the short, medium and long term, including through the development of measures

such as land-use planning, structural standards improvement and the sharing of expertise, knowledge, post-disaster reviews and lessons learned and integrate post-disaster reconstruction into the economic and social sustainable development of affected areas. This should also apply to temporary settlements for persons displaced by disasters:

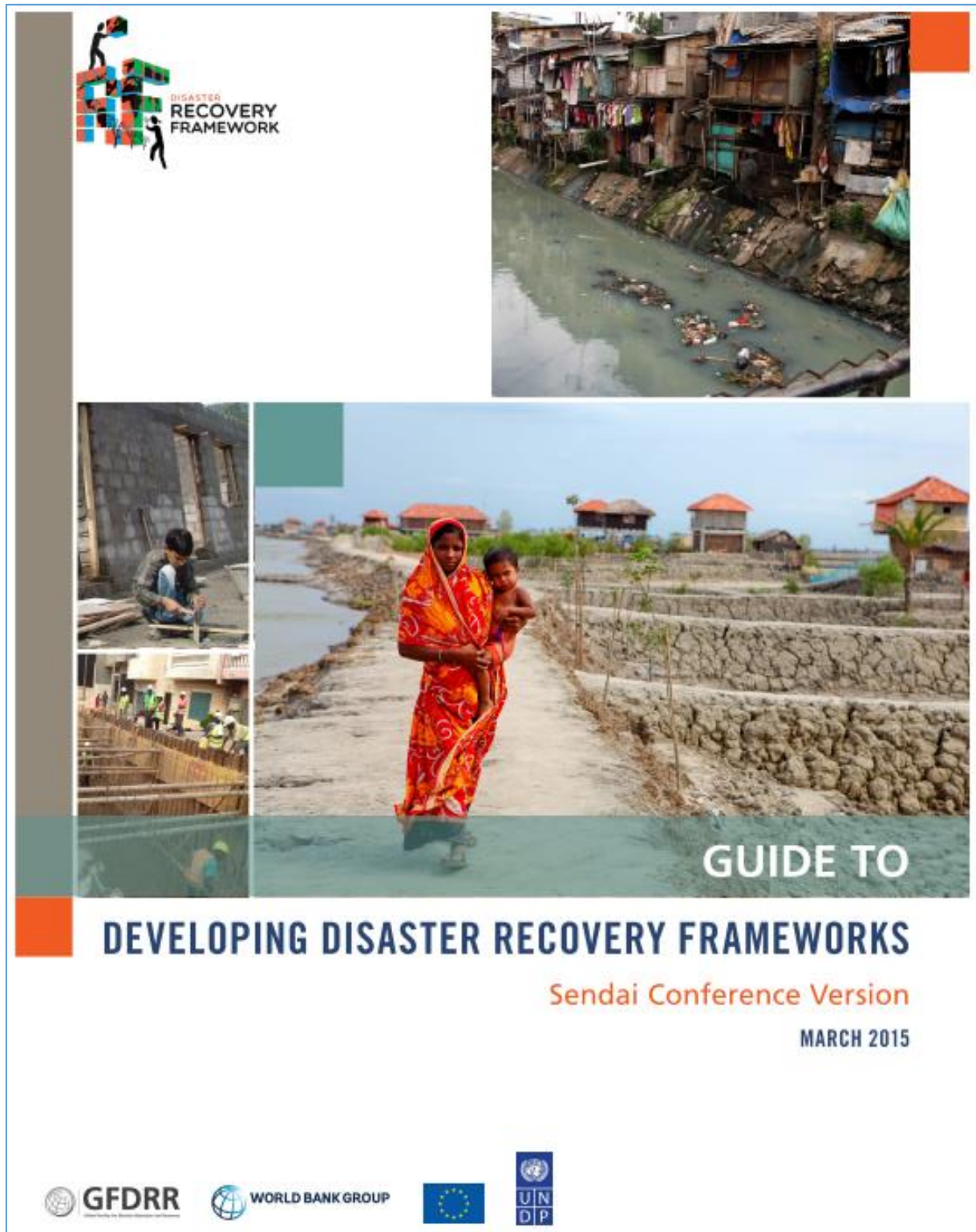
- (k) To develop guidance for preparedness for disaster reconstruction, such as on land-use planning and structural standards improvement, including by learning from the recovery and reconstruction programmes over the decade since the adoption of the Hyogo Framework for Action, and exchanging experiences, knowledge and lessons learned;
- (l) To consider the relocation of public facilities and infrastructures to areas outside the risk range, wherever possible, in the post-disaster reconstruction process, in consultation with the people concerned, as appropriate;
- (m) To strengthen the capacity of local authorities to evacuate persons living in disaster-prone areas;
- (n) To establish a mechanism of case registry and a database of mortality caused by disaster in order to improve the prevention of morbidity and mortality;
- (o) To enhance recovery schemes to provide psychosocial support and mental health services for all people in need;
- (p) To review and strengthen, as appropriate, national laws and procedures on international cooperation, based on the Guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance.

Global and regional levels

34. To achieve this, it is important:

- (a) To develop and strengthen, as appropriate, coordinated regional approaches and operational mechanisms to prepare for and ensure rapid and effective disaster response in situations that exceed national coping capacities;
- (b) To promote the further development and dissemination of instruments, such as standards, codes, operational guides and other guidance instruments, to support coordinated action in disaster preparedness and response and facilitate information sharing on lessons learned and best practices for policy practice and post-disaster reconstruction programmes;
- (c) To promote the further development of and investment in effective, nationally compatible, regional multi-hazard early warning mechanisms, where relevant, in line with the Global Framework for Climate Services, and facilitate the sharing and exchange of information across all countries;
- (d) To enhance international mechanisms, such as the International Recovery Platform, for the sharing of experience and learning among countries and all relevant stakeholders;
- (e) To support, as appropriate, the efforts of relevant United Nations entities to strengthen and implement global mechanisms on hydrometeorological issues in order to raise awareness and improve understanding of water-related disaster risks and their impact on society, and advance strategies for disaster risk reduction upon the request of States;
- (f) To support regional cooperation to deal with disaster preparedness, including through common exercises and drills;
- (g) To promote regional protocols to facilitate the sharing of response capacities and resources during and after disasters;
- (h) To train the existing workforce and volunteers in disaster response.

Annex 3 Guide to development disaster recovery frameworks (GFDRR 2015)



CONTENTS

■ Disaster Recovery Framework Process Flowchart	vi	Auditing and Monitoring, Oversight Checklist	47 48
■ Note To Policy Makers	viii	■ Module 5. Implementation Arrangements and Recovery Management	49
How Can Policy Makers Use the Guide?	viii	Coordination Mechanisms	49
Key Considerations for the Policy Makers in the Recovery Process	viii	Standard Implementation Mechanisms	50
■ Introduction	1	Establish Reconstruction Standards	50
Why Disaster Recovery Frameworks?	1	Decentralize Implementation	51
What Does the DRF Guide Do?	2	Monitoring and Evaluation	51
DRF Guide Objectives	2	Procurement	53
How Is the DRF Guide Used?	2	Communication Strategy for Recovery	55
■ MODULE 1. CONDUCTING POST-DISASTER DAMAGE AND NEEDS ASSESSMENT	5	Promoting Transparency in Recovery	56
Checklist	9	Checklist	57
■ Module 2. Policy and Strategy Setting for Recovery	11	■ Module 6. Strengthening Recovery Systems in National and Local Governments	59
Development of a Central Vision for Recovery	11	Develop Capacity to Implement Disaster Assessments	59
Policy Frameworks for Recovery	12	Preparing Recovery Frameworks Prior to a Disaster Improves Resilience	60
Programmatic Framework for Recovery	14	Predictable Financing	61
Intersectoral Prioritization	17	■ Common Good Practices and Lessons Identified	65
Setting up Sector-Level Recovery	18	Recap of Country Case Studies under the Recovery Framework Guide Initiative	65
Disaster Recovery in Conflict Contexts	21	Lessons Learned Provide Options for Policy Action on Recovery	65
Checklist	22	Key Lessons from the Recovery Framework Case Studies	66
■ Module 3. Institutional Framework for Recovery	25	■ Annex I: Integrated Results Framework for Recovery Planning	71
Ensuring Continuity from Humanitarian Response to Recovery	25	■ Annex II: Sector Recovery Planning From the National Disaster Recovery Framework, India	75
Who Will Manage Recovery?	26	■ Glossary	80
Selecting an Effective Lead Agency	27	■ Selected Bibliography	85
Appointing an Effective Recovery Leader	30	■ Figures	
Creating a Legal Institutional Mandate for Post-Disaster Land Use Planning	31	1.1 PDNA and DRF Relationship	8
Staffing for Recovery	32	2.1 Recovery Planning Processes	11
Ensuring Community Participation	34	4.1 Global View of Post-Disaster Financing	40
Role of Private Sector	35	4.2 Key Elements of Recovery Financing	40
Government Coordination and Local Implementation	36	4.3 Overlap between Public and Private Funding	41
Roles of International Agencies and Development Partners	37	4.4 Timeframe for Use of Allocated Resources	44
Checklist	38	6.1 Risk Layering of Disaster Risk Financing Options	62
■ Module 4. Financing for Recovery	39	■ Table	
Post Disaster Budget Review	41	3.1 Pros and Cons of Recovery-Specific and Planning Agencies' Participation in Recovery	29
Disaster Assessments for Resource Mobilization	42		
Resource Mobilization	42		
Coordination and Allocation of Financial Resources	44		
Public Financial Management Systems	45		