Measuring Recovery: Signposts to Good Practice

A review of tools, frameworks and practices for measuring recovery in the built environment following disaster

Laura Howlett & John Twigg

Correspondence lauraehowlett@gmail.com *or* j.twigg@ucl.ac.uk

Acknowledgements

We are grateful to the Institution of Structural Engineers' Earthquake Engineering Field Investigation Team (EEFIT) for providing funding for this piece of work.

We would also like to thank the following for assisting with sourcing the materials reviewed:

Carlos Molina Hutt, Aaron Opdyke, Denis Heidebroek, Megan Passey, Fatimah Arefian, Jamie Richardson, Siddharth Nadkarny, Giulia Sala

Introduction

Our knowledge of post-disaster recovery processes and the impact of reconstruction interventions is still relatively limited, beyond the short term. There is little agreement on how to measure success in reconstruction and recovery programmes, nor on where to identify an 'end-point' in recovery. Many recent disasters have been urban; but understanding about the distinctive features of urban recovery has also been slow to develop.

In recent years, there has been renewed academic and practitioner interest in frameworks and models for measuring progress in reconstruction and recovery.[1] Post-disaster follow-up surveys and evaluations also provide examples of how recovery assessment can be carried out.[2] However, humanitarian agencies, evaluators and even academic researchers are often unaware of the range of measurement approaches and tools available to them; nor do they necessarily know which approaches work best in particular circumstances.

The project builds on a 2-day workshop, 'Measuring Recovery', held at University College London in April 2016, which was organized by UCL's Earthquake and People Interaction Centre (EPICentre). This brought together researchers and practitioners from different countries and disciplines to examine strengths, weaknesses and gaps in this field and make recommendations for improving recovery assessment.

This project has attempted to identify and describe some of the key effective methods and tools currently available for measuring and assessing post-disaster recovery in the built environment (shelter and local infrastructure), as well as the resources, capacities and skills needed to use them effectively. v

The report is intended to benefit EEFIT's membership and other disaster practitioners by providing an analysis of existing tools and literature and thereby helping them to select appropriate methodologies for monitoring reconstruction and recovery, and also by providing a basis for further research and methodology development. Responses, suggestions and feedback are welcomed. We would also welcome information on resources we may have missed, and on new (or improved) guidance and experiences that appear in the future.

Where possible, we have provided hypertext links to the documents discussed in the following pages; other material reviewed here is either unavailable online or, in the case of some journal articles, only available on payment.

[1] e.g. Chang SE, Urban Disaster Recovery: a measurement framework and its application to the 1995 Kobe earthquake. *Disasters* 34(2): 303-327 (2010); Cheng S, et al., Measuring Disaster Recovery: bouncing back or reaching the counterfactual state? *Disasters* 39(3): 427-446 (2015); Dwyer C, Horney J, Validating Indicators of Disaster Recovery with Qualitative Research. *PLOS Currents Disasters* (16 Dec. 2014); GFDRR, *Guide to Developing Disaster Recovery Frameworks*. Washington DC: The World Bank, Global Facility for Disaster Reduction and Recovery (2015); Brown D, et al., *Disaster Recovery Indicators: guidelines for monitoring and evaluation*. Cambridge: Cambridge University Centre for Risk in the Built Environment (2010).

[2] e.g. Pomonis A, et al., Recovery Two Years after the 2011 Tohoku Earthquake and Tsunami: a return mission report by EEFIT. London: EEFIT (2013)

Methodology

The authors relied on crowd-sourced gathering of resources, and made their own searches. We engaged with practitioners and researchers in the humanitarian shelter and settlements sector (principally through the UK Shelter Forum[3]), describing the objective of the project, and the intended output. They were requested to identify and/or send materials to be considered for inclusion in this report. We then followed up with individuals on a one-to-one basis to secure additional details or access to materials not yet in the public domain. We also carried out our own search, online and using the ALNAP[4] and Shelter Centre[5] resource libraries.

The resource gathering exercise generated 48 documents for consideration, of which 37 were reviewed in depth. Those that were not reviewed in depth were documents that were superseded by later or more complete, or were of little relevance to the study due to their focus on early response. Of those reviewed in depth, a shortlist of 23 resources included here was drawn up. These were selected on the basis of their specific relevance to reconstruction and recovery or the shelter sector, the depth of the monitoring guidance presented and its application in a humanitarian setting, contribution to wider discussions, accessibility of the resource and practical applicability in the field.

We acknowledge that we will inevitably have missed some key resources, and may have made some disputed selections. We welcome feedback and suggestions to inform later editions of this compilation.

Selected resources were categorised by their typology; see table below:

Tools Tools are stand-alone methods for gathering data on specified themes. Tools may contribute to frameworks and be referenced in practitioner guides.	**Frameworks** Provide a set of principles on which to undertake evaluations or assessments and may include one or more tools and assessment templates.
Guides Distinct from frameworks as they endeavour to give practical suggestions about how the activities should be delivered. Includes significant reference books.	**Papers & reports** Include academic journal articles, articles in non-peer-reviewed publications and agency-published evaluations and programme reports.

[3] UK Shelter Forum is a community of practice to share knowledge regarding humanitarian shelter and settlement. See http://www.shelterforum.info/

[4] ALNAP (the Active Learning Network for Accountability and Performance in Humanitarian Action) is dedicated to improving humanitarian performance through increased learning and accountability. See http://www.alnap.org/who-we-are/our-role for further details

[5] Shelter Centre is a is non-operational humanitarian NGO which works to support all humanitarian stakeholders involved in the shelter of populations affected by conflict and natural disaster. See http://sheltercentre.org/

Selected Resources

Frameworks

1. Quantifying Sustainability in the Aftermath of Natural Disaster (QSAND)

(BRE, 2014)

Description

The QSAND tool is specifically designed to allow reconstruction programmes and projects to be self-assessed on sustainability indicators following natural disasters. QSAND comprises a pair of self-assessment tools, the Pre-Assessment Tool (PAT) and the Core Assessment Tool (CAT). The PAT may be used during the emergency and early recovery phases as it is intended to help identify the key issues of sustainability that may arise and ensure that decisions are taken that promote sustainability. The CAT is the main part of the QSAND framework, and intended for use during and after the recovery and reconstruction phases, aimed at supporting the establishment of a sustainable built environment. QSAND incorporates a broad spectrum of definitions of sustainability, grouping indicators into 8 categories. The CAT is a 4-step process which first defines the issues relevant to the project for assessment, then prioritises them, then takes the assessor through the assessment process, then allows the score to be calculated overall and against the 8 categories of sustainability,

Applications

QSAND is an extensive framework which can be tailored to suit the issues most relevant to a programme, with all the tools for self-assessment provided. It can be adapted for use at all levels of response due to the relevance of the scoring process and the self-assessment approach. Data gathering is primarily performed through key informant interviews, document reviews and needs assessment outcomes (for the PAT). This means that it is not significantly demanding of operations staff time, except for the assessor, and does not require extensive resources and field deployment.

Considerations

QSAND is fairly complex: it would be a difficult task for a practitioner to complete without having first undertaken training, either the online training or face-to-face. QSAND has a very specific 'lens' on recovery and reconstruction, as with many of the resources here.

2. (Re)Settlement toolkit

ARUP ID, forthcoming 2017 (NB the (Re)Settlement Toolkit is in development with completion expected at the end of 2017; see overview document (Gryc & Nadkarny, 2016)

Description

The (Re)Settlement toolkit is designed around 4 key tools aimed at providing 'development and humanitarian organisations with tools to select, appraise, and plan sites for unsettled people … and create resilient communities that thrive in their new neighbourhoods'. It sets out 250 'factors' for consideration when planning (re)settlement sites, each of which could be considered as monitoring criteria. It is designed to produce detailed data on which decision-making processes may be based, along with communications and advocacy with beneficiary groups and populations as well as other key stakeholder entities.

Applications

At the time of publication, this toolkit was not yet available; however the draft framework documents recently presented at the UK Shelter Forum show promise that it may fill a clear gap for a bespoke framework specifically focusing on post-disaster reconstruction.

Considerations

May require staff to be trained in usage – uncertain until publication.

3. ASPIRE

(ARUP ID, 2014)

Description

A Sustainable Poverty and Infrastructure Routine for Evaluation (ASPIRE) is a downloadable software-based tool for assessing the sustainability of infrastructure, taking special consideration of poverty reduction. The framework for the assessment is organised by 4 key dimensions: environment, society, economies and institutions, which are sub-divided into 29 themes and 96 sub-themes. The sub-themes may be considered the indicators. The software allows data to be inputted against best-case and worst-case scenarios for each indicator, with a narrative note to provide justification, which may be drawn from a wide range of sources, stakeholders and methodologies.

Applications

ASPIRE essentially is a means to consolidate existing data from a variety of sources into a neat visual representation of current sustainability using a traffic-light coded grid wheel. The framework may be used for gap analysis and commissioning of projects, and to provide a way to bring together monitoring and evaluation data into a communications-friendly format, as well as signposting for project managers where greater attention needs to be paid in implementation. Though it is not intended for use in a disaster response setting, an experienced user would be capable of utilising existing data to generate an overview relatively rapidly.

Considerations

The tool relies on data already gathered and although data inputting is fairly simple, it may be time consuming, and would most likely need to be implemented by someone who has been trained in its use, or is at least familiar with it and not using it for the first time in the field. Because of the form of data input used, it is possible for the tool to be used with a high degree of subjectivity, and rigorous data collection methodology needs to support it to ensure this is avoided. A free trial version of the software is downloadable from the ARUP website, valid for 30 days; thereafter a variety of options from monthly rentals to annual subscription options are available.

4. REDi Rating System: Resilience-based Earthquake Design Initiative for the Next Generation of Buildings

(ARUP, 2013)

Description

REDi is a framework for assessing the level of resilience designed into buildings and the organisational preparedness of entities using them to withstand the effects of earthquakes. It focuses mainly on engineering and architectural specifications, alongside organisational resilience features, and utilises a three-tiered ratings system assessed against a ‘design level earthquake’, defined as an earthquake event that would have a probability of occurrence of around once in 50 years, based on the best possible data available.

Applications

Particularly useful for non-specialist practitioners who find themselves dealing with post-earthquake reconstruction, as it is capable of acting as a prompt to ensure that specialist technical considerations are included.

Considerations

Designed for use only in post-earthquake reconstruction. An experienced practitioner may be able to adapt the principles of the rating system against other recurring hazard events, but this would require significant effort to achieve.

Tools

5. SHERPA

(UN HABITAT, 2017)

Description

The Sustainable Habitat Evaluation Rating and Participative Approach (SHERPA) tool is a web-based application available for mobile devices which is intended as sustainability self-assessment tool for shelter and settlement development projects. Designed to be used from the project design phase and throughout implementation, the tool assesses sustainability laterally across concepts of Environmental, Economic, Social and Cultural sustainability, and vertically from household through neighbourhood to territory levels; and it also assesses processes. It combines quantitative and qualitative criteria, including some which are intended as common-sense prompts, especially useful for those working under time or resource pressures. Certain criteria are designated 'killers': if the programme fails to meet them, it will probably fail to deliver sustainable outcomes.

Applications

SHERPA requires no prior training (though familiarity with the app and the concepts it relies on will speed up implementation) and tasks can be split between team members to assess different aspects. It can be used as a planning tool and throughout programme delivery and evaluation. It requires little additional human resources and so does not risk generating survey fatigue amongst community members.

Considerations

SHERPA is not intended as a post-disaster tool, but it is intended to be adaptable. It evaluates programmes through a very specific lens of sustainability and therefore may not match organisational priorities, even though sustainability is a dimension of recovery.(N.B. At the time of writing CRAterre were embarking on Beta testing of the tool with selected partners, and expected to publish the tool free of charge by the end of 2017 – see www.unhabitat.org/sherpa for updates).

6. Advanced Indicators in Disaster Risk Reduction and Response

(Habitat for Humanity International, 2017)

Description

Forming part of Habitat for Humanity's overall monitoring and evaluation of its disaster risk reduction and response programmes, the *Advanced Indicators* are intended as a self-assessment tool to measure project and programme outcomes and impact. Programmes are assessed against three headline 'indicators' of Disaster Response, Recovery (Early and Long-term) and Risk Reduction. They can be used at intervals during recovery programmes to assess beneficiaries' own experience of recovery. Each 'Indicator' has a number of categories of assessment (11 in total across the three 'indicators'), which are broken down into a total of 87 'items'. These items are essentially questions for household level surveys, with data gathered using a Likert scale[6].

Applications

Can be used to engineer a pre-disaster baseline where none exists, by getting respondents to answer a number of the questions based on their experience prior to the disaster. The Likert methodology is simple and surveyors can be trained rapidly to use it effectively. The tool can be easily digitised for use on Kobo or other platforms.

[6] The Likert Scale is a scale (typically 5 to 7 points), used to represent people's attitudes to a topic and often in the form of 'Agree totally' to 'Disagree totally' with a given statement and sometimes simplified to pictures.

Considerations

This tool procures highly subjective data at the household level; however, it should be able to reveal trends across beneficiary groups on their own perception of recovery. Data should be cross-referenced with other data sources, including technical assessments. At the time of writing, HFHI were still finalising the Advanced Indicators for internal roll-out at the end of 2017. Publication of the Indicators was not yet confirmed, however permission to include them in this publication was granted. Interested parties should request further details from HFHI.

Practitioner Guides

7. Disaster recovery Indicators: guidelines for monitoring and evaluation

(Brown, Platt, & Bevington, 2010)

Description

Focusing on 'available data' such as remote imagery, internet-sourced statistics, and field survey techniques, this guide proposes 13 core indicators grouped into 6 categories. Indicators are focused on observable physical structures or tangible services represented by them. The intention is that the practitioner would choose from the 13 available indicators according to what is relevant to the response/recovery and what they are able to measure against. The guidance is intended to be useful across all disaster typologies, although both of the case studies in which the indicators were piloted were natural hazards (flood and earthquake). The document introduces each indicator with a rationale for its inclusion, along with the methodology for assessment: in most cases this involves intersecting remote imagery with field observations.

Applications

The Framework is simple and clear, and capable of being used at all levels of a response where resources allow, from single-agency projects to multi-agency reviews across large geographic areas. It has the potential to deliver long-term impact analysis without risking over-burdening communities through agency surveying, due to the remote nature of primary data-gathering.

Considerations

It relies on access to remote imagery and satellite data, coupled with extensive initial field team deployment for verification and household surveys. This may be beyond the resource allowances of smaller agencies.

8. Disaster Recovery Toolkit

(Tsunami Global Lessons Learned Project, 2015)

Description

This extensive toolkit includes a handbook, training manual and 4 guidance notes on facilities, housing, land Use and livelihoods. The handbook is the key document for practitioners undertaking monitoring of recovery and reconstruction programmes. It is structured around guiding principles of recovery and reconstruction through cross-cutting issues (such as gender, empowerment, social protection, stakeholders, valuation and environment) within 6 core themes of the programme cycle (institutional set-up; planning and implementation; mobilising and managing financial resources; coordination and communication; information management, monitoring and evaluation; from recovery to development). Section 5 (Information Management, Monitoring and Evaluation) identifies the need for monitoring and evaluation (M&E) and discusses the constraints that may be encountered. It then provides guidance on developing the M&E system, including selection of indicators and data collection methodologies.

Applications

This Guide provides comprehensive guidance for practitioners at all levels of operation and the accompanying training resources and supplementary materials mean that it can be used to train staff unfamiliar with monitoring projects.

Considerations

The M&E guidance is wide-ranging and practical; some is generic, some more specific to recovery. As with other larger resources, prior familiarity or training may be necessary to fully utilise, however familiarity with the concepts of M&E will speed up the process

9. Safer Homes, Stronger Communities

(GFDRR, 2010)

Description

This is an extensive guide for policy makers and programme leads engaged in large-scale reconstruction programmes. Using case studies throughout, the guide covers assessment, planning, implementation and monitoring phases of programme delivery, and includes technical recommendations and resource guidance. Part 2 focuses on monitoring and includes 'How to Do It' primers on GIS data gathering, social audit and impact evaluation. Starting with information gathering, data management, and information technology solutions, it then proceeds to detail the guiding principles of monitoring and evaluation and the key decisions needed in relation to a reconstruction monitoring plan. It makes recommendations on the kind of monitoring that agencies should undertake and the kinds of questions to be answered depending on their level of operation (e.g. national v project-specific) and proposes data sources appropriate to these. Finally, the guide discusses risks and challenges of monitoring and evaluation of reconstruction and makes key recommendations.

Applications

This is the only guide focused on reconstruction and recovery to include such extensive guidance on monitoring without a specific 'lens' being applied (such as sustainability). The guide provides some tools, exemplars and case studies to illustrate good practice. It stands as an excellent single point of reference for reconstruction and recovery programmes.

Considerations

Familiarity with the material is a bonus, as the document is a substantial read at 407 pages.

10. Contribution to Change: An Approach to evaluating the role of intervention in disaster recovery

(Few, McAvoy, Tarazona, & Walden, 2014)

Description

This book attempts to overcome a specific challenge that all programme and project monitoring and evaluation frameworks face: that of evidencing the contribution that an intervention has made to the observed changes, outcomes and impacts. The guide aims to provide practical advice for programme design monitoring and evaluation practitioners to evaluate humanitarian interventions and assess recovery in such a way as to be able to provide evidence.

Applications

The guide is organised into 3 parts. The first is an overview of the components of the *Contribution to Change* approach. The second is an extensive data collection guide, while the third focuses on data analysis and presentation. Each section is highly detailed and includes examples of questionnaires, qualitative data gathering methodologies and advice on working with affected communities. This is a must-have guide for practitioners responsible for monitoring recovery and reconstruction.

Considerations

Practitioners should aim to be familiar with the guide prior to deployment, and use it as a reference as it is a substantial publication.

11. Shelter After Disaster 2nd Edition

(Davis, 2015)

Description

This classic resource presents a thorough overview of the issues and considerations of all types of traditional shelter intervention, and also includes non-physical interventions such as supporting hosting and renting, land tenure and micro-loan interventions. It does not provide specific guidance on monitoring of recovery or reconstruction, but stands as a guide on best practice and how to avoid common pitfalls.

Applications

Each chapter section offers where possible a list of suggested intervention modalities and associated key considerations, along with policy advice on the theme under discussion. This is a core reference for any field practitioner.

Considerations

Although this is a hefty read, practitioners should aim to be familiar with the concepts prior to a deployment and use the book as a reference. Some emerging intervention modalities are missing, such as cash and support for self-recovery.

12. Guide to developing Disaster Recovery Frameworks (DRF) Sendai Conference Version

(GFDRR, 2015)

Description

The intended audience for this guide is governments and other implementation stakeholders or government partners, and it is intended to be practice-based and results-focused. The aims are to inform policy, ensure inclusive and resilient recovery, increase the likelihood of sustainable development outcomes from recovery processes, enhance co-ordination and provide mechanisms for monitoring reconstruction. The guide is arranged into 6 modules, each with their own results matrices, with actions denoted by icons signifying whether they are for communications, financing, implementation, institutions or policy purposes. The results focus on framework development outcomes rather than the outcomes of recovery processes themselves.

Applications

The guide provides excellent background reading for field-level practitioners to understand the contexts in which they may be operating, and module 5's (implementation arrangements and recovery management), M&E section provides practical guidance on the core steps of developing a recovery monitoring system for field-level practitioners. Throughout the guide, the implementation icons are a good signal for other implementation actions.

Considerations

The guide's intended audience is those acting at high-level with significant influence on policy and strategy, such as cluster leads and governmental recovery planners.

13. Guidance Note: National Post-Disaster Recovery Planning and Coordination

(UNDP, 2016)

Description

The objective of this guidance is to provide UNDP country offices with advice on how to support the design and implementation of national-level disaster recovery initiatives that will strengthen government capacities to enable them to take the lead as the recovery effort progresses short to long term. It draws on the recent experiences of UNDP country offices in Bangladesh, Chile, Dominican Republic, Haiti, Indonesia, Maldives, Pakistan, Philippines and Tajikistan.

Applications

The guide is structured in 2 parts. Part A focuses on how UNDP country offices can support government entities. Complemented by the Disaster Recovery Framework document (GFDRR, 2015), this section details the role that UNDP country teams can play in supporting governments with overwhelmed capacities, including aiding the design of national data tracking systems. Part B focuses on UNDP internal management, mindful that country team staff will likely have been affected by the disaster event. The third chapter of Part B covers project design monitoring and evaluation for recovery projects and proposes some outputs, indicators and activities that facilitate recovery. The Annex section also contains a detailed logframe-like 'Results and Resources Framework'.

Considerations

Generally, the document is targeted at UNDP country team leads, and aims to guide strategic-level intervention to support the development of recovery.

14. An integrated approach to disaster recovery: A toolkit on cross-cutting issues

(UNDP, 2008)

Description

Despite its name, this document is more of a guidance note than a tool per se. It aims to show practitioners how to ensure that cross-cutting issues are not drowned out in the relief and recovery phases following disaster. Based on the experiences of the UNDP Sri Lanka Country Office in the response to the 2004 Indian Ocean tsunami, the observation was made that all too often, cross cutting issues that are core themes for a variety of agencies in their country programming (e.g. conflict sensitivity, gender, rights-based approaches, disaster risk mitigation) are often side-lined in crisis response and recovery situations.

Applications

The document is essentially a comprehensive list of lessons identified following implementation of livelihoods, housing and settlements, and capacity building programmes, and a checklist of considerations, recommendations and pitfalls to avoid.

Considerations

A list of 'indicators' concludes each section: these are focused on the management of the project, rather than being recovery indicators themselves.

15. Methodological Guide for Post-Disaster Recovery Planning Processes: Guidelines and actions for national, regional and local governments

(UNDP, 2011)

Description

This Guide is aimed at policy makers in local, regional and national levels of government, and community stakeholders, both private and public. Focussing primarily on preparedness measures, it refers to monitoring only in stating that indicators should be developed as part of the planning process. Provides guidance on developing a framework for action for post-disaster recovery which includes operational guides and information management systems.

Applications

The document breaks down key objectives into concise tables of actions including issues to be considered, information required and methodologies to be used, as well as the results expected. These may be used to organise a workplan for the overall planning process.

Considerations

Document published as a 'document for discussion', however the authors were unable to source follow-up materials.

Papers and reports

16. Measuring disaster recovery: bouncing back or reaching the counterfactual state?

(Cheng, Ganapati, & Ganapati, 2015)

Description

This paper discusses whether recovery should be measured by the extent to which normalcy is regained following disaster (bouncing back) or by having achieved a state which would have existed had the disaster not occurred (counterfactual). It argues that the former approach tends to focus on localised effects of disaster and does not consider external factors influencing recovery, while the latter adopts a broader view, leading to very different recovery outcomes. The paper then discusses the policy implications of these two approaches for housing recovery and challenges assumptions around whether urban or rural areas are more vulnerable to decline following disaster. The paper stands in contrast with many of the other resources identified here, because it sees recovery only as a return to a familiar state, rather than the improved state that many of the sustainability tools and 'Build Back Better' approaches tend to strive for.

Applications

The paper's main application is to provoke further thinking into what the goal of recovery is and to consider how the theory of change will differ depending on your definition of what a 'recovered' community will look like.

Considerations

The paper is somewhat inconclusive, however, because the two approaches studied appear to generate conflicting outcomes. Taking the 'bouncing back' approach seems to generate evidence of further decline in the housing sector following disaster, whereas the 'counterfactual' approach suggests that growth trajectories in the housing sector kept pace with the mapped countries.

17. Measuring resilience and recovery

(Platt, Brown, & Hughes, 2016)

Description

This paper supports the CURBE guide *Disaster Recovery Indicators* (resource no. 7 above), provides an overview of the methodologies for measuring recovery and resilience, and compares the results. The paper serves as a quick reference guide to how remote sensing data can be used to measure the speed and quality of recovery when triangulated with social audits and published data, but cautions that measuring resilience is a greater challenge and can only be achieved in relative terms using these methodologies.

18. Typhoon Haiyan (Yolanda) Shelter Response Outcome Assessment

REACH 2016, Shelter Cluster/IFRC

Description

The report details the findings of an inter-agency review of shelter programme outcomes. Utilising agencies' own data cross-referenced with new primary data collected on a field visit in March 2015, the paper provides a detailed methodology for data collection and analysis. The annexes provide examples of surveys used and data processing examples.

Applications

Practitioners may borrow the templates from the annexes and adapt them to suit their monitoring needs, so long as they carefully consider their own monitoring/evaluation key questions first.

Considerations

The paper focuses on shelter recovery at the household level and little detail is evident of settlement-level assessments having been made.

19. Nepal Earthquake recovery monitoring assessment

(Global Shelter Cluster, 2015)

Description

A REACH[7] assessment team was deployed to Nepal in September 2015 (5 months after the earthquake) to undertake shelter relief and recovery monitoring. The team was limited to covering just one district due to the ongoing political turmoil and fuel crisis. The paper thoroughly describes the methodology of the multi-stage cluster sampling exercise used in the assessment, which involved an extensive household level questionnaire. As with the Haiyan assessment above, the full questionnaire is included in the annexes and can be used as an exemplar.

20. Lessons from Aceh

(da Silva, 2010)

Description

This paper is an evaluation of the reconstruction program delivered by multiple agencies in Aceh following the 2004 Indian Ocean Tsunami. Organised loosely by chronological phases of implementation (planning, design, construction), the document describes the overarching issues in for consideration in each phase and lessons identified. It provides a set of key considerations for program managers and questions that should be asked of proposed interventions. In the 'planning sections, there are some recommendations on what monitoring frameworks for construction programs should include.

21. Evaluating Reconstruction effects on urban resilience: a comparison between two Chilean tsunami-prone cities

(Tumini, Villagra-Islas, & Herrmann-Lunecke, 2017)

Description

This paper uses the concept of reconstruction process being the entry point for resilience building. It presents case studies of coastal communities in Chile, hit by tsunami in 1960 and 2010 respectively, and describes the contrasting approaches used – one focussing entirely on re-housing affected families, the other including urban amenities and services. The paper proposes an 'urban morphology analysis framework' and describes the indicators that can be used to make an assessment of urban resilience. These indicators include statistical data on population densities, open spaces, amenities and evacuation routes. This framework and its indicators may be adapted to monitor recovery if used comparatively over time, where we take resilience to be a factor of recovery.

---

[7] REACH is a joint initiative of IMPACT, its sister-organisation ACTED, and the United Nations Operational Satellite Applications Programme (UNOSAT) (http://www.reach-initiative.org/reach/about-reach)
REACH was created in 2010 to facilitate the development of information tools and products that enhance the humanitarian community's decision-making and planning capacity.

22. Indicators of Community Recovery: Content analysis & Delphi approach

(Jordan & Javernick-Will, 2013)

Description

This paper describes a meta-analysis of multi-disciplinary perspectives on indicators for community recovery from articles published between 2000 and 2010. Collating all the indicators from these, an expert panel review was undertaken using the Delphi method, in which indicators were ranked in importance. The review presents a comprehensive list of 19 core indicators identified as a result of this exercise, ranging across 4 categories (Economic, Environment, Infrastructure, Social) and focusing mainly on the built environment and infrastructure, with some of these forming proxies for socio-economic recovery. It was not within the scope of the paper to discuss the methodologies of measurement and monitoring of these indicators, however.

Applications

The rigour of the selection of the indicators makes them a good start point for developing a reconstruction and recovery programmes at smaller scale, and a framework on which to monitor it due to the focus on community recovery (as opposed to national for example).

Considerations

The indicators here are simple headlines and baseline and 'SMART'[8] objectives will need to be set in order for them to be of use in monitoring.

[8] SMART Objectives are a project management tool in which objects and goals are defined as: Specific – target a specific area for improvement; Measurable – quantify or at least suggest an indicator of progress. Assignable – specify who will do it; Realistic – state what results can realistically be achieved, given available resources; Time-related – specify when the result(s) can be achieved.

Discussion

- Almost all the featured tools and frameworks are monitoring reconstruction through specific lenses. This is in part because the concept of recovery and reconstruction are still too ill-defined, with little consensus around what a community that has 'recovered' looks like and reconstruction blending in to what may have been simply 'construction'. This is why papers such as *Measuring disaster recovery: bouncing back or reaching the counterfactual state?*(Cheng, Ganapati, & Ganapati, 2015) are included here, as it is important for any practitioner responsible for monitoring reconstruction and recovery to have clearly defined what the end point for their recovery programme is, and to acknowledge that this may not match other programmes or the concepts of the community they serve and will therefore need to be carefully managed.
- Many of the resources are primarily aimed at strategic and policy levels of intervention. The specifics of what monitoring recovery means in the field needs to be defined at this level and a monitoring plan designed around this as appropriate. The key is to ensure that the indicators used are sufficiently well developed to be able to measure recovery, whatever definition of the term has been agreed.

Bibliography

ARUP. (2013). REDi™ Rating System Resilience-based Earthquake Design Initiative for the Next Generation of Buildings. Retrieved 2017, from http://publications.arup.com/publications/r/redi_rating_system

ARUP ID. (2014). ASPIRE. OASYS. Retrieved from http://www.oasys-software.com/products/environmental/aspire.html

BRE. (2014). *Quantifying Sustainability in the Aftermath of Natural Disaster (QSAND)*. Retrieved from http://www.qsand.org/

Brown, D., Platt, S., & Bevington, J. (2010). *Disaster Recovery Indicators.* Retrieved 2017, from http://www.carltd.com/article/Disaster-recovery-indicators

Cheng, S., Ganapati, E., & Ganapati, S. (2015). Measuring disaster recovery: bouncing back or reaching the counterfactual state? *Disasters, 39*(3), 427-446.

da Silva, J. (2010). *Lessons from Aceh: Key Considerations in Post-Disaster Reconstruction.* Rugby: Practical Action Publishing. Retrieved from http://publications.arup.com/publications/l/lessons_from_aceh

Davis, I. (2015). *Shelter After Disaster (Second Edition).* OCHA/IFRC. Retrieved from http://www.ifrc.org/Global/Documents/Secretariat/201506/Shelter_After_Disaster_2nd_Edition.pdf

Few, R., McAvoy, D., Tarazona, M., & Walden, V. M. (2014). *Contribution to Change: An approach to evaluating the role of intervention in disaster recovery.* Rugby: Practical Action Publishing. doi:10.3362/9781780448114

GFDRR. (2010). *Safer Homes, Stronger Communities.* Retrieved 2017, from GFDRR: http://www.preventionweb.net/files/12229_gfdrr.pdf

GFDRR. (2015). Guide to Developing Disaster Recovery Frameworks (DRF), Sendai Conference Edition. Washington, USA: GFDRR, World Bank. Retrieved from https://www.gfdrr.org/disaster-recovery-frameworks

Global Shelter Cluster. (2015). *Nepal Earthquake Recovery Monitoring Assessment.* Retrieved 2017, from Global Shelter Cluster: https://www.sheltercluster.org/nepal-earthquake-2015/documents/nepal-earthquake-recovery-monitoring-assessment

Global Shelter Cluster. (2016). *Typhoon Haiyan (Yolanda) Shelter Response Outcome Assessement.* Retrieved 2017, from Global Shelter Cluster: https://www.sheltercluster.org/typhoon-haiyan-2013/documents/philippines-shelter-recovery-outcome-assessment-may-2016

Gryc, H., & Nadkarny, S. (2016). (Re)Settlement Toolkit. *UK Shelter Forum 19.* ARUP. Retrieved from http://www.shelterforum.info/wp-content/uploads/2016/12/1.-161110-Resettlement-Toolkit-ppt.pptx

Habitat for Humanity International. (2017). Advanced Indicators in Disaster Risk Reduction and Response. *(Unpublished)*.

Jordan, E., & Javernick-Will, A. (2013). Indicators of Community Recovery: Content Analysis and Delphi Approach. *Natural Hazards Review, 14*, 21-28.

Opdyke, A., & Javernick-Will, A. (2014). Resilient and Sustainable Infrastructure Systems: The Role of Coordination, Stakeholder Particiaption and Training in Post-Disaser Reconstruction. *Working Paper*

Proceedings; Engineering Project Organization Conference (EPOC). Pennsylvania State University. doi:10.13140/2.1.4796.0326

Platt, S., Brown, D., & Hughes, M. (2016). Measuring Resilience and Recovery. *International Journal of Disaster Risk Reduction*, 447-460. doi:10.1016/j.ijdrr.2016.05.006

Tsunami Global Lessons Learned Project. (2015). Disaster Recovery Toolkit. Asian Disaster Preparedness Centre. Retrieved 2017, from http://www.adpc.net/igo/contents/Our_works/TGLL/index.asp

Tumini, I., Villagra-Islas, P., & Herrmann-Lunecke, G. (2017). Evaluating reconstruction effects on urban resilience: a comparison between two Chilean tsunami-prone cities. *Natural Hazards, 85*(3), 1363-1392. doi:10.1007/s11069-016-2630-4

UN HABITAT. (2017). *SHERPA Your Guide to Sustainable Housing*. Retrieved 2017, from UNHABITAT: https://unhabitat.org/sherpa/

UNDP. (2008). *An integrated approach to disaster recovery: A toolkit on cross-cutting issues.* Columbo: UNDP Si Lanka. Retrieved from http://www.undp.org/content/dam/undp/library/gender/Gender%20and%20CPR/Integrated%20Approach%20to%20Disaster%20Recovery-%20A%20toolkit%20on%20Cross-cutting%20Issues%20-%20Lessons%20from%20the%20Tsunami%20Recovery%20Unit.pdf

UNDP. (2011). Methodological Guide for Post-Disaster Recovery Planning Processes: Guidelines and actions for national, regional and local governments. Quito, Ecuador: UNDP. Retrieved 2017, from http://www.preventionweb.net/publications/view/32306

UNDP. (2016). *A Guidance Note: National Post-Disaster Recovery Planning and Coordination.* New York: UNDP Bureau for Policy and Program Support.