

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?



by Prof Anthony B. Zwi
Dr Kim Spurway
Mr Ryan Marincowitz
Dr Geetha Ranmuthugala
Ms Karen Hobday
Ms Lisa Thompson

September 2018

The authors of this report are:

Professor Anthony B. Zwi
Dr Kim Spurway
Mr Ryan Marincowitz
Dr Geetha Ranmuthugala
Ms Karen Hobday

Funders

The review was funded through an Australian Development Research Award from AusAID.

Acknowledgements

Thanks to Professor Sandy Oliver and colleagues at the EPPI-Centre (Claire Stansfield, Carol Vigurs, Jeff Brunton); AusAID (Alison Ramp, Tymon Kennedy, Steve Taylor); and Gill Westhorp for valuable feedback and advice.

Conflicts of interest

There were no conflicts of interest in the writing of this report.

Citation:

This report should be cited as:

Zwi AB, Spurway K, Marincowitz R, Ranmuthugala G, Hobday K, Thompson L (2018) Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)? EPPI-Centre: London.

© Copyright

Authors of the systematic reviews on the EPPI-Centre website (<http://eppi.ioe.ac.uk/>) hold the copyright for the text of their reviews. The authors give permission for users of the review to display and print the contents of the review for their own non-commercial use, provided that the materials are not modified, copyright and other proprietary notices contained in the materials are retained, and the source of the material is cited clearly, following the citation details provided. Otherwise, users are not permitted to duplicate, reproduce, republish, distribute, or store the review without written permission.

Photograph on front cover: Kathmandu home, post-2015 earthquake. Source: Anthony Zwi

Contents

| | |
|---|-----|
| Contents..... | iii |
| List of tables..... | iv |
| List of figures | iv |
| Acronyms and abbreviations | v |
| Executive summary | 1 |
| Background..... | 1 |
| Relevance and importance of the review..... | 1 |
| Methods..... | 2 |
| Results and findings..... | 3 |
| Strengths and limitations of the review | 5 |
| Conclusions..... | 6 |
| 1. Background | 9 |
| 1.1 Aims and rationale for review | 9 |
| 1.2 Research questions..... | 11 |
| 1.3 Definitional and conceptual issues..... | 11 |
| 1.4 Policy and practice background..... | 15 |
| 1.5 Research background | 16 |
| 1.6 Authors and contributors | 21 |
| 2. Research approach and methods | 22 |
| 2.1 Candidate theory selection..... | 22 |
| 2.2 Search strategy and in-depth mapping | 24 |
| 2.3 Methods used in realist mapping and realist review | 27 |
| 2.4 Conclusion | 30 |
| 3. Summary of findings from in-depth mapping stage | 31 |
| 4. Results and findings of the realist mapping and review | 33 |
| 4.1 Studies included in realist mapping: methods | 35 |
| 4.2 Summary of study outcomes from the studies included in realist mapping..... | 37 |
| 5. Realist review: evidence synthesis..... | 41 |
| 5.1 Integrated knowledges | 41 |
| 5.2 Expressed empowerment..... | 56 |
| 5.3 Actioned agency | 69 |
| 5.4 Resilient livelihoods..... | 82 |
| 5.5 Gender and social equity promotion..... | 107 |
| 5.6 Enhanced safety, security and protection | 115 |
| 5.7 Technological innovation and communication | 123 |

| | |
|---|-----|
| 5.8 Multi-strategy studies and linking mechanisms | 130 |
| 6 Discussion..... | 150 |
| 6.1 Value of the review: key observations | 150 |
| 6.2 Strengths and limitations of the review | 165 |
| 7. Implications, recommendations and conclusions..... | 168 |
| 7.1 Implications for policy | 168 |
| 7.2 Implications for practice | 170 |
| 7.3 Implications for research | 171 |
| References | 174 |
| Appendices..... | 181 |
| Appendix 1: Search sources..... | 181 |
| Appendix 2: Keyword search terms..... | 185 |
| Appendix 3: In-depth mapping and review tool..... | 187 |
| Appendix 4: Rigour assessment tool | 195 |

List of tables

| | |
|---|-----|
| Table 2.1: Weight of evidence allocated to the included studies | 27 |
| Table 4.2: Study methods overview | 35 |
| Table 4.3: Overview of outcomes by study | 38 |
| Table 5.1: Integrated knowledges: context, sustainable livelihoods framework and outcomes..... | 42 |
| Table 5.2: Expressed empowerment: context, sustainable livelihoods framework and outcomes..... | 57 |
| Table 5.3: Actioned agency: context, sustainable livelihoods framework and outcomes | 70 |
| Table 5.4: Resilient livelihoods: context, sustainable livelihoods framework and outcomes..... | 83 |
| Table 5.5: Gender and social equity promotion: context, sustainable livelihoods framework and outcomes | 109 |
| Table 5.6: Enhanced safety, security and protection: context, sustainable livelihoods framework and outcomes | 116 |
| Table 5.7: Technological innovation and communication: context, sustainable livelihoods framework and outcomes | 124 |
| Table 5.8: Studies with multiple mechanisms operating | 132 |
| Table 5.9: Linking mechanisms: context, sustainable livelihoods framework and outcomes | 136 |
| Table 6.1: Promoting climate change adaptation and disaster risk reduction through social protection (SP) | 157 |

List of figures

| | |
|---|-----|
| Figure 1.1: DFID's Sustainable Livelihoods Framework..... | 14 |
| Figure 2.1: Filtering of studies from in-depth mapping to realist review stages | 26 |
| Figure 5.1: Three types of social capital for communities faced with natural disaster..... | 148 |

Acronyms and abbreviations

| | |
|---------|--|
| ADPC | Asian Disaster Preparedness Centre |
| ALNAP | Active Learning Network for Accountability and Performance |
| AusAID | Australian Agency for International Development |
| CBDRM | Community-based disaster risk management |
| CBDRR | Community-based disaster risk reduction |
| CBO | Community-based organisation |
| CBRMA | Community-based risk management arrangements |
| CCA | Climate change adaptation |
| CMO | Context, mechanism and outcomes |
| DFID | Department for International Development (UK) |
| DRM | Disaster risk management |
| DRR | Disaster risk reduction |
| EWS | Early warning system |
| GTZ/GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit |
| HFA | Hyogo Framework for Action |
| IFRC | International Federation of Red Cross and Red Crescent Societies |
| INGO | International non-governmental organisation |
| IPCC | Intergovernmental Panel on Climate Change |
| LMIC | Low-and middle income county |
| NGO | Non-governmental organisation |
| SHG | Self-help group |
| SLF | Sustainable Livelihoods Framework |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNISDR | United Nations International Strategy for Disaster Reduction |

Executive summary

The initial review question was:

Do community-based disaster risk management (CBDRM) initiatives reduce the social and economic cost of disasters? If so, how, why, when and in what way(s)?

This was further refined to:

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

This question formed the basis for this review.

Background

High-profile natural disasters underscore the importance of implementing effective and sustainable disaster risk reduction (DRR) activities and have brought this issue to the forefront of policy debates. This culminated in the 2005 Hyogo Framework for Action (HFA) (UNISDR, 2005) which sought the 'substantial reduction of disaster losses, in lives and the social, economic and environmental assets of communities and countries'. Emphasis was placed on involving communities in disaster risk management (DRM) processes in order to enhance community ownership and sustainability. Community-based disaster risk management (CBDRM) aims to actively engage at-risk communities in the process of identification, analysis, treatment, monitoring and evaluation in order to reduce vulnerabilities to disasters and to increase their coping capacities thus limiting the negative impact to life, property, livelihoods and the environment (ADPC, 2003; Abarquez and Zubair, 2004).

These issues are currently receiving lively attention, at least in part in relation to the post-2015 development agenda and the associated framework for disaster risk reduction. 'A post-2015 framework for disaster risk reduction should build on the current HFA and focus on those elements that are still in need of further action' (UNISDR, 2012). Post-HFA consultations commenced in 2012 or earlier, seeking input from countries and stakeholder groups to assess the progress and challenges in developing regional strategies for reducing disaster risks, including trans-boundary risks. The post-2015 framework should draw on available evidence to ensure that proposed interventions and investments are evidence-informed.

This review was supported by an Australian Development Research Award (ADRA), commissioned by the Australian Agency for International Development (AusAID) and the UK Department for International Development (DFID). This is, to our knowledge, the first report to document and synthesise existing evidence on what CBDRM initiatives work, in what contexts, and whether and how CBDRM interventions contribute to reducing the social and economic impact of disasters on communities.

Relevance and importance of the review

Considerable effort has been devoted to mobilising government support for the integration of CBDRM activities into policy, planning and programming. DRR initiatives comprise a wide range of activities and measures aimed at reducing the adverse effects associated with natural disasters. For DRR/DRM initiatives to be successful and sustainable, it is widely held that communities should be actively involved (ADPC, 2003; Abarquez and Zubair, 2004). Disasters can have a significant negative impact on a community's livelihoods and wellbeing, erasing earlier development gains and reinforcing those mechanisms that create poverty traps and reinforce chronic poverty among the most vulnerable. DRR/DRM initiatives seek to limit these negative consequences.

This review mapped available literature and undertook a realist review on a key area of focus within the topic. This report examines the subset of studies identified which present outcomes (positive and/or negative) and are focused on both CBDRM and socio-economic themes. The studies examined in particular detail were assessed for quality, as well as relevance and rigour. All contribute to understanding how, why, when and in what way(s) CBDRM interventions reduce the social and economic costs of disasters. The review sought to provide policy makers and practitioners with context-appropriate policy-relevant information and analysis which can be used to enhance community-based programming and support to limit the adverse effects of natural disasters.

Methods

Search process and studies examined

A wide range of data sources was used to identify research reports and documents that reflect the content, focus, implementation or evaluation of CBDRM programmes in low- and middle-income (LMIC) settings. Electronic bibliographic databases were utilised, along with Google and Google Scholar to search the World Wide Web. In addition, targeted searches of websites of relevant international agencies such as UNISDR, UNDP, and UNFCCC, international NGOs (INGOs), and materials listed on Prevention Web (www.preventionweb.net), a leading site for relevant materials, were sought. Reference lists were obtained from experts in the field and the study Reference Group. Searches were limited to studies and papers published in English after 1995. Database and grey literature searches took place between 1 November 2011 and 2 March 2012.

The total number of citations identified through the initial broad search was 31,938, of which 24,333 were culled on examination of title as being outside the scope of the review. The 7,605 potentially relevant studies retained were assessed against the inclusion/exclusion criteria based on title and abstract. This left 779 studies from the electronic databases and 257 from the grey literature searches, a total of 1,036. These 1,036 studies were mapped against the categories set out in Appendix 5: 261 studies from the electronic databases and 21 from the grey literature (282 in total) were excluded as being out of scope on closer assessment. The remaining 754 studies were included in the preliminary mapping stage. (For more detail see the Study Protocol, Zwi et al., 2013a).

Consultation process

These 754 studies were categorised and preliminary findings presented to AusAID, the EPPI-Centre and the study Reference Group. After refining the content and structure of the review, additional studies describing slow-onset disasters were retrieved from the initial search and analysed; this led to 151 additional studies being included in the mapping, bringing the mapped total to 905 (see Figure 2.1).

After the initial mapping report was completed, consultation with AusAID and the Reference Group led to a focus on those studies that incorporated both CBDRM and socio-economic attributes, a subset of 43 studies that had available insights also on outcomes. After applying a quality assessment tool, 16 of these studies were excluded, leaving 27 for analysis in this review.

Realist approach

A direct causal relationship between CBDRM interventions and a reduction in social and economic costs is difficult to establish given their complexity and varied social and cultural contexts. A realist approach was deemed appropriate, as it facilitated the identification and elaboration of the *mechanisms* through which outcomes and ultimately impact were postulated to take place under different contexts. In line with the realist approach, the team constructed models of proposed mechanisms and theories regarding how effective interventions were hypothesised to generate outcomes.

The team initially proposed three mechanisms as likely to generate the outcomes of interest in LMICs:

- **Integrated knowledges:** integrating community knowledge and experience with external expertise to produce enhanced or shared understanding of risks, vulnerabilities and actionable responses.
- **Expressed empowerment:** communities able to advocate, mobilise and control extra resources and shape new ideas, and transform relationships with government.
- **Actioned agency:** demonstrable agency which reflects community-based engagement and results in choices or changes to local institutions and structures and through which knowledge and resources may be channeled, transmitted or mobilised to empower the community.

During the search and subsequent realist mapping and review stages, a number of additional mechanisms emerged as likely to be important. These included:

- **Resilient livelihoods:** those which have the ability to withstand external climate stress and shocks, allow the rapid recovery of sustained livelihood activities post-disaster, and in the long term, facilitate sustainable livelihood adaptation to changing climatic conditions.
- **Gender and social equity promotion:** developing or promoting an enabling environment for gender and social equity through institutional, organisational and programmatic activities and operations.
- **Enhanced safety, security and protection:** relates to the fundamental rights of any community in which a minimum level of physical, mental and legal safety, security and protection is required to enable communities to progress and invest in their future.
- **Technological innovation and communication:** the application of existing and new technologies and networks to strengthen social capital (networking and bridging) and enhance preparedness, response and recovery activities, as well as building resilience through human capital (skills and knowledge) in a community.
- **Linking mechanisms:** these 'link up' different mechanisms, activating and triggering them and 'link in' community-based organisations with other stakeholders, including different levels of government; they enhance community coping capacity, resilience and sustainable development.

Results and findings

The core component of the results identifies the range of mechanisms that generated outcomes of interest (risk of natural disaster; vulnerability to natural disasters; resilience to natural disasters; capacities of community organisations; coping capacities of communities; education and awareness; incomes, outputs and enhanced livelihoods; mortality; morbidity; and psychosocial issues). The mechanisms are briefly described below.

'Integrated knowledges'

This mechanism was identified in 18 of the 27 studies. It was strongly associated with robust local institutions and government structures. The mechanism was shown to have been linked with seven specific outcomes: increased education and awareness; increased incomes, outputs and enhanced livelihoods; increased resilience; decreased vulnerability; increased community coping capacity; increased capacity of community organisations; and decreased incidence of psychosocial concerns. The most frequently identified outcome associated with this mechanism was increased education and awareness.

'Expressed empowerment'

This mechanism was identified in 16 of the 27 studies. The expressed empowerment mechanism generated outcomes predominantly associated with enhancing the capacity of community organisations. This mechanism was strongly associated with robust community organisations. Expressed empowerment by communities demonstrated their ability to take charge to reduce disaster risk and vulnerabilities and to build capacity, resilience and community wellbeing in the aftermath of a disaster.

'Actioned agency'

This mechanism was identified in 12 of the 27 studies. It was linked with a range of outcome categories: improved organisational and community capacities; increased resilience; enhanced livelihoods; improved education and awareness; decreased vulnerability; reduced morbidity and improved psychosocial support. Although the most common outcome was an improvement in local organisational capacity, other types of outcomes were also noted, including a strengthening of social capital (11 studies). The latter was reflected in social linkages, networks and enhanced community organisational structures and processes.

'Resilient livelihoods'

This mechanism was identified in 23 of the 27 studies. Programmes undertaken prior to (or in anticipation of) future disasters included disaster livelihood enhancements and various forms of diversification. This contrasted with interventions focused on the post-disaster period, which included the response and recovery of livelihood-associated activities that sought to overcome the negative effects of the disaster. The resilient livelihoods mechanisms in these studies were predominantly linked with four outcome categories: bolstering resilience; reducing vulnerability; enhancing incomes, outputs and livelihoods; and promoting education and awareness. An important recurring theme was of diversification as a means of building resilience and as a risk management strategy in anticipation of disaster and climate change events. Diversification took three main forms: same-sector diversification, value-chain diversification and sector diversification.

'Gender and social equity promotion'

This mechanism was identified in 11 of the 27 studies. Where impacts were evident from gender and social equity promotion activities, these outcomes were at times counterintuitive and negative. The mechanism related to the Sustainable Livelihoods Framework (SLF) and the different forms of capital it covers. The outcomes associated with insensitive gender and social equity promotion within community-based initiatives was often a reduction of resilience and increased vulnerability of communities. This reflected the desire by traditional power structures to maintain their control in the presence of marginal groups. Male leaders and some local institutions saw women as threatening, and sought to diminish their access to additional resources and scope for transformative change. This mechanism also highlights the importance of culture- and context-sensitive programming.

'Enhanced safety, security and protection'

This mechanism was identified in 7 of the 27 studies. Enhanced safety, security and protection are essential elements to building disaster resilient communities. Activities that can enhance these three important elements can be undertaken before or after disaster events. This mechanism was predominantly associated with outcomes which reduced vulnerability, suggesting a fundamental link between reducing vulnerability and promoting community safety, security and protection.

'Technological innovation and communication'

This mechanism was identified in 8 of the 27 studies. Technological innovation and communication were important mechanisms to strengthen social capital (networking and bridging) and enhance preparedness, response and recovery activities, as well as building resilience through human capital

(skills and knowledge) in a community. The main outcomes related to reduced vulnerability although five studies also demonstrated outcomes relating to education and awareness and two to incomes, outputs and enhanced livelihoods.

‘Linking mechanisms’

Nineteen studies reported on this mechanism – a mixture of linking other mechanisms with one another (‘linking up’) and also ‘linking in’ community-based agencies with other structures and institutions – and promoting the associated outcomes. This set of studies focused on contextual factors related to community organisation (18 studies) and supportive local government (17 studies). Social capital was operating in all 19 studies. Factors related to community and organisational coping capacities were strongly linked in eight studies.

Inhibitors

Inhibitors to each of these mechanisms were identified; these interfere with the potential of mechanisms to stimulate positive outcomes. Significant inhibitors included failure to identify local knowledge and to integrate it in disaster risk management; marginalisation and failure to take seriously the advice of community elders; corruption; lack of government support (at both local and national levels); lack of access to community financial services (a safe place to save and to access loans); social and gender inequality; lack of legal land tenure; excluding communities from the decision process; and undertaking an asset distribution programme without completing a market assessment or taking the local environment into account.

These mechanisms were affected by, and reflected the influence of differing contexts. Our analysis leads to the conclusion that **CBDRM programmes have the potential to contribute to reducing risk and vulnerability, and may contribute to enhancing resilience and the capacity of affected groups, thus mitigating the long-term economic and social impact of disasters.** However, achieving these positive outcomes is strongly dependent on programme design, the prevalence of enabling trigger mechanisms and the control of inhibitors.

Strengths and limitations of the review

By adopting a realist approach, this review recognises the importance of context in stimulating the mechanisms which determine outcomes. The review was able to document how a particular programme can achieve a range of potential outcomes depending on the context.

As with all systematic reviews, a number of limitations were present. These included the databases searched, the team’s decision to focus only on English language publications, and the requirement for publication post-1995. A number of challenges were encountered while working with electronic databases – keywords, syntax, and searching mechanisms varied and few information specialists appeared to have honed their skills across the diversity of databases able to be accessed. Other limitations include the following:

1. Realist reviews focus on predefined outcomes: while these are carefully identified and defined through earlier stages of the literature review and mapping, the scope of the review is limited to the outcomes specified.
2. The literature examined was largely based on traditional programme description or evaluation models that were not designed to inform realist reviews; they often failed to report mechanisms or context in sufficient detail.
3. The realist approach recognises that an intervention can result in a range of outcomes depending on the context; publication bias (studies demonstrating a ‘positive’ outcome are more likely to be published) suggest that positive outcomes are more likely to be reported, thus restricting the ability of a realist review to identify mechanisms that may lead to negative or failed outcomes.

4. The original focus was on fast-onset disasters, therefore, some key terms relating to slow-onset disasters were excluded from the initial search strategy; this study does not claim to comprehensively reflect the literature on slow onset disasters (such as famine or drought) and climate change adaptation.

Nevertheless the literature searched was extensive, covering numerous specialist databases across a range of geographic and disciplinary areas. Furthermore, publications in the DRR field have expanded exponentially, with most of the literature published in the past decade. To supplement the extensive database search, our team reviewed websites of key agencies and a number of journals by hand. As mentioned earlier, few documents provide details on CBDRM programmes that fail, thus limiting the learning that can be derived from prior experience.

The earlier stages of literature search, retrieval, and mapping generated a wide range of additional clusters of studies focusing on different aspects of DRR and DRM. These too could benefit from further analysis, given that only one central cluster of studies could be analysed in full in this review.

Conclusions

Mapping the literature addressing DRR and CBDRM in LMICs is of considerable value. This is the first review to systematically search, map and analyse CBDRM and the associated socio-economic and livelihoods-related literature. It provides decision makers, policy makers and practitioners with valuable insights and analyses of such programmes and their component parts, and identifies the underlying mechanisms through which outcomes, whether positive or negative, are produced.

The studies reviewed highlight the importance of a dynamic and multifaceted approach to managing disaster risk and climate change adaptation if positive outcomes are to occur. While at the broadest level, the outcomes have been framed as the reduction of the social and economic costs of disasters, we have also identified what we term the ‘foundation outcomes’ upon which these broader outcomes rest. These include the importance of reducing the risk of hazards which contribute to disasters and of vulnerability to such phenomena. Such ‘foundation outcomes’ include enhanced resilience and capacity, at a variety of levels, to adapt, mitigate and respond to disaster events.

We also identified a number of common mechanisms which operated across a variety of contexts, which produced predominantly positive, but also occasionally negative outcomes. ‘Integrated knowledges’ – a blending of traditional, experiential and scientific insights – was found to be a fundamental mechanism through which positive outcomes resulted from CBDRM and livelihood initiatives. A pair of closely related mechanisms – ‘actioned agency’ and ‘expressed empowerment’ – were also key to many studies in which positive outcomes were observed. This reflects individual and collective organisation and action which demonstrably facilitated change and transformed relationships, power dynamics or the availability of resources. A fourth mechanism was also present in almost all of the studies which revealed successful outcomes: ‘resilient livelihoods’. As described above, this mechanism operated both in pre-disaster and post-disaster settings and contributed strongly to bolstering resilience, reducing vulnerability, enhancing incomes, outputs and livelihoods and promoting education and awareness. The ‘resilient livelihoods’ mechanisms also interacted with many of the others identified in this review.

Three other mechanisms were found to generate positive outcomes: these were ‘enhanced safety, security and protection’, ‘technological innovation and communication’ and ‘linking mechanisms’. This last mechanism operated in a variety of ways – it facilitated ‘linking up’ different mechanisms to add value through their synergy and interaction, and also ‘linking in’ the community to institutions and actors operating at different levels. Together, this linking in and linking up built upon the range of identified mechanisms and reinforced them.

One mechanism was associated with negative outcomes, a surprising finding on some levels, but predictable on others. ‘Gender and social equity promotion’ was found to often leave women and

those least powerful worse off, at least in relation to reducing vulnerability and enhancing capacity and resilience. This mechanism operated negatively in the presence of influential conservative structures which perceived a threat or challenge from programmes which enhanced the visibility and voice of women and marginalised groups. Given that these conservative actors were often powerful, they were able to undercut the ambition, influence and actions of emergent groups and retain control of the inflow of additional resources.

Policy implications

The essence of the body of literature examined reveals that supporting, building and enabling local capacity, knowledge and livelihoods must be at the centre of CBDRM programming. These capacities ('actioned agency' and 'expressed empowerment') will be most effective when linked also to the integration of different forms of knowledge, and are cognisant of the importance of reinforcing and strengthening livelihoods. Interventions that facilitate community-based savings, and loans that acknowledge and integrate traditional livelihood strategies and experience, will greatly strengthen and facilitate the diverse forms of community capacities. By recognising and facilitating local agency and empowerment, CBDRM programmes can enhance long-term sustainability and resilience against natural disasters and climate change. Most importantly, development partners need to carefully examine their programmatic approaches so as to avoid discriminatory practices and ensure a fair and equitable distribution of aid and relief, and to do so with a high degree of sensitivity to culture and context.

These insights reinforce the importance of long-term engagement with community-sensitive policy makers, services and organisations, if initiatives are to promote the desired positive outcomes. The approach taken in undertaking this review recognises that programmes that work in one context do not necessarily work in all contexts. This review has synthesised existing information related to specific outcomes with the objective of providing policy makers with the information required to make evidence-informed policy decisions (Bowen and Zwi, 2005) relevant to context.

Practice implications

The implications of these insights for policy and practice are valuable. They highlight the centrality of enhanced community engagement and participation if positive outcomes are to be achieved. Practitioners, service providers and development partners must facilitate and build on local agency and capacity at all stages of the programme cycle. Careful identification of partners, astute assessment of the local political economy, and ensuring that planning is sensitive to conflict, culture and context more generally, are likely to be crucial.

A comprehensive assessment and analysis of potential markets and their operation and sensitivities is essential for CBDRM interventions that are based on diversifying livelihood strategies. Programmes need to bolster existing autonomous coping capacities and local knowledge so that communities can be actively engaged in, and sustain support for programme activities. Programme planning, implementation and evaluation need to incorporate an understanding of pre-existing social inequities so that agencies do not exacerbate levels of vulnerability, but instead, over time, support the organisation and capacity of marginalised social groups to effect change.

Development partners should also seek to recognise and build in any cross-cutting approaches that can act as a catalyst for other programme elements and strategies. Facilitating more coherent action by 'linking up' initiatives and 'linking in' community stakeholders with 'higher' levels is likely to increase the prospect of positive impacts.

Research implications

This review and its earlier components have highlighted the tremendous growth over the past decade of literature and programming around disaster risk reduction and management and climate change adaptation. The English language literature is geographically focused on Asia and Africa, and

the quality of research published is varied, with a minority of reports documenting outcomes. There are clear gaps in the literature which deserve attention.

A number of additional research needs were identified: research on cultural capital as well as the relationship between different kinds of capital found in this review (social, financial, physical, natural, human, technological and cultural) would be of value. Field-based research should examine social differentiation and inequity and how these influence DRR and disaster programming. More attention to careful documentation of the impact and outcomes of DRM/DRR programmes would be of value; this needs of course to be based upon careful assessments at baseline so as to indicate the presence of change. As DRM/DRR often incorporate similar strategies to climate change adaptation (CCA) programming, this research offers supportive evidence for successful local community-based CCA programming. This will help delineate the concepts involved while maximising learning from past successes and limitations.

This review also identified a powerful set of studies from which more learning can be derived. The Research Team focused attention on a core segment of this literature – the overlap between ‘classic’ CBDRM programmes and livelihood interventions. While this is a crucial interface and hence has been drawn to the core of this review, it should be noted that there are many other areas of interesting and insightful analysis that can still be undertaken, based upon the extensive literature search and mapping. This would be a worthwhile investment as the work of identifying and searching the literature has already been completed and the costs met; additional and lessons can still be derived from the work undertaken thus far.

With respect to this Report and the data presented here, key recommendations include making available and publishing these findings and engaging with the policy and practice community to enable them to adapt these insights to the work underway or planned, so as to promote evidence-informed policy (Bowen and Zwi, 2005). Disaster risk reduction and management, and climate change adaptation, are likely to be among the important sustainable development targets upon which development and humanitarian activities will be focused in the coming years and decades. Such investments **must** be based upon sound evidence if they are to contribute to eliciting positive outcomes and make an impact on lives and livelihoods. Knowing what works and why, in what circumstances, and through what mechanisms, is invaluable if investments are to make a difference by contributing to reducing risks and vulnerabilities, enhancing resilience and capacity, and ultimately reducing the otherwise accelerating social and economic costs of disasters.

Additional research can be undertaken to further learn from the work completed to date. The team have identified a wide range of additional studies which relate to the mechanisms identified and from which more learning can be derived. They could not be examined here as they did not have documented outcomes and time and resources were focused on those that did. Nevertheless, fine-grained learning about how such mechanisms operate in the field can be derived from this wider range of studies.

The team believe, also, that the concepts explored and elaborated here could usefully inform future interventions as well as study designs to assess their impact. The team welcome comment, critique and opportunities to examine these concepts *in the field*, where they can be more effectively tested, documented and analysed.

The HEARD@UNSW Research Team look forward to publishing and widely disseminating this work; this will promote debate and scrutiny, as well as ensure and strengthen accountability and transparency in the sector.

1. Background

This chapter defines the aims and rationale for the review as well as the key concepts used. It also outlines the policy and practice context and the nature of the problem, as well as the review questions and approach taken.

Recent natural disasters have underscored the necessity of implementing effective and sustainable disaster risk reduction (DRR) activities and brought this issue to the forefront of policy debate. This is reflected in key international resolutions and reports such as the 2005 Hyogo Framework for Action (HFA) (UNISDR, 2005) and, more recently, the UN General Assembly Resolution on Disaster Risk Reduction (UN, 2011) and the report on managing disaster risk by the Intergovernmental Panel on Climate Change (IPCC, 2012). An emphasis was placed on incorporating community involvement in the disaster risk management (DRM) process to create community ownership and potentially enhance sustainability of activities. The objective of community-based disaster risk management (CBDRM) is to actively engage at-risk communities in the process of identification, analysis, treatment, monitoring and evaluation to reduce vulnerabilities and to increase the coping capacities of at-risk communities to limit the negative impact on life, property, livelihoods and the environment (Abarquez and Zubair, 2004; ADPC, 2003).

This review was supported by an Australian Development Research Award (ADRA) through the Australian Agency for International Development (AusAID). This is the final report, which seeks to examine, analyse and synthesise existing evidence on what CBDRM initiatives work, in what contexts, and whether and how CBDRM interventions contribute to reducing the social and economic impact of disasters on communities. This report should be read in conjunction with the CBDRM Research Protocol, in which more details of method and approach are provided (Zwi et al., 2013a).

1.1 Aims and rationale for review

The United Nations International Strategy for Disaster Reduction (UNISDR) defines disaster risk management (DRM) as: 'The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster' (UNISDR, 2009b: 4). DRM aims to mitigate the effects of hazards through activities and measures aimed at disaster prevention and preparedness. The term 'DRM' is often used as an all-encompassing umbrella for several related concepts, such as disaster response, disaster relief, disaster preparedness and mitigation. In this review, we use this broad term and the concepts that underpin it, while also maintaining a particular focus on those activities, strategies and programmes which are explicitly focused on disaster risk reduction (DRR).

Community-based disaster risk management (CBDRM) generally encompasses a similar definition to DRM, but is particularly relevant to, or has a focus on the community level. Community participation at many (or indeed all) stages and levels of such interventions has been seen as a central component of CBDRM initiatives. There are numerous definitions of CBDRM that will be explored further in the study, but for clarity, this review initially draws on the definition proposed by the Asian Disaster Preparedness Centre (ADPC), which itself is based on other accepted definitions of the concept. This holds that:

Community-based Disaster Risk Management (CBDRM) is a process in which at-risk communities are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities. This means that people are at the centre of decision making and implementation (ADPC 2003).

Some CBDRM programmes are entirely driven by the community, while others are led by other agencies (government and non-government, public and private, local or central), working in partnership with the community. CBDRM incorporates both communal and local dimensions. In this study, we are interested in both communal and local aspects, i.e. both those structured around 'communities' and those structured around localities. It is hoped that the study will contribute to understanding these different foci both separately and/or together, how they are proposed to (or do indeed) work, and the extent to which they are effective in reducing adverse impacts, depending on the context in which they are implemented.

The objective of CBDRM interventions is typically to 'reduce vulnerabilities and to increase the capacities of vulnerable groups to prevent or minimize loss and damage to life, property, livelihoods and the environment, and to minimize human suffering and hasten recovery' (Abarquez and Zubair, 2004). CBDRM may also incorporate aspects of climate change adaptation (CCA). Climate change is defined by the United Nations Framework Convention on Climate Change (UNFCCC) as 'a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods' (UNFCCC 2007: 32).

As a result, CCA may incorporate similar strategies to DRM, especially in some areas such as small island states, where natural disasters are closely related to climate change and links between risk management and CCA are apparent in the field. Although the broadest aspects of climate change, trends and impact are not in scope for this study, we do consider the response to climate change at more local levels and their links to disaster risk management activities. We note, also, that in some situations activities and initiatives previously defined under the rubric of 'CBDRM' may now be reframed as 'climate change adaptation' (CCA), and often draw on similar approaches.

'Disasters' occur when a community is faced with a situation that exceeds its capacity to cope (UNISDR 2009b). There are numerous definitions of disasters; however, one of the most commonly used is that of the UNISDR: a 'serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources' (UNISDR 2009b: 9). Such situations affect the community in both economic and social terms, with the scale of damage determined by the form and magnitude of the disaster event, as well as the vulnerability and resilience of the community and the agencies with which it relates. Resource-poor countries are often at great risk, have increased vulnerability, reduced resilience and reduced capacity to respond. Within a community, disasters typically magnify inequalities, exacerbating prior social problems.

Preliminary scoping of the literature suggested that the evidence base for the assessment of medium- and longer-term impacts of DRM initiatives on social and economic outcomes is extremely limited. In addition, the literature revealed the diversity in the way CBDRM programmes have been designed and implemented, making it difficult to extrapolate across programmes and draw out key lessons. With so much variation in the way CBDRM is delivered, there is a need to establish which models work when, and why, so that policy makers and programme staff can be informed about appropriate models for particular contexts as well as indicate which programmatic areas are least understood. To date, there has been limited information with which to guide policy makers, relief and development agencies, when planning and delivering CBDRM interventions. Furthermore, there exists some uncertainty as to their long-term social and economic impact, as well as concerning the extent to which they reduce vulnerability and enhance preparedness. A key aspect of this review has been to examine, analyse and synthesise existing evidence on what CBDRM initiatives work, in what contexts, and whether and how CBDRM interventions contribute to reducing the social and economic impact of disasters on communities.

1.2 Research questions

The initial review research question was:

Do community-based disaster risk management (CBDRM) initiatives reduce the social and economic cost of disasters?

Given the desire to better understand the nature of the evidence and the complex pathways between CBDRM and the social and economic cost of disasters, a realist-based approach was selected. This allowed the question to be reframed to ask:

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

A wide range of literatures from diverse disciplinary perspectives and databases was sought and retrieved: this included online databases, searches of the grey literature from key agencies through their own websites and others which focus on the dissemination of DRR-related information. This diversity was intended to elucidate context, mechanism and outcome interactions, key elements of complex interventions, amenable to realist approaches and particularly relevant to the review.

1.3 Definitional and conceptual issues

There are numerous definitions for each of the terms listed below. We offer one or more to clarify how we understand and use the particular term.

Capacity: The combination of all the strengths, attributes and resources available within a community, society or organisation that can be used to achieve agreed goals (UNISDR, 2009b: 5-6). According to UNDP (2009), an improved understanding of the institutional arrangements, organisational leadership issues, knowledge resources and accountability mechanisms can lead to institutional change and ultimately improved development outcomes. Furthermore, programmes that develop capacity enable agents at all levels to be more effective: individuals through improved understanding, skills and access to information; communities and organisations through development in the form of enhanced management structures, processes and procedures; and institutional and legal frameworks and regulatory changes that provide enabling environments for organisations, institutions and agencies at all levels (UNDP 2009: 13).

Capacity may include infrastructure and physical means, institutions, societal coping abilities, as well as human knowledge and skills and collective attributes such as social relationships, leadership and management. Capacity may be closely linked to the term 'capability'. Elucidated extensively by Nussbaum (2011) and others, capacity assessment is a term for the process by which the capacity of a group is reviewed against desired goals, and the capacity gaps are identified for further action (UNISDR 2009b: 5-6).

Climate change adaptation: 'In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate' (IPCC 2012: 5). Pelling (2011: 6) argues that social systems have constantly been adapting to changes in their external environment and that this is a dynamic, ongoing process. Further, he contends that CCA has been 'an intimate element of human history – both an outcome and driver of development decisions for individuals, organisations and governments'.

Community: A group of people 'who engage in a particular purpose, task or function together, or who have some form of identity in common, though not necessarily associated with the same locality' (Black, 2001: 9).

Community-based disaster risk management: This is a process in which communities engage with the identification, analysis, mitigation, monitoring and evaluation of disaster risks in order to reduce

their vulnerabilities and enhance their capacities (ADPC, 2003: 17). The term community-based ‘adaptation’ is also often used. We use the term ‘CBDRM Classic’ to emphasise programmes which are structured around typical core CBDRM-related activities such as community risk mapping. We differentiate these from some of the other community-related activities that have a disaster risk reduction element or focus.

Community development: ‘Community development focuses on the development project as it relates to local, usually rural or small urban communities, in particular addressing issues that are of immediate concern to communities that have the capacity to produce continuing localized results’ (Kingsbury et al., 2008: 222).

Disaster: A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social wellbeing, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation (UNISDR, 2009b: 9).

Disaster risk: UNISDR defines disaster risk as the ‘potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period’ (UNISDR, 2009: 4).

Disaster risk management: The systematic process of using administrative directives, organisations and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

Comment: This term is an extension of the more general term ‘risk management’ to address the specific issue of disaster risks. Disaster risk management aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness (UNISDR 2009b: 10).

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

A comprehensive approach to reduce disaster risks is set out in the United Nations-endorsed Hyogo Framework for Action (HFA), adopted in 2005 (UNISDR, 2005), whose expected outcome is the ‘substantial reduction of disaster losses, in lives and the social, economic and environmental assets of communities and countries’. The International Strategy for Disaster Reduction (ISDR) system provides a vehicle for cooperation among governments, organisations and civil society actors to assist in the implementation of the framework. Note that while the term ‘disaster reduction’ is sometimes used, the term ‘disaster risk reduction’ provides a better recognition of the ongoing nature of disaster risks and the potential to reduce these risks (UNISDR, 2009b: 10-11).

Empowerment: A type of capacity development in which [community] members decide on the goals and strategies for disaster risk management, contribute some (if not all) of the resources needed, and monitor their performance (ADPC, 2008: 1). An alternate definition is that an empowerment approach, ‘places the emphasis on autonomy in the decision making of territorially organised communities, local self-reliance, direct and inclusive (participatory) democracy, and experiential social learning’ (Kingsbury et al., 2008: 222).

Exposure: People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses. Measures of exposure can include the number of people or types of

assets in an area. These can be combined with the specific vulnerability of the exposed elements to any particular hazard to estimate the quantitative risks associated with that hazard in the area of interest (UNISDR, 2009b: 15).

Hazard: A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UNISDR, 2009b: 17).

Mainstreaming: Mainstreaming involves the integration of its key principles into broader development planning, policy making and implementation (ADPC, 2012; La Trobe and Davis, 2005). Although certain sectors are the primary focus of mainstreaming due to their relative importance in terms of DRR (such as agriculture, infrastructure and urban planning), the term implies that the key elements of disaster risk management are to be integrated into all relevant governmental and non-governmental approaches to development and policy making (UNISDR, 2005).

Mechanisms: To evaluate an intervention, one needs to understand underlying mechanisms that are triggered by the context to achieve a range of outcomes (Pawson et al., 2005). It has been recognised that '[t]he causal power of an initiative lies in its underlying mechanism (M), namely its basic theory about how programme resources will influence the subject's actions' (Pawson, 2001). Using Pawson's definition, 'Mechanisms refer to the choices and capacities which lead to regular patterns of social behaviour' (Pawson and Tilley, 1997).

Mitigation: Mitigation activities involve: 'reducing or eliminating the likelihood or consequences of a hazard, or both' (Coppola, 2007: 8), and can also be called 'prevention' or 'risk reduction' (Coppola, 2007: 175). These activities involve more long-term strategies developed to deal with both structural mitigations which are intended to make changes to the physical or built environment as well as non-structural policy interventions, including mandated changes to social processes or structures that might increase vulnerability to disaster (Alexander, 2002: 5; Coppola, 2007: 175-190).

Preparedness: The knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions. Preparedness activities are often carried out within the context of disaster risk management and aim to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response through to sustained recovery (UNISDR, 2009b: 21).

Prevention: The outright avoidance of adverse impacts of hazards and related disasters. Prevention expresses the concept and intention to completely avoid potential adverse impacts through action taken in advance. Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high-risk zones, and seismic engineering designs that ensure the survival and functioning of a critical building in any likely earthquake. Very often the complete avoidance of losses is not feasible and the task transforms to that of mitigation (UNISDR, 2009b: 22).

Resilience: 'The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions' (UNISDR, 2009b: 10).

Response: The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected. Disaster response is predominantly focused on immediate and short-term needs and is sometimes called 'disaster relief'. The division between this response stage and the subsequent recovery stage is not clear-cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage (UNISDR, 2009b:

24). In a number of settings, humanitarian and emergency response is long drawn-out, but still compromises the promotion of enhanced capabilities and capacity.

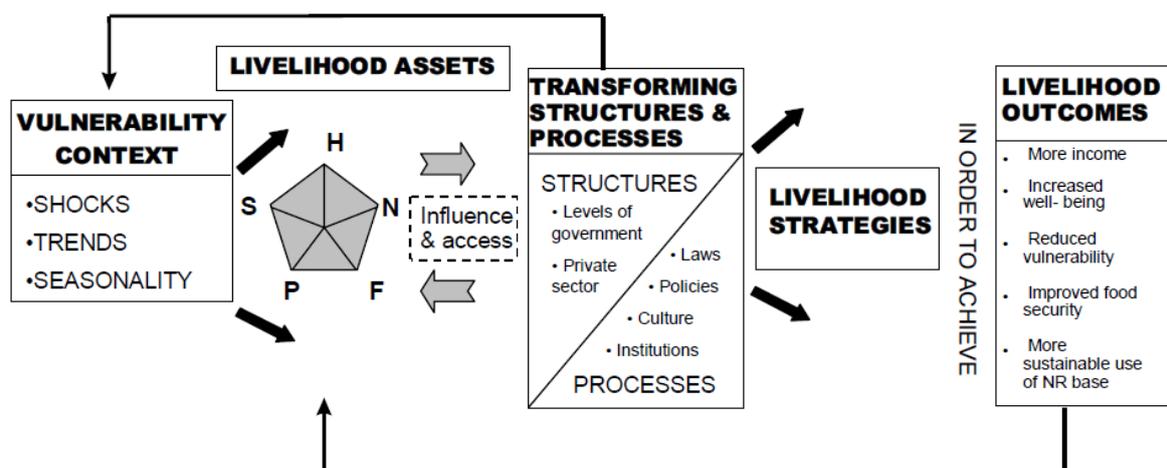
Risk assessment: Risk assessment is an essential stage in implementing a DRR programme. It is defined as a 'methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend' (UNISDR, 2009b: 11).

Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This definition, coined by the 1987 Brundtland Commission, is succinct, but leaves unanswered questions regarding the meaning of the word 'development' and the social, economic and environmental processes involved. Disaster risk is associated with unsustainable elements of development such as environmental degradation, while conversely, disaster risk reduction can contribute to the achievement of sustainable development, through reduced losses and improved development practices (UNISDR 2009b: 29). The concept of sustainability is also commonly applied to the ways in which developmental and disaster risk management programmes, institutions and processes are able to be self-sufficient over time without being overly dependent on injections of external funding and resources.

Sustainable Livelihoods Framework (SLF): The classic and widely accepted definition by Chambers and Conway (1992: 7-8) is: 'A livelihood comprises the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.'

The Department for International Development (DFID) is the leading agency in terms of developing and refining the SLF. The DFID stresses that there are many ways of applying livelihoods approaches and that there is not one single approach. However, six principles underlie all these approaches: people-centred, responsive and participatory, multi-level, conducted in partnership, sustainable and dynamic. The DFID also stresses the importance to livelihoods of capital assets, and distinguishes five categories of such assets: natural, social, physical, human and financial. It also stresses the need to maintain an 'outcomes focus', thinking about how development activity impacts upon people's livelihoods, not only about immediate project outputs. DFID's SLF is illustrated in Figure 1.1.

Figure 1.1: DFID's Sustainable Livelihoods Framework



H represents **human capital**: the skills, knowledge, ability to labour and good health important to the ability to pursue different livelihood strategies;

P represents **physical capital**: the basic infrastructure (transport, shelter, water, energy and communications) and the production equipment and means that enable people to pursue livelihoods;

S represents **social capital**: the social resources (networks, membership of groups, relationships of trust, access to wider institutions of society) upon which people draw in pursuit of livelihoods;

F represents **financial capital**: the financial resources which are available to people (whether savings, supplies of credit or regular remittances or pensions) and which provide them with different livelihood options; and

N represents **natural capital**: the natural resource stocks from which resource flows useful for livelihoods are derived (e.g. land, water, wildlife, biodiversity, environmental resources).

(Source: Carney et al., 1999: 9)

Vulnerability: Vulnerability to disaster depends on the level and nature of individual and societal resources, capacity and coping mechanisms, including the robustness and quality of individual, community, organisational and governmental response mechanisms and processes (Alexander 1997; Darcy and Hofmann 2003; Oliver-Smith 2007; Wisner et al. 2007). Vulnerability arises out of the characteristics and nature of social relationships between human populations based on socially constructed differentiations between one group and another, such as age, gender, ethnicity and mobility (Bankoff et al., 2007: 4-6; Wisner et al., 2007: 5-8). Depending on the community or population affected and the nature of the trigger event, these social differentiations play more or less an important role in the unfolding disaster:

Far from being occasions in which social inequities are erased, disasters expose and often magnify those inequities ... predisaster inequities express themselves when disasters occur, and patterns of mortality, morbidity, loss, displacement, and recovery are inextricably linked to the social contexts in which disasters occur. (Tierney 2007: 515)

1.4 Policy and practice background

Recent efforts have been undertaken to mobilise government support for the integration of CBDRM into policy, planning and programming. An important development in this regard was the 2005 Hyogo Framework for Action (UNISDR, 2005), which emphasised the importance of community involvement in the DRM process to reduce the negative social, economic and environmental effects of natural disasters. In 2010, the 26th meeting of the Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP; www.alnap.org) in Kuala Lumpur highlighted the role of governments in responding to disasters and complex emergencies (ALNAP, 2010). NGOs, UN agencies, and other international and locally based organisations have promoted CBDRM in a variety of ways. These have included national and local advocacy, capacity building and integrating the response to risk factors in development planning (ADPC, 2006). Local and international NGOs, plus other civil society organisations, have been instrumental in refining and promoting DRM activities, including at the community level.

A wide range of guidelines has been developed by different organisations in this field. While not attempting to be comprehensive, these include the community-based disaster risk management field practitioners' handbook for ADPC (Abarquez and Zubair, 2004); the community-based DRM approach, based on work done in South America for GTZ (Bollin, 2003); guidelines on community-based disaster risk management for local authorities (ADPC, 2006); *Disaster Management: A Disaster Manager's Handbook* (Carter, 2008), which acts as a practical reference and is designed to cover the broad disaster management concepts; *A Guide to Community-based Disaster Risk Reduction in Central Asia* (UNISDR, 2006), which is an example of a regional guide to enhance awareness of the key concepts in CBDRM; *Populations at Risk of Disaster: A Resettlement Guide* (Correa et al., 2011), which aims to use a participatory approach to resettling high risk communities to mitigate extreme

risks to natural disasters; and *Safer Homes, Stronger Communities: A Handbook for Reconstructing after Natural Disasters* (Jha et al., 2010), which aims to set guidelines in the reconstruction of housing and communities in disaster affected areas.

There has been an increased focus on integrating CBDRM and CCA interventions to reduce vulnerabilities and build community resilience against the effects of climate related natural hazards that affect many communities worldwide (Gero et al., 2010). Realising the importance of taking proactive measures, governments in developing countries have started to incorporate countrywide policies to target DRR/DRM and CCA. In 2009, the Maldives initiated the Strategic National Action Plan (SNAP) 2010-2020, integrating DRR and CCA (Republic of the Maldives, 2009). The plan aims to enhance collaboration between stakeholders to develop a comprehensive risk management approach to enhance DRR and limit the adverse effects of climate change. The Philippines Government enacted new legislation in 2009 called the Climate Change Act, which highlighted the vulnerability of the island nation to climatic events (Republic of the Philippines, 2009). The aim was to integrate DRR measures with CCA plans, development and poverty reduction programmes. Samoa, an island nation that regularly experiences natural disasters, in 2011 adopted the Samoa National Action Plan for Disaster Risk Management 2011-2016 (Government of Samoa, 2011). The plan aims to bring about sustainable development by facilitating the inclusion of risk reduction and risk awareness with a specific focus on the community level. In 2007, the Vietnam Government adopted the National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020 (Government of the Socialist Republic of Vietnam, 2007), and in line with the growing importance of CCA, in 2008 implemented the National Target Program to Climate Change Response (UNISDR, 2009a). These are just a few of the developments that national governments are progressing and highlight the shifting focus from a reactive to a proactive disaster management approach.

1.5 Research background

The costs associated with disasters set back gains in development (UNISDR, 2005). The UN Global Assessment Report (UNISDR, 2011) identifies certain key trends in the pattern of disaster impacts and consequences worldwide. The report highlights the fact that mortality associated with natural hazards is decreasing globally despite increases in populations at risk of disasters. However, the report also shows that mortality risk is becoming more concentrated in low- to middle-income countries with weak governance and even increasing in those countries with weak governance capacity. In addition, improvements in human development and reductions in poverty mean that there has been an equally rapid increase in exposure to loss of wealth, livelihoods and income. The report concludes that there is an imminent need to improve disaster risk management capacity worldwide in order to address the increasing exposure of populations, resources and livelihoods to the negative consequences of natural disasters (UNISDR, 2011: 4-6).

A connection between the felt impact, in terms of human and economic loss, and the vulnerability of a population is apparent (Yodmani, 2001). Variables such as location, socio-economic status, environmental degradation, unplanned urbanisation, caste and gender compound the effects of disasters (UNISDR, 2005). This was noted by Fredrick Cuny in his book *Disasters and Development*, in which he compared the human loss from earthquakes in San Fernando, California 1971 and Managua, Nicaragua 1973. Both cities experienced similar size earthquakes (6.4 and 6.2 respectively) yet, in San Fernando, only 58 deaths were reported compared to 6,000 in Managua (Cuny, 1983 cited in Yodmani, 2001). This analysis highlighted vulnerability as a key determining factor of impact, leading to a 'vulnerability analysis' being incorporated in disaster management (Yodmani, 2001).

Similar patterns of vulnerability and enhanced disaster loss continue to persist, as was seen in the impact of the earthquakes in Haiti and Chile in 2010. Over 200,000 people died in Haiti versus 507 in Chile, despite the latter experiencing a significantly more serious earthquake as measured on the Richter scale (7.0 and 8.8 respectively) (Vanholder and Borniche, 2011). Clearly, contextual factors are important and include not only patterns of habitation but also differences in preparedness (Chile

has experienced more seismic activity in the past) and in the country's economic and administrative capacities. Chile is one of the most developed countries in South America, whereas Haiti is the least developed country in the Western hemisphere, emphasising again the relationship between vulnerability and socio-economic loss due to disasters.

United Nations resolutions related to DRR, DRM and CBDRM

The United Nations has taken a lead role in disaster risk management and in developing community-based approaches to disaster risk reduction. Numerous UN Resolutions have been promulgated since the 1980s, outlining the actions, policies and practices to be undertaken and implemented in order for UN agencies, civil society and governments to effectively respond to natural disasters.

An important early resolution related to DRR was the UN General Assembly Resolution 44/236 of 1989, which declared the 1990s the International Decade for Natural Disaster Reduction (IDNDR) (Resolution 44/236) and established a special secretariat in Geneva for the IDNDR (Dore, 2000).

One of the main outcomes of the IDNDR was the 1994 Yokohama Conference. There, the 'Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation and its Plan of Action' (referred to as Yokohama Strategy) was adopted (UNISDR, 2007). The guidelines stressed the importance of risk assessment, disaster prevention and preparedness, the capacity to prevent, reduce and mitigate disasters, and early warning. They also mentioned the importance of community participation (INDRDR, 1994). A community-based approach to managing disaster risk emerged in the 1980s–1990s due to a recognition of the role played by communities in mitigation and response and the limitations of a top-down approach (ADPC, 2006). In addition to the efforts put forth by the UN in 2000, the World Bank established the Global Facility for Disaster Reduction and Recovery and the ProVention Consortium aimed at reducing the human and economic costs of natural disasters (Dore, 2000).

Maintaining the momentum around disaster risk reduction from the 1990s led the UN in 2004 to convene the World Conference on Disaster Reduction. Held in Kobe, Japan, in 2005, almost 10 years to the day after the Great Hanshin earthquake in Kobe and less than a month after the 2004 Indian Ocean earthquake and resulting tsunami, it pledged to facilitate the following:

- To establish global tsunami warning systems.
- To reduce disaster damage.
- To improve healthcare after disasters.
- To set up more early warning systems.
- To develop safe building standards.
- To agree upon cost-effective preventative countermeasures.
- To create a global database on relief and reconstruction and a centre on water hazards (UNISDR, 2005).

In 2005, the UN General Assembly called for a review of the Yokohama Strategy. The review recognised that there was an increasing, if not universal, understanding among countries that disaster risk reduction was essential for sustainable development. It also stressed the need for systematic action to address disaster risks through sustainable development and the important role of national and local actors in building resilience through risk management (UN, 2005). Gaps and challenges were identified in five main areas, forming the five key areas for the development of the Hyogo Framework for Action.

One of the most important outcomes of the 2005 World Conference on Disaster Reduction was a decision to commit to a 10-year DRR strategy entitled the Hyogo Framework for Action (HFA)

(UNISDR, 2005). The HFA 2005-2015 set out three strategic goals and outlined five priorities for action.

The three strategic goals were:

1. integration of disaster risk reduction into sustainable development policies and planning;
2. development and strengthening of institutions, mechanisms and capacities to build resilience to hazards; and
3. systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes.

The five priorities for action identified were:

1. ensuring that disaster risk reduction (DRR) is a national and local priority with a strong institutional basis for implementation;
2. identifying, assessing and monitoring disaster risks and enhancing early warning;
3. using knowledge, innovation and education to build a culture of safety and resilience at all levels;
4. reducing the underlying risk factors; and
5. strengthening disaster preparedness for effective response at all levels (UNISDR, 2005).

Cross-cutting themes in the HFA included the importance of a multi-hazard approach, recognition of gender and cultural diversity, community participation and capacity building and technology transfer (UNISDR 2005). The expected outcome was framed as 'The substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries' (UNISDR, 2005: 3).

The HFA highlights the importance of community involvement in disasters (UNISDR, 2005), both in terms of harnessing indigenous knowledge of coping mechanisms in response to natural disasters and as an essential component of community development. CBDRM aims not only to facilitate the establishment of 'disaster-resilient communities' (Twigg, 2007), but also to ensure that communities can and are actively involved in assessing risks and are working towards developing preparedness, response, recovery, prevention and mitigation strategies.

More recently, the United Nations General Assembly has called for an increased focus on strengthening local coping capacities and community-based approaches to disaster risk management in Resolution 65/157: International Strategy for Disaster Reduction 2011. Article 17 of the resolution stresses the need:

to build and strengthen coping capacities through, inter alia, the transfer and exchange of experiences and technical knowledge, educational and training programmes for disaster risk reduction, access to relevant data and information, the strengthening of institutional arrangements and the promotion of community participation and ownership through community-based disaster risk management approaches (UN, 2011: 5).

The Intergovernmental Panel on Climate Change (IPCC) also recognises the importance of utilising local knowledge and experience in order to more efficiently adapt to and manage risks related to climate change processes and disasters. Indeed, according to the IPCC, 'Community participation in planning, the determined use of local and community knowledge and capacities, and the decentralization of decision making, supported by and in synergy with national and international policies and actions, are critical for disaster risk reduction' (IPCC, 2012: 28).

Substantial discussion is taking place at the time of writing with regard to the post-2015 framework for disaster risk reduction. 'A post-2015 framework for disaster risk reduction should build on the current HFA and focus on those elements that are still in need of further action' (UNISDR, 2012). Post-HFA consultations are being undertaken, with particular emphasis on enabling countries and stakeholder groups to assess the progress and challenges of developing regional strategies and plans

to reduce disaster risks, including regional trans-boundary risks. The post-2015 framework should draw on the best available evidence to ensure the relevance and effectiveness of proposed interventions.

Monitoring and evaluation

Indicators and tools have been developed by a range of agencies, most notably the United Nations International Strategy for Disaster Reduction (UNISDR), the Asian Disaster Preparedness Centre (ADPC), the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) and Oxfam, to guide practitioners in monitoring and evaluating CBDRM projects.

Some attempts have been made to measure the impact of DRR activities, especially to measure progress towards implementation of the HFA, such as the HFA Monitor and other review processes (UNISDR 2010-2011; UNISDR 2012). In 2005, AusAID commissioned a study to examine the economic impact of natural disasters on development in the Pacific; this found that costs continued to be underestimated as there is very little accurate data on the impact (McKenzie et al, 2005). Due to the lack of data, much of the impact assessment was based on estimation and communities' perceptions of how the CBDRM programmes had improved their ability to mitigate and cope with disasters (McKenzie, 2005). The DFID Disaster Risk Reduction Interagency Co-ordination Group also commissioned a study to explore the 'characteristics of a disaster resilient community' (Twigg, 2007).

One of the most important of these attempts to measure progress was the UNISDR Mid-term review of the Hyogo Framework for Action (UNISDR, 2010-2011). This review highlighted the significant progress made over the previous five years in disaster risk reduction and the ways in which the HFA had played a significant role in promoting progress worldwide. This was reflected in various countries' legislation and policy-making frameworks that had put into place early warning systems and strengthened disaster preparedness, response, recovery and mitigation strategies. However, the review also noted that progress in implementing the HFA was uneven globally and that this reflected socio-economic and institutional disparities between different regions and countries.

Attempts have also been made to develop methods to estimate the social and economic costs of disasters. The World Bank (2005) categorises disaster losses as:

- direct costs: physical damage to capital assets, including social infrastructure;
- indirect costs: knock-on disruption to the flow of goods and services (e.g. reduced output, loss of earnings, job losses and livelihoods); and
- secondary effects: short- and long-term impacts of a disaster on the overall economy and socio-economic conditions (e.g. macroeconomic effects such as fiscal and monetary performance, levels of indebtedness, the distribution of income and the scale and incidence of poverty).

Other negative social effects of natural disasters can lead to a decrease in health and human capital in a community. This may result from a decline in schooling, poor nutrition and stunting, diminished cognitive abilities and increased incidence of mental health problems (World Bank, 2010). All these costs affect a community's ability to live productively and reduce subsequent earning in future years, highlighting the lasting impact that natural disasters can have on communities unless interventions successfully mitigate these risks.

Our preliminary research revealed few reports on the long-term outcomes or impact of CBDRM programmes. Monitoring and evaluation tools and guidelines have been produced by a range of agencies (Oxfam, International Federation of the Red Cross, ADPC) but it is difficult to find evidence of the extent to which organisations and programmes are using such guidance. Reports reviewing stakeholder activities are often non-specific and vague, and there are few reports on impact (ADPC, 2008; Bollin, 2003). There is consensus that data on disaster impacts are lacking and on the need for more accurate, systematic and clear information (McKenzie et al, 2005).

Although the CBDRM programmes have a strong focus on community engagement and management, involvement of government, particularly local government, may be required to ensure sustainability. UNISDR (2010) highlights four ways in which local government complements community involvement in disaster risk reduction:

1. co-ordinating and sustaining a multi-level, multi-stakeholder platform to promote disaster risk reduction in the region or in relation to a specific hazard;
2. engaging communities and citizens with disaster risk reduction activities and linking their concerns with government priorities;
3. strengthening their own institutional capacities and implementing practical disaster risk reduction actions by themselves; and
4. devising and implementing innovative tools and techniques for disaster risk reduction, which can be replicated elsewhere or scaled up nationwide.

Some agencies have recommended that CBDRM become institutionalised within the government, through the development of policy and legislation, resource allocation and mainstreaming DRM into government planning (ADPC, 2008).

Research evidence on the effectiveness of CBDRM initiatives and impact

Research on disasters has been promoted since the 1990s. This is apparent through journals dedicated to the topic, including *Disasters*, *Journal of Natural Disasters, Hazards and Crisis in Public Policy* and consortia such as Sphere, ALNAP, ProVention, the Humanitarian Partnership Project, ADPC and many others. Nevertheless, preliminary searches revealed limited studies about the effectiveness of CBDRM in relation to longer-term outcomes, in particular, economic and social costs. Whilst there are journals available on this topic and UN agencies such as the World Bank, UNICEF, the Food and Agriculture Organisation and the United Nations Development Programme all have guidelines and documentation in this area, gaps exist. Furthermore, much of the empirical research on CBDRM is limited to descriptive accounts; in part, this reflects the challenge of demonstrating the impact of prevention and preparedness activities on reducing morbidity, mortality or social and economic costs.

Papers reporting the results of CBDRM programme evaluations often take place after the programme has ended, and use process indicators as the main means of assessment. A preliminary search revealed a lack of rigorous assessment of long-term impact associated with these process indicators and limited assessment of the sustainability of interventions and their outcomes and impact.

Two earlier reviews of the literature found limited research on the effectiveness of CBDRM in developing countries. The first, by Bhattamishra and Barrett (2010) reviewed community-based risk management arrangements (CBRMA) across the developing world. The authors included both 'home grown' and 'externally-induced' interventions co-ordinated formally or informally for risk pooling. Interventions included informal mutual insurance, health insurance associations, savings and credit arrangements, grain and cereal banks, microfinance, social assistance facilities and community-based provision of public goods and services (Bhattamishra and Barrett, 2010). The authors concluded that while CBRMA programmes potentially enhance social protection, improved the two-way informational flow between communities and stakeholders and limited enforcement costs of these agreements, there were no careful evaluations that examined the effectiveness or the potential returns from these arrangements (Bhattamishra and Barrett, 2010: 930). A second recent but somewhat broad review by Roy and colleagues (2011) found that less than 1 percent of the cited literature on disasters in the PubMed database dealt with disasters in developing countries. The majority of articles were case-series studies or case reports, which 'add little to the evidence base' (Roy et al., 2011: 114). The authors recommended sustained long-term disaster research with increased contributions from the developing world (Roy et al., 2011).

While the lack of research examining the effectiveness of CBDRM initiatives on reducing the social and economic impact on vulnerable populations in low- and middle-income countries is a major constraint, the published literature will nevertheless offer valuable insights into how CBDRM initiatives are structured and implemented and the contexts in which they operate.

Case studies and qualitative analyses may contain insights into whether activities delivered as part of CBDRM initiatives contribute to assisting vulnerable populations to change behaviour or mobilise resources. This may contribute to reducing disaster impact. Rigorous analysis of the published literature, drawing on realist approaches, will help determine what is known about mechanisms which cause outcomes across a range of countries. It will also help synthesise understanding of the underlying mechanisms and contexts, and identify research and policy and practice gaps.

1.6 Authors and contributors

The review was undertaken by a team from the University of New South Wales in Sydney, Australia. The team was led by Professor Anthony Zwi (AZ) and included the following personnel: Dr Kim Spurway (KS); Mr Ryan Marincowitz (RM); Ms Lisa Thompson (LT); Ms Karen Hobday (KH); and Dr Geetha Ranmuthugala (GR). The team have research experience in humanitarian and disaster-related issues (AZ, KS), global health in low- and middle-income settings (AZ, LT, KH), equity and the social determinants of health (AZ), systematic reviews including realist reviews (AZ, GR, KS) and interface between research and policy and practice (AZ, GR, KS).

The review was supported by an Australian Development Research Award (ADRA) commissioned by the Australian Agency for International Development (AusAID). The review seeks to contribute insights and synthesised evidence to inform disaster risk reduction programming, particularly in low- and middle-income countries.

The review was registered with the EPPI-Centre (based within the Social Science Research Unit, Institute of Education, University of London), which supports the conduct of systematic reviews, including those focused on low and middle-income countries. Realist review advice was provided by Dr Gill Westhorp. The team drew in policy and practice insights from a Reference Group established for this purpose.

The Reference Group comprised:

- Moira Reddick, Coordinator, Nepal Risk Reduction Consortium Secretariat and UNDP Nepal;
- Raymond Apthorpe, Professorial Research Associate, School of Oriental and African Studies, University of London; Advisory Research Associate, Institute of Social Studies, The Hague, Erasmus University, Rotterdam; London Anthropology Forum;
- Paul Smart, Humanitarian Coordinator, Act for Peace;
- Dominic Bowen, International Assignments Manager, RedR Australia;
- Anna Gero, Research Consultant, Institute for Sustainable Futures; and
- Amara Bains, Independent consultant (formerly IFRC Indonesia).

2. Research approach and methods

This report focuses on the methods, results and findings of the realist mapping and realist review phases of this study. However, this chapter briefly outlines the methods and processes used during all three stages of this review so as to inform understanding of this final stage of the analysis.

2.1 Candidate theory selection

The CBDRM approach is grounded in a community development framework, and incorporates risk reduction and the promotion of resilience as key components. These elements were incorporated into the conceptual framework, as applied to LMICs.

The realist approach was selected to allow examination of evidence drawn from diverse literatures, not all of which met the more conventional criteria for examining effectiveness. It also allowed emphasis to be placed on the importance of context, an issue discussed in more detail in the next section. A realist review allowed for the identification and elaboration of the mechanisms through which outcomes and ultimately impact were postulated to take place.

A realist synthesis focused on identifying and examining the mechanisms triggered to generate one or more of many possible outcomes depending on the contexts. As the first step, the team identified candidate theory upon which CBDRM programmes might be based. The framework was derived from a preliminary search and analysis of the literature and emergent themes of the mechanisms which produced outcomes of interest, then refining these ideas in discussion with Reference Group members and AusAID personnel. Candidate theories and associated hypotheses were considered in relation to how they operated in different contexts. This analysis appears in Chapters three and four of this report.

Early in the process, the team identified important outcomes and explored the mechanisms that would have generated such outcomes in different contexts. The development of these context-mechanism outcome configurations illustrates the iterative nature of the realist approach. Identified outcomes and mechanisms were subsequently refined, adapted and supplemented in the light of emerging insights.

The team's emerging insights are reflected in the diagrammatic representation of programme activities, potential mechanisms and how they generated particular outcomes in a range of contexts (see Appendix 6. Additional insights are presented around factors which might enable or pose barriers to these interventions.

In line with the realist approach, the team constructed models to reflect the set of proposed mechanisms regarding how effective interventions are hypothesised to produce the outcomes of interest. Based on the team's knowledge of the field, a number of mechanisms and contexts were discussed and assessed as being likely to interact in CBDRM projects and to have an impact on outcome in LMICs.

For example, the following government-related contextual factors were identified as likely to influence CBDRM:

- whether DRR is recognised as a policy priority at all levels of government;
- whether there is political consensus on the importance of DRR;
- the national DRR policy, strategy and implementation plan;
- the local government DRR policies, strategy and implementation plan;
- official policy and strategy to support CBDRM; and
- local-level official understanding of, and support for, community vision (Twigg 2007: 12).

In this report we propose that CBDRM programmes have the potential to generate outcomes that impact on levels of risk, vulnerability, resilience and the capacity of affected groups, and which mitigate the long-term economic and social impact of disasters. The team originally hypothesised that the literature would contain both negative and positive outcomes related to certain mechanisms and contexts. These initial outcomes included concepts such as:

- reduced or increased vulnerability;
- increased or reduced resilience;
- decreased or reduced risk;
- no change to the degree or quality of vulnerability, resilience or risk.

The team also initially proposed three mechanisms that were specific to these contexts and were likely to contribute to achieving the outcomes of interest:

- **Integrated knowledges:** integrating community knowledge and experience with external expertise to produce enhanced or shared understanding of risks, vulnerabilities and actionable responses.
- **Expressed empowerment:** communities able to advocate, mobilise and control extra resources and shape new ideas, and transform relationships with government.
- **Actioned agency:** demonstrable agency which reflects community-based engagement and results in choices or changes to local institutions and structures and through which knowledge and resources may be channelled, transmitted or mobilised to empower the community.

These were assumed to work with, and alongside, an emphasis on building capacity.

During the search and subsequent realist mapping and review stages, a number of additional mechanisms emerged as important. These were:

- **Resilient livelihoods:** those which have the ability to withstand external climate stress and shocks, allow the rapid recovery of sustained livelihood activities post-disaster, and in the long term, facilitate sustainable livelihood adaptation to changing climatic conditions.
- **Gender and social equity promotion:** developing or promoting an enabling environment for gender and social equity through institutional, organisational and programmatic activities and operations.
- **Enhanced safety, security and protection:** this relates to the fundamental rights of any community in which a minimum level of physical, mental and legal safety, security and protection is required to enable communities to progress and invest in their future.
- **Technological innovation and communication:** the application of existing and new technologies and networks to strengthen social capital (networking and bridging) and enhance preparedness, response and recovery activities, as well as building resilience through human capital (skills and knowledge) in a community.
- **Linking mechanisms:** these 'link up' different mechanisms, activating and triggering them and 'link in' community-based organisations with other stakeholders, including different levels of government; they enhance community coping capacity, resilience and sustainable development.

These mechanisms were affected by, and reflected the influence of differing contexts. Programmes operating at community level are influenced by enabling or constraining (and at times 'disabling' or inhibiting) environments (Twigg, 2007). For example, one environmental and contextual factor that may well undermine potential interventions is the presence of widespread conflict with the resultant negative impacts on social cohesion and trust. For CBDRM initiatives, contextual factors may influence the associated mechanisms and the outcomes they generate.

The team identified the following broad contextual features as being potentially influential to generating or inhibiting underlying mechanisms and moderating the outcomes:

- recovery from prior disasters alongside capacity and desire to ensure better preparation for future problems (enabling);
- collective strengths and high level of interest in community safety (enabling);
- transparent power dynamics with leaders viewed as representing the population (enabling);
- history of working in partnership with local and international NGOs (enabling);
- positive relationships with government (enabling);
- positive outlook, with leaders and the majority of the population wanting to see improvements and willing to share the work required (enabling);
- corrupt representatives and leaders (disabling);
- community fatalism in relation to experiencing disasters (disabling);
- poor history of working with NGOs or government (disabling); and
- community divisions (disabling).

The review results and findings are set out in Chapters 3 and 4, with a discussion of the broader policy implications in Chapters 5 and 6.

2.2 Search strategy and in-depth mapping

This section briefly outlines the approaches used in the search for literature and the subsequent in-depth mapping stage of the review, the key components of which will be reported elsewhere (Zwi et al., 2013b will provide more details regarding this). This report focuses on the last two stages of a three-stage review process.

2.2.1 Search strategy

The following data sources were used to identify research reports and documents in which CBDRM programmes in LMIC settings are explored, described, evaluated or in other ways documented and researched:

- electronic bibliographic databases (Appendix 1);
- Google and Google Scholar to search the World Wide Web;
- targeted searches of websites of international agencies (see Appendix 1). As the majority of disaster-related documents (NGOs, donors and international organisations) are listed on Prevention Web, the strategy included a thorough search of key reports under the theme 'community-based DRR'.
- three journals identified during the 'grey' literature stage and searched for relevant articles: *Community Development Journal*; *World Bank Economic Review*; *Journal of Disaster Risk Studies* (South Africa);
- reference lists obtained from experts in the field and the Reference Group; and
- snowballing (citation searches) based on documents relating to social protection was used to supplement literature found from the database and grey literature search (first paper: Siegel et al., 2011). This reflected team concerns that social protection was under represented in the search results and could be an important tool for CBDRM.

The search was limited to materials published in English after 1995. Database and grey literature searches took place between 1 November 2011 and 2 March 2012. The initial set of search terms used was developed around the three main components of the research topic: LMIC, natural disasters and the concept of CBDRM. The LMIC search terms were derived from the list of LMICs in the World Bank's World Development Indicators 2011 (World Bank, 2012). Natural disaster and CBDRM search terms were developed through consultation with the Reference Group and insights gained through an initial exploratory review of the literature. In keeping with a realist-based approach, the terms were reviewed in consultation with the Reference Group, the EPPI-Centre and AusAID programme staff, and refined as the search commenced and further understanding of the literature evolved. The detailed search strategy and terms are presented in Appendix 2.

2.2.2 Identifying potentially relevant literature

The abstracts of all potentially relevant literature identified through the database and grey literature searches were screened to identify studies that were potentially relevant in terms of understanding the link between CBDRM programmes and the social and economic costs of natural disasters. Exclusion and inclusion criteria were developed to standardise this process (see Appendix 5) by application to each record to identify potentially relevant literature. Also retained for the next stage were records of the literature that required full-text review to determine their relevance to the review questions.

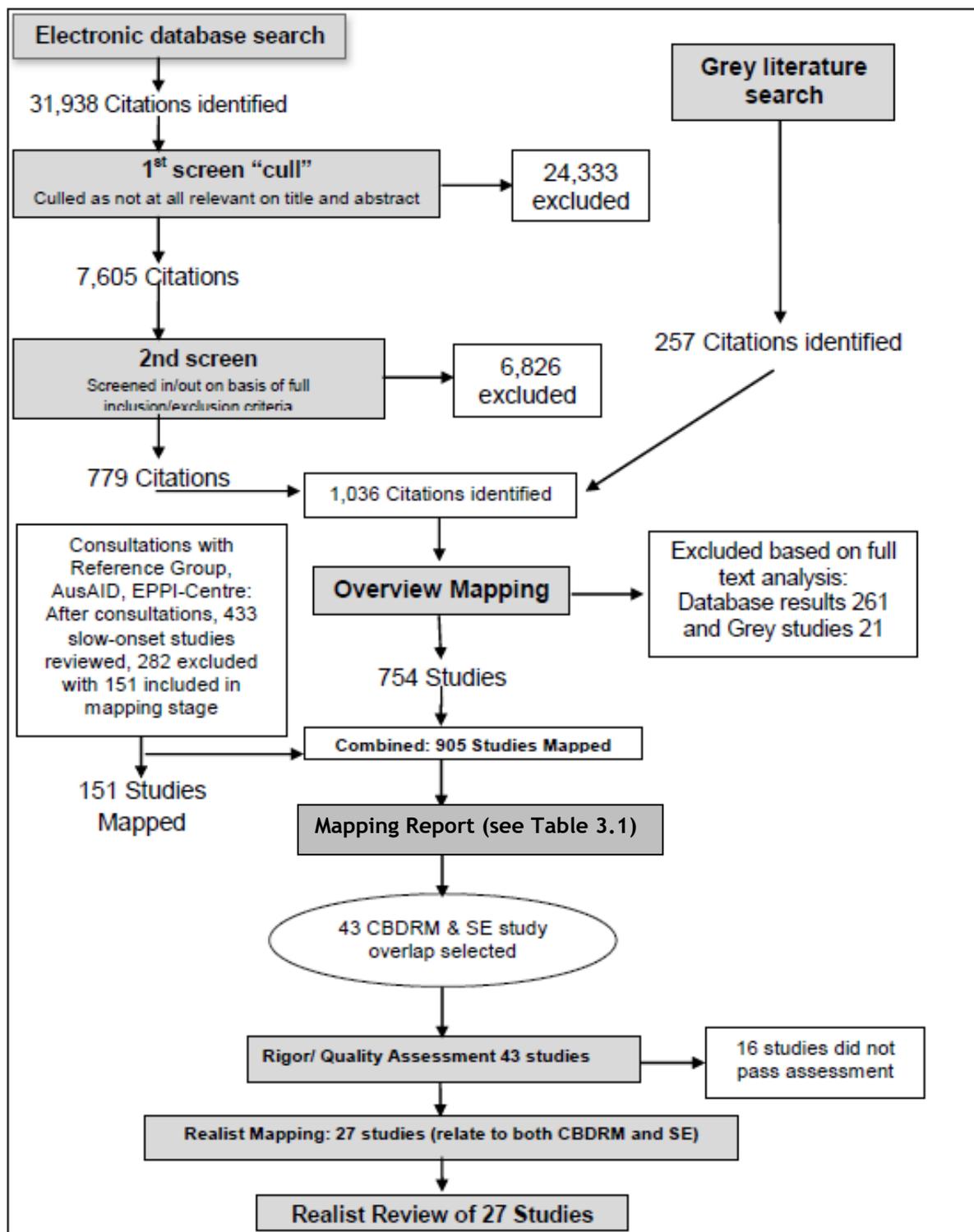
2.2.3 Inclusion/exclusion criteria and data management

In keeping with a realist-based approach, the research eligibility criteria included literature relevant to our initial 'candidate theory', as well as any that described the implementation, impact assessment or evaluation of CBDRM. They included peer-reviewed and grey literature.

The search was managed using EndNote (version 5) software, in which a library of all search results was created. All duplicate records were identified and deleted. The records in the Endnote library were then imported into EPPI-Centre's online review software, EPPI-Reviewer 4.0 (Thomas et al., 2010). EPPI-Reviewer was used to manage and document the screening, review and outcome of all processes and analyses associated with the review.

The literature extracted by the searches was screened by one of the two reviewers (KS and RM) to identify potentially relevant literature. A subset of these was screened by both reviewers to determine inter-rater reliability. At each of the three stages (screening, overview mapping and realist mapping), the reviewers compared notes, coding practices, conceptual understandings and decision criteria in order to standardise practices in screening, coding and reviewing the studies. Differences were discussed with other team members to refine the decision-making processes and criteria.

The literature was assessed in terms of 'whether a particular inference drawn by the original research [in the paper studied] has sufficient weight to make a methodologically credible contribution to the test of a particular intervention theory' (Pawson et al., 2005). Such an assessment, based only on the review of a study's abstract, was not always possible, and in these cases, a more detailed review of the full document was undertaken. If the study met the review inclusion criteria, it was retained for the next stage of the review. All aspects of the study processes were documented to ensure rigour and transparency.

Figure 2.1: Filtering of studies from in-depth mapping to realist review stages

2.2.4 Mapping the literature

All papers deemed potentially relevant were mapped for the purpose of describing and classifying available research, examining concepts, patterns and themes emerging from the studies and to narrow the focus of the detailed review. Studies identified from the electronic databases and grey literature searches were used to inform the mapping analysis. This will outline the key trends by geographic region, thematic content and programme element (see Zwi et al., 2013b, in preparation).

This overview mapping of the literature was used to identify a subset of studies for the subsequent stages of the review: realist mapping and realist review.

The total number of citations identified through the initial broad search was 31,938, of which 24,333 were culled as being outside the scope of the review. After this, 7,605 potentially relevant studies remained; these were assessed against the inclusion/exclusion criteria based on title and abstract. This left 779 studies from the electronic databases and 257 from the grey literature searches, making a total of 1,036. These studies were mapped against the categories set out in Appendix 5; a further 261 studies from the electronic databases and 21 from the grey literature, totalling 282 studies, were excluded as being out of scope on closer assessment. This left 754 studies included in the in-depth mapping stage.

These 754 studies were categorised and preliminary findings presented to AusAID, the EPPI-Centre and the study Reference Group. This process led to further refinements regarding both the content and structure of the review. Consequently, slow-onset studies that had earlier been excluded were retrieved and analysed according to the inclusion/exclusion criteria. Of the initial 433 slow-onset studies, 282 were excluded based on screening and full-text review leaving 151 slow-onset studies in the mapping. The final total of studies mapped after applying the revised inclusion, exclusion and screening criteria was 905.

Only those studies which incorporated a socio-economic and livelihood dimension and CBDRM activities and had textured information and outcomes data were incorporated into the Realist Mapping and Realist review.

2.3 Methods used in realist mapping and realist review

This section outlines the conceptual frameworks that underpinned the methods and analysis used in the review, the type of review undertaken and the weight of evidence allocated to studies selected for the realist mapping and review stages. It also outlines the approach used to review the literature and explains key methodological components of the review process. These are discussed in brief, in turn.

2.3.1 Weight of evidence allocated to selected studies

Quality appraisal of relevant sections of the studies included in the last stages of the review were undertaken to determine rigour and relevance (Pawson et al., 2005). This was undertaken jointly by two team members, with a third resolving disagreements. Studies were not excluded solely on quality assessment, with some studies with weaker designs but rich, fine-grained information, being integrated into the synthesis in keeping with realist principles (Mays et al, 2005).

Each study was assessed and scored in relation to rigour and quality (see Appendix 4). Studies were scored according to whether the team member included the study in the next round of review (Score = 2); was uncertain (Score = 1) or excluded the study altogether (Score = 0). These scores were averaged across all team members and a weight of evidence score given to each study, which is illustrated in Table 2.2 below.

Table 2.1: Weight of evidence allocated to the included studies

| Study | Weight of evidence rating | Level of analysis |
|------------------------------|---------------------------|-------------------|
| Awotona (1997) | Medium | Thick |
| Berke and Beatley (1997) | Medium | Thick |
| Bhattacharjee et al., (2010) | High | Thick |
| Care (2011) | High | Medium |

| Study | Weight of evidence rating | Level of analysis |
|-------------------------------|---------------------------|-------------------|
| Dekens (2007) | High | Thick |
| Dodman et al. (2010) | Medium | Thick |
| Doocy et al. (2006) | High | Thick |
| Giri and Malakar (2011) | Medium | Medium |
| Islam et al. (2011) | High | Medium |
| Kotowicz (2010) | High | Thick |
| Leone and Gaillard (1999) | Medium | Thick |
| Luna (2001) | Medium | Thick |
| Matsimbe (2003) | High | Thick |
| Mulligan and Nadarajah (2012) | Medium | Thick |
| Oxfam (2009) | Medium | Thick |
| Pelham et al. (2011) | Medium | Thick |
| Practical Action (2010a) | Medium | Thick |
| Rempel (2010) | Medium | Thick |
| Rossing et al. (2010) | Medium | Thick |
| Sato (2010) | Medium | Thick |
| Schutte and Kreutzmann (2011) | High | Thick |
| Selvaraju et al. (2006) | High | Thick |
| Thorburn (2009) | High | Thick |
| Tougiani et al. (2009) | Medium | Thick |
| USAID (2011) | High | Thick |
| Younous (2010) | High | Thick |
| Zaidi et al. (2010) | Medium | Thick |

All empirical (descriptive and analytical, quantitative and qualitative) research studies and grey literature were eligible for inclusion. In recognition of the value of detailed description, studies were also rated for whether they provided thick,¹ medium or thin description. Twenty-four of the 27 studies were rated as 'thick description' and three as 'medium'. Studies considered to be 'thin' were excluded from further analysis.

2.3.2 Selection of studies for realist review

The overview mapping stage determined the diversity and extent of the literature across all CBDRM programme types and regions, and for different types of natural disasters. In order to derive greatest value from the review, the subsequent realist mapping and review stages focused on an aspect of

¹ 'A rich, detailed description of specifics (as opposed to summary, standardization, generalization, or variables) ... It captures the sense of what occurred and the drama of events, thereby permitting multiple interpretations.' (Neuman, 1997: 347).

theory that would benefit from this deeper-level analysis. After consultation with the Reference Group, review advisers and AusAID, a focus on the set of studies that had investigated CBDRM programmes in combination with socio-economic strategies was agreed. Those that fell into this category, clearly stated explicit outcomes associated with reducing the social and economic impact of disasters, were ultimately included. From an initial set of 43 studies, 16 were excluded due to quality and rigour concerns, leaving a total of 27 studies for realist mapping and review.

2.3.3 Realist mapping

The 905 studies identified as meeting the inclusion criteria were mapped with realist considerations in mind, using NVIVO 9 qualitative data analysis software to assist with data categorisation and management. Studies offering insights into how context, mechanisms and outcomes related to each other, or offered other insights of relevance to theory generation and/or theory testing, were integrated into the final analytic stage: realist review. Studies included in the realist mapping and review stages stated explicit outcomes in their analysis.

2.3.4 Realist review

The literature was categorised and analysed using a realist approach to test the candidate theories and emergent models identifying how, why and when CBDRM interventions do (or do not) impact on the social and economic costs of disasters. Realist synthesis involved identifying the potential impact of CBDRM programme mechanisms on social and economic outcomes. Outcomes of interest included reducing risk, reducing vulnerability, enhancing resilience to disasters and building local coping capacity in order to actively engage with and reinforce these efforts.

In relation to the purposively selected subset of the literature (CBDRM and socio-economic), this review attempts to explain how, when and why these programmes are effective. Central to this analysis is a reassessment of the earlier candidate theory and conceptual models in relation to the studies being analysed using a realist-based approach. The team also devoted attention to assessing how context, mechanisms and outcomes related to each other in this subset of studies.

This analysis has further refined the team's understanding of how the different mechanisms determined outcomes in given contexts. This analysis also augmented and built on earlier documented mechanisms and identified any new mechanisms. The review team examined how these documented interventions related to, differed from or developed further understanding of the relationships between context, mechanisms and outcomes. As set out in Chapters 5 and 6, it is anticipated that this analysis will be of particular interest to those working on policy and programming in such environments.

Realist synthesis involved analysing and interpreting the ways in which context, mechanism and outcome intersect in each of the selected studies. A cross-case comparison of studies was also carried out in order to identify and study emerging thematic and conceptual patterns. Two processes were used simultaneously: a theory-driven approach that searched for those mechanisms already identified by the team, as well as a more exploratory approach that allowed new mechanisms to emerge from the literature. Feedback on these preliminary conclusions was sought from the study Reference Group.

2.3.5 Process used to combine and synthesise data

Our realist-based synthesis involved qualitative analysis of studies using NVIVO 9 software in order to identify any possible context, mechanism and outcome (CMO) configurations. Studies were examined and coded with emerging themes related to CMO configurations then identified. Refined CMO configurations based on the findings in the selected studies were then created for use as an analytic tool. Studies were then re-read, with the entire data set being recoded and analysed based on the identified candidate mechanisms and CMO configurations. Cross-case comparisons were made across studies to detect patterns and further test emergent theories.

2.4 Conclusion

This chapter describes the key stages and techniques used in the CBDRM realist mapping and review stages. At an earlier stage the research team identified a range of candidate mechanisms and theory regarding how context, mechanisms and outcomes might be related. These initial candidate theories were further refined and other emergent theories added, based on our analysis.

3. Summary of findings from in-depth mapping stage

This chapter briefly summarises the results and findings from the in-depth mapping stage of this study. More detailed results and findings from this stage of the review can be found in the CBDRM mapping report (Zwi et al., unpublished, 2013b).

As with the final two stages (described in Chapter 4), a realist-based approach was applied to reviewing the literature during this initial stage, with the objective of understanding the connections between CBDRM interventions and the social and economic costs of natural disasters in low- and middle-income countries. As recommended by Pawson et al. (2005) and applied by others (Anderson, 2007; Robert et al., 2012) this multi-stage approach was adopted, recognising that the process is highly iterative.

From the results of the mapping stage, it was clear that although the review's emphasis was on CBDRM, many related studies offered some insights of relevance to the study questions and were not excluded during the inclusion/exclusion process.

The last 25 years have revealed a significant growth, in all regions, in the number of studies focusing on communities and DRR/DRM. The main disaster types related to climate hazards (predominantly drought), followed by flooding, tsunamis (especially after 2004), earthquakes, meteorological storms (hurricanes, cyclones and typhoons) and landslides. The majority of studies that analysed primary or secondary data drew on mixed methods. South Asia was the predominant region studied followed by East Asia and the Pacific. There was a significantly greater focus on rural than on urban areas.

The largest group of studies covered multiple issues, without a specific focus on the community in the study or intervention. Community vulnerability assessments, 'CBDRM classic' programmes or interventions and community perceptions of adaptation, including traditional coping measures, were all well represented in the literature. The largest programme element investigated was socio-economic support and resilience, followed by pre-disaster preparedness or preparation and long-term disaster mitigation. Disaster response and recovery were also well represented. Most studies had a medium-scale focus. Medium-scale projects were those that were localised in multiple communities within one district or sub-region or were operating across multiple districts or sub-regions.

The populations investigated were primarily communities, with a secondary focus on service providers (such as NGOs and microfinance institutions) and governments, both at the national and local level. Of those studies that focused on a specific group, 'other vulnerable groups' were the major focus, with a limited range of studies examining groups by ethnicity, religion or persons with disability. In studies with a gender component, women received particular attention, and in those studies with an age-associated focus, children were studied more than older persons.

Most of the studies that collected and analysed data had explicit outcomes specified among the main categories of interest. Most of these outcomes were beneficial or positive rather than adverse or negative. This is especially true in relation to the 'CBDRM classic' programmes and interventions, suggesting that many such studies contributed positively to increasing community resilience and reducing vulnerabilities. A significant proportion of the studies also had mixed outcomes (some beneficial, some adverse), however. The number of studies categorised according to programme element and sector with explicit outcomes is shown in Table 3.1. More detailed analysis of a subset of these was undertaken within the realist mapping stage of the review.

Table 3.1: Studies of interest with explicit outcomes present

| Element(s) of DRM/DRR/CBDRM programme highlighted with outcomes | Count |
|---|-------|
|---|-------|

3. Summary of findings from in-depth mapping

| | |
|---|--------------|
| Community capacity building | 59 |
| Community early warning systems and networks | 51 |
| Risk communication, community awareness and disaster education programmes | 87 |
| Pre-disaster preparedness or preparation programmes | 194 |
| Disaster response programmes | 136 |
| Disaster recovery programmes | 113 |
| Long-term disaster mitigation programmes | 143 |
| Socio-economic support/resilience | 172 |
| All of the above | 14 |
| Other | 78 |
| Principal programme or sector(s) being investigated with outcomes | Count |
| CBDRM classic programme/intervention | 85 |
| Community development programme | 12 |
| Poverty reduction programme | 12 |
| Economic support | 20 |
| Climate change adaptation | 118 |
| Community vulnerability assessment | 124 |
| Social capital | 37 |
| Community perceptions of adaptation | 92 |
| Other | 215 |

Note: 43 studies were initially included in this review (although 16 were ultimately rejected on quality grounds) since the area of interest involved the overlap of studies with both socio-economic support/resilience and CBDRM classic programme/intervention. Many other potentially useful studies were collected and initially mapped in earlier stages; these could provide the basis for other important and relevant studies.

4. Results and findings of the realist mapping and review

This chapter briefly describes the key characteristics and findings from the studies selected for the realist mapping and review stages. We first summarise and tabulate the characteristics of the studies selected for in-depth analysis (Table 4.1). A total of 42 countries were assessed within the 27 published studies; some studies described more than a single country programme.

Table 4.1: Overview of studies selected for realist mapping and analysis

| | Africa | East Asia & Pacific | Latin America & Caribbean | South Asia | Total |
|--|--------|---------------------|---------------------------|------------|-------|
| Country | | | | | |
| Bangladesh | | | | 7 | 7 |
| India | | | | 4 | 4 |
| Indonesia | | 4 | | | 4 |
| Pakistan | | | | 4 | 4 |
| Philippines | | 3 | | | 3 |
| Sri Lanka | | | | 3 | 3 |
| Niger | 2 | | | | 2 |
| Thailand | | 2 | | | 2 |
| Antigua | | | 1 | | 1 |
| Belize | | | 1 | | 1 |
| Brazil | | | 1 | | 1 |
| Ethiopia | 1 | | | | 1 |
| Maldives | | | | 1 | 1 |
| Mexico | | | 1 | | 1 |
| Mozambique | 1 | | | | 1 |
| Nepal | | | | 1 | 1 |
| Nicaragua | | | 1 | | 1 |
| Peru | | | 1 | | 1 |
| St Kitts and Nevis | | | 1 | | 1 |
| Timor Leste | | 1 | | | 1 |
| Venezuela | | | 1 | | 1 |
| Total | 4 | 10 | 8 | 20 | 42* |
| Note: * totals vary because more than one category was possible. | | | | | |
| Setting | | | | | |
| Rural | 3 | 9 | 2 | 15 | 29 |

4. Results and findings of the realist mapping and review

| | Africa | East Asia & Pacific | Latin America & Caribbean | South Asia | Total |
|--|--------|---------------------|---------------------------|------------|-------|
| Urban | | 5 | 2 | 5 | 12 |
| Total | 3 | 14 | 4 | 20 | 41* |
| Note: * totals vary because more than one category was possible. | | | | | |
| Disaster type | | | | | |
| Tsunami | | 6 | | 5 | 11 |
| Flood | 1 | 2 | 1 | 4 | 8 |
| Meteorological storm (cyclones, hurricanes and typhoons) | | 1 | 2 | 4 | 7 |
| Landslide | | 2 | 2 | 1 | 5 |
| Earthquake | | | 1 | 4 | 5 |
| Climate-related hazards | 2 | | 1 | 1 | 4 |
| Volcanic hazards | | 3 | | | 3 |
| Fire-related hazard | | 1 | 1 | | 2 |
| Various/multiple | | 2 | | | 2 |
| Other geological disasters | | 1 | | | 1 |
| Total | 3 | 18 | 8 | 19 | 48* |
| Note: * totals vary because more than one category was possible. | | | | | |
| Scale of programme | | | | | |
| Pilot programme or intervention | | | 1 | 1 | 2 |
| Small (localised project in one community) | | | | | 0 |
| Small/medium (multiple communities) | 2 | 4 | | 7 | 13 |
| Medium/large (multiple districts/sub-regions) | | 2 | | 3 | 5 |
| Large (large scale project) | 1 | 2 | 1 | 2 | 6 |
| Unclear | | 1 | | | 1 |
| Not a programme or intervention | | 1 | 1 | 2 | 4 |
| Total | 3 | 10 | 3 | 15 | 31 |
| Element of CBDRM programme/ intervention | | | | | |
| Socio-economic support/resilience | 3 | 10 | 2 | 14 | 29* |
| Pre-disaster preparedness or preparation programmes | 2 | 7 | 2 | 10 | 21 |
| Disaster recovery programmes | 2 | 9 | 1 | 8 | 20 |

4. Results and findings of the realist mapping and review

| | Africa | East Asia & Pacific | Latin America & Caribbean | South Asia | Total |
|---|--------|---------------------|---------------------------|------------|-------|
| Disaster response programmes | 2 | 7 | 2 | 8 | 19 |
| Long-term disaster mitigation programmes | 2 | 4 | 3 | 9 | 18 |
| Community capacity building | 2 | 5 | 1 | 6 | 14 |
| Community early warning systems | 2 | 4 | | 7 | 13 |
| Risk communication, community awareness and disaster education programmes | 1 | 5 | 1 | 6 | 13 |
| All of the above | | 1 | | 2 | 3 |
| Total | 16 | 52 | 12 | 70 | 150* |
| Note: * totals vary because more than one category was possible. | | | | | |

South Asia was most represented (n=20) with Bangladesh (n=7) being the most commonly studied country within this region. East Asia and the Pacific was second (n=10), with Indonesia assessed in four of the studies. This was followed by Latin America and the Caribbean, in which eight countries were each considered once. Africa was reflected in four studies, two of which focused on Niger. Studies assessing interventions in Europe, Central Asia, the Middle East and North Africa did not get selected into the realist review.

Rural areas predominated in all regions with the exception of Latin America and the Caribbean, where there were even numbers of studies on urban and rural areas (n=2). Rural areas were considered in 29 cases compared to 12 for urban areas.

The disaster type most represented in the studies was the 2004 tsunami (n=11) with this quite evenly spread between East Asia and Pacific (n=6) and South Asia (n=5). This was followed by floods (n=8) and meteorological storms (n=7). A small number of studies relating to earthquakes (n=5) and climate-related hazards (n=4) were also included.

The majority of studies assessing an intervention or programme were classified as small/medium (n=13); these were localised projects implemented in multiple communities in one district or sub-region. This was followed by large interventions or programmes (n=6) operated at the country level by national governments and medium/large projects (n=5) that were implemented in multiple districts or sub-regions. Only two studies assessed pilot programmes.

The programme elements most often identified included those focused on socio-economic support and resilience (27 studies; one of the defining features of the studies included in the review) followed by pre-disaster preparedness or preparation programmes (n=21). Disaster recovery (n=20) and disaster response (n=19) activities were also described. Only three studies considered all programme elements of interest.

4.1 Studies included in realist mapping: methods

Table 4.2: Study methods overview

| | 1995-1999 | 2000-2004 | 2005-2009 | After 2010 | Total |
|----------------------|-----------|-----------|-----------|------------|-------|
| Type of study | | | | | |

4. Results and findings of the realist mapping and review

| | | | | | |
|--|----------|----------|----------|-----------|-----------|
| Secondary data presentation | | | 1 | 1 | 2 |
| Theory-practice studies | 1 | 1 | 2 | 2 | 6 |
| Primary data collection without outcome evaluation | | 1 | | 1 | 2 |
| Primary data collection with outcome evaluation | 2 | | 1 | 6 | 9 |
| Formal programme evaluation | | | 2 | 6 | 8 |
| Total | 3 | 2 | 6 | 16 | 27 |
| Study methodology | | | | | |
| Qualitative | | | | | |
| Case study | 3 | 1 | 6 | 14 | 24 |
| Grounded theory | | | | | 0 |
| Phenomenology | | 1 | | | 1 |
| Historical | | | 1 | | 1 |
| Ethnographic | | | | 1 | 1 |
| Total | 3 | 2 | 7 | 15 | 27 |
| Quantitative | | | | | |
| Case control | | | | | 0 |
| Cross-sectional | | 1 | 5 | 7 | 13 |
| Longitudinal | | | 1 | 1 | 2 |
| Quasi-experimental | | | | | 0 |
| Experimental | | | | | 0 |
| Total | | 1 | 6 | 8 | 15 |
| Quantitative and qualitative | | | | | |
| Mixed | | 1 | 5 | 7 | 15 |
| Weight of evidence | | | | | |
| Strong | | 1 | 4 | 7 | 12 |
| Medium | 3 | 1 | 2 | 9 | 15 |
| Weak | | | | | 0 |
| Total | 3 | 2 | 6 | 16 | 27 |

Table 4.2 provides an overview of the methods used by publication period for the 27 studies reviewed. Over half the studies included were published after January 2010. A sizeable proportion (9 of 27) involved primary data collection with some form of outcome evaluation (n=9). This was followed by formal programme evaluations (n=8) and studies linking theory and practice (n=6).

All the studies adopted a qualitative approach, with one utilising multiple qualitative methods (case study and historical) and quantitative methods (cross-sectional and longitudinal) to collect data.

Case studies were most frequent. Studies drawing on quantitative data were mostly cross-sectional, with only two longitudinal studies identified. Fifteen studies employed mixed methods.

The majority of studies were classified as 'medium' in terms of weight of evidence; most contained elements of both thick² and thin characteristics (n=15). Twelve studies were classified as having a strong weight of evidence. Those studies classified as weak were excluded prior to the final stage of the review.

4.2 Summary of study outcomes from the studies included in realist mapping

Table 4.3 provides an overview of the outcomes present in the 27 studies included in the review. Outcomes relating to resilience and vulnerability to natural disasters were greatest, followed by outcomes relating to incomes, outputs and enhanced livelihoods. This is not surprising, given the criteria for inclusion into the review. The majority of outcomes specified in the studies were positive, with a smaller number of negative outcomes included.

² 'rich, detailed description of specifics (as opposed to summary, standardization, generalization, or variables). This captures the sense of what occurred and the drama of events, thereby permitting multiple interpretations.' (Neuman, 1997: 347)

Table 4.3: Overview of outcomes by study

| Study | Risk of natural disaster | | Vulnerability to natural disasters | | Resilience to natural disasters | | Capacities of community organisations | | Coping capacities of communities | | Education and awareness | | Incomes, outputs and enhanced livelihoods | | Mortality | | Morbidity | | Incidence of mental health presentations | |
|--|--------------------------|-----|------------------------------------|-----|---------------------------------|-----|---------------------------------------|-----|----------------------------------|-----|-------------------------|-----|---|-----|-----------|-----|-----------|-----|--|-----|
| | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg |
| Awotona (1997) (Peru and Bangladesh) | | ✓ | | ✓ | | | | | | | | | | | | | | | | |
| Berke and Beatley (1997) (St Kitts and Nevis, and Antigua) | | | ✓ | | ✓ | | | | ✓ | | | | | | | | | | | |
| Bhattacharjee et al. (2010) (multiple countries) | | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | |
| Care (2011) (Timor Leste) | | | ✓ | | ✓ | | | | | | ✓ | | | | | | | | | |
| Dekens (2007) (Pakistan) | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | | | | | | | | ✓ | ✓ |
| 7Dodman et al. (2010) (Philippines) | | | ✓ | | ✓ | | ✓ | | ✓ | | | | | | | | | | | |
| Doocy et al. (2006) (Indonesia) | | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | | | | ✓ | |
| Giri and Malakar (2011) (Nepal) | | | ✓ | ✓ | | | | | ✓ | | ✓ | | ✓ | | | | | | | |
| Islam et al. (2011) (Bangladesh) | | | | ✓ | | ✓ | | | | ✓ | ✓ | ✓ | | | | | | | | |
| Kotowicz (2010) (Thailand) | | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | | | | | |

4. Results and findings of the realist mapping and review

| Study | Risk of natural disaster | | Vulnerability to natural disasters | | Resilience to natural disasters | | Capacities of community organisations | | Coping capacities of communities | | Education and awareness | | Incomes, outputs and enhanced livelihoods | | Mortality | | Morbidity | | Incidence of mental health presentations | |
|---|--------------------------|-----|------------------------------------|-----|---------------------------------|-----|---------------------------------------|-----|----------------------------------|-----|-------------------------|-----|---|-----|-----------|-----|-----------|-----|--|-----|
| | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg |
| Leone and Gaillard (1999) (Philippines) | | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | | | | | | | | |
| Luna (2001) (Philippines) | | | ✓ | | | | ✓ | | ✓ | | ✓ | | | | | | | | | |
| Matsimbe (2003) (Mozambique) | | | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | | | | | | |
| Mulligan and Nadarajah (2012) (Sri Lanka and India) | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | | | | ✓ | |
| Oxfam (2009) (Sri Lanka and India) | | | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | | | | | | |
| Pelham et al. (2011) (multiple countries) | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | | | | | | | |
| 17Practical Action (2010a) (Bangladesh) | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | | | | | | | |
| Rempel (2010) (India) | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | | | | | | | | |
| Rossing et al. (2010) (multiple countries) | | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | | | | | | | | | |
| Sato (2010) (Thailand) | | | ✓ | | | | | | | ✓ | | | | | | | | | | |
| Schutte and Kreutzmann (2011) (Pakistan) | | | ✓ | ✓ | | | | | | | | | ✓ | ✓ | | | | | | |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

4. Results and findings of the realist mapping and review

| Study | Risk of natural disaster | | Vulnerability to natural disasters | | Resilience to natural disasters | | Capacities of community organisations | | Coping capacities of communities | | Education and awareness | | Incomes, outputs and enhanced livelihoods | | Mortality | | Morbidity | | Incidence of mental health presentations | |
|--------------------------------------|--------------------------|-----|------------------------------------|-----|---------------------------------|-----|---------------------------------------|-----|----------------------------------|-----|-------------------------|-----|---|-----|-----------|-----|-----------|-----|--|-----|
| | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg | Pos | Neg |
| Selvaraju et al. (2006) (Bangladesh) | | | ✓ | | ✓ | | | | | | | | ✓ | ✓ | | | | | | |
| Thorburn (2009) (Indonesia) | | | ✓ | | ✓ | | | | | | ✓ | | ✓ | | | | | | | ✓ |
| Tougiani et al/ (2009) (Niger) | | | | | ✓ | | ✓ | | ✓ | | | | ✓ | | | | | | | |
| USAID (2011) (Bangladesh) | | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | | | | | |
| Younus (2010) (Bangladesh) | | | | ✓ | ✓ | | | | | | | | ✓ | | | | | | | |
| Zaidi et al. (2010) (Pakistan) | | | | | | | | ✓ | | ✓ | | | | ✓ | | | | | | |

5. Realist review: evidence synthesis

This chapter outlines the key analytic categories and analysis arising out of the realist-based in-depth review of 27 studies investigating both CBDRM and socio-economic programme elements. The chapter sets out the key context-mechanism outcome connections and analyses the linkages between each element. Studies which reflect the mechanism of interest are described alongside others; contextual factors affecting outcomes are also identified for discussion in subsequent sections of the report.

5.1 Integrated knowledges

5.1.1 Brief overview of the mechanism

This mechanism is defined as the integration of local knowledge and experience with external expertise to produce enhanced or shared understandings of risks and vulnerabilities, and of appropriate interventions. Local knowledge in this sense is similar to definitions of indigenous knowledge systems, which encompass:

locally distinctive, situated and learned knowledge by which a particular society or community apprehends the biotic and abiotic components of the environment and their interrelationships and engages them in a practical sense for sustenance, health, shelter, tools and other survival needs and wants. (Zent, 2012: 21)

Local knowledge is also often used synonymously with the term ‘traditional knowledge’, which is:

a cumulative body of knowledge, know-how, practices and representations maintained and developed by peoples with extended histories of interaction with the natural environment. These sophisticated sets of understandings, interpretations and meanings are part and parcel of a cultural complex that encompasses language, naming and classification systems, resource use practices, ritual, spirituality and worldview. (ICSU 2002: 3)

External expertise can take the form of technical knowledge such as engineered water systems, scientific knowledge such as climatology or meteorology and foreign expertise such as lessons learned from disaster risk reduction globally.

Table 5.1: Integrated knowledges: context, sustainable livelihoods framework and outcomes

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Bhattacharjee et al., (2010) (India, Indonesia and Sri Lanka) | Rural and urban settings Conflict-affected Limited community organisation Supportive local government Supportive national government Fragile ecosystem | | | | ✓ | ✓ | Education and awareness: • communities prepared visual educational materials for illiterate members • understanding of hazards and risk increasing |
| Care (2011) (Timor Leste) | Rural setting Limited community organisation Supportive local government Fragile ecosystem | | | | | ✓ | Education and awareness: • Expert knowledge can build awareness of climate change and projected trends |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|-----------------------------|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Dekens (2007) (Pakistan) | Rural setting Community organisation apparent Supportive local government Fragile ecosystem | ✓ | ✓ | | ✓ | ✓ | <p>Decreased vulnerability:</p> <ul style="list-style-type: none"> • traditional early warning systems: mirror and fire signals • call for prayer as EWS • shouting, whistling and physically contacting other communities to warn them • store food, administrative papers, other belongings above flood • relocate people and livestock to safer places • at night during rainy season: stay awake, sleep with shoes on, have 'go-bag' <p>Increased resilience:</p> <ul style="list-style-type: none"> • build in safe areas • dispersed landholdings • traditional food stores • agricultural terraces • flood retaining walls • traditional earthquake resistant structures • savings in government banks • diversify livelihoods • regulation of grazing and deforestation via customary rules |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|------------------------------------|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | Mental health presentations: <ul style="list-style-type: none"> • traditional 'Lavak Katesh' ceremony a symbolic means of dealing with anxiety re uncertainty and risk |
| Dodman et al. (2010) (Philippines) | Rural and urban settings Limited community organisation Some degree of supportive local government Some degree of supportive national government Fragile ecosystem | | | | ✓ | ✓ | Capacity of community organisations: <ul style="list-style-type: none"> • Enhanced local federation processes • Increased organisational ambition and innovation |
| Doocy et al. (2006) (Indonesia) | Rural and urban settings Conflict-affected Limited community organisation | | | | ✓ | ✓ | Increased incomes, outputs and enhanced livelihoods: <ul style="list-style-type: none"> • Project length decreased • Expert knowledge enhanced recovery and reconstruction |
| Islam et al. (2011) | Rural setting | | ✓ | ✓ | ✓ | ✓ | Community coping capacity: <ul style="list-style-type: none"> • Inadequate capacity of shelters in the study area |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|-------------------------------|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| (Bangladesh) | Limited community organisation Supportive local government Supportive national government Fragile ecosystem | | | | | | <ul style="list-style-type: none"> Overcrowded shelters led to some population at risk Inadequate storm warning systems Lack of livestock shelters led to population placing themselves at risk to save livelihoods Capacity of community organisations: <ul style="list-style-type: none"> Remote villages not covered by community and government emergency organisations Poor ongoing management of storm shelters |
| Kotowicz (2010) (Thailand) | Rural setting Limited community organisation Some degree of supportive local government Supportive national government Fragile ecosystem | | | | ✓ | ✓ | Capacity of community organisations: <ul style="list-style-type: none"> Enhanced awareness of disaster preparedness and response strategies Establishment of disaster response committees Education and awareness: <ul style="list-style-type: none"> Enhanced awareness of disaster preparedness and response strategies |
| Luna (2001) (Philippines) | Rural and urban settings Conflict-affected | | | | ✓ | ✓ | Education and awareness: <ul style="list-style-type: none"> Community members and organisations trained in disaster response and preparedness strategies |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | Limited community organisation Supportive local government Supportive national government Fragile ecosystem | | | | | | |
| Matsimbe (2003) (Mozambique) | Rural setting Conflict-affected Community organisation apparent Some degree of supportive local government Supportive national government | | ✓ | | ✓ | ✓ | <p>Education and awareness:</p> <ul style="list-style-type: none"> Information dissemination and educational programmes for communities on hazards and environmental management Training of national and provincial teams for monitoring, recording and evaluating hazard indicators <p>Capacity of community organisations:</p> <ul style="list-style-type: none"> Local disaster management committees strengthened disaster risk management <p>Community coping capacity:</p> <ul style="list-style-type: none"> Community-driven planning improved preparedness Integration of conventional wisdom with scientific information improved planning and strategies <p>Decreased vulnerability:</p> |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | <ul style="list-style-type: none"> Strengthening or adapting structures at start of cyclone season to avoid being destroyed by winds Build on higher ground or build upper floors to houses Build small huts to protect livestock |
| Mulligan and Nadarajah (2012) (Sri Lanka and India) | <p>Rural setting</p> <p>Area affected by conflict to some degree</p> <p>Limited community organisation</p> <p>Some degree of supportive local government</p> <p>Some degree of supportive national government</p> | | | | ✓ | ✓ | <p>Mental health presentations:</p> <ul style="list-style-type: none"> Local knowledge and appropriate traditional rituals used to address post-disaster trauma related to addressing death and loss |
| Oxfam (2009) (Sri Lanka and India) | <p>Rural and urban settings</p> <p>Community organisation apparent</p> | | | | ✓ | ✓ | <p>Increased incomes, outputs and enhanced livelihoods:</p> <ul style="list-style-type: none"> Community-driven planning, local experience and traditional knowledge led to improved humanitarian programming Local community adaptation strategies to climate change increased agricultural yields |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---------------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | Education and awareness: <ul style="list-style-type: none"> HIV education raised awareness of participating communities re sexual health issues |
| Pelham et al. (2011) (Mexico) | Rural and urban settings Area affected by conflict to some degree Limited community organisation Some degree of supportive local government Supportive national government Fragile ecosystem | ✓ | ✓ | | ✓ | ✓ | Community coping strategies: <ul style="list-style-type: none"> New risk strategies to cope with impact of disasters: intra-community and bank loans and social transfers |
| Practical Action (2010a) (Bangladesh) | Rural setting Community organisation apparent Supportive local government | | ✓ | | | ✓ | Community coping strategies: <ul style="list-style-type: none"> Adapted means of income generation, food consumption habits, savings, social or kinship relations to deal with shocks Raised plinths of houses above previous flood levels |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|--|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | Fragile ecosystem | | | | | | <ul style="list-style-type: none"> • Flood-proof sanitation • Elevated hand pumps for drinking water • Floating seed beds and vegetable gardens for floods • Fodder production and preservation for livestock • Storage of food and valuables above flood levels • Use of portable stoves Education and awareness: <ul style="list-style-type: none"> • Training to build on local knowledge to further reduce disaster impact |
| Rossing et al. (2010) (Mexico, Brazil, Venezuela, Nicaragua, Belize) | Rural setting Area affected by conflict to some degree Community organisation apparent Supportive local government Some degree of supportive national government | | | | ✓ | ✓ | Increased resilience: <ul style="list-style-type: none"> • Local institutional and social memory of natural hazards strengthens resilience • Collective memory prepared social system for changes caused by hazards • Social memory and social capital enhanced livelihood resilience • Strong social memory and bonding and bridging social capitals assisted in mobilising provisions and organisation of emergency shelters |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | Fragile ecosystem | | | | | | |
| Selvaraju et al. (2006) (Bangladesh) | Rural setting Community organisation apparent Supportive local government Supportive national government Fragile ecosystem | | ✓ | | ✓ | ✓ | Increased resilience: <ul style="list-style-type: none"> Traditional practices including pond excavation, retention of rainwater for drought, miniponds Increased incomes, outputs and enhanced livelihoods: <ul style="list-style-type: none"> Successful livelihood strategies: mango farming, integrated crop-livestock farming systems, dry seedbed, improved short-duration crop varieties, supplemental irrigation, reduction of moisture loss, closing of soil cracks, homestead gardening with fruit trees, strengthening of field bunds |
| Thorburn (2009) (Indonesia) | Rural setting Conflict-affected Community organisation apparent Supportive local government Some degree of supportive national government | | | | | ✓ | Increased incomes, outputs and enhanced livelihoods: <ul style="list-style-type: none"> Skill training, support, guidance, follow-up and monitoring led to successful enterprise development programmes Use of local expertise improved planning, distribution and management |
| Tougiani et al. (2009) | Rural setting | ✓ | | ✓ | | ✓ | Increased incomes, outputs and enhanced livelihoods: |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|-------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| (Niger) | Conflict-affected Community organisation apparent Supportive local government Fragile ecosystem | | | | | | <ul style="list-style-type: none"> • Valorising community members, their ideas, knowledge, experience and enthusiasm resulted in land regeneration and poverty alleviation • Farmer-managed natural regeneration improved livelihoods and vegetative cover • Hybrid of scientific and local environmental knowledge and governance structures engendered indigenous tree regeneration |
| Younus (2010) (Bangladesh) | Rural setting Community organisation apparent Some degree of supportive local government Supportive national government Fragile ecosystem | | | ✓ | | ✓ | <p>Increased incomes, outputs and enhanced livelihoods:</p> <ul style="list-style-type: none"> • Farmers' empirical knowledge enhanced livelihood adaptive capacity • Local knowledge enabled maximum crop production and return from land • Crops successfully matured due to farmers' autonomous crop adaptation strategies |

5.1.2 Discussion of the mechanism table

The mechanism was identified in 18 of the 27 studies, and described activities in 15 countries. In all of these, at least one type of outcome was specified. Countries studied in terms of this mechanism are spread across all geographic regions, although Africa is not well represented. Two studies looked at countries in Africa (Niger, Mozambique); four were in South Asia (Bangladesh, India, Sri Lanka, Pakistan); four in South East Asia (Indonesia, Philippines, Thailand, Timor Leste) and five from Central and Latin America (Mexico, Brazil, Venezuela, Nicaragua, Belize). Four studies compared community-based risk management and socio-economic programme elements in more than one country (Bhattacharjee et al., 2010; Mulligan and Nadarajah, 2012; Oxfam, 2009; Rossing et al., 2010).

These studies were all published after 2000, reflecting the growing interest and awareness of the value of traditional and local forms of knowledge and their intersection with scientific and technical knowledge (ICSU 2002).

5.1.3 The how, why and when of the mechanism

This mechanism was most effective in the presence of robust local institutions and government structures. All eighteen of the studies indicated that there was some kind of community organisation present (Bhattacharjee et al., 2010; Dodman et al., 2010; Doocy et al., 2006; Islam et al., 2011; Kotowicz, 2010; Luna, 2001; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Oxfam, 2009; Pelham et al., 2011; Practical Action, 2010; Rossing et al., 2010; Selvaraju et al., 2006; Tougiani et al., 2009; Younus, 2010). These included local disaster management committees, village leadership structures and other community-based organisations. Fifteen studies indicated the presence of supportive local governments (Bhattacharjee et al., 2010; Dodman et al., 2010; Doocy et al., 2006; Islam et al., 2011, Kotowicz, 2010; Luna, 2001; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Oxfam, 2009; Pelham et al., 2011; Practical Action, 2010; Rossing et al., 2010; Selvaraju et al., 2006; Tougiani et al., 2009; Younus, 2010) and 13 supportive national governments (Bhattacharjee et al., 2010; Dodman et al., 2010; Islam et al., 2011; Kotowicz, 2011; Luna, 2001; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Oxfam, 2009; Pelham et al., 2011; Rossing et al., 2010; Selvaraju et al., 2006; Thorburn, 2009; Younus, 2010).

The presence and influence of strong local institutions appears to support the workings of integrated local knowledge and experience in CBDRM programmes.

All of the studies investigated rural settings, however, six also included insights from urban settings (Bhattacharjee et al., 2010; Dodman et al., 2010; Doocy et al., 2006; Luna, 2001; Oxfam, 2009; Pelham et al., 2011). Nine of the studies took place in conflict-affected settings (Bhattacharjee et al., 2010; Doocy et al., 2006; Luna, 2001; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Pelham et al., 2011; Rossing et al., 2010; Thorburn, 2009; Tougiani et al., 2009), although none of the studies indicated a strong influence of conflict on the workings of this mechanism. In Nicaragua Rossing et al. (2010) highlighted the fact that communities were able to overcome the destruction and social divisions caused by conflict in order to build strong community disaster management committees and risk reduction strategies.

Eleven studies demonstrated a strong influence of fragile ecosystems on the ability of communities to adapt to extreme events (Care, 2011; Bhattacharjee et al., 2010; Dodman et al., 2010; Islam et al., 2011; Kotowicz, 2010; Luna, 2001; Pelham et al., 2011; Practical Action, 2010; Rossing et al., 2010; Tougiani et al., 2009; Younus, 2010). These communities have developed strong repositories of local environmental knowledge and have large repertoires of adaptive and coping strategies. Nevertheless, these strategies can, on occasion, be overwhelmed by the sheer force and size of a disaster. This is clearly shown in countries with fragile ecosystems that are potentially affected by climate change and extreme meteorological events, such as Niger (Tougiani et al., 2009) and Bangladesh (Islam et al., 2011; Practical Action 2010; Selvaraju et al., 2006; Younus, 2010).

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Using the Sustainable Livelihoods Framework to analyse these studies, it is apparent that this mechanism was very strongly associated with social capital (13 studies) and to a lesser degree human capital (18 studies). This is not surprising, since social capital describes the functioning of social and individual networks, mutual trust and forms of mutually beneficial collective action (Rossing et al., 2010: 270). As demonstrated in those studies investigating human capital, this is also about individual skill development, training and learning support (see Islam et al., 2011; Luna, 2001; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Rossing et al., 2010; Selvaraju et al., 2006 for example).

All 18 studies investigating human capital also highlighted the importance of social capital, with human capital formation in disaster risk management being used to supplement, build on and support social capital formations linked with traditional and local forms of knowledge and experience. This mechanism is much less strongly associated with physical capital (six studies: Dekens, 2007; Islam et al., 2011; Matsimbe, 2003; Pelham et al., 2011; Practical Action, 2010a; Selvaraju et al., 2006) and only marginally associated with either financial (Dekens, 2007; Pelham et al., 2007; Tougiani et al., 2009) or natural capitals (Islam et al., 2011; Tougiani et al., 2009; Younus, 2010).

5.1.4 Mechanism outcome

The mechanism was shown to have been linked with seven specific outcomes: increased education and awareness; increased incomes, outputs and enhanced livelihoods; increased resilience; decreased vulnerability; increased community coping capacity; increased capacity of community organisations and decreased incidence of mental health presentations. The most important of these was increased education and awareness, identified in seven studies overall (Bhattacharjee et al., 2010; Care, 2011; Kotowicz, 2010; Luna, 2001; Matsimbe, 2003; Oxfam, 2009; Practical Action, 2010a). Since the mechanism builds on local knowledge and experience, this outcome is in keeping with what might be expected.

Care (2011) in its study of flooding and landslides in small-scale agricultural communities in Timor Leste, found that expert knowledge can help communities build awareness of climate change and projected meteorological trends. The study by Bhattacharjee et al. (2010) of rural communities in Sri Lanka, India and Indonesia found that communities not only had an increased awareness and knowledge of disasters but that they proactively prepared visual educational materials for illiterate community members. In her thesis on rural communities in Thailand recovering from the consequences of the 2004 Asian tsunami, Kotowicz (2010) found that the training and education of disaster response committees increased overall awareness and knowledge within the communities of current and future hazards. Luna's study (2001) also demonstrated that training community members and their organisations in rural and urban Filipino communities enhanced awareness and management strategies. Matsimbe's research (2003) highlighted the increased levels of disaster education possible in agricultural communities in the Búzi River basin in Mozambique if information dissemination programmes were co-ordinated with hazard monitoring and evaluation teams. Oxfam (2009) in its study of rural and urban communities in India and Sri Lanka found that educating tsunami-affected communities in HIV also improved their awareness of their overall sexual health. Practical Action's review (2010a) of its Bangladesh programme showed that awareness of disasters improved if educational strategies built on pre-existing local disaster knowledge.

Increased incomes, outputs and enhanced livelihoods outcomes were found in six of the studies (Doocy et al., 2006; Oxfam, 2009; Selvaraju et al., 2006; Thorburn 2009; Tougiani et al., 2009; Younus, 2010). Doocy and colleagues (2006) found in Indonesia after the tsunami that using local knowledge combined with expert knowledge improved recovery and reconstruction, and shortened the length of time required for post-disaster interventions. Oxfam (2009) also highlighted the fact that integrating local knowledge into an intervention could improve humanitarian programming and

increase agricultural yields. In their study of subsistence farmers in Bangladesh, Selvaraju et al. (2006) demonstrated that local environmental knowledge of droughts improved agricultural yields due to adaptive livelihood strategies: mango farming, integrated crop-livestock farming systems, dry seedbed, improved short-duration crop varieties, supplemental irrigation, reduction of moisture loss, closing of soil cracks and homestead gardening with fruit trees. In the harsh climatic conditions of the Sahel in Niger, integrating community knowledge, experience and ideas resulted in land regeneration, improved livelihoods, increased vegetative cover and environmental regeneration (Tougiani et al., 2009). Younus (2010) called this 'autonomous adaptation' and he also demonstrated the flexibility and adaptive capacity of Bangladesh farming communities in preparing for, responding to and recovering from disasters.

An increase in the capacity of community organisations was found in three studies (Dodman et al., 2010; Kotowicz, 2010; Matsimbe, 2003). Dodman et al. (2010) demonstrated how organisational processes and increased organisational ambition and innovation improve if local knowledge and experience were valorised. Two studies showed that local knowledge allowed members of community organisations to more effectively develop preparedness and response strategies in Thailand after the 2004 tsunami (Kotowicz, 2010) and in rural communities in Mozambique (Matsimbe, 2003).

An increase in community coping capacities resulting from integrated local knowledge and experience was found to operate in four of the studies (Islam et al., 2011; Matsimbe, 2003; Pelham et al., 2011; Practical Action, 2010a). In Mozambique, community-driven planning that integrated both conventional and scientific wisdom improved community preparedness, planning and strategy development (Matsimbe, 2003). In Mexico, community organisations working with external expertise developed new strategies and innovations to cope with the impact of disasters, such as intra-community and bank loans and social transfers (Pelham et al., 2011). Practical Action (2010) highlighted the ways in which community organisations in Bangladesh developed and adapted their means of income generation, food consumption habits, savings and social or kinship relations to deal with shocks as well as making structural changes to housing, sanitation, water supplies, agriculture and fodder production.

The use of integrated local knowledge and experience also increased overall resilience (Dekens, 2007; Rossing et al., 2010; Selvaraju et al., 2006). Both Dekens (2007) and Selvaraju et al. (2006) argued that communities were able to increase their resilience through strategies such as constructing houses and traditional food stores in dispersed, safe areas, and building agricultural terraces, flood retaining walls and traditional water storage mechanisms. Rossing et al. (2010) showed that local institutional and social memory increased overall social and livelihood resilience, as well as the mobilisation of emergency shelters. Increased community capacity in Mozambique resulted from the integration of conventional wisdom and experience with scientific information and hazard reduction strategies (Matsimbe, 2003).

Outcomes related to decreased vulnerability (Dekens, 2007; Matsimbe, 2003) were found in only two studies, and increases in community capacity (Islam et al., 2011; Matsimbe, 2003; Pelham et al., 2011) in only three. Dekens (2007) and Matsimbe (2003) described the efficacy of traditional mechanisms in reducing vulnerability in Pakistan and Mozambique respectively. This included early warning systems (EWS) such as signalling by mirror and fire and using the mosque to broadcast EWS, as well as storing essential supplies, and adapting and strengthening structures for disaster resistance for housing and livestock. Matsimbe (2003) and Pelham et al. (2011) both found that strengthening community-led interventions and integrating traditional knowledge into programmes improved community capacity to plan and strategise.

A decreased incidence of psychosocial problems (Dekens, 2007; Mulligan and Nadarajah, 2012), resulting from the assimilation of traditional culture, indicated that local customary practices and rituals helped reduce the trauma and loss resulting from disasters in Pakistan, Sri Lanka and India.

5.1.5 Inhibitors

Eight studies demonstrated how certain factors could inhibit or constrain the functioning of a specific mechanism. Two key factors constrained the integrated knowledge mechanism: a lack of community ownership and empowerment (see Dekens, 2007; Matsimbe, 2003; Oxfam, 2009; Rempel, 2010; Selvaraju et al., 2006; Thorburn, 2009; Tougiani et al., 2009) and the imposition of, and/or inappropriate external technical ‘fixes’ and ‘advice’ (see Dekens, 2007; Islam et al., 2011; Rempel, 2010; Selvaraju et al., 2006; Thorburn, 2009; Tougiani et al., 2009). These inhibitors intersected and interacted strongly with each other, as seen in the overlap in the studies described here.

Dekens (2007) strongly argued for the value and strength of local and traditional knowledge, highlighting innumerable instances in which outside agencies intervened in Pakistani villages, ignored local wisdom and experience and imposed external technical ‘fixes’. A good example was the new early warning systems introduced into the Chitral area that relied on sirens, telephones and information delivered to the communities from the central government’s Flood Forecasting Division of the Meteorological Office. Unfortunately, this actually accentuated socio-economic disparity, since not everybody in the communities could afford to access all of the new technologies such as the sirens, which were located in only two areas and relied on communication technology for the warning to be disseminated.

Matsimbe (2003) also showed that hazard information and planning based on information from national or provincial levels could not reflect local realities and did not address the needs of rural communities. In Mozambique, with poor information and communication systems, this was not an effective way to design and address vulnerability and reduce risk. In another instance, international NGOs constructed boreholes in Búzi district that had no water because they made decisions without consulting local authorities or communities who knew the region well. Oxfam’s (2009) study on the lessons learned from its tsunami research programme found that ‘the knowledge, capacity, and priorities of communities were often overlooked, and their members cast as consultants or passive recipients of aid rather than as equal partners in the process’ (Oxfam, 2009: 2).

Despite humanitarian agency commitment to community-driven programming, a number of agencies established interventions that reflected their own agendas and not the priorities of the communities involved. This led to duplication of programmes, a waste of funding, and frustrated, suffering communities.

Rempel (2010) also highlighted the forces that act against empowerment of communities and devalue their ideas and perspectives, as seen in post-tsunami programming. The lack of co-ordination between the different levels of government and the range of local and international agencies resulted in significant delays in the construction of permanent housing, as well as the construction of houses that were inappropriate in terms of being too far away from the seashore for people to easily practise their livelihoods. Islam et al. (2011) also argued that a lack of co-ordination between government, NGOs and local populations led to increased risk for people in Bangladesh attempting to cope with the effects of extreme weather events such as Cyclone Sidr. Islam et al. (2011) demonstrated that because local people’s experience and cultural practices were not taken into account, some people were unable to access storm shelters provided by the government and NGOs.

In the study by Selvaraju et al. (2006), the introduction of foreign carp species to replace native species in Bangladeshi villages led to reduced income for communities because the introduced species was more susceptible to pests and diseases. Other interventions also attempted to introduce

commercial rice production to replace adaptive local agricultural practices that relied on diversified and more drought-resilient local crops, such as wheat, lentils and sweet potato, without much success. Thorburn et al. (2009) highlighted the importance of empowering local people and their embedded local knowledge in their discussion about livelihood recovery in post-tsunami Aceh. Disaster relief and recovery programming was shown to have provided boats and engines without consulting local people; thus they proved too large and inappropriate for the local fishermen, with many of the older men being unable to launch these boats at all due to their size. Finally, Tougiani et al. (2009) showed that the exotic tree species introduced to reforest the Sahel were poorly adapted to local environmental conditions and proved disastrous for the local environment and local communities affected. After decades of these top-down approaches, NGOs, donors and the Nigerian Forestry Department finally acknowledged the fact that local community members were the 'greatest resource available to address land degradation while alleviating poverty'. The introduction of indigenous tree regeneration programmes based on traditional farming and environmental management methods has resulted in the region being able to turn the tide against desertification.

The increasing importance of local knowledge was recognised at the World Conference on Science organised by UNESCO in July 1999. The conference declared that:

traditional and local knowledge systems, as dynamic expressions of perceiving and understanding the world, can make and historically have made, a valuable contribution to science and technology, and that there is a need to preserve, protect, research and promote this cultural heritage and empirical knowledge.(ICSU, 2002)

This also reflects a growing interest in the link between local knowledge systems and broader developmental issues, such as sustainability, participatory decision making and grassroots decision making (Atran, 1992; Warren, 1992; Zent, 2012).

The importance of integrating local and scientific knowledge is increasing being recognised by the international community, as illustrated in the latest IPCC Special Report, highlighting the ways in which a 'self-generated knowledge' of extreme events can help improve community capacity to mitigate, prepare, respond and recover from disasters (IPCC, 2012: 15). Dekens (2007: 23) argues that:

Agencies tend to favour scientific and specialised knowledge; a great deal of which is not in tune with local contexts and realities. Local people are the first to suffer from the direct impacts of disasters, but they are also the first to respond to them ... Ignoring their knowledge may lead to important human and economic costs, especially in the long term.

5.2 Expressed empowerment

5.2.1 Brief overview of the mechanism

Expressed empowerment refers to demonstrating the enhanced abilities of communities to advocate, mobilise and control extra resources, shape new ideas and transform relationships with government.

Table 5.2: Expressed empowerment: context, sustainable livelihoods framework and outcomes

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial Capital | Physical Capital | Natural Capital | Social Capital | Human Capital | |
| Berke and Beatley (1997) (St Kitts and Nevis, and Antigua) | Rural and urban settings Community organisation apparent Supportive local government Supportive national government | ✓ | | | ✓ | | Vulnerability: <ul style="list-style-type: none"> Participants believed that the programmes would benefit them if there was widespread compliance which led to whistle blowing on beneficiaries that were trying to defraud the project |
| Bhattacharjee et al. (2010) (multiple countries) | Rural and urban settings Area affected by conflict to some degree Community organisation apparent Supportive local government Supportive national government | ✓ | ✓ | | ✓ | ✓ | Enhanced livelihoods: <ul style="list-style-type: none"> Internal lending within the group with a much lower interest rate – 2% instead of 10% Self-help groups for elders which had their own revolving funds were used by members to borrow either for investments in micro-enterprises or in times of crisis Increased capacity of community organisations: <ul style="list-style-type: none"> In Sri Lanka, discussions on DRR took place in monthly meetings of community groups. 20 of the 23 community groups interviewed felt they had the capacity to negotiate with or challenge authorities regarding disaster protection and DRR issues |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|-----------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial Capital | Physical Capital | Natural Capital | Social Capital | Human Capital | |
| | Fragile ecosystem | | | | | | <ul style="list-style-type: none"> • In India, elderly men's and women's self-help groups led to changes in policies for financial institutions which earlier didn't consider working with older people • In Mamplam (Indonesia), a school collected money for use in public emergencies or other social purposes • Community-level DRR work in Sri Lanka helped foster more openness by grassroots-level government functionaries (Grama Niladhari, divisional secretary etc.) toward consultation with communities in general and village DMCs in particular <p>Vulnerability and resilience:</p> <ul style="list-style-type: none"> • Due to greater awareness of disasters, where communities can afford, they were already investing in making their houses stronger and safer, without waiting for NGOs or governments. Communities actively seeking to manage disaster risks to their livelihoods and houses through micro-insurance in Tamil Nadu. |
| Dekens (2007) (Pakistan) | Rural setting Community organisation apparent Supportive local government | ✓ | | | ✓ | | <p>Resilience:</p> <ul style="list-style-type: none"> • <i>Negative</i>: migration away from the village could impact on community solidarity in the face of threats as men start to work outside the villages to earn cash, which increases individualism <p>Vulnerability:</p> |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---------------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial Capital | Physical Capital | Natural Capital | Social Capital | Human Capital | |
| | Fragile ecosystem | | | | | | <ul style="list-style-type: none"> • <i>Negative</i>: people were more dependent on the government and did not rely on traditional systems to fall back on • <i>Negative</i>: communities that organised themselves and successfully arranged funds for mitigation efforts were criticised by local mullahs, who saw their activities as 'un-Pakistani' <p>Psychosocial support:</p> <ul style="list-style-type: none"> • Neighbours and relative increasingly provided 'social and psychological insurance before, during and after floods' |
| Dodman et al. (2010) (Philippines) | Rural and urban settings Very low-income community members Community organisation apparent Some degree of supportive local government Some degree of supportive national government | ✓ | ✓ | | ✓ | ✓ | <p>Vulnerability:</p> <ul style="list-style-type: none"> • An important outcome relating to collective action concerned water supplies. When resettled communities first moved to the site, families had to pay 50 pesos a day for water. After some months, members lobbied for the water network to be extended and they now pay 159 pesos a month (the minimum charge for water in the city). It costs 2,700 pesos to purchase a connection, and families who have made the investment sell water to those without a connection, charging 2 pesos for 20 litres of water • Federation members used a variety of strategies to negotiate reduced land prices; they recognise that |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|------------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial Capital | Physical Capital | Natural Capital | Social Capital | Human Capital | |
| | Fragile ecosystem | | | | | | <p>their new challenge is to find affordable strategies for accessing basic services.</p> <p>Capacity of community organisations:</p> <ul style="list-style-type: none"> • Local savings groups had strong participation from local barangay (village/district) councillors and were beginning to negotiate with municipal officials for support for infrastructure investment • Communities were able to negotiate support from the barangay, which assisted with permissions and sometimes loan of machinery • Relations between savings scheme members helped them respond rapidly to the fire, immediately taking advantage of the situation to 're-block' the site prior to moving back on to the land; this stimulated negotiations with authorities • Community network lobbied the council (sometimes with mass demonstrations) on numerous occasions to ensure that key officials and politicians responded to requests from the federation |
| Doocy et al. (2006) (Indonesia) | Rural and urban settings Conflict-affected Limited community organisation | ✓ | | | ✓ | ✓ | <p>Coping capacities of communities:</p> <ul style="list-style-type: none"> • Many communities had already taken the initiative and began clean-up, introducing cash for work (CFW) enabled these activities to expand to scale. By mobilising labour via CFW, the decision-making power remained with individuals, and households |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial Capital | Physical Capital | Natural Capital | Social Capital | Human Capital | |
| | | | | | | | <p>were empowered to make their own choices and spend money accordingly</p> <ul style="list-style-type: none"> The potential benefits of empowering beneficiaries in decision making outweighed the risks of misappropriation of funds <i>Negative</i>: an issue reported was that because of widespread CFW initiatives, communities were less willing to contribute to rebuilding without compensation in later reconstruction phases |
| Kotowicz (2010) (Thailand) | <p>Rural setting</p> <p>Community organisation apparent</p> <p>Some degree of supportive local government</p> <p>Supportive national government</p> <p>Fragile ecosystem</p> | | | | ✓ | ✓ | <p>Vulnerability:</p> <ul style="list-style-type: none"> A 2-day workshop on leadership, conflict resolution and peace-building was initiated in response to reports of increasing conflict in communities, especially between local leadership (village heads and local officials) and community members <p>Resilience, community and organisational capacity:</p> <ul style="list-style-type: none"> Village heads' involvement secured government participation and accountability as well as increased co-ordination between fund members and government |
| Leone and Gaillard (1999) (Philippines) | <p>Rural setting</p> <p>Limited community organisation</p> | | | | ✓ | ✓ | <p>Capacity of community organisations:</p> <ul style="list-style-type: none"> In some villages, the local community developed their own surveillance and warning system with their own observation teams. Others, even more organised, mobilised available vehicles to make up |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial Capital | Physical Capital | Natural Capital | Social Capital | Human Capital | |
| | Some degree of supportive local government Supportive national government | | | | | | for the shortage of official means needed for the evacuations |
| Matsimbe (2003) (Mozambique) | Rural setting Conflict-affected Community organisation apparent Some degree of supportive local government Supportive national government | | | | ✓ | ✓ | Resilience: <ul style="list-style-type: none"> In Búzi during the 2000 floods, informal social networks based on neighbourhood, friendship, kinship or church evacuated themselves to safer ground before the arrival of official authorities or external agencies |
| Mulligan and Nadarajah (2012) (Sri Lanka and India) | Rural setting Area affected by conflict to some degree Limited community organisation Some degree of supportive local government | ✓ | ✓ | | ✓ | ✓ | Community and organisational capacity: <ul style="list-style-type: none"> In Hambantota, a broadly based community committee was formed after the 2004 tsunami; this provided oversight for more fair distribution of aid, ensuring that no groups were being neglected or ill-treated by government representatives A small Muslim community organisation, the Al-Hikma Foundation, advocated on behalf of a neglected Buddhist temple. In gratitude, local Sinhalese people joined the Muslim community in |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial Capital | Physical Capital | Natural Capital | Social Capital | Human Capital | |
| | Some degree of supportive national government | | | | | | resisting calls by authorities to relocate a damaged, historic mosque, and many gave donations to ensure that it could be rebuilt on its historic site near the sea. |
| Oxfam (2009) (Sri Lanka and India) | Rural and urban settings Community organisation apparent | ✓ | ✓ | | ✓ | ✓ | <p>Community and organisational capacity:</p> <ul style="list-style-type: none"> Community clarity over priorities and needs was key to programme success: rather than accepting all aid, communities refused some aid (food) and requested another type (irrigation system to grow food) <p>Resilience:</p> <ul style="list-style-type: none"> The establishment of self-help groups enabled savings and investment led to the creation of federations which helped the community to have clout in the market place and gain access to high-quality seeds, affordable insurance and lenders that charged 2% instead of 10 |
| Pelham et al. (2011) (multiple countries) | Rural and urban settings Area affected by conflict to some degree Community organisation apparent | ✓ | | | ✓ | | <p>Vulnerability:</p> <ul style="list-style-type: none"> When comparing Cash-for-Work and Food-for-Work interventions, it was found that CFW was seen as less paternalistic and more empowering. |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---------------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial Capital | Physical Capital | Natural Capital | Social Capital | Human Capital | |
| | Some degree of supportive local government Supportive national government Fragile ecosystem | | | | | | |
| Practical Action (2010a) (Bangladesh) | Rural setting Community organisation apparent Supportive local government Fragile ecosystem | ✓ | ✓ | | ✓ | ✓ | <p>Coping capacities of communities:</p> <ul style="list-style-type: none"> The mobilisation of communities around disaster preparedness activities reinforced community cohesion and stressed the value of collective action during times of adversity <p>Capacities of community organisations:</p> <ul style="list-style-type: none"> Community leaders were able to identify available local resources and mobilise resources from outside the community (fishing boats, communication equipment, evacuation site and volunteers) |
| Rempel (2010) (India) | Rural and urban settings Conflict-affected Community organisation apparent Supportive local government | | | | ✓ | ✓ | <p>Capacities of community organisations:</p> <ul style="list-style-type: none"> <i>Negative:</i> in Veerpandiapattinam, a fish-drying unit which included men, women and some members from a scheduled caste lacked unity and had to be re-formed with women only Through the project, community members became aware of issues requiring community action and they were resolved to act to address such issues |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial Capital | Physical Capital | Natural Capital | Social Capital | Human Capital | |
| | Supportive national government | | | | | | <ul style="list-style-type: none"> Community members became aware of programmes offered by different levels of government, gained increased access to such programmes and were drawing on personal, household and village benefits <p>Vulnerability:</p> <ul style="list-style-type: none"> Through the project, self-confidence, especially in women, increased significantly which translated into women elected to their respective panchayats in several villages; also, women became involved in addressing and petitioning panchayat officials as well as district collectors |
| Rossing et al. (2010) (multiple countries) | <p>Rural setting</p> <p>Area affected by conflict to some degree</p> <p>Community organisation apparent</p> <p>Supportive local government</p> <p>Some degree of supportive national government</p> <p>Fragile ecosystem</p> | | | | ✓ | ✓ | <p>Capacities of community organisations:</p> <ul style="list-style-type: none"> Respecting the local processes of participatory planning ensured ownership of the overall initiative, the empowerment of social sectors to make decisions related to local planning and the legitimacy of the commitments made <p>Coping capacities of communities:</p> <ul style="list-style-type: none"> The small projects implemented helped foster trust and increase participation among the participants Established local institutions were essential facilitators for households and social groups to deploy specific adaptation practices and also |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|-----------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial Capital | Physical Capital | Natural Capital | Social Capital | Human Capital | |
| | | | | | | | provided local communities with a forum to voice their concerns and make claims |
| Thorburn (2009) (Indonesia) | Rural setting Conflict-affected Community organisation apparent Supportive local government Some degree of supportive national government | ✓ | | | ✓ | ✓ | Incomes, outputs and enhanced livelihoods: <ul style="list-style-type: none"> Livelihood recovery programmes were most successful in communities that had been engaged in administering the aid and managing its use, which helped overcome poor-quality or misdirected aid |
| Tougiani et al. (2009) (Niger) | Rural setting Conflict-affected Community organisation apparent Supportive local government Fragile ecosystem | ✓ | ✓ | ✓ | ✓ | ✓ | Community capacity: <ul style="list-style-type: none"> Farmer Managed Natural Regeneration (FMNR) enabled farmers to respond to felt needs, such as maximising local drought-resistant trees to increase harvests and income and to improve environmental management and resilience As knowledge and confidence grew, community members progressively adopted new practices, such as the development of 'living fences' around agro-forestry and pastoral plots |

5.2.2 Discussion of the mechanism table

This mechanism was identified in 16 of the 27 studies; at least two types of outcomes related to expressed empowerment were documented in each. The studies incorporating this mechanism took place across four regions, with South Asia and South East Asia predominating. Three studies focused on Africa while only one focused on Latin America and the Caribbean. All the studies were published after 1996. The majority (n=14) were published after 2002, with 8 of 16 after January 2010.

Only one study (Tougiani et al., 2009) concentrated on all five forms of capital, as described in the Sustainable Livelihoods Framework; others reflected one or more forms of capital. Social capital was represented in all 16 studies, highlighting the strong links between social capital and community expressed empowerment. Human capital (n=13), financial capital (n=11) and physical capital (n=6) were also associated with expressed empowerment; natural capital, however, was only specified in one study.

5.2.3 The how, why and when of the mechanism

All studies which specified this mechanism were conducted in rural settings; seven of these also included urban or peri-urban areas. Thirteen studies were associated with apparent community organisation, whereas a further three took place in the presence of limited community organisation. Eight studies were conducted in areas with a supportive local government while six studies took place in the presence of limited local government support. Eleven studies were implemented in countries with full or partial national government support. Of the 16 studies, eight were conducted in an area with a fragile ecosystem. Nine studies were conducted in areas affected, strongly or to some extent, by conflict.

Expressed empowerment by communities demonstrates their ability to take charge to reduce disaster risk and vulnerabilities and to build capacity, resilience and community wellbeing in the aftermath of a disaster. According to Oxfam (2009):

The humanitarian community has a key role to play in emergencies, but as the research confirmed, it is the disaster affected people who need to guide the response. At the end of the day this is their home, their disaster, their rights, their future. As humanitarian agencies, we need to take care that the ownership of the recovery process is theirs as well (Oxfam, 2009: 31).

Dodman et al. (2010) identified a valuable impetus to building community cohesion and facilitating expressed empowerment. Their study shows that if a local group is able to agree norms and procedures through which to manage their collective funds, this leads to relationships of trust being built with one another and forms the basis for strong local groups, creating possibilities of collective action to respond to a variety of challenges. The study showed how community members (mostly women) would come together on a regular basis to discuss their problems and savings and determine how to use their resources to find solutions that worked for themselves and others in similar situations.

Dodman et al. (2010) also showed that a critical mass of motivated people in close spatial proximity to one another helped foster the development of social, economic and political interactions that could generate even more effective responses in the future.

This is relevant also to informal social networks. Matsimbe (2003), in Mozambique, emphasised the importance of informal local networks in building strong communities. According to Matsimbe, 'informal social networks based on neighbourhood, kinship, friendship, and church ties were identified as important elements that replaced formal institutions in reducing the impact of the disaster in places where these [formal] institutions were limited or altogether absent' (Matsimbe, 2003: 46). The report also highlighted the importance of local networks in the aftermath of a disaster: they were more durable, more efficient and more able to assure longer-term food security than external assistance, which was often short term.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Dodman et al. (2010) showed that community-managed maps and surveys could be important in mobilising the community and building community cohesion. This drew willing participants into the identification and verification of their shack and plot boundaries. Their study found that 'Managing these processes strengthens existing savings groups, and the high-profile local activities related to the enumeration catalyse new savings groups' (Dodman et al., 2010: 16). This assisted in enhancing the group's negotiating position, as politicians and officials recognised the federation's capacity to provide fair and accurate information.

5.2.4 Mechanism outcomes

The expressed empowerment mechanism generated outcomes predominantly associated with enhancing community organisational capacities (n=11). One study showed a negative outcome (Rempel, 2010), although there were also apparent strengths. In this case, a fish-drying unit was established, comprising men and women and members of scheduled castes. The group failed to cohere (negative outcome) but led to the establishment of a women's only group, which was more successful (positive outcome).

Outcomes relating to reduced vulnerability were present in seven studies, with one revealing some negative outcomes (Dekens, 2007). Enhanced resilience was assessed in five studies, with one (Dekens, 2007) revealing some negative effects. In the latter study out-migration of men led to some weakening of local resilience, and criticism by local religious leaders also undermined community efforts.

Strengthened community coping capacity was documented in three studies, with one study presenting negative outcomes (Doocy et al., 2006). Positive outcomes associated with livelihoods were present in two studies and psychosocial support in one.

Dodman et al. (2010) assessed the outcomes associated with expressed empowerment in a resettled community in the Philippines. When initially resettled to the site, families had to pay 50 pesos a day for water. After some months, members lobbied for the water network to be extended and reduced costs to 159 pesos a month (the minimum charge for water in the city). In some cases, families invested 2,700 pesos to purchase a water connection, and then sold water to those without a connection, charging only 2 pesos for 20 litres of water. This shows that communities can enhance benefits for all and become self-sufficient by initiating changes through collective action.

Mulligan and Nadarajah (2012) also demonstrated how, in Sri Lanka, different communities demonstrate expressed empowerment and derive benefits:

One rather ironic outcome of this was that a small Muslim community organisation, the Al-Hikma Foundation, advocated on behalf of a neglected Buddhist temple. In gratitude, local Sinhalese people joined the Muslim community in resisting calls by district authorities to relocate a damaged, historic mosque, and many gave donations to ensure it could be rebuilt on its historic site near the sea. (Mulligan and Nadarajah, 2012: 358).

Livelihood recovery programmes were most successful in communities that had been engaged in administering the aid and managing its use, which helped overcome poor quality or misdirected aid. Involving communities in the management of aid receipts not only empowered them but could also lead to more successful project outcomes (Thorburn, 2009).

5.2.5 Inhibitors

Local leaders (both political and religious) can erect barriers in the presence of weak local communities. Where local leaders exert high levels of influence and power, attempts to enhance the capabilities of communities without the express co-operation of these leaders can lead to negative implications, especially for outspoken community members. If community members were able to bond together to lobby for the proposed measures, the local leaders might succumb, as is often the

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

case in the face of popular demand. This highlights the transformed relationships which sit at the core of the expressed empowerment mechanism:

We managed to arrange four million Pakistani rupees from the Aga Khan Rural Support Programme to construct retention walls against recurrent floods, but the local mullahs [religious and political leaders] prevented us from having any kind of arrangement with Aga Khan Rural Support Programme. We received threats that we were engaging in anti-Pakistani actions and we fear that whenever we make a request for action we may be arrested. (Villagers group discussion, Lower Chitral) (Dekens, 2007: 46).

Weak social capital is a significant inhibitor to this mechanism, even at the household level. According to Rossing et al. (2010), for an individual household without bridging or linking social capital support, disasters can significantly exacerbate poverty, creating a need to take out high-interest loans (or default on existing loans), sell assets and livestock, or engage in low-risk, low-yield farming to lessen exposure to extreme events. By empowering communities and strengthening social capital, some of these paths to chronic poverty can be reduced.

Local culture can also be an inhibitor to the expressed empowerment of all community members. In Veerpandiapattinam, the fish-drying unit referred to above had to be re-formed as a women-only group: 'Where cultural resistance to direct integration is strong, it makes sense to consider an alternative means of expanding female employment that draws strength from the prevailing sexual division of labour instead of being defeated by it' (Rempel, 2010: 111). The group 'built back better' in this case and was subsequently more successful, revealing that generating positive outcomes through expressed empowerment requires a nuanced understanding and sensitivity to gender, cultural and social relationships. It also suggests that a willingness to identify weaknesses, and to have the flexibility to redesign aspects of interventions, can enhance positive outcomes.

5.3 Actioned agency

5.3.1 Brief overview of the mechanism

Actioned agency refers to the demonstrable agency which reflects community-based engagement and results in choices or changes to local institutions and structures, and through which knowledge and resources may be channelled, transmitted or mobilised to empower the community.

Table 5.3: Actioned agency: context, sustainable livelihoods framework and outcomes

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Bhattacharjee et al. (2010) (India, Indonesia and Sri Lanka) | Rural and urban settings Area affected by conflict to some degree Community organisation apparent Supportive local government Supportive national government Fragile ecosystem | ✓ | | | ✓ | ✓ | <p>Decreased morbidity:</p> <ul style="list-style-type: none"> Improved health promotion around water and sanitation issues with positive impact on public health <p>Vulnerability:</p> <ul style="list-style-type: none"> Shop owners encouraged to register with the government, thus attracting compensation in the event of fire or floods Since the tsunami, fishermen have registered with the government, so as to attract compensation following lean years or disasters Actively managing disaster risks to livelihoods through micro-insurance in Tamil Nadu <p>Enhanced livelihoods:</p> <ul style="list-style-type: none"> Internal lending within the group with a much lower interest rate – 2% vs 10% <i>Negative:</i> some negative effects of poorly targeted external support that ignored local experience resulted in higher cost of maintaining fishing boats because of the need for fuel following motorisation and increased pressure on repaying debt to private lenders <p>Organisational capacity:</p> |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|-------|---------|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | <ul style="list-style-type: none"> • Women’s self-help groups (SHG) and a women-managed company were established • There was progress linking grassroots organisations with district government in all countries, e.g. with panchayats in India • Tamil Nadu – community organisations were built on DRR activities to articulate community needs within the local political system; following the Nisha cyclone, they played an active role • Increased engagement with older people in self-help groups – >7,800 joined older persons associations in Tamil Nadu and Kerala • Sri Lanka: 20 of 23 community groups felt they had the capacity to negotiate with or challenge authorities; there was more openness by government to consult with communities and village Disaster Management Centres (DMCs) • India: elderly men’s and women’s groups led to changes in policies for financial institutions which didn’t previously work with older people • in Cut Mamplam (Indonesia), a school collected money for use in public emergencies or other social purposes <p>Education and awareness:</p> <ul style="list-style-type: none"> • increased preparedness and response training |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|-----------------------------|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | <ul style="list-style-type: none"> • Good access to early warning systems and information in villages, temples, mosques and churches equipped with loudspeakers • Improved community-level first aid as a result of other training; could be applied in different circumstances <p>Negatives:</p> <ul style="list-style-type: none"> • in some settings, there was little real advance for fishing communities in terms of coping with future disasters |
| Dekens (2007) (Pakistan) | Rural setting Community organisation apparent Supportive local government Fragile ecosystem | | | | ✓ | | <p>Organisational capacity:</p> <ul style="list-style-type: none"> • Enhanced ability to organise at community level and to request help from government and NGOs <p>Education and awareness:</p> <ul style="list-style-type: none"> • Men and women travelling further from home – this might expose them to other stories and strategies related to dealing with floods <p>Psychosocial support:</p> <ul style="list-style-type: none"> • Neighbours and relatives increasingly provided ‘social and psychological insurance before, during and after floods’ <p>Negatives:</p> |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|------------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | <ul style="list-style-type: none"> • Not everybody gained access to technologies that assisted with early warning; this may have increased disparities within the community • Longstanding knowledge was being disregarded due to other pressures; older people and their advice were taken less seriously |
| Giri and Malakar (2011) (Nepal) | Rural setting Limited community organisation Supportive local government Supportive national government Fragile ecosystem | | | | ✓ | | <p>Education and awareness:</p> <ul style="list-style-type: none"> • Information was available much earlier through mobiles; people were warned of likely floods, enabling them to save lives, documents and valuable assets <p>Community capacity:</p> <ul style="list-style-type: none"> • The project allowed longer-term linkages to be built; farmers built more 'confidence and social capital' as a result |
| Kotowicz (2010) (Thailand) | Rural setting Community organisation apparent Some degree of supportive local government | ✓ | | | ✓ | ✓ | <p>Organisational capacity:</p> <ul style="list-style-type: none"> • Community-led revolving funds positively transformed local structures and processes, enabling increased trust and understanding if members participated actively in fund management and functions • Community participation increased the likelihood of loan repayment and fund sustainability |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | Supportive national government Fragile ecosystem | | | | | | <ul style="list-style-type: none"> • Village heads' involvement secured government participation and accountability as well as increased co-ordination between fund members and government • Community-based DRR programmes trained village leaders in preparedness, response and disaster planning, which enhanced resilience to coastal hazards • Kamphuan Community Learning Centre became the centre for training, revolving fund management and a tsunami museum |
| Luna (2001) (Philippines) | Rural and urban settings Area affected by conflict to some degree Community organisation apparent Supportive local government Supportive national government Fragile ecosystem | ✓ | | | ✓ | ✓ | <p>Organisational capacity:</p> <ul style="list-style-type: none"> • Volunteers created a province-wide CBO in response to Mt Pinatubo, which led to more experience in managing the community and successful mobilisation of funding from an INGO • A CBO was formed to resist and respond to collusion between a private corporation and local authorities to establish an environmentally damaging project; this was sustained by the community and carried out disaster mitigation, advocacy and community mobilisation |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Matsimbe (2003) (Mozambique) | Rural setting Conflict-affected Community organisation apparent Some degree of supportive local government Supportive national government | | | | ✓ | | Resilience: <ul style="list-style-type: none"> In Búzi during the 2000 floods, informal social networks based on neighbourhood, friendship, kinship or church evacuated themselves to safer ground before the arrival of official authorities or external agencies Local churches as well as traditional and administrative authorities played an important role in the effective and timely emergency response activities |
| Mulligan and Nadarajah (2012) (Sri Lanka and India) | Rural setting Area affected by conflict to some degree Limited community organisation Some degree of supportive local government Some degree of supportive | ✓ | ✓ | | ✓ | | Enhanced livelihoods and incomes: <ul style="list-style-type: none"> Broadly based community committees were formed after the 2004 tsunami; this provided oversight for the equal and fair distribution of aid, ensuring that no groups of people were being neglected or ill-treated by government representatives |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---------------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | national government | | | | | | |
| Oxfam (2009) (Sri Lanka and India) | Rural and urban settings Community organisation apparent | ✓ | ✓ | | ✓ | | <p>Organisational capacity:</p> <ul style="list-style-type: none"> • 24 local NGOs prepared contingency plans for floods which were used to improve flood and cyclone response activities • Community clarity over priorities and needs was key to programme success: rather than accepting all aid, communities refused some aid (food) and requested another type (irrigation system to grow food) • A small group of women in Gonnoruwa took control of the project and, despite complaints and resistance from the men, they ensured three meals a day; pulled themselves out of debt; started to grow rice and home gardens; built better houses for themselves; sent their children to school for extra classes and helped them continue with higher education |
| Pelham et al. (2011) (Mexico) | Rural and urban settings Area affected by conflict to some degree Community organisation apparent | ✓ | | | ✓ | | <p>Organisational capacity:</p> <ul style="list-style-type: none"> • Community funding mechanisms such as social funds provide financing for community-driven projects that were grounded within and accounted for by government structures • If local CBOs were community-driven, led and managed by the local communities, NGOs and local government only needed to provide small-scale investments across |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | Some degree of supportive local government Supportive national government Fragile ecosystem | | | | | | education, water and health sectors to achieve good outcomes |
| Practical Action (2010a) (Bangladesh) | Rural setting Community organisation apparent Supportive local government Fragile ecosystem | | | | ✓ | ✓ | Resilience: <ul style="list-style-type: none"> • Community participation was the most important component of the project ensuring commitment, ownership and sustainability • Partnerships with local NGOs ensured that project impacts were sustained beyond the project lifetime and that a reservoir of local expertise was built and available for implementation of local development activities |
| Tougiani et al. (2009) (Niger) | Rural setting Conflict-affected Community organisation apparent | ✓ | ✓ | ✓ | ✓ | ✓ | Community capacity: <ul style="list-style-type: none"> • Farmer Managed Natural Regeneration (FMNR) enabled farmers to respond to felt needs, such as maximising local drought-resistant trees to increase harvests and income, and improve environmental management and resilience • Farmers, herders, men, women, agricultural extension workers, researchers and the Aguié departmental and |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | Supportive local government Fragile ecosystem | | | | | | <p>government services as well as the International Fund for Agricultural Development (IFAD) worked together for the first time and were fully involved in programming, implementing, monitoring and evaluating natural resource management activities</p> <ul style="list-style-type: none"> As knowledge and confidence grew, community members progressively adopted new practices such as the development of 'living fences' around agro-forestry and pastoral plots |
| USAID (2011) (Bangladesh) | Rural setting Community organisation apparent Some degree of supportive local government Fragile ecosystem | ✓ | | | ✓ | | <p>Organisational capacity:</p> <ul style="list-style-type: none"> Establishing Ward Disaster Management Committees, community-based disaster preparedness (CBDP) teams and community monitoring committees led to a high level of community participation in Somriddhi CBDP teams created early warning plans that evacuated livestock and family members effectively using warning signals <p>Community capacity:</p> <ul style="list-style-type: none"> Community preparedness activities included livestock vaccination, formation of emergency help teams and household-level preparedness such as storing fodder for cattle, raising houses and latrines, plus saving money for emergencies and asset protection against floods |

5.3.2 Discussion of the mechanism table

Actioned agency was identified in 12 of the 27 studies. Eight outcomes were associated with this mechanism: increased community capacity, improved organisational capacity, enhanced resilience, improved education and awareness; reduced morbidity, decreased vulnerability, enhanced livelihoods and increased psychosocial wellbeing.

Outcomes were predominantly associated with improved community and organisational capacity, highlighting the social capital dimension to this mechanism. The studies incorporating this mechanism mostly took place in South Asia and South East Asia. All the studies were published after 2000, with 9 of the 12 conducted since 2008.

5.3.3 The how, why and when of the mechanism

All of the studies investigated rural settings, with four also covering urban settings (Bhattacharjee et al., 2010; Luna, 2001; Oxfam, 2009; Pelham et al., 2011) and eight covering rural settings only (Dekens, 2007; Giri and Malakar, 2011; Kotowicz, 2010; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Practical Action, 2010; Tougiani et al., 2009; USAID, 2011).

Six studies took place in conflict-affected settings (Bhattacharjee et al., 2010; Luna, 2001; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Pelham et al., 2011; Tougiani et al., 2009). Only two studies reported an impact of the conflict, however. Luna (2001) reported that NGOs working in areas with conflict in the Philippines were diverting resources into relief services, which then impacted on their overall programmes. The study by Tougiani et al. (2009) in Niger reported that conflict between herder and farmer communities initially led to the exclusion of the Fulani herders from resource management committees, but that the farmer-managed natural resource programme eventually helped to reduce tensions between the two groups. Of the other four studies, one reported on the integration of former combatants (Bhattacharjee et al., 2010), but no direct influence of conflict on the programmes or interventions in these studies was reported.

Eight studies reported that communities were adapting to living in fragile ecosystems (Bhattacharjee et al., 2010; Dekens, 2007; Kotowicz, 2010; Luna, 2001; Pelham et al., 2011; Practical Action, 2010; Tougiani et al., 2009; USAID, 2011). In these studies, communities all demonstrated robust adaptive strategies in the face of extreme weather and climatic events such as floods, droughts, landslides and earthquakes.

In terms of the Sustainable Livelihoods Framework, all five types of capital were reported in relationship to this mechanism. Social capital was the most commonly reported form and was reported in 11 of these studies (Giri and Malakar, 2011; Dekens, 2007; Bhattacharjee et al., 2010; Kotowicz, 2010; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Oxfam, 2009; Pelham et al., 2011; Practical Action, 2010; Tougiani et al., 2009; USAID, 2011). Social capital took the form of social linkages, networks and enhanced community organisational structures and process. For example, Giri and Malakar (2011) reported on the development of long-term social networks and linkages in communities in Nepal and Dekens (2007) on enhanced capacity for community organisations in Pakistan. In India, Indonesia and Sri Lanka after the 2004 tsunami, Bhattacharjee et al. (2010) reported the establishment of self-help groups and grassroots organisations. USAID (2011) addressed the establishment of Ward Disaster Management Committees and the resulting enhanced evacuation strategies and procedures.

Financial capital was reported in eight studies (Bhattacharjee et al., 2010; Kotowicz, 2010; Luna, 2001; Mulligan and Nadarajah, 2012; Oxfam, 2009; Pelham et al., 2011; Tougiani et al., 2009; USAID, 2011). Financial capital took the form of organisational processes and community committees that facilitated disaster response as well as equal community access to post-disaster relief services and funding (Bhattacharjee et al., 2010; Luna, 2001; Oxfam, 2009) and participation in community-driven revolving social funds (Kotowicz, 2010; Pelham et al., 2011). In Tougiani et al. (2009), participation in

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

farmer-led programmes increased incomes and in USAID (2011), financial capital was shown in the way that communities organised to save money for emergencies.

Human capital was promoted in five of the studies (Bhattacharjee et al., 2010; Kotowicz, 2010; Luna 2001; Practical Action, 2010a; Tougiani et al., 2009). In DEC's (2010) study of India, Indonesia and Sri Lanka, health promotion as well as training in first aid, preparedness and response had a positive impact on public health. Dekens (2007) showed that by travelling outside their community, men and women in Pakistan learnt alternate adaptive strategies to address floods. Kotowicz (2010) demonstrated that participation in revolving funds led to increased knowledge and CBDRM programmes trained village leaders in disaster risk reduction in Thailand after the 2004 tsunami. For Tougiani et al. (2009), participation in, and management of, natural resource management programmes in Niger by community members led to innovative solutions to resource management problems.

Physical capital was reported in three studies (Mulligan and Nadarajah, 2012; Oxfam, 2009; Tougiani et al., 2009). This was reflected in well-organised community committees, ensuring that communities were able to access relief goods (Mulligan and Nadarajah, 2012) and the active participation of women in a project in Sri Lanka, which led to houses being constructed more quickly and efficiently (Oxfam, 2009). In Tougiani et al. (2009) community disaster activities led to innovative practices, such as the development of 'living fences' for forestry and animal lots.

Natural capital was only found in one study (Tougiani et al., 2009), in which the effective management of natural resources by farmer-led initiatives resulted in improved forest and foliage coverage. Tougiani et al. (2009) was unique in that they reported all forms of capital operating in their study of farmer-managed natural resource programmes in Niger.

5.3.4 Mechanism outcomes

The actioned agency mechanism was predominantly linked with eight outcome categories: improved organisational capacities; improved community capacities; increased resilience; enhanced livelihoods; improved education and awareness; decreased vulnerability; a reduction in morbidity and improved psychosocial support. Although the most common outcome was an improvement in local organisational capacities, the types of outcome are diverse and dispersed throughout the 12 studies linked to actioned agency.

Actioned agency led to an improvement in community-level organisational capacities in six studies. In Dekens (2007), this manifested in Pakistan in the form of an enhanced ability to organise at community level and gain assistance from government and NGOs, whereas in India, Sri Lanka and Indonesia, this took the form of women's self-help groups, women-managed agencies and progress in linking grassroots organisations with government (Bhattacharjee et al., 2010). Kotowicz (2010) discussed the importance of revolving funds, which positively transformed local social structures and processes in Thailand. Luna (2001) argued that the creation of a community-based organisation improved the mobilisation of resources by communities in the Philippines. Oxfam (2009) drew attention to the organisation of project plans by local NGOs and groups of women in Sri Lanka and India and Pelham et al. (2011) highlighted the establishment of community funding mechanisms for community-led projects in Mexico.

Community capacity outcomes were also reported in three studies. In Nepal, farmers built stronger social capital through establishing more robust social linkages that strengthened long-term community risk reduction strategies (Giri and Malakar, 2011). Tougiani et al. (2009) also argued that strengthening farmer and community agency through participatory management and programming enabled community members to work with government and international organisations for the first time. In Bangladesh, USAID's study (2011) showed that the establishment of disaster risk management committees allowed communities to participate in both short-term response activities and longer-term programming.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Education and awareness outcomes were reported in three studies. In Nepal, Giri and Malakar (2011) reported that the use of mobile phones for communicating within social networks allowed for an enhanced understanding and awareness of potential flood risks. Dekens (2007) reported that community members who travelled outside their communities in Pakistan were exposed to alternative adaptive strategies and learned new ways of addressing flood-related events. DEC (2010) showed that organising at community level and training related to early warning systems and first aid allowed for improved preparedness and response.

Resilience-related outcomes occurred in two studies. In Mozambique, community action led to more sustainable, collective emergency response activities (Matsimbe, 2003). Practical Action (2010a) argued that community participation was the most important component of sustainable projects if they want to ensure that long-term commitment, ownership and positive programme impact lasted beyond its life-time.

Outcomes related to enhanced livelihoods and incomes for communities were documented in two studies. Bhattacharjee et al. (2010) showed that committees in Tamil Nadu were able to manage threats to livelihoods through the use of micro-insurance and community micro-finance schemes. Mulligan and Nadarajah (2012) found that community committees worked to ensure a fair and equitable distribution of aid among all community members and ensured that no groups were excluded by government service providers.

Reduced morbidity, improved psychosocial support and decreased vulnerability outcomes were found in one study each. Bhattacharjee et al. (2010) demonstrated that enhanced agency led to improved promotion of water and sanitation issues and public health outcomes in India, Sri Lanka and Indonesia. Collective agency also led to improved psychosocial outcomes in the form of social and kinship networks used as support during disasters in Pakistan (Dekens, 2007). Vulnerability was reduced in India, Sri Lanka and Indonesia when fishing communities and shop owners were able to actively register their needs with government service providers.

However, actioned agency not only applies to the immediate needs of the DRR programme:

The role played by local support networks is more important than just simple relief. Local networks are durable, more efficient and can guarantee longer-term food security than external simple relief, which normally lasts no longer than six months following an emergency. Developing local networks avoids dependency of local communities on external donors. (Matsimbe, 2003: 48)

5.3.5 Inhibitors

Some studies showed that actioned agency could be constrained in two ways: when people lacked the resources to actively engage in disaster risk reduction activities and when local knowledge was not recognised and integrated into disaster risk management. For example, in Pakistan, Dekens (2007) showed that not all members of the community were able to actively contribute to DRR activities because they lacked the resources necessary to participate. This study also demonstrated the second inhibitor by highlighting the ways in which local knowledge and experience were marginalised, with community elders' advice not taken seriously by external agencies. Bhattacharjee et al. (2010) also showed that relief programmes that did not take into account local exigencies provided inappropriate and poorly targeted support that actually led to increased costs and loss of livelihoods.

5.4 Resilient livelihoods

5.4.1 Brief overview of the mechanism

We define a 'resilient livelihood' as one which has the ability to withstand external climate stress and shocks, allows the rapid recovery of sustained livelihood activities post-disaster, and in the long term, facilitates sustainable livelihood adaptation to changing climatic conditions.

This is based around three previous interrelated definitions which are central to the Sustainable Livelihoods Framework:

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base. (DFID, 2001: 1)

Livelihood adaptation is understood as the changes people make to adapt their livelihoods to a new situation, in response to or in preparation for increased climatic variability or climate change (both gradual and extreme events). Successful adaptation depends on the short-term response to disasters (degree of coping), as well as on long-term rebuilding and long-term response to gradual climate change (degree of resilience). In this regard, the adaptation process depends crucially on the assets that people have available and on pro-poor social policies, including safety nets and indexed insurance. (Rossing et al., 2010: 277).

Livelihood resilience is understood as the ability to withstand external climate stress (both gradual ones and shocks) and as a longer-term revitalization of livelihoods after damage to livelihood assets has occurred. The extent of resilience depends on the physical exposure to natural hazards, as well as ability to apply the various forms of capital to shield livelihoods. (Rossing et al., 2010: 275)

The resilient livelihoods mechanism is based around activities to enhance the capabilities and assets that can potentially lead to self-sufficient communities. However it is important to recognise that in extreme disaster events (such as the 2004 tsunami), where livelihoods, safety nets and markets are completely destroyed, external assistance is essential to enable the survival of communities and to re-establish improved sustainable livelihoods and normality effectively, but as quickly as possible. Therefore, post-disaster activities aimed at achieving this have also been included.

Table 5.4: Resilient livelihoods: context, sustainable livelihoods framework and outcomes

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Bhattacharjee et al. (2010) (multiple countries) | Rural and urban settings Area affected by conflict to some degree Community organisation apparent Supportive local government Supportive national government Fragile ecosystem | ✓ | ✓ | ✓ | ✓ | ✓ | <p>Incomes, outputs and enhanced livelihoods:</p> <ul style="list-style-type: none"> • Livelihood interventions had been highly effective when the livelihood activities were diversified and looked at in relation to the overall sector and with a deeper understanding of value chains • Self-help groups were established with elderly community members, which lent money to members to invest in micro-enterprises or in times of crises <p>Vulnerability:</p> <ul style="list-style-type: none"> • Low-cost micro-insurance was introduced for high risk coastal communities which were priced nominally to allow the most vulnerable to take part. During a subsequent disaster, a significant number of households received claims to assist them to bounce back quickly • The cash-for-work programming implemented in the aftermath of the tsunami assisted in reducing vulnerabilities and resilience by paying local community members to plant a green belt; this would act as a bio-shield against future storm surges, and also augment livelihoods, reduce the |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|------------------------------|--|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | <p>fuel wood collection burden of women and contribute to the community fund of the village</p> <p>Education and awareness:</p> <ul style="list-style-type: none"> Vocational skills were provided for ex-combatants and a conflict-related early earning mechanism was developed, which assisted in maintaining peace |
| Care (2011) (Timor Leste) | <p>Rural setting</p> <p>Limited community organisation</p> <p>Supportive local government</p> <p>Fragile ecosystem</p> | ✓ | ✓ | ✓ | | ✓ | <p>Resilience:</p> <ul style="list-style-type: none"> Households that were able to employ a greater range of different livelihood strategies were able to adjust reliance when a particular component of their livelihoods is affected by stress or shock <p>Vulnerability:</p> <ul style="list-style-type: none"> Households that had a wider range of climate sensitive alternatives available to them were less vulnerable to climate hazards. Poorer households were often heavily dependent on maize production, with few alternatives available, making them particularly vulnerable to climate hazards |
| Dekens (2007) (Pakistan) | <p>Rural setting</p> <p>Community organisation apparent</p> | ✓ | ✓ | ✓ | | ✓ | <p>Resilience:</p> <ul style="list-style-type: none"> Livelihood diversification was found to be a key coping mechanism for facing harsh environmental conditions and economic hardship |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---------------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | Supportive local government Fragile ecosystem | | | | | | <ul style="list-style-type: none"> Transhumance was found to be an important diversification strategy which allowed people to take advantage of ecological niches, depending on seasonal climate changes <p>Vulnerability:</p> <ul style="list-style-type: none"> A <i>negative</i> outcome related to the existing education policy, where it was found that training that replaced traditional skills served no purpose in the community and contributed towards youth unemployment A <i>negative</i> outcome of diversification was the selling of wood, which led to deforestation and the negative implications associated with this |
| Dodman et al. (2010) (Philippines) | Rural and urban settings Very low-income community members Community organisation apparent Some degree of supportive local government Some degree of supportive national government | ✓ | ✓ | | ✓ | | <p>Resilience:</p> <ul style="list-style-type: none"> Savings were found to provide an initial buffer for federation members in the event of shocks or stresses Less than two years after the initial disaster, local savings organisations had 1,147 members and total savings of 853,000 pesos (approx. US\$18,000) <p>Vulnerability:</p> <ul style="list-style-type: none"> Savings groups made up of very low-income communities (homeless) were found to respond rapidly in the aftermath of a disaster where funds |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|------------------------------------|--|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | Fragile ecosystem | | | | | | were used to provide food for affected families, and were mobilised for the rapid construction of transit housing, reducing the trauma faced by displaced families |
| Doocy et al. (2006) (Indonesia) | Rural and urban settings Conflict-affected Community organisation apparent | ✓ | ✓ | ✓ | ✓ | ✓ | <p>Resilience:</p> <ul style="list-style-type: none"> • Cash-for-work (CFW) provided a structured mechanism to engage people in low-skilled construction activities while injecting cash into the economy and promoting decision making at the community and individual level • CFW was responsible for the clearing of 136km² of land, 262km of roads and 2,006 buildings; in addition 306 permanent and 577 temporary structures, including mosques, schools and temporary homes were constructed • Where CFW was implemented with food distribution, 81% of cash distributed was reinvested in livelihood recovery <p>Vulnerability:</p> <ul style="list-style-type: none"> • Since the majority of productive assets and livelihoods were lost due to the tsunami, CFW provided much-needed income to local communities and sped up the clean-up process. <p>Incidence of mental health presentations:</p> |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---------------------------------|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | <ul style="list-style-type: none"> • Distribution of cash improved the ability of households to cope with the tsunami because they could decide how to spend and invest their money <p>Education and awareness:</p> <ul style="list-style-type: none"> • Other benefits of CFW included skills transfer |
| Giri and Malakar (2011) (Nepal) | <p>Rural setting</p> <p>Limited community organisation</p> <p>Supportive local government</p> <p>Supportive national government</p> <p>Fragile ecosystem</p> | ✓ | ✓ | ✓ | ✓ | ✓ | <p>Incomes, outputs and enhanced livelihoods:</p> <ul style="list-style-type: none"> • Mobile phones were used to get advice about treating crops and livestock, seed varieties, planting times and other agricultural methods, leading to increased incomes. • Income from agriculture was increased, particularly from vegetables. The increased incomes and strengthened livelihood options paved the way to resilience <p>Vulnerability:</p> <ul style="list-style-type: none"> • A network between upstream and downstream communities was established, leading to pre-disaster warnings for downstream communities and the ability to evacuate livestock, property, family etc. <p>Education and awareness:</p> <ul style="list-style-type: none"> • The network established using mobile phones helped by providing information and awareness |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|-------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | that improved agricultural and disaster-related decision making. |
| Kotowicz (2010) (Thailand) | Rural setting Community organisation apparent Some degree of supportive local government Supportive national government Fragile ecosystem | ✓ | ✓ | ✓ | ✓ | ✓ | <p>Resilience:</p> <ul style="list-style-type: none"> • The village revolving fund was successful in two ways: loan funds were used to buy productive materials for livelihood re-entry; and loan funds introduced more money into the local economy, stimulating demand • A <i>negative</i> outcome of the boat distribution was that it introduced more boats than before the tsunami, which saturated the market and led to decreased fish stocks, lower sale prices and lower incomes • CFW was successfully implemented, utilising local labour and skills to restore natural habitats and rebuild essential communal infrastructure. The additional fund injected into the economy by the programme help stimulate community recovery <p>Incomes, outputs and enhanced livelihoods:</p> <ul style="list-style-type: none"> • Solid waste management and recycling was introduced as a business, which led to additional income for recovering families and the local economy. It also created a market for recyclables • |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Leone and Gaillard (1999) (Philippines) | Rural setting Limited community organisation Some degree of supportive local government Supportive national government | ✓ | | ✓ | | | Coping capacity, resilience and vulnerabilities: <ul style="list-style-type: none"> During the first years following the eruption, some community members tried to adapt the agricultural production to the periodical threat. Instead of growing traditional annual yielding produce such as rice or sugar cane, they produced quick growing crops such as tomatoes, peanuts and sweet potatoes which allowed for multiple harvests and reduced the risk that the whole crop (and therefore incomes) would be lost in the event of a volcanic eruption |
| Luna (2001) (Philippines) | Rural and urban settings Area affected by conflict to some degree Community organisation apparent Supportive local government Supportive national government Fragile ecosystem | ✓ | ✓ | | | | Vulnerability: <ul style="list-style-type: none"> Projects were implemented that aimed at improving food security by providing soft loans for agricultural production, animals, farm tools and boat distribution |
| Matsimbe (2003) | Rural setting | ✓ | ✓ | | ✓ | | Resilience: |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| (Mozambique) | <p>Conflict-affected</p> <p>Community organisation apparent</p> <p>Some degree of supportive local government</p> <p>Supportive national government</p> | | | | | | <ul style="list-style-type: none"> Local seed varieties were used which had adapted to local soil and climate conditions Local seed exchanges were encouraged between farmers from different communities to trade quality local seeds Livelihoods were diversified into livestock production as a second means of income, which introduced communities into the cash market through the sale of chickens or goats. This increased resilience, as in times of stresses or shocks, as long as there are functioning markets, livestock can be sold and funds used for immediate needs or for food |
| <p>Mulligan and Nadarajah (2012)</p> <p>(Sri Lanka and India)</p> | <p>Rural setting</p> <p>Area affected by conflict to some degree</p> <p>Limited community organisation</p> <p>Some degree of supportive local government</p> <p>Some degree of supportive national government</p> | ✓ | ✓ | | ✓ | ✓ | <p>Resilience:</p> <ul style="list-style-type: none"> Self-help groups (SHG) assisted disaster survivors maintain income-generating activities by providing interest-free loans <p>Education and awareness:</p> <ul style="list-style-type: none"> SHG leveraged off existing networks to link some people (especially women) to other organisations that could help them build more sustainable enterprises |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Oxfam (2009) (Sri Lanka and India) | Rural and urban settings Community organisation apparent | ✓ | ✓ | | ✓ | | <p>Incomes, outputs and enhanced livelihoods:</p> <ul style="list-style-type: none"> The programme enhanced the income of women who were operating in the coir (coconut fibre) industry, which resulted in the doubling and in some cases tripling of pre-tsunami incomes <p>Resilience:</p> <ul style="list-style-type: none"> SHGs were organised that enabled savings and investment Federations were created that led to clout in the marketplace Access to high quality seeds was gained, and affordable insurance and lenders who charged 2% instead of the usual 10%. Home gardens were started, in addition to growing rice <p>Vulnerability and education:</p> <ul style="list-style-type: none"> The additional produce and incomes enabled women in the community to eat three meals a day and send their children to school for extra classes and continue with higher education |
| Pelham et al. (2011) (multiple countries) | Rural and urban settings | ✓ | ✓ | ✓ | ✓ | ✓ | <p>Resilience:</p> <ul style="list-style-type: none"> Cash grants in the aftermath of the Mozambique floods were found to be successful and were predominantly spent on basic consumption, on |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|-------|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | <p>Area affected by conflict to some degree</p> <p>Community organisation apparent</p> <p>Some degree of supportive local government</p> <p>Supportive national government</p> <p>Fragile ecosystem</p> | | | | | | <p>purchases made locally which stimulated the local and national economy</p> <ul style="list-style-type: none"> • Ex ante public works programmes were found to help prevent the impacts of a natural disaster through building skills and community assets • Ex post workfare was found to provide unskilled manual employment for affected households that had lost access to labour opportunities, in the longer term • Ex post public works may be particularly useful in a post-disaster clearing-up process to help restore infrastructure and repair or rebuild houses • Voucher programmes linked to the purchase of seeds were found to be particularly useful, linking farmers with the commercial sector and stimulating the re-emergence of a seed market in the aftermath of a crisis • It was found that an important strategy to decrease dependency on flood-sensitive monsoon season crops was to promote the production of winter crops <p>Vulnerability and education:</p> <ul style="list-style-type: none"> • Conditional cash transfer programmes were found to be effective in preventing the loss of child |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | human capital after households were hit by uninsured shocks |
| Practical Action (2010a) (Bangladesh) | Rural setting Community organisation apparent Supportive local government Fragile ecosystem | ✓ | ✓ | ✓ | ✓ | ✓ | Resilience: <ul style="list-style-type: none"> • Livelihood activities that were found to be resilient to flooding were floating gardens and nurseries, fisheries in flood water and small enterprises as alternative income generating activities. • It was found that community members who did not receive training on disaster alternative livelihood options together with disaster preparedness and mitigation found it much more difficult to overcome distress situations |
| Rempel (2010) (India) | Rural and urban settings Conflict-affected Community organisation apparent Supportive local government Supportive national government | ✓ | ✓ | ✓ | ✓ | ✓ | Resilience and vulnerability: <ul style="list-style-type: none"> • A negative outcome was that a surge of boats in the community aggravated the depletion of the fish stock which, was already in decline prior to the tsunami • Diversifying fishing activities to cultivating seaweed appeared to be successful, as it was used in both cosmetics and fertiliser and looked to be a good market • It was found that women in the fishing industry were overlooked by other recovery programmes; they were therefore given 525 fish vending kits to support livelihood recovery |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Rossing et al. (2010) (multiple countries) | Rural setting Area affected by conflict to some degree Community organisation apparent Supportive local government Some degree of supportive national government Fragile ecosystem | ✓ | ✓ | ✓ | ✓ | ✓ | <p>Resilience:</p> <ul style="list-style-type: none"> It was found that in times of stress, community members relied more on their bonding capital (relatives in the community), than on their bridging (neighbour solidarity) or linking (government aid) capital to overcome their social vulnerability. Relatives living within the community were the most important source of financial assistance for affected households. The outcome of transferring income gained from better education and nutrition was improved livelihood resilience (improved ex post coping behaviour) <p>Vulnerability:</p> <ul style="list-style-type: none"> <i>Negative:</i> falling incomes reduced these farmers' ability to create a financial reserve for difficult times, creating a vicious circle of low resilience and coping capacity, low savings, lack of climate-adaptive instruments (crop insurance, a reserve fund), and greater vulnerability to disasters Communities that minimised disaster impacts on their economic, social and natural capital succeeded in reducing their levels of poverty The productive investment grant helped initiate livelihood adaptation by making people who |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | previously had focused on day-to-day survival more forward looking |
| Schutte and Kreutzmann (2011) (Pakistan) | Rural setting Community organisation apparent | ✓ | ✓ | ✓ | ✓ | | <p>Incomes, outputs and enhanced livelihoods:</p> <ul style="list-style-type: none"> • The livestock intervention was successful for 66% of project participants, where a consolidation of economic security took place. These households were successful in maintaining the cow or had exchanged it for other animals, such as the higher-yielding buffalo • The intervention generated uplift for only 14% of study households, where economic conditions were improved sustainably <p>Vulnerability:</p> <ul style="list-style-type: none"> • Of the households producing surplus milk, milk-sharing practices in family networks took place, enabling households without livestock to also benefit from the project • <i>Negative:</i> The breed of cow, although high yielding in milk, was not adapted to the rugged terrain and harsher climate of the project villages • Households that sold their animals did so because they impaired household mobility strategies or overstretched their capacity to care for the animals as a result of additional expense for fodder |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| 22. Selvaraju et al. (2006) (Bangladesh) | Rural setting Community organisation apparent Supportive local government Supportive national government Fragile ecosystem | ✓ | ✓ | ✓ | | | <p>Resilience:</p> <ul style="list-style-type: none"> Liquid assets such as livestock and poultry still played a part in risk management by providing a source of livelihood security Rainwater harvesting and recycling, essential to managing seasonal droughts, were enhanced through supplemental irrigation, such as excavation and re-excavation of traditional ponds and khari canals, water control structures and miniponds Promotion of alternative enterprises helped increase overall household income as a drought risk management strategy <p>Incomes, outputs and enhanced livelihoods:</p> <ul style="list-style-type: none"> Autonomous adaptation through the cultivation of mangos showed long-term promise through increased incomes and mitigation of the effects of seasonal drought <p>Vulnerability:</p> <ul style="list-style-type: none"> It was found that various drought-tolerant crops, such as wheat, sweet potato, potato, mustard, sesame, pulses such as lentils and black gram, and spices such as onion, garlic, ginger and turmeric were grown, but were phased out with the introduction of tubewells and rice growing, |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | increasing the community's vulnerability to droughts |
| Thorburn (2009) (Indonesia) | Rural setting Conflict-affected Community organisation apparent Supportive local government Some degree of supportive national government | ✓ | ✓ | ✓ | ✓ | ✓ | <p>Resilience:</p> <ul style="list-style-type: none"> The agricultural activity that showed the best signs of recovery was rubber tapping, which could be resumed as soon as people gained access to existing groves, and it was found that communities could earn more from this than from a similar expenditure of labour in construction work In the aftermath of the tsunami, 93% of household incomes were supported by CFW programmes <p>Vulnerability:</p> <ul style="list-style-type: none"> Livestock interventions were found to be mixed, and the main problems were related to: the quality or health of the animals provided; the lack of appropriate skills and training and extension services; and perceived inequality in the distribution of the animals Inflationary pressures from CFW were mitigated by the UNDP setting all CFW wages at a daily rate comparable to that of unskilled workers before the tsunami <p>Education and awareness:</p> <ul style="list-style-type: none"> The enterprise development programmes that had been most successful were those that included |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--------------------------------|--|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | <p>appropriate skills training and support, and routine follow-up and monitoring</p> <p>Incidence of mental health presentations:</p> <ul style="list-style-type: none"> CFW income was also used to support the revival of community religious or cultural events |
| Tougiani et al. (2009) (Niger) | <p>Rural setting</p> <p>Conflict-affected</p> <p>Community organisation apparent</p> <p>Supportive local government</p> <p>Fragile ecosystem</p> | ✓ | ✓ | ✓ | | | <p>Incomes, outputs and enhanced livelihoods:</p> <ul style="list-style-type: none"> The project resulted in significant gains for livestock production through increase availability of tree browse and shelter There were increased crop yields due to the transfer of nutrients from trees to crops through leaf, fruit and flower drop and decomposition as well as manure from bird excretions and livestock sheltering among trees Farmer Managed Agroforestry Farming System FMAFS provided significantly increased farm incomes compared to traditional millet farming and more diversity in income sources <p>Resilience:</p> <ul style="list-style-type: none"> Farm labour inputs and incomes were found to spread more evenly across the year instead of being concentrated within a four-month period The diversification of crops resulted in greater insurance against total crop loss during adverse events such as drought, insect attack or storms, as |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | not all species and products would be equally disadvantaged by the same event in a particular year |
| USAID (2011) (Bangladesh) | Rural setting Community organisation apparent Some degree of supportive local government Fragile ecosystem | ✓ | ✓ | | ✓ | ✓ | <p>Incomes, outputs and enhanced livelihoods:</p> <ul style="list-style-type: none"> • 24% of beneficiaries changed livelihoods to more valuable or productive assets than had been the case prior to the disaster. These beneficiaries were no longer reliant on less profitable activities such as prawn peeling or working as domestic maids • Beneficiaries commonly purchased poultry with their remaining voucher balance. These secondary assets often provided initial income while beneficiaries waited for their main assets to generate income • CFW activities initiated during the lean seasons augmented incomes for beneficiaries while many waited for cattle or other assets to begin to generate income • Among project participants, income during the lean season increased from 38% to 72% in December-March and from 27% to 57% in April-June when comparing pre-disaster levels to the last year of the project <p>Resilience:</p> <ul style="list-style-type: none"> • Data showed a steady increase in the percentage of household earning income from their assets. In |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|-------------------------------|---------------|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | <p>August, only 38% were earning income and this had increased to 59% by February of the following year</p> <p>Vulnerability:</p> <ul style="list-style-type: none"> • <i>Negative</i>: due to price inflation, the voucher amounts were often not sufficient to cover the cost of a fully grown cow and thus immature cows were purchased, which resulted in a 6- to 10-month delay in milk production • CFW earnings were used to increase the number of meals consumed per day, pay for children's educational expenses and purchase additional or more valuable assets • CFW activities were successful in identifying and rebuilding the key infrastructure that was vital in protecting lives and crops from tidal waves in October 2010 <p>Education and awareness:</p> <ul style="list-style-type: none"> • Training given to beneficiaries contributed significantly to improved cattle health and productivity and was highly regarded among project participants |
| Younus (2010) (Bangladesh) | Rural setting | ✓ | ✓ | ✓ | | | Resilience: |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|--------------------------------|--|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | Community organisation apparent Some degree of supportive local government Supportive national government Fragile ecosystem | | | | | | <ul style="list-style-type: none"> It was found that in Maijari, relatively few people had alternative or secondary forms of occupation, but on the char land, people were more likely to have a secondary occupation such as day labouring or rickshaw pulling on the mainland |
| Zaidi et al. (2010) (Pakistan) | Rural setting Community organisation apparent Supportive local government Supportive national government | ✓ | ✓ | | | | Community coping capacity, organisational capacity and livelihoods: <ul style="list-style-type: none"> <i>Negative:</i> The targeting of cash at families based on eligibility criteria was largely ineffective, with only half of the families who received the payments being eligible |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

5.4.2 Discussion of the mechanism table

The mechanism was identified in 23 of the 27 studies. In all of these, at least one type of outcome that specifically related to resilient livelihoods was specified. The main outcomes focused on: enhanced resilience; reduced vulnerability; enhanced incomes, outputs and livelihoods; and education. Studies incorporating this mechanism covered all regions, with a focus on South Asia and South East Asia and were all published after 1998, with more than half (13) published after January 2010.

With regard to the Sustainable Livelihoods Framework, 9 of the 22 studies described all 5 SLF forms of capital, and 11 described 3 or 4 of the capitals. Financial capital was included in all studies.

5.4.3 The how, why and when of the mechanism

The types of programmes implemented in the studies focused either on pre- or post-disaster activities. Those undertaken prior to or in anticipation of future disasters related to pre-disaster livelihood enhancement, diversification and climate resistance whereas those focused on post-disaster related to the response and recovery of livelihood associated activities that sought to overcome the negative effects of the disaster. All studies drew upon at least two forms of capital; however, all five could be used build longer-term community resilience to both slow-onset climate change effects and rapid-onset hazards (Rossing et al., 2010).

Understanding the context is essential to the successful design of any intervention. The studies included operated in varying contexts; however, all were undertaken in a rural area. In addition, seven of those studies were also undertaken in an urban or peri-urban environment. Seventeen studies were associated with apparent community organisation present, whereas only six took place in settings with limited community organisational presence. In the majority of studies, there were both a supportive national government (11) and a supportive local government (12), compared to only four studies in which national government was limited and eight in which this applied to local government.

Of the 23 studies, 14 were conducted in an area with a fragile ecosystem, which places more emphasis on the need to manage natural resources effectively. Only three of those fourteen studies did not examine natural capital. Five studies were conducted in areas that were conflict affected and five more in areas that were affected by conflict, but to a lesser extent. This significant proportion of studies highlights the degree of overlap between those areas affected by natural disasters and conflict and the need for this context to be appreciated.

Highlighting the importance of understanding context, Rossing et al. (2010) stated that in order to provide a strong foundation for the design of effective, asset-based adaptation that enhanced resilience and coping capacity, a context-specific social analysis of livelihood assets was needed. Such an analysis should include:

1. identifying vulnerable groups living in places prone to climate-induced natural hazards in order to identify where to build long-term protection against both slow- and rapid-onset impacts;
2. examining the extent to which the groups were capable of taking action to avoid the effects of climatic impacts (pre-disaster damage limitation), in anticipation, for example, of future hurricanes, or when faced with a gradually worsening situation such as drought;
3. investigating the ability of different groups to cope with the immediate effects of natural hazards, that is, their ability to judge whether an immediate response was required, especially when a natural hazard had turned into an actual disaster; and
4. analysing how different groups were able to adapt over the long term by undertaking planned actions after a slow- or rapid-onset climate event in anticipation of similar or worse climatic impacts in the future (Rossing et al., 2010).

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

The first two aspects relate to the way different types of assets (physical, financial, human, social, cultural and natural capital) can protect against livelihood shocks caused by climatic events prior to, and in anticipation of such events. They may thus contribute to preventing the event from turning into an actual disaster. The last two aspects refer to the ability to cope with the shocks immediately after their occurrence, with the focus on longer-term recovery in a more sustainable and resilient fashion, thus also contributing to being better prepared for future stresses (Rossing et al., 2010).

An important recurring theme was of diversification as a means of building resilience and as a risk-management strategy in anticipation of disaster and climate change events. This was highlighted repeatedly in the literature (Bhattacharjee et al., 2010; Care, 2011; Dekens, 2007; Kotowicz, 2010; Leone and Gaillard, 1999; Matsimbe, 2003; Oxfam, 2009; Practical Action, 2010a; Rempel, 2010; Rossing et al., 2010; Selvaraju et al., 2006; Tougiani et al., 2009; USAID, 2011; and Younus, 2010).

Diversification is important to building resilience and can take three main forms:

- same-sector diversification - production of multiple crops in multiple areas or through intercropping or rearing multiple kinds of livestock;
- value-chain diversification – moving into other related business areas in the value chain such, as moving from fishing to drying and processing of fish, which can then be sold at a higher price; and
- sector diversification - moving into other sectors, such as from agriculture to small-scale trading.

Selvaraju et al. (2006) suggested that the promotion of alternative enterprises helped increase overall household income, which acted as a drought risk-management strategy. It did this, for example, by minimising the impact of drought through stabilisation of year-round income from one source, even if all other sources failed due to drought. This could include promoting such enterprises as economically viable livestock management, fisheries, sericulture and homestead gardening. Alternative enterprises could also help to reduce the reliance of internal and temporary migration as a coping mechanism in times of stresses and shocks.

Care (2011) also stated that an important approach to reducing vulnerability of poor households was through livelihood diversification; this could include diversification within agriculture (same-sector diversification) to new and more climate-resilient varieties of staple crops, to different crops or livestock species that might be able to withstand variable climate conditions and/or to new practices which might manage agricultural resources more sustainably. Value-chain diversification through the improvement of storage, processing and marketing of agricultural products could play an important role in maximising the value of production in good years, which helped to create safety nets in times of disasters. Sector diversification was also important, and could involve the creation of opportunities not related to agriculture, such as producing and selling handicrafts or work in the service sector, such as trading. However for diversification strategies to be successful and climate resilient, programmes ‘must be planned on sound analysis, capturing the full range of hazards people are exposed to, how these hazards interact with each other, and how they affect existing and planned livelihood activities’ (Care, 2011: 27).

Undertaking multiple activities can assist in reducing the negative consequences of localised disasters. There should however, remain a focus on traditional livelihoods, which can strategically enable a community to have an economic base for survival and recovery (Rempel, 2010).

An important post-disaster intervention was cash-for-work (CFW) (Bhattacharjee et al., 2010; Doocy et al., 2006; Kotowicz, 2010; Pelham et al., 2011; Thorburn, 2009; USAID, 2011). Following an emergency, damaged infrastructure can block or impede access to markets and delivery of supplies. Responding by facilitating in-kind transfers may be an appropriate response in situations where markets are not operating, whether due to supply constraints or inaccessibility to consumers. Conversely, providing cash transfers can also be an incentive in response to sluggish supply, by

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

stimulating demand (Pelham et al., 2011). This shows that there are two potential options for responding to a disaster to ensure that community needs are addressed and to restart livelihoods – especially for cash transfers, where local markets are still active and cash infusions overcome the loss of assets to kick-start the local economy. All of the six studies examined assessed CFW, not food-for-work.

Rossing et al. (2010) stated that the key to improving community resilience was through the establishment of small-scale, local programs that embody close cooperation among all in the community and that safeguard existing livelihoods or create new ones. Community-based risk assessment projects are valuable for their ability to facilitate adaptation while helping create social capital. Local institutions are essential facilitators for households and social groups to deploy specific adaptation practices — particularly among the rural poor, for whom this support may significantly enhance various types of capital necessary for adapting their livelihoods. (Rossing et al., 2010: 293)

This statement emphasises the important link between resilient livelihoods, CBDRM and local institutions in creating community resilience.

5.4.4 Mechanism outcome

The resilient livelihoods mechanisms in these studies were predominantly linked with four outcome categories: bolstering resilience; reducing vulnerability; enhancing incomes, outputs and livelihoods; and promoting education. The most important of these outcomes related to bolstering resilience (n=18) (Care, 2011; Dekens, 2007; Dodman et al., 2010; Doocy et al., 2006; Kotowicz, 2010; Leone and Gaillard, 1999; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Oxfam, 2009; Pelham et al., 2011; Practical Action, 2010a; Rempel, 2010; Rossing et al., 2010; Selvaraju et al., 2006; Thorburn, 2009; Tougiani et al., 2009; USAID, 2011; Younus, 2010) and vulnerability (n=18) (Bhattacharjee et al., 2010; Care, 2011; Dekens, 2007; Dodman et al., 2010; Doocy et al., 2006; Giri and Malakar, 2011; Kotowicz, 2010; Leone and Gaillard, 1999; Luna, 2001; Oxfam, 2009; Pelham et al., 2011; Rempel, 2010; Rossing et al., 2010; Schutte and Kreutzmann, 2011; Selvaraju et al., 2006; Thorburn, 2009; USAID, 2011; Younus, 2010).

The large number relating to both resilience and vulnerability suggests that the two are interrelated, and when one outcome is generated, it could have an impact on the other. This is not to suggest that these are mirror images of one another, but rather that both deserve attention and can often be addressed in the same setting.

Education and awareness was well represented, in eight studies (Giri and Malakar, 2011; Bhattacharjee et al., 2010; Doocy et al., 2006; Mulligan and Nadarajah, 2012; Oxfam, 2009; Pelham et al., 2011; Thorburn, 2009; USAID, 2011) and incomes, outputs and enhanced livelihoods was represented in nine studies (Bhattacharjee et al., 2010; Giri and Malakar, 2011; Kotowicz, 2010; Oxfam, 2009; Schutte and Kreutzmann, 2011; Selvaraju et al., 2006; Tougiani et al., 2009; USAID, 2011; Zaidi et al., 2010). Outcomes with a bearing on psychosocial wellbeing were present in two studies (Doocy et al., 2006; Thorburn, 2009), as was coping capacities (Leone and Gaillard, 1999; Zaidi et al., 2010).

In programming focused on pre-disaster planning and preparation, according to Care (2011), it was found that better-off households were able to employ a greater range of different livelihood strategies. This was due to the diversity and expandability of these alternative livelihood options which meant that households could adjust relative contributions to meet food and income needs when a particular component of their livelihoods was affected by a stress or shock. The better off households practised a wider range of livelihood activities, which included coffee production, selling cows rather than chickens, selling labour in more distant places (such as Dili, which had higher incomes), group gardening or involvement in pond activities. As these households had a wider range

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

of climate sensitive alternatives available to them, they were less vulnerable to climate hazards, whereas poorer households were often heavily dependent on maize production, with few alternatives available, making them particularly vulnerable to climate hazards (Care, 2011).

Diversifying livelihoods into livestock production to complement agricultural activities is an important means of increasing resilience, as in times of stresses or shocks, livestock can be sold quickly and funds used for immediate needs (Matsimbe, 2003). These liquid assets (livestock and poultry) play an important part in household risk management by providing a source of livelihood security (Selvaraju et al., 2006). However, this is dependent on functioning markets.

An interesting traditional same-sector diversification strategy was identified in Dekens (2007), where communities used transhumance between the lowland and the pastures ('vertical spatial diversification'), which allowed people to take advantage of the 'ecological niches' related to seasonal climatic changes, as a resource optimisation strategy, by moving livestock between different grazing lands.

In programming post-disaster, Bhattacharjee et al. (2010) stated in their study that the most notable achievements in livelihoods had been made when the interventions had led to diversification of livelihoods, rather than merely focusing on recreating what existed before the disaster (tsunami), through asset replacement. The study found that a diversified portfolio of livelihoods enabled families and communities to better withstand the impact and incidence of disasters. The programmes assessed had been based on a total livelihoods approach, with interventions along the value chain. This also included making use of existing bank and government funding (linking mechanism) to improve input availability, product quality and marketing. Successful outcomes were seen in the case of fish processing and crab farming. It was found that value chains were core to the success, as emphasised in the following passage:

[Livelihoods interventions had been] highly effective when the livelihood activities were looked at in relation to the overall sector and with a deeper understanding of value chains, rather than when it took a traditional income-generating approach targeted at individual families without adequate attentions to value-chain analysis' (Bhattacharjee, 2010: 8).

An example of a successful enhanced livelihood activity along the value chain was the construction of a fish-drying yard in one village, which led to a 20-30 percent increase in price realisation and an improvement in quality. Another example was assisting vulnerable women's groups who previously engaged in small-scale fish-drying activities to move to higher-value crab cultivation and marketing (Bhattacharjee et al., 2010). Another successful example initiated after the 2004 Asian tsunami was the expansion of a women's group to operate in the coir industry (coconut fibre), which resulted in the doubling and in some cases tripling of pre-tsunami incomes (Oxfam, 2009).

Agricultural activities that were found to be successfully resilient in the presence of flooding were those that leveraged off excess water. According to Practical Action (2010a) communities were capable of restoring their livelihoods during a flood by initiating floating gardens and nurseries, adopting fisheries in flood water and commencing small enterprises as an alternative income generating activity. According to the report, households that adopted these practices, which were taught to them through training in disaster preparedness, mitigation and alternative livelihood options, recovered in 6 to 12 months after severe floods compared to those that had not received any training, who were unable to recover to pre-disaster levels.

Another agricultural adaptation to periodical threats in the aftermath of a volcanic eruption was that of changing crops. Communities in the study area traditionally grew annual yielding produce such as rice or sugar; however, with the threat of another volcanic eruption and the loss of whole harvests, communities changed to quick-growing crops such as tomatoes, peanuts and sweet potato, where multiple harvests could be completed (Leone and Gaillard, 1999). This could be especially useful in

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

high-risk areas where harvests (and their incomes) could be spread throughout the year and saved in a safe place, as well as limiting any potential losses from a disaster.

CFW and other social protection measures were found to be successful in restoring livelihood activities and reducing vulnerabilities in the aftermath of natural disasters. According to Doocy et al. (2006) 'CFW appeared to have a positive impact on the local economy by providing much needed employment, which in turn gave people the resources to act on their demands for goods and services, stimulating the re-establishment of markets and contributing to the start of economic recovery' (Doocy et al., 2006: 292). In Indonesia it was found that 81 percent of cash distributed was reinvested in livelihood recovery and 68 percent of funds spent on household purchases went towards food security (Doocy et al., 2006). These examples show that CFW can inject much-needed funds into an economy in the aftermath of a disaster by providing temporary employment until other forms of permanent livelihoods can be re-established.

CFW can also provide a public good in the aftermath of a disaster. In extreme weather events, infrastructure can be severely damaged and CFW can be used to clean up and repair communal infrastructure. In the aftermath of the 2004 tsunami, CFW was implemented in Aceh and was responsible for clearing 136km² of land, 262km of roads and 2,006 buildings; in addition, 306 permanent and 577 temporary homes were constructed (Doocy et al., 2006). Many livelihoods are dependent on access to infrastructure, and in order for livelihoods to resume, infrastructure needs to be accessible. In the aftermath of the tsunami, one of the most resilient and successful livelihoods was rubber tapping (Thorburn, 2009). However communities were unable to gain access to existing groves due to the blockage of village roads. Once these were cleared, rubber tapping showed the strongest recovery, which underscored the importance of agro-ecological diversity and the critical role of tree crops in household livelihood diversification. Villages with durian or other high-value fruit crops recovered similarly (Thorburn, 2009). However, this also shows the importance of clearing communal infrastructure post-disaster, where CFW could be used to re-establish existing livelihoods whilst providing a boost to the local economy in the short term.

Other social protection instruments are important in supporting and re-establishing livelihood activities for the most vulnerable. A pilot project in Nicaragua sought to limit income vulnerability due to uninsured weather-related risks through three interventions: 1) nutrition and education package (income transfers); 2) a nutrition and education package plus a scholarship that allowed one household member to participate in a vocational training course; or 3) a nutrition and education package plus a productive investment grant, aimed at encouraging recipients to start a small non-agricultural activity. According to Rossing et al. (2010) households in the group that received the productive investment grant increased their incomes the most and helped increase savings, which enabled them to better cope with natural disasters.

According to Thorburn (2009), the most successful examples of small-scale enterprise development in the aftermath of the 2004 tsunami were due to grants and loans that allowed individuals to re-establish enterprises they had owned or managed before the tsunami, such as fishing, fish processing and marketing, petty trade, food services, vehicle and equipment repair, construction and contracting (Thorburn, 2009). This highlights the importance of access to capital to re-establish livelihoods.

5.4.5 Inhibitors

A lack of access to financial services can be a significant inhibitor to building resilient livelihoods. Prior to the 2004 Asian tsunami, for example, many community members lacked access to financial services and were forced to save cash and valuables in the home. As a result, many people lost everything, as the tsunami washed away all their belongings (Kotowicz, 2010). This highlights the importance of facilitating access to a safe and accessible place to save.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Livestock assistance programmes have the ability to enhance community resilient livelihoods. However according to Thorburn (2009), who assessed a livestock intervention, some of the main inhibitors to the success were related to: poor quality or health of the animals provided; the lack of appropriate skills training and extension services (many of the recipients had little or no experience in raising livestock); and perceived inequality in the distribution of this aid. Some of the challenges of the project were summed up by one of the beneficiaries:

There was the time people were given ducks, but it turns out that all the ducks were the same sex. Well, they're not going to multiply, are they? Then we were given calves by the government. They were still young, still nursing, but already distributed to the community. I guess people thought that cattle are just like buffalo: you let them go and they take care of themselves. But cows are thin-skinned and need a pen to be safe. Because they were just allowed to roam free, they all died. Somebody should have taught the people how to care for the cattle. (Thorburn, 2009: 93)

Asset distribution can also be a significant inhibitor to building resilient livelihoods both before and after disasters. An example of this was in the aftermath of the 2004 tsunami, where there was a rush to distribute boats to communities, even to those that were not involved in fishing activities prior to the disaster. The result was that too many boats were distributed and saturated the market, which led to decreased fish stocks, lower sale prices and in the end, lower incomes and reduced resilience (Kotowicz, 2010).

In the move to provide advanced education, traditional activities are often overlooked. According to a participant in a study conducted by Dekens (2007):

In the traditional society of Chitral, youngsters were given training in different skills. Chitrali handicrafts of wool, clay, iron, wood, and skin were the main sources of subsistence. The education policy that replaced the old system has no direction. It produces people with certificates and degrees that serve no purpose. The result is that our society has produced unemployed youth instead of skilled people. New generations in the families of traditional craftsmen/women are giving up their ancestral professions without being able to adopt better ones. (Dekens, 2007: 35)

The inhibitors discussed in this section highlight the need to understand the local context and include community members in the planning and decision processes, if activities are to successfully reduce vulnerability to natural disasters and build long-term community resilience.

Policy makers and practitioners should pay particular attention to understanding the local context and limiting inhibitors if programmes are to be successful.

5.5 Gender and social equity promotion

5.5.1 Brief overview of the mechanism

Table 5.5 sets out those studies reporting efforts to address gendered and social inequity. This mechanism relates to the development or promotion of enabling environments for gender and social equity through institutional, organisational and programmatic activities and operations. Gendered vulnerability does not emerge from one single set of factors, but 'reflects historical and social patterns of relations in social institutions, culture and personal lives', which intersect with other forms of inequity based on ethnicity or socio-economic disadvantage (Enarson, 1998: 159). Gendered and social vulnerability make certain social groups more at risk when populations experience extreme meteorological phenomena. However, the presence of a hazard does not automatically lead to increased risk, because as the IFRC's 2007 *World Disasters Report* demonstrates, 'Disasters do not discriminate. They affect minorities and majorities, the able-bodied

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

and persons with disabilities, young and old, men and women. But discrimination can multiply the effects of a crisis on vulnerable people' (IFRC, 2007: 11). As these studies show, a major challenge for disaster risk reduction is to promote gender and social equity in a way that also provides an enabling environment for local solutions.

Table 5.5: Gender and social equity promotion: context, sustainable livelihoods framework and outcomes

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Awotona (1997) (Peru and Bangladesh) | Urban setting Limited community organisation Supportive local government Supportive national government | | | | ✓ | | Increased vulnerability (<i>Negative</i> outcome): <ul style="list-style-type: none"> Social, economic and political issues influenced community vulnerability to natural hazards |
| Berke and Beatley (1997) (St Kitts and Nevis, and Antigua) | Rural and urban settings Limited community organisation Supportive local government Supportive national government | | ✓ | | ✓ | | Community coping capacity (<i>Negative</i> outcome): <ul style="list-style-type: none"> Poor, rural and isolated communities were discriminated against and did not receive aid from some faith-based organisations |
| Dekens (2007) (Pakistan) | Rural setting Community organisation apparent Supportive local government Fragile ecosystem | | ✓ | ✓ | ✓ | | Increased vulnerability (<i>Negative</i> outcome): <ul style="list-style-type: none"> Forced relocation and land confiscation of farmers by local rulers based on low social status led to the poorest living in more vulnerable locations Community coping capacity (<i>Negative</i> outcome): <ul style="list-style-type: none"> Poorest members of community unable to access new EWS because based on access to technology (electricity, telephones) |

5. Realist review: evidence synthesis

| | | | | | | | |
|--|---|---|---|--|---|--|---|
| Matsimbe (2003) (Mozambique) | Rural setting Conflict-affected Community organisation apparent Some degree of supportive local government Supportive national government | ✓ | ✓ | | ✓ | | Reduced resilience (<i>Negative outcome</i>): <ul style="list-style-type: none"> USAID's gendered approach to promoting equality, decreasing women's vulnerability and improving their access to and management of financial resources led to conflict between male and female community members and social instability, with male community members viewing USAID's financial aid to women as a challenge to their authority |
| Oxfam (2009) (Sri Lanka and India) | Rural and urban settings Community organisation apparent | ✓ | ✓ | | ✓ | | Reduced resilience (<i>Negative outcome</i>): <ul style="list-style-type: none"> Aid distribution fuelled pre-existing social tensions along lines of ethnicity, politics, class, gender, religion and caste because of competition for aid and biased beneficiary selection processes |
| Rempel (2010) (India) | Rural and urban settings Affected by conflict Community organisation apparent Supportive local government Supportive national government | ✓ | ✓ | | ✓ | | Community coping capacity (<i>Negative outcome</i>): <ul style="list-style-type: none"> Dalits were severely affected by the tsunami but were less likely to have their needs met by NGOs or government because of discrimination Increased vulnerability (<i>Negative outcome</i>): <ul style="list-style-type: none"> Women and girls, as the most vulnerable group due to lower status and higher mortality, were at higher risk in relief camps, were less likely to be compensated for livelihood losses and had least access to authorities |
| Rossing et al. (2010) (Mexico, Brazil, Venezuela, | Rural setting Area affected by conflict to some degree | ✓ | ✓ | | ✓ | | Reduced resilience (<i>Negative outcomes</i>): <ul style="list-style-type: none"> The poorest were forced to focus on daily survival and coping strategies, not capital accumulation or livelihood resilience |

5. Realist review: evidence synthesis

| | | | | | | | |
|--|--|--|---|---|---|---|--|
| Nicaragua, Belize) | Community organisation apparent Supportive local government Some degree of supportive national government Fragile ecosystem | | | | | | <ul style="list-style-type: none"> The poorest communities, without formal financial mechanisms, used migration as an adaptive coping mechanism to escape poverty |
| Sato (2010) (Thailand) | Rural and urban settings Some degree supportive local government Some degree supportive national government | | ✓ | | ✓ | | <p>Community coping capacity (<i>Negative</i> outcome):</p> <ul style="list-style-type: none"> Good resource endowment (proximity to roads, outspoken leaders, strong bonding and bridging social capitals), not the needs of communities, led to increased amount of commodities and aid received |
| Schutte and Kreutzmann (2011) (Pakistan) | Rural setting Community organisation apparent | | | | ✓ | ✓ | <p>Livelihoods (<i>Negative</i> outcome):</p> <ul style="list-style-type: none"> Gendered bias in providing training in livestock health care (men received training, women responsible for cows) led to reduced animal health and decreased livelihood income |
| Selvaraju et al. (2006) (Bangladesh) | Rural setting Community organisation apparent Supportive local government Supportive national government Fragile ecosystem | | | ✓ | ✓ | ✓ | <p>Livelihoods and resilience (<i>Negative</i> outcomes):</p> <ul style="list-style-type: none"> Poor and illiterate farmers made more individual adjustments to drought because they had less access to government and resources Wealthy farmers and businessmen made fewer adjustments to drought because they were more educated and had a higher social position, and were able to access government representatives and aid resources |

| | | | | | | | |
|-----------------------------------|---|---|---|--|--|--|--|
| Zaidi et al. (2010) (Pakistan) | Rural setting Community organisation apparent Supportive local government Supportive national government | ✓ | ✓ | | | | Community coping capacity, organisational capacity and livelihoods: <ul style="list-style-type: none"> • <i>Negative</i>: the targeting of cash at families based on eligibility criteria was largely ineffective, with only half of the families receiving payments being eligible. The families excluded tended to be female-headed households, elderly women and families with large numbers of children. Ineligible groups receiving payments tended to be young males (20-29) and families with more male members |
|-----------------------------------|---|---|---|--|--|--|--|

5.5.2 Discussion of the mechanism table

This mechanism is unique in that it is almost completely associated with negative outcomes, which will be discussed more in the final paragraph of this section.

Eleven studies in total reported on this mechanism and associated outcomes, looking at 16 countries in total. Countries from Central and Latin America figure strongly in this set, with a strong showing from South Asia. One country in Africa (Mozambique) was studied; six studies researched four South Asian countries (Bangladesh, India, Sri Lanka, Pakistan); and three studies addressed CBDRM in eight Central and Latin American countries (Mexico, Brazil, Venezuela, Nicaragua, Belize, Peru, St Kitts and Nevis, Antigua). Four studies investigated and compared community-based risk management and socio-economic programme elements in more than one country (Awotona, 1997; Berke and Beatley, 1997; Oxfam, 2009; Rossing et al., 2010).

Studies found to have this mechanism were almost all published after 2000, with the exception of two studies, published in the late 1990s (Awotona, 1997; Berke and Beatley, 1997).

5.5.3 The how, why and when of the mechanism

Most of the studies reporting gender and social equity promotion mechanisms investigated rural settings: a total of 9 out of the 16 studies. Of these, six studies investigated rural settings only (Dekens, 2007; Matsimbe, 2003; Rossing et al., 2010; Schutte and Kreutzmann, 2011; Selvaraju et al., 2006; Zaidi, 2010) with another four studies investigating both urban and rural settings (Berke and Beatley, 1997; Oxfam 2009; Rempel, 2010; Sato, 2010). Only one study researched an urban setting only (Awotona, 1997).

Only three studies investigated the effects of disaster risk management for communities inhabiting fragile ecosystems on the capacity of communities to cope with extreme weather events (Dekens, 2007; Rossing et al., 2010; Selvaraju et al., 2006). In response to often precarious living conditions that were further threatened by extreme weather events, communities normally relied predominantly on relatives, neighbours and nearby communities to prepare, cope and adapt. None of the studies related the presence of a fragile ecosystem to the workings of this mechanism, however.

Three studies reported on communities living in conflict-affected areas (Matsimbe, 2003; Rempel, 2010; Rossing et al., 2010). However, even though conflict was present in the areas studied, none of these authors argued that conflict influenced the functioning of this mechanism or the outcomes. In a similar way, none of the studies highlighted the degree of community organisation or supportive local and national governments with this mechanism. The main concern of authors was not organisational mechanisms, but the workings of institutionalised forms of discrimination, bias and social differentiation based on gender, class, ethnicity, disability or religion, and the ways in which these led to negative outcomes for the social groups concerned.

This mechanism strongly relates to the Sustainable Livelihoods Framework (SLF) and its different categories of capital. Social capital was found to be operating in a negative way in 10 of these studies (Awotona, 1997; Berke and Beatley, 1997; Dekens, 2007; Matsimbe, 2003; Oxfam, 2009; Rempel, 2010; Rossing et al., 2010; Sato, 2010; Schutte and Kreutzmann; Selvaraju et al., 2006). Social capital is clearly an important mechanism that reflects the levels of trust and ties that people have with each other both within communities and between them as well as with the different levels of government. However, when there are strong divisions and social differentiation between groups in a community, social capital is weakened and so, as a result, is overall resilience.

The next most important type of capital was physical capital, which was found in eight studies (Berke and Beatley, 1997; Dekens, 2007; Matsimbe, 2003; Oxfam, 2009; Rempel, 2010; Rossing et al., 2010; Sato, 2010; Zaidi et al., 2010). Only five studies had financial capital present (Matsimbe, 2003; Oxfam, 2009; Rempel, 2010; Rossing et al., 2010; Zaidi et al., 2010); two studies reported on human

capital (Schutte and Kreutzmann, 2011; Selvaraju et al., 2006) and two studies on natural capital (Dekens, 2007; Selvaraju et al., 2006). Nevertheless, even though these other kinds of capital were present, the main focus of these studies was on how weak social capital in terms of social differentiation based on gender, ethnicity, rurality, caste, remoteness and socio-economic disadvantage led to negative outcomes for communities. In essence, as with the set of studies with linking mechanisms, robust forms of social capital were essential for successful outcomes.

5.5.4 Mechanism outcomes

All of the outcomes linked to this mechanism were negative, with the most common outcomes being decreased resilience and increased vulnerability of communities. Instances of decreased resilience were found in four studies (Matsimbe, 2003; Oxfam, 2009; Rossing et al., 2010; Selvaraju et al., 2006). Matsimbe (2003) showed that USAID's gendered approach to CBDRM attempted to challenge existing gendered roles and inequalities by increasing women's access to and management of financial aid. However, this led to increased social tension and fragmentation, with conflict developing between male and female community members. Oxfam's study (2009) also showed that humanitarian aid increased pre-existing social tensions based on ethnicity, politics, class, gender and religion in Sri Lanka and India after the tsunami. Rossing et al. (2010) showed that poverty meant that disadvantaged community members were forced to focus on daily survival and did not have the resources available to accumulate capital or develop long-term livelihood resilience. The study by Selvaraju et al. (2006) is interesting in that it showed that the poorest farmers were forced into adapting to drought in order to survive because of a lack of resources. Wealthy farmers and businessmen, on the other hand, did not make adaptations because they relied on their connections with government and access to resources to cope with the consequences of disasters.

Factors related to community coping capacity was found in five studies (Berke and Beatley, 1997; Dekens, 2007; Rempel, 2010; Sato, 2010; Zaidi et al., 2010), with two studies reporting also on increased vulnerability. Berke and Beatley (1997) argued that on the Caribbean islands of St Kitts and Nevis and Antigua, the discriminatory practices of certain faith-based organisations led to some poor, isolated rural communities not being provided with much-needed humanitarian relief. Dekens (2007) shows that in Pakistan the poorest and most disadvantaged community members were unable to access the new early warning systems because they lacked the means to access the required technology (telephones, electricity). In India, Dalits who were severely affected by the 2004 tsunami also did not receive appropriate levels of humanitarian relief because of the discriminatory practices of service providers (Sato, 2010). Sato (2010) argued that the different levels of resource endowment of a community influenced the amount of relief aid they received after the 2004 tsunami. Aid agencies tended to give more aid to those communities that were easiest to access, and had outspoken leaders who could advocate for assistance and who had a strong history of collective action and solidarity both within the community and with external agencies. Finally, in the study by Zaidi et al. (2010) of cash grant distribution following the 2005 Pakistan earthquake, multiple levels of discrimination led to socially and economically marginalised and disadvantaged groups (female-headed households, large families and the elderly) being excluded from aid payments and resources. In contrast, groups with more socio-economic advantage (young men in particular) were found to be able to access humanitarian aid more readily.

A reduction in the income and livelihoods of communities was only reported in one study (Schutte and Kreutzmann, 2011). This study showed that disaster risk programmes had trained local men in how to manage and improve the health and care of cattle when was actually the women of the community who were responsible for this. This led to a poor outcome in terms of animal health and a resulting decrease in income, as animals were not treated correctly for health problems such as intestinal worms.

However, despite almost overwhelmingly negative outcomes, at times perseverance led to mixed outcomes, with some of the male community members accepting new gendered roles for women in Mozambique (Matsimbe, 2003). Although the majority of male community members displayed increased hostility and there was an increase in social discord, this did not hold true in all cases, with some male members of the community eventually accepting and even welcoming women into their new roles.

5.5.5 Inhibitors

This mechanism manifested mostly in terms of negative outcomes in this set of studies. All of the studies described above are good examples of the ways in which gendered and social inequality produced negative outcomes. Matsimbe's study (2003) of Mozambican communities is a good example of the ways in which pre-existing gendered and social inequities could impact on DRR activities and programming despite the best intentions and efforts of the implementing agency:

In Búzi, similar social tensions arose when USAID distributed financial relief to women only. USAID had decided to allocate money to the community using selection criteria based on gender, with only women receiving the 1,500,000.00MZM (about US\$60) designated per household. According to district authorities, the objective was to promote gender balance. USAID recognised that women were the most vulnerable and generally in a better position to manage financial resources, but men misinterpreted this decision, seeing it as a challenge to their authority within the household, thus creating social problems between men and women. (Matsimbe, 2003: 33)

The financial aid provided by USAID led to many social problems and increased tensions within and between communities: divorce, suicide, capture of the funds by men to purchase beer and tobacco; in one extreme case, a village chief was killed because he excluded a community from receiving relief aid.

5.6 Enhanced safety, security and protection

5.6.1 Brief overview of the mechanism

The enhanced safety, security and protection mechanism relates to the fundamental rights of any community in which a minimum level of physical, mental and legal safety, security and protection is required to enable communities to progress and invest in their future.

Table 5.6: Enhanced safety, security and protection: context, sustainable livelihoods framework and outcomes

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---------------------------------------|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Dekens (2007) (Pakistan) | Rural setting Community organisation apparent Supportive local government Fragile ecosystem | | ✓ | ✓ | | ✓ | <p>Resilience:</p> <ul style="list-style-type: none"> • Use of seasonal migration as a protection measure <p>Vulnerability:</p> <ul style="list-style-type: none"> • Due to population growth, land fragmentation reduced people's options and their flexibility to choose safe locations and to resettle during the rainy season. • Loss of local knowledge on safe areas increased vulnerability • Vertical transhumance was used as a disaster preparedness measure for flooding • Transhumance, however, increased vulnerabilities to other disasters, where the transfer of livestock puts flocks and herders at risk of avalanches, storms, blizzards and landslides • Land holdings were dispersed over a wide area to protect against flash flooding |
| Dodman et al. (2010) (Philippines) | Rural and urban settings Very low-income community members Community organisation apparent | | ✓ | | ✓ | | <p>Vulnerability:</p> <ul style="list-style-type: none"> • Savings groups made up of very low-income communities (homeless) were found to respond rapidly in the aftermath of a disaster, where funds were used to provide food for affected families and were mobilised for the rapid construction of |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| | | | | | | | |
|--|--|--|---|---|---|---|--|
| | Some degree of supportive local government Some degree of supportive national government Fragile ecosystem | | | | | | transit housing, reducing the trauma faced by displaced families <ul style="list-style-type: none"> Unclear land title deterred communities from investing in safe homes as they were at risk of relocation |
| Doocy et al. (2006) (Indonesia) | Rural and urban settings Conflict-affected Limited community organisation | | ✓ | ✓ | ✓ | | Resilience: <ul style="list-style-type: none"> CFW was responsible for the clearing of 136km² of land, 262km of roads and 2,006 buildings; in addition, 306 permanent and 577 temporary structures, including mosques, schools and temporary homes, were constructed CFW helped participants remain active while reducing feelings of trauma and stress; it increased the amount of time spent with community members, which created a sense of unity that helped to facilitate rebuilding Vulnerability: <ul style="list-style-type: none"> The CFW programme empowered displaced populations to return to their communities: 91% of participants indicated that CFW facilitated their return |
| Leone and Gaillard (1999) (Philippines) | Rural setting Limited community organisation | | ✓ | | | ✓ | Vulnerability: <ul style="list-style-type: none"> <i>Negative:</i> Resettled families could remain in 'bunkhouses' for several months or even years, prior to being definitively re-accommodated in a resettlement centre. This was often very difficult |

| | | | | | | | |
|--|---|--|---|---|---|---|---|
| | Some degree of supportive local government Supportive national government | | | | | | <p>on the families owing to the length of time waiting and poor living conditions</p> <ul style="list-style-type: none"> • Every June, at the onset of the rainy season, many people chose to leave their home as a preventive measure • Houses raised above broad and strong concrete posts had already withstood several seasons of destructive mudflows and thus seemed to be one of the best protection means |
| Luna (2001) (Philippines) | Rural and urban settings Area affected by conflict to some degree Community organisation apparent Supportive local government Supportive national government Fragile ecosystem | | | | ✓ | ✓ | <p>Vulnerability:</p> <ul style="list-style-type: none"> • A community organisation was created which advocated on behalf of the community to prevent projects that polluted the environment and to provide legal assistance services to the community. |
| Mulligan and Nadarajah (2012) (Sri Lanka and India) | Rural setting Area affected by conflict to some degree Limited community organisation Some degree of supportive local government | | ✓ | ✓ | ✓ | | <p>Vulnerability (<i>Negative</i>):</p> <ul style="list-style-type: none"> • There was a lack of privacy in regard to washing and toilet facilities and a lack of security • Men were left without employment and frequently turned to alcohol, and community workers told the researchers that there were rising levels of domestic violence, rape and incest in crowded temporary shelters |

| | | | | | | | |
|---------------------------------------|--|--|---|---|---|---|--|
| | Some degree of supportive national government | | | | | | <ul style="list-style-type: none"> Resettlement area had been built in an area populated by wild elephants, and mothers were fearful, so they kept their children indoors for fear of encountering an angry elephant |
| Practical Action (2010a) (Bangladesh) | Rural setting Community organisation apparent Supportive local government Fragile ecosystem | | ✓ | ✓ | ✓ | ✓ | <p>Vulnerability:</p> <ul style="list-style-type: none"> Community volunteers conducted courtyard meetings, which were found to be an effective tool for building a culture of safety People commonly had to move from their homes and take refuge on the embankments, on hillocks, in school buildings or other buildings. 81% of respondents reported that they were prepared for future disasters because they had a disaster preparedness plan, and as a result of the training that they had received, they were able to follow the plan |

5.6.2 Discussion of the mechanism table

The mechanism was identified in 7 of the 27 studies. In all of these, at least two outcomes that specifically related to enhanced safety, security and protection were specified. The main outcomes related to reduced vulnerability, although two studies had outcomes relating to enhanced resilience. The studies incorporating this mechanism took place in only two regions – South Asia and South East Asia. Studies demonstrating this mechanism were all published after 1998. The majority (6) were published after 2000, with a significant proportion (3/6), published after January 2010.

In relation to the Sustainable Livelihoods Framework, none of the studies concentrated on all five forms of capital, with financial capital not considered at all. One study focused on four of the capitals, three studies on three capitals and three studies on two capitals. Physical capital was the most represented (n=6) followed by social capital (n=5), which suggests that both physical assets and social networks are important in enhancing community safety, security and protection, whereas financial resources are not.

5.6.3 The how, why and when of the mechanism

Understanding the context is essential to enhancing community safety, security and protection. The studies included were all undertaken in a rural area, with three also undertaken in an urban or peri-urban environment. Four studies were associated with apparent community organisation, whereas a further three took place in the presence of limited community organisation.

In only two studies were there supportive national governments, and in three, supportive local governments. There were a similar number of studies in which there was limited support from national (2) and local (3) governments.

Of the seven studies, four were conducted in an area with a fragile ecosystem, which placed more emphasis on the need to manage natural resources effectively in order to enhance community safety, security and protection. Three studies were conducted in conflict-affected areas.

Enhanced safety, security and protection are essential elements in building disaster-resilient communities. Activities that can enhance these three important elements can be undertaken before or after disaster events.

Commercial or government projects can place a lot of strain on communities and lead to increased vulnerability in community members. In some cases, disasters occurred because those who would be affected by the disaster were unable to use legal means to prevent inappropriate schemes (Luna, 2001). In response to this the community established a community organisation to advocate to prevent developments that polluted the environment and to provide legal assistance to the community (expressed empowerment linked with enhanced safety, security and protection).

In post-disaster settings, once the immediate needs of disaster victims have been cared for, it is critically important to plan and construct adequate temporary accommodation in which the survivors might live, sometimes for three to four years (Mulligan and Nadarajah, 2012). This is essential, as the provision of adequate temporary accommodation relieves the pressure to construct new settlements which allows time to ensure that settlements are well planned and constructed. Poorly planned and constructed settlements can have negative consequences for a community's safety, security and protection (discussed below).

5.6.4 Mechanism outcome

The enhanced safety, security and protection mechanism was predominantly related to outcomes associated with vulnerability. All seven studies presented outcomes that relate to increased (negative) or decreased (positive) vulnerability. This strongly suggests that there is a fundamental link between vulnerability and community safety, security and protection. Two studies also produced outcomes relating to resilience (Dekens, 2007; Doocy et al., 2006).

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

According to Doocy et al. (2006), an important reported outcome related to the reduction of displacement through CFW activities. Ninety-one percent of respondents indicated that the CFW programme helped them return to their village by providing a source of income, while improving the village, either via clean-up or reconstruction. This was important, as the outputs of the CFW programme (cleaning and reconstruction) contributed to the recovery process. An additional benefit of CFW was related to psychosocial improvements, which were an important by-product of the CFW programme. Many of the respondents reported that CFW helped them remain active while reducing feelings of trauma and stress; in addition, the CFW programme increased the amount of time spent with community members, which created a sense of unity and social cohesion that helped facilitate rebuilding.

Anticipating and planning rescue and evacuation plans are also essential tools to enhance community safety, security and protection. According to Practical Action:

The rescue and evacuation plan proved very useful to the community as it provided operational guidelines and clarified roles and responsibilities before, during and after the flood. The plan helped community members to identify activities to be undertaken to address vulnerabilities before, during and after the disaster. The community leaders were able to identify available local resources and to mobilize resources from outside the community (fishing boats, communication equipment, evacuation site and volunteers) (Practical Action, 2010a: 8).

Of the respondents, 81 percent reported that they were better prepared for future disasters because they had a disaster preparedness plan and that they were able to follow the plan as a result of the training received.

The study also highlighted the importance of both these measures linked with building sustainable resilient livelihoods: 'Practical Action DRR project in Bangladesh has demonstrated that more secure and sustainable livelihood strategies, coupled with preparedness and contingency planning has enabled communities to efficiently manage hazardous situations and recover more quickly' (Practical Action, 2010a: 9).

This study indicated that activities to build a culture of community safety were successful. This was done through mobilising community volunteers to conduct courtyard meetings to discuss any issues out in the open.

5.6.5 Inhibitors

One of the main inhibitors found in the studies related to land tenure. Unclear land title is an ongoing concern to local residents. According to Dodman et al. (2010) communities were constantly coping with seawater intrusion using landfill, but were unprepared to invest in securing their homes, as it made little sense due to the risk of relocation.

Poor conditions can lead to decreased community safety, security and protection. According to Mulligan and Nadarajah (2012), in the aftermath of the disaster, there was a lack of privacy with regard to washing and toilet facilities, which could worsen gender inequalities, and there was a general lack of security. It was also found that men who were left without employment frequently turned to alcohol, and community workers told the researchers that there were rising levels of domestic violence, rape and incest in crowded temporary shelters (Mulligan and Nadarajah, 2012).

Including communities in decision making is a central element of both CBDRM and the Livelihoods approach. An example of failure to do so follows:

[T]he population seems little involved in the choice of reconstruction. This lack of participation, which also concerns the local authorities, is due to a centralisation of the powers and decisions quite unfavourable to dialog. The government's first target seems to

be to reconstruct the infrastructures as quickly as possible without really bothering with the expectations and the needs of the affected communities. This results in decreased motivation to recreate a social organisation and to the development of a culture of dependence, on the part of the evacuees, on local voluntary associations and on various government organisations which undertake the management of the centres (Leone and Gaillard, 1999: 232).

Exclusion can lead to dependence, which is detrimental to a community's long term safety, security and protection.

5.7 Technological innovation and communication

5.7.1 Brief overview of the mechanism

Technological innovation and communication refers to the application of existing and new technologies and networks to strengthen social capital (networking and bridging), enhance preparedness, response and recovery activities and build resilience through human capital (skills and knowledge) in a community.

Table 5.7: Technological innovation and communication: context, sustainable livelihoods framework and outcomes

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|---|-----------------------------------|------------------|-----------------|----------------|---------------|---|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Bhattacharjee et al. (2010) (multiple countries) | Rural and urban settings Area affected by conflict to some degree Community organisation apparent Supportive local government Supportive national government Fragile ecosystem | | ✓ | | ✓ | ✓ | <p>Vulnerability:</p> <ul style="list-style-type: none"> Dedicated internet access and telephone lines were provided in some of the villages for providing early warning so that every community had access to information from the District Collectorate, fire stations, police stations and panchayat <i>Negative:</i> Emergency telephone numbers were available in the team's files but not stored in their personal mobile phones; equipment given to the teams for use during an emergency was not located in places that were easily accessible <p>Incomes, outputs and enhanced livelihoods and vulnerability:</p> <ul style="list-style-type: none"> In some communities, use of high-tech equipment, like GPS and mobile phones (and in some cases echo sounders) were already in use once available (well before the tsunami), as the fishermen understood the need for safety measures and the fact that the equipment reduced the time spent looking for shoals of fish |
| Dekens (2007) (Pakistan) | Rural setting Community organisation apparent | | ✓ | | ✓ | ✓ | <p>Vulnerability:</p> <ul style="list-style-type: none"> <i>Negative:</i> The early warning system relied on new, centralised technologies, and these did not reach many isolated communities |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | Supportive local government Fragile ecosystem | | | | | | <ul style="list-style-type: none"> A villager with a mobile phone was able to warn others of a flash flood and as a result, people were able to evacuate in time with no loss of life <i>Negative:</i> People became more dependent on external technologies and external experts, which might be contributing towards a reduction in their flexibility, adaptability and creativity |
| Giri and Malakar (2011) (Nepal) | Rural setting Limited community organisation Supportive local government Supportive national government Fragile ecosystem | ✓ | | | ✓ | ✓ | <p>Incomes, outputs and enhanced livelihoods:</p> <ul style="list-style-type: none"> Using mobile phones to get advice about treating crops and livestock, seed varieties, planting times and other agricultural methods led to increased incomes <p>Vulnerability:</p> <ul style="list-style-type: none"> Established a network using mobile phones between upstream and downstream communities, leading to pre-disaster warnings for downstream communities and the ability to evacuate livestock, property and family <i>Negative:</i> Validity of some of the information provided was sometimes questionable and hard for the villagers to assess due to their limited broader knowledge on issues <p>Education and awareness:</p> <ul style="list-style-type: none"> The network established using mobile phones helped by providing information and awareness |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|-------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| | | | | | | | that improved agricultural and disaster-related decision making |
| Kotowicz (2010) (Thailand) | Rural setting Community organisation apparent Some degree of supportive local government Supportive national government Fragile ecosystem | ✓ | | | ✓ | ✓ | Incomes, outputs and enhanced livelihoods: <ul style="list-style-type: none"> • Solid waste management and recycling was introduced as a business, which led to additional income for recovering families and the local economy. It also created a market for recyclables Vulnerability, education and awareness: <ul style="list-style-type: none"> • A communication (or awareness-raising) mechanism was created through the establishment of a tsunami museum in the community that reminded people of the need to stay prepared |
| Luna (2001) (Philippines) | Rural and urban settings Area affected by conflict to some degree Community organisation apparent Supportive local government Supportive national government Fragile ecosystem | ✓ | | | ✓ | | Awareness and vulnerability: <ul style="list-style-type: none"> • Media exposure made it easier to obtain funds for relief operations |

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---------------------------------------|---|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Matsimbe (2003) (Mozambique) | Rural setting Conflict-affected Community organisation apparent Some degree of supportive local government Supportive national government | | ✓ | | ✓ | | Vulnerability, education and awareness: <ul style="list-style-type: none"> The local radio station in Búzi was promoted to disseminate early warnings. This was successful as it used the local language, allowing the many illiterate people to understand what was happening and where to go Solar or wind-up radios were distributed (as villagers could not afford batteries), to allow community members to access the local radio station and disseminate early warnings |
| Oxfam (2009) (Sri Lanka and India) | Rural and urban settings Community organisation apparent | | | | ✓ | ✓ | Vulnerability, education and awareness: <ul style="list-style-type: none"> A pilot project bringing community radio to villages enabled them to create radio programmes of their own choosing. Participants embraced the project and were sending a combination of DRR and development messages over the airwaves |
| Sato (2010) (Thailand) | Rural and urban settings Some degree supportive local government Some degree of supportive national government | | ✓ | | ✓ | | Vulnerability: <ul style="list-style-type: none"> Mass media played a critical role in connecting resources (in this case land) with ethnic identities, and helped in triggering public support for vulnerable communities in the aftermath of the tsunami |

5.7.2 Discussion of the mechanism table

The mechanism was identified in 8 of the 27 studies. In all of these at least two outcomes that specifically related to technological innovation and communication were described. The main outcomes related to reduced vulnerability although five studies had outcomes relating to education and awareness, and three related to incomes, outputs and enhanced livelihoods. The studies incorporating this mechanism predominantly took place in two regions – South Asia and South East Asia, with one study in Africa (Mozambique). Studies with this mechanism were all published after 2000 with the majority (6) after 2006 and half (4/8) since January 2010.

In relation to the Sustainable Livelihoods Framework, none of the studies concentrated on all five forms of capital. Social capital was present in all studies, highlighting the importance of leveraging technological innovation and communication to enhance this. Human capital was documented in five studies, highlighting the link between using technological innovation and communication to enhance skills and knowledge. Physical capital and financial capital were explored in fewer studies.

5.7.3 The how, why and when of the mechanism

The studies assessed under this mechanism were all conducted in rural settings, with four also including urban or peri-urban areas. Six studies were associated with apparent community organisation; one took place in the presence of limited community organisation. Implementing interventions aimed at enhancing technological innovation and communication benefit from the presence of strong community organisations.

Four studies were conducted in areas with a supportive local government while three took place in contexts with more limited support. Six studies were implemented in countries with fully or only partial national government support. Of the eight studies, five were conducted in an area with a fragile ecosystem. Three studies were conducted in areas that were to some extent conflict-affected.

Technological innovation and communication can be valuable mechanisms to strengthen social capital (networking and bridging), enhance preparedness, response and recovery activities, and build resilience through human capital (skills and knowledge) in a community.

An example of technological innovation with existing technologies related to the use of mobile phones. According to Giri and Yuwan (2011), mobile phones made a critical contribution by communicating data and information in three critical areas:

- Agricultural practices: farmers were provided with the phone contacts of technical service providers, which enabled them to access advice about treating crops and livestock. They also used this service for more general advice on seed varieties, planting times and methods, with the aim of raising incomes and thus reducing vulnerabilities.
- Market prices: farmers were provided with a phone contact list of agricultural traders in nearby markets; this allowed a network to be established to swap market information.
- Disaster early warning: a phone list of key contacts was provided in both upstream and downstream communities. When there was continuous heavy rain, those in the upstream areas phoned and warned those in downstream communities, who were thus able to prepare and evacuate livestock, property and family. They also warned about landslides that might block planned transport routes. In return, those in the downstream – more populated, better connected and more commercial – areas, provide information on markets, agricultural practice and development opportunities.

In areas where existing technology, such as mobile phones, are available these can be used to enhance communication between networks. This may produce positive effects, such as reducing vulnerability to disasters and impact on livelihoods.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Community radio is a valuable method of enhancing communication. According to Oxfam (2009), approaching DRR from a community-empowerment perspective can produce programmes that are significantly more likely to be embraced by community members. The report documented a pilot programme in India where the focus of the project was on disaster response and risk reduction; it used local radio as a dissemination mechanism. It suggested that the project was successful in gaining local acceptance as the villages could initiate and produce their own radio programmes on whatever topics interested them. There was also a link between technological innovation and communication and expressed empowerment, as the project helped increase community empowerment while disseminating important information relating to disasters.

In Mozambique, a project to broadcast information on disasters to remote villages found that beneficiaries could not afford to buy batteries on an ongoing basis. Therefore the project distributed solar or wind-up radios to overcome this problem (Matsimbe, 2003). In addition to radios being used to disseminate information on disasters, they could also be used to provide information on agricultural practices and market information, potentially helping to establish more resilient livelihoods.

Integrating technological innovation and communication with simple disaster dissemination strategies is essential to ensure that all beneficiaries understand these important warnings. Matsimbe (2003) reported on a project supported by GTZ which improved early-warning systems by providing technical assistance and new scientific equipment. This equipment relied on a simple method for dissemination: flags of different colours were used to convey meaning:

- blue meant that within 24 to 48 hours the area might be affected by a cyclone;
- yellow meant that the cyclone might be affecting the region within 24 hours; and
- red meant that the area might be affected almost immediately.

Technological innovation can help improve early warning systems, although for any dissemination strategy to be successful at the community level, it must be accessible and convey information clearly.

Mass media was a potentially effective means for enhancing communication. According to Pelham et al. (2011), 'what primarily emerges from the case studies is that safety nets for disaster prevention or impact mitigation are only possible with political will. Governments respond reactively, to media attention on crisis situations but the focus needs to shift to publicise situations where disasters have been avoided' (Pelham et al., 2011: 9). As political will is an essential precursor to government intervention, mass media is an important mechanism to stimulate political will. This is shown in a study conducted by Sato (2010), where a vulnerable community was denied a right to rebuild on land they occupied prior to the tsunami. In this case, the mass media played a critical role in 'connecting resources (in this case, land) with people's ethnic identity to strike a balance in relief efforts. In situations complicated by entrenched inequalities in basic resources, engines of public opinion such as mass media often have the power to galvanise positive change, a power that local poor and disaster victims alone seldom possess' (Sato, 2010: 82).

Mass media can also play an important role in enhancing community safety, security and protection, as well as social equality in the aftermath of a disaster. It does so also through enhancing social cohesion and offers vehicle for actioned agency and expressed empowerment.

5.7.4 Mechanism outcomes

The technological innovation and communication mechanism was predominantly related (8 studies) to reducing vulnerability, although in a small number of cases vulnerability increased (n=3). Outcomes relating to education and awareness were present in five studies, and three studies had outcomes involving incomes, outputs and enhanced livelihoods.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Giri and Yuwan (2011) indicated that the use of mobile phones in establishing networks was successful in providing information and awareness that improved agricultural and disaster-related decision making. An important aspect of this was the establishment of a network with mutual benefits between upstream and downstream communities, as described earlier. According to Dekens (2007), a villager attending to his flock in an upstream area was successful in warning community members of a flash flood, and as a result, people were able to evacuate in time with no loss of life; however, crops and larger assets were destroyed.

Another successful project that harnessed pre-existing technology used the Búzi Community Radio station in Mozambique. According to Matsimbe (2003) the radio station was successful in warning flood-prone households about rising rivers in ample time, and suggested safe places for people to evacuate. This conveyed the early warnings in the local language which enabled even illiterate members of the community to understand the hazard threat in their area and to find out what to do or where to go.

Communities stay prepared when the threat of a disaster is present. However, when the threat fades, communities are less likely to do so or to invest in mitigation activities. Kotowicz (2010) described an innovative awareness raising mechanism – the creation of a tsunami museum reminded people of the need to stay prepared.

5.7.5 Inhibitors

The use of new technologies can have negative implications. According to Dekens (2007) a new early warning system which relied on new, centralised technologies was unsuccessful in reaching isolated communities. For those communities that were reached, communities became more dependent on external technologies and external experts, which contributed to reducing flexibility, adaptability and creativity. This created a situation in which traditional early warning systems might be forgotten and replaced by less functional new early warning systems. One respondent stated: ‘The traditional early warning system was perfectly fine. The herders used to pass on the message to the communities. They used to shout and it was very efficient’ and ‘the old system is gone and the new system is not working!’ (Dekens, 2007: 54).

There is a need to include both new technological innovation and communication with traditional methods to enhance disaster preparedness – a similar concept to the integrated knowledge mechanism described earlier (Section 5.1).

5.8 Multi-strategy studies and linking mechanisms

Table 5.8 presents details of the studies reporting more than one mechanism. It is apparent that many of the mechanisms described previously do not stand alone but interact dynamically with each other during CBDRM programming and implementation. The ways in which multiple mechanisms interact and impact on one another will influence the outcomes.

Twenty-six studies reported on the outcomes associated with these multiple mechanisms; whereas there were only one study in which a single mechanism operated (Islam et al., 2011). There are strong relationships between the top four most common mechanisms (Resilient Livelihoods, Actioned Agency, Expressed Empowerment and Integrated Knowledge and Experience). The strongest interaction is between Resilient Livelihoods and the other three most common mechanisms. All four mechanisms were reported in nine studies as operating in tandem with each other. In addition, there are clear interactions between individual mechanisms, especially between the predominant mechanism, Resilient Livelihoods and the other three most common mechanisms. Resilient Livelihoods was reported in 12 studies alongside Actioned Agency; 15 studies with Expressed Empowerment and 17 studies alongside Integrated Knowledge and Experience. Actioned Agency interacted with Expressed Empowerment in 9 studies and with Integrated Knowledge and

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Experience in 10 studies. Expressed Empowerment interacted with Integrated Knowledge and Experience in 13 studies.

Another important interaction is demonstrated by those studies that have multiple mechanisms but also reported some kind of linking mechanism that enhanced the operations of the other mechanisms. Nineteen studies, described in Table 5.9, highlighted these 'linking mechanisms' along with their related context, Sustainable Livelihoods Framework and reported outcomes.

Table 5.8: Studies with multiple mechanisms operating

| Study | Resilient livelihoods | Actioned agency | Expressed empowerment | Integrated knowledge & experience | Enhanced safety, security & protection | Technological innovation & communication | Gender and social equity promotion | Linking mechanisms |
|--|-----------------------|-----------------|-----------------------|-----------------------------------|--|--|------------------------------------|--------------------|
| Awotona (1997) (Peru and Bangladesh) | | | | | | | ✓ | ✓ |
| Berke and Beatley (1997) (St Kitts and Nevis, and Antigua) | | | ✓ | | | | ✓ | ✓ |
| Bhattacharjee et al. (2010) (multiple countries) | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| Care (2011) (Timor Leste) | ✓ | | | ✓ | | | | |
| Dekens (2007) (Pakistan) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Dodman et al. (2010) (Philippines) | ✓ | | ✓ | ✓ | ✓ | | | ✓ |
| Doocy et al. (2006) (Indonesia) | ✓ | | ✓ | ✓ | ✓ | | | ✓ |
| Giri and Malakar (2011) (Nepal) | ✓ | ✓ | | | | ✓ | | ✓ |
| Islam et al. (2011) (Bangladesh) | | | | ✓ | | | | |
| Kotowicz (2010) (Thailand) | ✓ | ✓ | ✓ | ✓ | | ✓ | | |

5. Realist review: evidence synthesis

| Study | Resilient livelihoods | Actioned agency | Expressed empowerment | Integrated knowledge & experience | Enhanced safety, security & protection | Technological innovation & communication | Gender and social equity promotion | Linking mechanisms |
|---|-----------------------|-----------------|-----------------------|-----------------------------------|--|--|------------------------------------|--------------------|
| Leone and Gaillard (1999) (Philippines) | ✓ | | ✓ | | ✓ | | | ✓ |
| Luna (2001) (Philippines) | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ |
| Matsimbe (2003) (Mozambique) | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Mulligan and Nadarajah (2012) (Sri Lanka and India) | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| Oxfam (2009) (Sri Lanka and India) | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Pelham et al. (2011) (multiple countries) | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| Practical Action (2010a) (Bangladesh) | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| Rempel (2010) (India) | ✓ | | ✓ | | | | ✓ | ✓ |
| Rossing et al. (2010) (multiple countries) | ✓ | | ✓ | ✓ | | | ✓ | ✓ |
| Sato (2010) (Thailand) | | | | | | ✓ | ✓ | |
| Schutte and Kreutzmann (2011) (Pakistan) | ✓ | | | | | | ✓ | |
| Selvaraju et al. (2006) (Bangladesh) | ✓ | | | ✓ | | | ✓ | ✓ |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

5. Realist review: evidence synthesis

| Study | Resilient livelihoods | Actioned agency | Expressed empowerment | Integrated knowledge & experience | Enhanced safety, security & protection | Technological innovation & communication | Gender and social equity promotion | Linking mechanisms |
|-----------------------------------|-----------------------|-----------------|-----------------------|-----------------------------------|--|--|------------------------------------|--------------------|
| Thorburn (2009) (Indonesia) | ✓ | | ✓ | ✓ | | | | |
| Tougiani et al. (2009) (Niger) | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| USAID (2011) (Bangladesh) | ✓ | ✓ | | | | | | ✓ |
| Younus (2010) (Bangladesh) | ✓ | | | ✓ | | | | |
| Zaidi et al. (2010) (Pakistan) | ✓ | | | | | | ✓ | |

5.8.1 Brief overview of the linking mechanisms

Table 5.9 describes those studies reporting 'linking mechanisms', which we define as those that 'link up' different mechanisms, activating and triggering them and 'link in' community-based organisations with other stakeholders, including different levels of government; these all enhance community coping capacity, resilience and sustainable development. Linking in and linking up may operate independently or together; the associated outcomes will be most positive when reinforcing one another.

Table 5.9: Linking mechanisms: context, sustainable livelihoods framework and outcomes

| Study | Context | Sustainable Livelihoods Framework | | | | | Represented outcomes of relevance |
|---|--|-----------------------------------|------------------|-----------------|----------------|---------------|--|
| | | Financial capital | Physical capital | Natural capital | Social capital | Human capital | |
| Awotona (1997) (Peru and Bangladesh) | Urban setting Limited community organisation Supportive local government Supportive national government | | | | ✓ | | Risk: <ul style="list-style-type: none"> A <i>negative</i> outcome was lack of contact and linkages between the local community, local municipalities, national government and NGOs that hindered sustainable risk reduction |
| Berke and Beatley (1997) (St Kitts and Nevis, and Antigua) | Rural and urban settings Limited community organisation Supportive local government Supportive national government | | ✓ | | ✓ | | Resilience: <ul style="list-style-type: none"> Government, communities and NGOs networks post-disaster ensured that aid was effectively distributed, and the delivery of appropriate housing; this stimulated positive political atmosphere and sense of mutual trust |
| Bhattacharjee et al. (2010) (India, Indonesia and Sri Lanka) | Rural and urban settings Area affected by conflict to some degree Community organisation apparent Supportive local government Supportive national government | ✓ | | | ✓ | ✓ | Community capacity: <ul style="list-style-type: none"> Community-level preparedness mechanisms were strengthened establishing linkages with local public disaster management committees Self-help groups were formed at village and district levels and established revolving funds allowing access to credit for times of crisis |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

5. Realist review: evidence synthesis

| | | | | | | | |
|---------------------------------------|---|---|---|---|---|--|--|
| | Fragile ecosystem | | | | | | <ul style="list-style-type: none"> • Self-help groups were linked with other village committees that facilitated community ownership • DEC members supported local networks that provided vocational skills to ex-combatants and developed a conflict-related early warning mechanism |
| Dekens (2007) (Pakistan) | Rural setting Community organisation apparent Supportive local government Fragile ecosystem | | | | ✓ | | <p>Resilience:</p> <ul style="list-style-type: none"> • Communities had very strong bonding social capital that enabled them to support other community members before, during and after disasters <p>Psychosocial health:</p> <ul style="list-style-type: none"> • Bonding social capital in the form of relatives and neighbours provided social and psychological insurance before, during and after floods, which helped reduce a sense of helplessness |
| Dodman et al. (2010) (Philippines) | Rural and urban settings Community organisation apparent Some degree of supportive local government Some degree of supportive national government Fragile ecosystem | ✓ | ✓ | ✓ | ✓ | | <p>Community and organisational capacity:</p> <ul style="list-style-type: none"> • Villagers used their savings to provide food for disaster-affected families • Savings groups enabled further mobilisation of funds for construction of transitional housing • Collective action and advocacy by displaced communities led to negotiated settlements with municipal and state officials for reduced utility costs, support for infrastructure investment and negotiations over land ownership |

5. Realist review: evidence synthesis

| | | | | | | | |
|--|---|---|---|--|---|---|--|
| | | | | | | | <ul style="list-style-type: none"> • In Bicol, savings groups helped address the consequences of disaster and gave survivors the agency to define and realise preferred development responses • Community-to-community exchanges of ideas and experiences strengthened and catalysed disaster federations |
| Doocy et al. (2006) (Indonesia) | Rural and urban settings Conflict-affected Limited community organisation | ✓ | ✓ | | ✓ | ✓ | <p>Organisational capacity:</p> <ul style="list-style-type: none"> • Technical expertise and equipment facilitated the implementation of Mercy Corps' CFW programme in Aceh <p>Community capacity:</p> <ul style="list-style-type: none"> • Households were able to cope better with tsunami recovery processes because of CFW programmes, which empowered their decisions regarding the expenditure and investment of the money |
| Giri and Malakar (2011) (Nepal) | Rural setting Limited community organisation Supportive local government Fragile ecosystem | ✓ | ✓ | | ✓ | | <p>Community capacity:</p> <ul style="list-style-type: none"> • Community EWS and networks effectively warned downstream communities about landslides, floods • Downstream communities provided information on markets, agricultural practices and development opportunities |
| Leone and Gaillard (1999) (Philippines) | Rural setting Supportive local government | | | | ✓ | ✓ | <p>Vulnerability:</p> <ul style="list-style-type: none"> • Disaster Coordination Councils (local authorities) effectively disseminated evacuation orders to |

5. Realist review: evidence synthesis

| | | | | | | | |
|---------------------------------|--|--|---|--|---|---|---|
| | Supportive national government | | | | | | <p>affected populations, building on previous work in disaster education</p> <ul style="list-style-type: none"> The most effective method of disseminating warnings was found to be to focus at the local level using the Coordination Councils, even though there were some challenges related to the slowness of passing information via word of mouth |
| Luna (2001) (Philippines) | <p>Rural and urban settings</p> <p>Area affected by conflict to some degree</p> <p>Community organisation apparent</p> <p>Supportive local government</p> <p>Supportive national government</p> <p>Fragile ecosystem</p> | | ✓ | | ✓ | ✓ | <p>Community and organisational capacity:</p> <ul style="list-style-type: none"> Volunteers created a province-wide NGO before the eruption of Mount Pinatubo and obtained funding from an INGO to implement mitigation and preparedness programmes Working as volunteers, NGO members provided assistance to victims of Mt Pinatubo Collaboration between local NGOs and INGOs is increasing because of the recognition that local NGOs have a significant role to play in disaster risk management |
| Matsimbe (2003) (Mozambique) | <p>Rural setting</p> <p>Conflict-affected</p> <p>Community organisation apparent</p> <p>Some degree of supportive local government</p> <p>Supportive national government</p> | | ✓ | | ✓ | ✓ | <p>Organisational and community capacity:</p> <ul style="list-style-type: none"> Case studies demonstrated the importance of informal social networks, local institutions, local authorities (traditional and administrative) and locally-based organisations (e.g. churches) in response, recovery and disaster mitigation Informal social networks played a significant role in the 2000 floods with search and rescue being provided by community members before local authorities or external agencies could mobilise |

5. Realist review: evidence synthesis

| | | | | | | | |
|--|---|---|--|--|---|---|---|
| | | | | | | | <p>Resilience:</p> <ul style="list-style-type: none"> • Linking the Mozambican government with external international agencies facilitated better co-ordination, less haphazard assessments and better distribution of disaster relief • The establishment of permanent disaster committees at each level of government (including natural hazard specialists) facilitated understanding and the design of mechanisms between government and communities, especially related to early warning |
| Mulligan and Nadarajah (2012) (Sri Lanka and India) | <p>Rural setting</p> <p>Area affected by conflict to some degree</p> <p>Limited community organisation</p> <p>Some degree of supportive local government</p> <p>Some degree of supportive national government</p> | ✓ | | | ✓ | ✓ | <p>Livelihoods:</p> <ul style="list-style-type: none"> • Self-help groups established by NGOs when tsunami survivors lived in a large temporary settlement called Tsunami Nagar enabled families to maintain income-generating activities • Self-help groups also helped with microcredit and put women in touch with organisations and networks that led to more sustainable enterprises <p>Organisational and community capacity:</p> <ul style="list-style-type: none"> • Partnerships need to be built at all levels and for aid agencies to find local people with skills or aptitudes for community development work |
| Oxfam (2009) (Sri Lanka and India) | <p>Rural and urban settings</p> <p>Community organisation apparent</p> | | | | ✓ | ✓ | <p>Organisational and community capacity:</p> <ul style="list-style-type: none"> • Research in India showed that the relationship between communities, humanitarian actors and |

| | | | | | | | |
|-------------------------------|--|--|--|--|---|--|---|
| | | | | | | | <p>the networks around them were crucial to successful disaster risk reduction</p> <ul style="list-style-type: none"> • The NGO Coordination and Resource Centre disseminated information on programmes and services for communities • The NGO Coordination and Resource Centre also helped communities voice concerns and needs to service providers • The centres were originally part of the tsunami response, but took on a disaster risk reduction role so that vulnerable communities could proactively engage with governmental and non-governmental service providers • Improved interagency alignment and co-ordination minimised disruptions to community life <p>Vulnerability:</p> <ul style="list-style-type: none"> • A <i>negative</i> outcome was that communities that were unaware of services available through the government and NGOs were at a disadvantage during disasters |
| Pelham et al. (2011) (Mexico) | <p>Rural and urban settings</p> <p>Area affected by conflict to some degree</p> <p>Community organisation apparent</p> <p>Some degree of supportive local government</p> | | | | ✓ | | <p>Resilience:</p> <ul style="list-style-type: none"> • Co-ordination between government agencies and ministerial departments led to enhanced disaster programming |

| | | | | | | | |
|--|---|---|---|--|---|--|---|
| | Supportive national government Fragile ecosystem | | | | | | |
| Practical Action (2010a) (Bangladesh) | Rural setting Community organisation apparent Supportive local government Fragile ecosystem | | ✓ | | ✓ | | Community and organisational capacity: <ul style="list-style-type: none"> • Linkages between communities and local service providers and external humanitarian agencies pre-disaster influenced the speed of emergency aid delivery and reduced suffering • Linkages between CBOs, NGOs and Union and Upazila Parishads (Union and Sub-district Councils) facilitated an effective and co-ordinated recovery • Community preparedness and contingency plans need linkages with appropriate humanitarian agencies to which they can appeal for assistance if required |
| Rempel (2010) (India) | Rural and urban settings Conflict-affected Community organisation apparent Supportive local government Supportive national government | | | | ✓ | | Organisational capacity: <ul style="list-style-type: none"> • Co-ordination between all agencies was important to avoid creating duplication and disparities among project activities, as well as improving advocacy on behalf of affected populations |
| Rossing et al. (2010) (Mexico, Brazil, Venezuela, | Rural setting Area affected by conflict to some degree | ✓ | ✓ | | ✓ | | Vulnerability: <p><i>Negative</i> outcomes occurred if:</p> <ul style="list-style-type: none"> • Individual households did not have bridging or linking social capital support in the form of credit |

5. Realist review: evidence synthesis

| | | | | | | | |
|---|---|--|--|----------|----------|--|--|
| <p>Nicaragua, Belize)</p> | <p>Community organisation apparent</p> <p>Supportive local government</p> <p>Some degree of supportive national government</p> <p>Fragile ecosystem</p> | | | | | | <p>or insurance from banks or government; they faced increasing poverty, and were forced to take out high-interest loans, sell assets, or engage in low-risk, low-yield farming</p> <ul style="list-style-type: none"> • Bonding social capital was insufficient to meet needs in large-scale disasters where distant, cross-cutting connections to other communities and state agencies were needed • There was insufficient bridging and linking social capital; this resulted in insufficient credit and insurance and increased vulnerability through erosion of the existing asset base <p>Resilience:</p> <ul style="list-style-type: none"> • Chiapas community members relied on bonding capital (relatives) as safety nets during and after disasters • Vulnerable groups increased resilience if they used linking social capital to make claims for access to basic services, e.g. sanitation, water supply • Strengthening linking social capital, such as formal collaboration and interaction with government officials, allowed for clear identification and distribution of roles and responsibilities and transparent administration |
| <p>Selvaraju et al. (2006) (Bangladesh)</p> | <p>Rural setting</p> <p>Community organisation apparent</p> | | | <p>✓</p> | <p>✓</p> | | <p>Resilience:</p> <ul style="list-style-type: none"> • For medium- to long-term sustainability, linkages between climate change adaptation and |

5. Realist review: evidence synthesis

| | | | | | | | |
|-----------------------------------|---|---|--|--|---|--|--|
| | Supportive local government Supportive national government Fragile ecosystem | | | | | | development need to be ensured and an enabling institutional environment established Livelihoods and resilience: <ul style="list-style-type: none"> • Prerequisite for long-term livelihood adaptation is co-ordination of agency planning, communication and field operations, as well as the activities of government agencies, NGOs and farmers • Businessmen, large landholders and service holders received more government support than farmers due to better access via social and professional networks • Climate change adaptive strategies (rainwater harvesting, drought-tolerant crops) must be linked to mainstream development activities and institutional programming to succeed |
| Tougiani et al. (2009) (Niger) | Rural setting Conflict-affected Community organisation apparent Supportive local government Fragile ecosystem | | | | ✓ | | Resilience, community and organisational capital: <ul style="list-style-type: none"> • Increased links between local and national levels and building social capital were crucial to programme impact • Programmes need to be built with the community at the centre of decision making, the women and herders included in consultations, and villages linked via village committees to strengthen programming |
| USAID (2011) (Bangladesh) | Rural setting Community organisation apparent | ✓ | | | ✓ | | Organisational and community capacity: <ul style="list-style-type: none"> • Disaster management committees (DMC) increased community participation and acted as |

| | | | | | | | |
|--|-----------------------------|--|--|--|--|--|---|
| | Supportive local government | | | | | | <p>reliable links between community and project staff</p> <ul style="list-style-type: none"> • Male and female project beneficiaries raised issues and reported that their voice was heard; DMCs were supportive and facilitated access to CFW |
|--|-----------------------------|--|--|--|--|--|---|

5.8.2 Discussion of the mechanism table

Nineteen studies reported on linking mechanisms and the associated outcomes. The studies illustrating this mechanism covered 17 countries in total. Three studies from Central and Latin America examined CBDRM and covered seven countries (Mexico, Brazil, Venezuela, Nicaragua, Belize, St Kitts and Nevis, Antigua). In addition four South Asian countries (Bangladesh, India, Sri Lanka, Pakistan) revealed such mechanisms, along with six studies looking at three South East Asian countries (Indonesia, Philippines, Nepal), and two in Africa (Niger, Mozambique). Six of the studies investigated and compared community-based risk management and socio-economic programme elements in more than one country (Awotona, 1997; Berke and Beatley, 1997; Bhattacharjee et al., 2010; Mulligan and Nadarajah, 2012; Oxfam, 2009; Rossing et al., 2010).

The studies demonstrating linking mechanisms were almost all published after 2000, with the exception of three studies published in the late 1990s (Awotona, 1997; Berke and Beatley, 1997; Leone and Gaillard, 1999). All of the studies referred to the importance of social networks and linkages or 'social capital', and the recent nature of this set of studies reflects in part the exponential growth in usage of this term since 2000 (Google Books Ngram Viewer, 2012).

5.8.3 The how, why and when of the mechanism

Eighteen of the studies reporting a linking mechanism and associated outcomes investigated rural settings. Of these, 10 studies investigated rural settings only (Dekens, 2007; Giri and Malakar, 2011; Leone and Gaillard, 1999; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Practical Action, 2010a; Rossing et al., 2010; Selvaraju et al., 2006; Tougiani et al., 2009; USAID, 2011) with another eight covering both urban and rural (Berke and Beatley, 1997; Bhattacharjee et al., 2010; Dodman et al., 2010; Doocy et al., 2006; Luna, 2001; Oxfam, 2009; Pelham et al., 2011; Rempel, 2010). One study researched an urban setting only (Awotona, 1997).

Ten studies investigated disaster risk management for communities inhabiting fragile ecosystems to cope with extreme weather events (Bhattacharjee et al., 2010; Dekens, 2007; Dodman et al., 2010; Giri and Malakar, 2011; Luna, 2001; Pelham et al., 2011; Practical Action, 2010a; Rossing et al., 2010; Selvaraju et al., 2006; Tougiani et al., 2009). In response to often precarious living conditions that were further threatened by extreme weather events, communities reportedly relied predominantly on relatives, neighbours and nearby communities to prepare, cope and adapt. The real need identified was the development of stronger linkages with formal institutions such as government, NGOs and other external service providers.

Nine studies reported on communities living in conflict-affected areas (Bhattacharjee et al., 2010; Doocy et al., 2006; Luna, 2001; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Pelham et al., 2011; Rempel, 2010; Rossing et al., 2010; Tougiani et al., 2009). Although conflict affected some of the programmes reported here, only one of these studies indicated a strong influence of conflict in relation to the workings of this mechanism. Bhattacharjee et al. (2010: 52) reported that 'the reintegration of ex-combatants has been a key issue in maintaining peace in Aceh. DEC members have supported local networks that have provided vocational skills to ex-combatants and developed a conflict-related early warning mechanism'.

Most significantly in terms of the workings of this particular mechanism, this set of studies focused on contextual factors related to community organisation (18 studies) and supportive local government (17 studies). Only one study did not investigate community organisation (Leone and Gaillard 1999) and only two did not investigate local government (Doocy et al. 2006; Oxfam 2009). Supportive national authorities were reported to a lesser extent, in 12 studies, always in combination with some degree of supportive local government (Awotona, 1997; Berke and Beatley, 1997; Bhattacharjee et al., 2010; Dodman et al., 2010; Leone and Gaillard, 1997; Luna, 2001; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Pelham et al., 2011; Rempel 2010; Rossing, et al. 2010; Selvaraju et al., 2006).

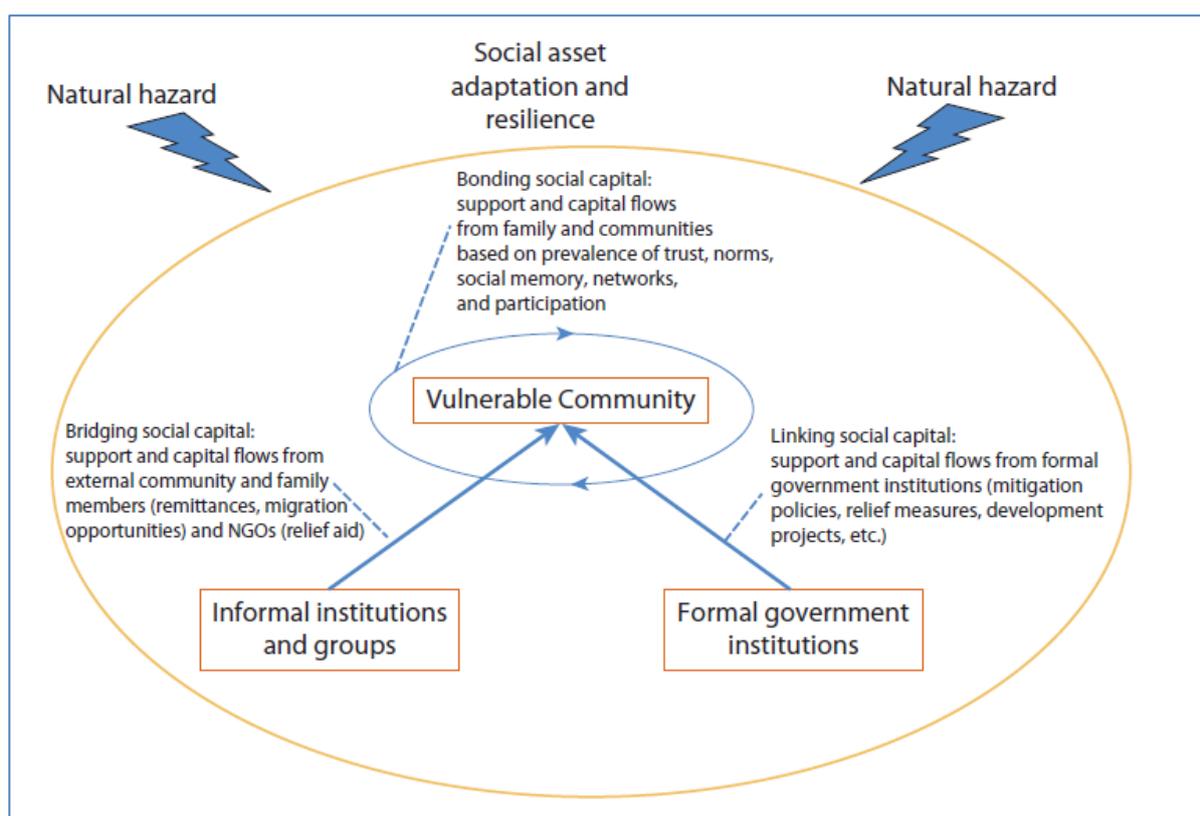
Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Sustainable Livelihoods Framework

This mechanism relates strongly to the Sustainable Livelihoods Framework (SLF) and its different categories of capital. Social capital was found to be operating in all 19 studies, and was clearly the most important form of capital, which effectively operated as a linking mechanism. However, physical and financial forms of capital were also well represented. There were eight studies with some form of physical capital present (Berke and Beatley, 1997; Giri and Malakar, 2011; Dodman et al., 2010; Doocy et al., 2006; Luna, 2001; Matsimbe, 2003; Practical Action, 2010a; Rossing et al., 2010) and seven studies with some form of financial capital present (Giri and Malakar, 2011; Bhattacharjee et al., 2010; Dodman et al., 2010; Doocy et al., 2006; Mulligan and Nadarajah, 2012; Rossing et al., 2010; USAID, 2011). Another six studies reported on human capital (Bhattacharjee et al., 2010; Doocy et al., 2006; Leone and Gaillard, 1999; Luna, 2001; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Oxfam, 2009) and two studies on natural capital (Dodman et al., 2010; Selvaraju et al., 2006). Nevertheless, even though these other kinds of capital were present, the main focus of all the studies was on how strong social capital led to positive outcomes for communities and weak social capital resulted in less than ideal outcomes. In essence, social capital was essential to the successful functioning of all the other kinds of capital reported in the studies.

The literature also highlights the workings of the three different forms of social capital: bonding, bridging and linking. Citing Woolcock (2000), Rossing et al. (2010: 270) defined bonding social capital as ‘ties among people who tend to be closely connected, such as immediate family members, neighbours, close friends, and business associates’. Bridging social capital, on the other hand, refers to ‘ties among people from different ethnic, geographical, and occupational backgrounds who have similar economic status and political influence’ (Rossing et al. 2010: 270). A good example is the link between poor rural communities living in proximity to each other that have similar access (or lack thereof) to the political process. Bonding social capital relies on ‘kinship, loyalty and friendship’, whereas bridging social capital relies on ‘trust and reciprocity’ (Rossing et al. 2010: 270). Linking social capital refers to ‘the ties between the community and people in positions of influence in formal organisations, such as schools, agricultural extension offices, the police, or local or national government entities’ (Rossing et al. 2010: 270). Rossing et al. argue that ‘poor people tend to have strong bonding social capital and some level of bridging social capital, but generally little linking social capital with formal organisations – often to the detriment of their economic development’ (Rossing et al. 2010: 271). The studies in which linking mechanisms are apparent reflect a degree of ‘linking social capital’ – perhaps a key point through which actioned agency, expressed empowerment and socio-economic livelihood and resilience support will be able to be promoted.

The ways in which the different kinds of social capital interact with natural hazards are illustrated in Figure 5.1. This diagram from Rossing et al. (2010) illustrates the ways in which bridging and linking social capital enable the functioning of community, local and national institutions and networks. In the presence of natural hazards, it is the interaction within and between the community (bonding social capital), informal institutions and groups (bridging social capital) and formal government agencies (linking social capital) that determines whether communities have sufficient adaptive capacity to effectively cope with extreme events and shocks.

Figure 5.1: Three types of social capital for communities faced with natural disaster

(Source: Rossing et al., 2010: 271)

5.8.4 Mechanism outcomes

Factors related to community and organisational coping capacity were strongly linked in eight studies (Dodman et al., 2010; Luna, 2001; Matsimbe, 2003; Mulligan and Nadarajah, 2012; Oxfam, 2009; Practical Action, 2010a; Tougiani et al., 2009; USAID, 2011). Another two studies reporting both outcomes together: Giri and Malakar (2011) stated that effective community early warning systems and networks were used to warn of landslides and floods in Nepal and hence increase local coping capacity; and in discussing organisational capacity, Rempel (2010) argued that agencies in India providing humanitarian aid to tsunami-affected communities needed to co-ordinate better in order to avoid duplicating activities and creating inconsistencies in the form and type of aid made available. Seven of the studies highlighted the fact that an increase in capacity for communities and community groups led to enhanced coping capacities. In Bangladesh, for example, USAID (2011) found that enhanced disaster committees led to improved access for communities to services, such as cash for work schemes and an improvement in their ability to address the consequences of disaster. In Niger, Tougiani et al. (2009) found that linking communities through village committees led to improved programme outcomes and community coping capacity. In Bangladesh, Practical Action (2010) reported that the speed of humanitarian aid delivery was influenced by the strength and types of links established between communities and local service providers and external humanitarian agencies.

Increased resilience to disasters was reported as an outcome in seven of the studies (Berke and Beatley, 1997; Dekens, 2007; Matsimbe, 2003; Pelham et al., 2011; Rossing et al., 2010; Selvaraju et al., 2006; Tougiani et al., 2009). In terms of discussing increased resilience to disasters linking mechanisms were strongly associated with improvements in institutional capacity, humanitarian co-ordination, enabling institutional environments and the development of positive political environments and mutual trust. These changes led to long-term, profound changes in organisations, *Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?*

government agencies and communities that enabled them to develop improved adaptive and coping strategies.

Two studies reported on outcomes related to reduced vulnerability to disasters (Leone and Gaillard, 1999; Oxfam, 2009). Leone and Gaillard (1999) highlighted the importance of disseminating early warnings at the local level of government because these officials had built solid relationships with communities, were closest to those at risk, and could most easily access them. Even though some local disaster committees relied on word of mouth to disseminate warnings, it was still more effective than if these came from higher up in the hierarchy. Oxfam (2009) argued that communities in Sri Lanka and India that were unaware of disaster assistance and welfare support services available through government and NGOs were at a large disadvantage during and after disasters. One study warned against the factors that might potentially inhibit vulnerability reduction (Rossing et al. 2009 – see the discussion of inhibitors below).

Two studies reported an increase in income and enhanced livelihoods due to linking mechanisms. Mulligan and Nadarajah (2012) reported that in tsunami-affected Indian and Sri Lankan villages, any community that was not aware of the services available and the required processes and networks for accessing these services was at a significant disadvantage. In these instances, the research showed that it was essential that NGOs take on a bridging role, linking communities with service providers to ensure that they receive necessary aid as well as being able to voice their needs and concerns. The study by Selvaraju et al. (2006) emphasised the need for an ‘enabling institutional environment’ that could facilitate the development of long-term livelihood adaptation and sustainable programming. This would include the co-ordination of relief agencies, government and NGO programming, communication and operations, as well as linking up with affected farming communities. Businessmen and service providers demonstrated a higher degree of social capital by being able to access more support from government. These two groups had strong links with local and sub-district government representatives, which they used to their advantage.

A rarely reported outcome was a reduction in the incidence of psychosocial distress and mental health presentations. One study indicated that the benefits of having strong linkages with family and neighbours helped to build psychological wellbeing and reduce the trauma faced by communities after disasters (Dekens, 2007). This sense of security and insurance against the worst consequences of disasters was illustrated by simple things such as the way some women returned to their parents’ home during the flood season to both provide and accept support from close kin.

Communities in general were found to have helped each other in a variety of ways: warning of impending floods, supporting displaced villagers and helping to store or move essential belongings. An older woman from Chenar village said, ‘The villagers from higher up used to warn us and we used to spend nights outside in this other village. The people of this village used to help us to save our belongings. They help us a lot!’ (Dekens, 2007: 40).

5.8.5 Inhibitors

The only inhibitor to the functioning of this mechanism is when the linking mechanisms are missing or very weak. As explained in the previous section, Rossing et al. (2010) argued that the main constraint arose out of a lack of bridging or linking social capitals for poor, marginalised and vulnerable communities. Linking and bridging capitals enable communities to cope with the consequences of large-scale disasters that potentially destroy communities to the degree that bonding social capital cannot be relied on. Many poor and vulnerable communities have insufficient bridging and linking capitals to facilitate access to higher levels of the government hierarchy, service providers and humanitarian relief agencies. This results in some communities being left behind, forced to engage in more precarious livelihoods, as well as increasing levels of poverty and vulnerability.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

6 Discussion

This chapter presents insights derived from the review, considers its strengths and limitations and describes implications for policy, research and practice. It highlights issues emerging from the study and relates them to current knowledge and literature.

6.1 Value of the review: key observations

The following section discusses the results and findings of the review in relation to the question:

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

We analyse the contextual factors shown to impact on mechanisms and outcomes and explore the ways in which particular mechanisms lead to specific outcomes. We draw on literature identified at earlier stages of the review, plus other relevant materials.

6.1.1 General points, including methods and approach

Here we examine emerging issues in relation to each of the key underlying mechanisms associated with generating the outcomes of interest. We address each in turn while drawing attention to cross-cutting and linking mechanisms. Additional references are cited to underpin explanations for how mechanisms operate.

The underlying mechanisms explored during the review were broadly consistent with those identified by Practical Action in their V2R 'From Vulnerability to Resilience' framework. This emphasised livelihood diversity as a key component to building resilience and comprised five interrelated factors:

1. strengthening community organisation and voice;
2. supporting access to and sustainable management of productive assets;
3. promoting access to skills and technologies;
4. improving access to markets and employment; and
5. ensuring secure living conditions (Practical Action, 2010b).

We highlight four particularly important mechanisms that resulted in important outcomes and discuss these in turn; we then go on to discuss other significant mechanisms, and linking mechanisms.

'Integrated knowledges' – builds on community knowledge and experience

This important mechanism facilitates the interface between scientific, technical and local insights and experience. It was strongly associated with the existence of robust local institutions and government structures.

Local environmental knowledge and adaptive capacity

Some communities have developed strong repositories of local environmental knowledge and have large repertoires of adaptive and coping strategies. Local and traditional knowledge and experience of the natural world will have developed over time as part of a community's set of autonomous adaptive strategies. Such knowledge is very effective in dealing with recurring hazards, such as the seasonal annual monsoon flooding in South Asia. However, local knowledge may not be enough, especially where enhanced forecasting or anticipation of extreme events are unlikely without access to sophisticated technologies and information. Large-scale catastrophes such as the 2004 Asian tsunami are anomalous, high-impact and rare events; they may not be 'registered' in local knowledge forms.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

In effect, local adaptive capacity and knowledge can be overwhelmed by the sheer scale and severity of the consequences resulting from extreme weather events. Integrated knowledges and adaptive strategies are apparent in countries with fragile ecosystems such as Niger (Tougiani et al., 2009) and Bangladesh (Practical Action, 2010a; Selvaraju et al., 2006; Younus, 2010) that are potentially affected by climate change and extreme meteorological events.

Niger is an excellent example, where ‘barren plains, infertile soils, drought, dust storms, severe fodder shortages, and agricultural pest outbreaks were normal occurrences in Niger’s rural regions’ (Tougiani et al. 2009: 277). However, the use of local environmental knowledge and practices combined with external agricultural scientific expertise enabled five million hectares of land to be utilised for agroforestry and halted the desertification of the region, enhancing food security and community resilience (Tougiani et al. 2009). It is for this reason that we use the term ‘knowledges’ – both systems and sets of knowledge are valuable and add to one another.

SOCIAL AND HUMAN CAPITAL

‘Integrated knowledges’ was strongly associated with social and human capital. These operated in tandem with human capital formation in disaster risk management, being used to supplement, build on and support social capital formation linked with traditional and local forms of knowledge and experience. Social capital describes the existence of networks, the presence of trust, and forms of mutually beneficial collective action (Rossing et al., 2010: 270). Sustaining and supporting existing local knowledge and experience is an important contributor to strengthening social networks and promoting collective trust. It also reflects the presence of such strengths within existing communities and broader social structures. Effective local institutions and organisations are better able to retain and articulate local knowledge and experience and contribute this to the development of appropriate responses in particular settings.

Communities respond to regular flash floods in the mountainous regions of Pakistan by utilising embedded forms of local knowledge and adaptive practices integrated with strong social capital. Years of experience allow communities to identify and interpret environmental signals, which are transmitted via strong local networks in the form of traditional early warning systems that use mirrors, fire or drums to warn other communities of potential danger (Dekens 2007: 3).

Human capital operates parallel to social capital, as local, indigenous and traditional knowledge may be located in individual community members, who act as knowledge bearers for extant local understandings of the environment and the cycles and processes of meteorological phenomena. Local religious, community and government leadership, along with community elders and other key social actors, hence often play an integral part in community adaptation and capacity. The introduction of technological innovations without recognising local capacities can undermine existing local knowledge and functional adaptive strategies, even exacerbating socio-economic divisions as poorer, more remote populations are typically disadvantaged.

ROBUST POSITIVE OUTCOMES

When external agencies and government actors acknowledge and use local knowledge, this mechanism was associated with a robust set of positive outcomes. The most important of these was an increase in education, awareness and community resilience. This mechanism was also linked to increased incomes, enhanced livelihoods and increased capacity of communities, community members, and their organisations. Integrated local knowledge and experience led to decreased vulnerability (Dekens, 2007; Matsimbe, 2003) and decreased incidence of psychosocial distress when local customary practices and rituals helped reduce the trauma resulting from disasters in south Asia (Mulligan and Nadarajah, 2012). When local cultural practices such as collective living spaces and structures that have developed over time in response to local environmental conditions are taken

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

into account, this assists in addressing not only the physical needs of communities but also elements of the trauma, anxiety and isolation often experienced (Mulligan and Nadarajah 2012).

How external forces interact and draw on embedded local knowledge influences whether or not this is successful. Local and traditional knowledge can either be validated or marginalised by external programmes. Where local knowledge and experience was ignored, programmes encountered negative outcomes due to a lack of community ownership and the imposition of external approaches. The most successful strategies reported involved integrating local practices and traditional knowledge of natural processes with technical and scientific knowledge such as meteorological or seismic prediction. This broadened community adaptive strategies and strengthened their ability to prepare, mitigate, respond and recover from natural disasters.

Factors inhibiting this mechanism included a lack of community ownership and empowerment, at times reflecting the imposition of often inappropriate, externally driven, technical 'fixes'. The value and strength of local and traditional knowledge in reducing or minimising disaster risk compared favourably with those instances where outside agencies intervened in villages, ignoring local wisdom. Other studies highlighted the external forces in disaster programming that can act against the empowerment of communities through lack of appreciation of their ideas, perspectives and experiences.

Expressed empowerment and actioned agency

'Expressed empowerment' and 'actioned agency' – terms developed by the research team, highlight the resilience of local people and community-based organisations in transforming relationships. Actioned agency demonstrates the ability of local communities to shape their surroundings by mobilising social and other forms of capital to do so – this enables them to make and exercise choice rather than be forced to act in a certain way by external environmental and organisational factors. We use the term 'actioned agency' to highlight the fact that not only are choices potentially available, but decisions are made about what and how to act. This may be in relation to reducing vulnerability, enhancing resilience or building capacities which increase options.

'Expressed empowerment' reflects the ability of community-based structures to shape not just choice, but how influence and power are wielded. It builds on and relates to actioned agency, but reflects enhanced ability to organise and mobilise community-based resources to negotiate or transform the political, organisational, social or economic environment through the use of power and influence, and in so doing, contributes to reducing vulnerability and the adverse impact of disasters.

These mechanisms enhance community capacity to not only identify needed interventions, but to effectively advocate for them, and to mobilise resources that will support their abilities to reduce risk and vulnerabilities, bolster resilience and capacity, and promote and enhance their social and economic development. Expressed empowerment demonstrates how communities are able to take charge and build community wellbeing in anticipation, and in the aftermath of, crises and disasters.

Empowered communities can contribute to, and lead, local development processes. This may draw on knowledge of their own community to inform decisions about how best to access support and resources to bolster their assets and improve livelihoods (Rossing et al., 2010: 294). In addition, when communities were empowered and took ownership of DRR interventions this not only strengthened the programme, it also actively generated and supported the long-term sustainability and resilience of community adaptation strategies. It did so by activating the agency of the villagers involved, who gained confidence in their ability to shape their environment and relationships.

Where local groups, for example, are able to agree on norms and procedures through which to manage collective funds, this builds relationships of trust and forms the basis for other forms of collective action in response to a variety of challenges. This enhances their ability to be self-sufficient, shape their environment, make choices and initiate change – 'actioned agency' – but may

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

be followed through by exercising their collective power to reshape relationships and ideas, and to mobilise resources – a manifestation of ‘expressed empowerment’. Another example relates to the involvement of communities in the management of aid receipts, which not only builds and expresses their agency and involvement in shaping what happens around them, but also leads to more successful project outcomes through their exercise or expression of influence at a local level (Thorburn, 2009).

A good example of the interface between ‘expressed empowerment’ and ‘actioned agency’ is demonstrated in those studies that reported on gender and social equity promotion. The empowerment of women’s groups that enabled women and other excluded social groups (such as Dalits or Fulani herders) to actively engage with organisational and social structures was an important, if not frequent, theme in these studies even if, at times, women’s agency was actively opposed by local men. Men wanted to make the decisions and were threatened by the agency shown by women and the expression of their growing empowerment, which they feared. Local organisations that encouraged women and other marginalised groups to participate strengthened the overall response of the programme and, equally importantly, developed women’s agency within what could be restrictive local institutions.

Communities in several studies demonstrated their ability to self-organise and develop effective DRR/DRM strategies without large amounts of external aid or inputs. These communities demonstrated high levels of actioned agency through independently establishing community-based organisations, social funds for community members and the equitable management and distribution of disaster aid and compensation. Women’s groups in some studies were an excellent example of how excluded community members can initiate activities, such as establishing self-help groups, women-managed businesses and community-led revolving funds and financial mechanisms. In these cases, DRM/DRR programmes need to support and facilitate these forms of galvanised collective agency to blossom, creating innovative, sustainable and locally appropriate solutions to disaster-related conundrums.

DRM programmes have a key role in linking communities without many resources of strong external networks with external agencies which have both of these – networks and resources, and at times also power and influence. These studies show that many DRM interventions, especially those led by NGOs, actively undertook this role and vigorously facilitated the collective agency of communities. DRM-focused agencies reportedly undertook this work through two main avenues: developing human capital and facilitating social capital development. These two focus areas are instrumental and highlight the importance of both knowledge and skills within a community to allow for the ability to promote agency which can be actioned, as well as the social bonds between community members that allow for the ability to instigate the collective action.

When further supported, as described below, to link up the range of different mechanisms operating in a setting, and when a linking in of community structures with those of other authorities is facilitated, then CBDRM initiatives stand the greatest chance of succeeding and making a significant difference in reducing the social and economic costs of disasters.

In terms of human capital, DRM interventions trained communities in first aid, water and sanitation, management, planning and long-term strategy development. External agencies also played a positive role encouraging connections and communication between communities and governments, ‘linking [them] in’ to decision-making processes and institutions as well as international organisations and funding sources.

Important inhibitors to ‘expressed empowerment’ include barriers which may be imposed by local leaders (both political and religious) and which undermine broader-based community empowerment. Weak social capital is also a significant inhibitor, even at the household level. Elements of local culture may establish, and/or seek to reinforce, various forms of social and political

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

hierarchy. These operate to undermine the ability of marginalised groups to act as agents which can transform relationships and build up the various forms of capital that allow ‘expressed empowerment’ to trigger positive outcomes. This reinforces the need for a richly textured understanding of the local political economy and community structures if external agencies are to effectively support community development.

‘Actioned agency’ can also be constrained by inequities inherent in social structures. Local people’s ability to work together to shape their environment and make choices, or to access aspects of DRM programmes, were constrained by their relative poverty and their lack of resources that would have facilitated their ability to engage with programme activities. Another way that people’s agency can be diminished is through the denial and marginalisation of the value of local knowledge and experience of the environment and extreme natural events. A good example is Dekens’ study (2007), which showed that because they ignored the experience and advice of older community members, programmes failed to achieve effective and sustainable outcomes. By ignoring local insights and history, DRM programmes may provide inappropriate and poorly targeted support that can actually lead to increased costs and loss of livelihoods.

Resilient livelihoods

This mechanism again highlights the importance of ensuring a deep and textured understanding of context and local political economy. While this is true of all interventions and mechanisms, those involving livelihoods are particularly susceptible to changing contexts. A thorough understanding of livelihood strategies, financial and other resource use, investments and expenditure, and the contexts in which they are accessed, succeed or fail, is essential. Rossing et al. (2010) emphasise that in order to provide a strong foundation for the design of effective, asset-based adaptation that enhances resilience and coping capacity, a context-specific social analysis of livelihood assets is needed.

According to Moench and Dixit (2004), there are four factors that are fundamentally important to resilience and adaptive capacity:

1. access to diverse, independent income sources and income strategies;
2. general educational and other skills required to respond to constraints and take advantage of diverse income niches as opportunities emerge;
3. support systems (information, social networks, community organisations, markets etc.) that allow people to migrate (or commute) and information and resources to flow through diverse channels and often across national and state boundaries when surprises occur or conditions change; and
4. the presence of capital reserves and assets.

Broekhuijsen (2009) states that in addition to building sustainable livelihoods, natural resource management is crucial to building disaster resilient communities. The natural capital in any community can be harnessed and can provide an important boost to livelihoods, although this must be done in a sustainable manner if benefits are to accrue beyond short-term exploitation.

An important recurring theme in relation to sustainable livelihoods was the importance of diversification as a means of building resilience and as a strategy for managing risk and reducing vulnerability to anticipated disaster and climate change events. This is especially relevant to points one and four above. According to Jabeen et al., (2010) poor households in Bangladesh that had more than one earning member and who were employed in diversified livelihoods were better off than those households dependent on only one family member or who were engaged in similar types of work. The study highlighted the importance of diversification in building resilience: ‘Diversification ensured minimum earning loss during any disaster’ (Jabeen et al., 2010: 426).

Diversification can be separated into three main diversification strategies, all of which are dependent on local contexts.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Same-sector diversification can take place through the production of multiple crops in multiple areas or through intercropping or rearing different types of livestock. Care (2011) suggested that an important strategy to reduce vulnerabilities was through same-sector diversification within agriculture to new and more climate-resilient varieties of staple crops, to different crops or livestock species that might be able to withstand variable climate conditions and/or to new practices which might manage agricultural resources more sustainably. According to Practical Action (2010a), examples of successful and popular on-farm activities in Bangladesh included livestock rearing (cow, goat and sheep), poultry rearing (duck, hen and pigeon), homestead gardening, garlic and watermelon cultivation, early maturing rice cultivation, nursery establishment and fruit sapling plantations. The report also stated that apiculture (beekeeping) was a profitable and popular enterprise among landless households in Bangladesh; it required little land, simple technology, and enable project participants to receive a high market price for their honey (Practical Action, 2010).

Diversifying livelihoods into livestock production to complement agricultural activities increases resilience in times of stresses or shocks, as livestock can be sold quickly and funds used for immediate needs (Matsimbe, 2003). These liquid assets (livestock and poultry) play an important part in household risk management by providing a degree of livelihood security (Selvaraju et al., 2006). Practical Action (2010a) also found that livestock interventions had a significantly greater impact on strengthening livelihoods than purely agricultural activities. Livestock interventions significantly increased earnings and formed an important alternative income source for poor households in Bangladesh. However, this is dependent on functioning markets, reinforcing the importance of stimulating 'normal' socio-cultural and economic activities if communities are to respond to a rapidly changing or post-disaster environment (Enarson, 2000; FAO, 2011). In areas frequently affected by high-impact disasters such as cyclones, safe areas need to be accessible (such as livestock shelters or at least raised platforms) in order to protect livestock and household livelihoods.

Adaptive agriculture and aquaculture activities were highly successful in the face of flooding. Practical Action (2010) demonstrated how traditional floating gardens and nurseries, as well as establishing fisheries in flood water, promoted resilience in flood times. Ullah et al., (2009) illustrated that in low-lying wetlands, the use of floating gardens was particularly important for flood-affected communities. These allowed communities to sow rice seeds and once the floods receded, they were able to transplant seedlings into their fields. This helped overcome a recurring problem of crop loss due to annual flooding and boosted resilience (Ullah et al, 2009). Adaptive same-sector diversification enables communities to continue to earn a livelihood even when faced with recurrent floods.

Agricultural enhancement strategies also support agriculture-related livelihoods. This can include implementing irrigation practices to address moisture deficiencies associated with climate change and reducing the risk of income loss due to recurring drought, and changing land topography to address the moisture deficiencies associated with climate change and reducing the risk of farmland degradation (Chuku and Okoye, 2009).

Value-chain diversification refers to undertaking related business areas in the value chain. An example is moving from fishing to the drying and processing of fish which can then be sold for a premium. Care (2011) explains that value-chain diversification which includes activities that improve storage, processing and/or marketing of agricultural products plays an important role in reducing vulnerability. These strategies assist in maximising the value of production in good years, which helps to create safety nets in times of stress, or worse, extreme events and disasters.

Bhattacharjee et al. (2010: 8) emphasised the importance of value chains to livelihood interventions. These had been 'highly effective when the livelihood activities were looked at in relation to the overall sector and with a deeper understanding of value chains, rather than when it took a

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

traditional income-generating approach targeted at individual families without adequate attentions to value-chain analysis’.

This suggests not only that communities that undertake a value-chain approach to income generation may be able to attract a premium and thus higher profits, but that the diversified business activities could help to reduce vulnerability to stresses and provide a larger safety net when communities are faced with extreme shocks.

Sector diversification takes place by moving into other sectors, such as to small-scale trading from agriculture. Selvaraju et al., (2006) suggest that promotion of alternative enterprises helps increase overall household income, which acts as a disaster-related risk management strategy. This sector diversification is also important and could involve the creation of opportunities which go beyond a given sector, such as operating a small shop, producing and selling supplies (such as handicrafts, making packaging, mat making, blanket making, curd production, or brick making) or working in the service sector as tradespeople (Care, 2011; Practical Action, 2010a).

Capital reserves are also an important component of resilient livelihoods. As discussed in the previous sections, collective savings associations can play an important role in mobilising resources which can be used for pre- or post-disaster activities. At household level, savings are a fundamental coping strategy which households rely on when faced with stresses or shocks (Jabeen et al., 2010). Therefore an important focus should also be put on establishing safe and reliable savings mechanisms, which can be easily accessed after a disaster. According to Jabeen et al. (2010) 50 percent of programme participants in Bangladesh saved regularly with savings groups or an NGO, with the intention of being able to access their savings during and after any disaster. These savings groups were formed within extended families, neighbourhoods and wider groups with a shared geographical identity. Savings rates ranged from between 3 and 17 percent of total household income. In addition, these savings groups also helped generate social and livelihood networks.

Promoting and undertaking a wider range of socio-economic and cultural activities can assist in reducing the negative consequences of localised crises and disasters. Rempel (2010) argues, however, that a focus on traditional livelihoods is important and strategic, as it enables a community to retain an economic base for survival and recovery. Many programmes seek to move communities into higher-paying livelihood activities without assisting them to retain traditional livelihood techniques which have already been shown to form an important component of resilient livelihoods.

PRE- AND POST-DISASTER

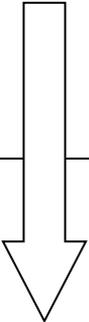
Supporting resilient livelihoods can take place both pre- and post-disaster. The type and speed of any intervention will depend on whether the activities are being implemented in a pre- or post-disaster setting. While building disaster resilient communities and resilient livelihoods should take place before a disaster occurs, post-disaster activities which have been found to be successful based on evidence, should be incorporated into community-based planning.

An important post-disaster intervention that has already been discussed is cash-for-work (CFW) programmes. CFW and other social protection measures successfully restored livelihood activities and reduced vulnerabilities in the aftermath of natural disasters (Doocy et al., 2006).

In pre-disaster contexts, according to Davies et al., (2011) adaptive social protection (ASP) can be a useful tool for moving away from ‘relief-centric approaches’ towards a more comprehensive and effective disaster management approach that includes prevention, mitigation, preparedness, relief

and rehabilitation. The ASP approach was developed to incorporate social protection,³ disaster risk reduction and climate change adaptation in programmes and projects which help to ‘simultaneously tackle unsafe living conditions, counter the underlying causes of vulnerability, and promote people’s ability to adapt to a changing climate’ (Davies et al., 2011: 2). Table 6.1 outlines the potential benefits of using Social Protection to enhance DRR and CCA.

Table 6.1: Promoting climate change adaptation and disaster risk reduction through social protection (SP)

| Time frame | SP category | SP instruments | CCA and DRR benefits |
|--|---|---|---|
| Short-term | Protective (coping strategies) | Social service protection Basic social transfers (food/cash) Pension schemes Public works programmes | Protection of those most vulnerable to climate risks, with low levels of adaptive capacity |
|  | Preventive (coping strategies) | Social transfers Livelihood diversification Weather-indexed crop insurance | Prevents damaging coping strategies as a result of risks to weather-dependent livelihoods |
| | Promotive (building adaptive capacity) | Social transfers Access to credit Asset transfers/protection Starter packs (drought/flood resistant) Access to common property resources Public works programmes | Promotes resilience through livelihood diversification and security to withstand climate-related shocks Promotes opportunities arising from climate change |
| Long-term | Transformative (building adaptive capacity) | Promotion of minority rights Anti-discrimination campaigns Social funds | Transforms social relations to combat discrimination underlying social and political vulnerability |

(Source: Davies et al., 2011: 22)

Not all adaptive social protection instruments may be relevant to CBDRM, although there are many key areas of overlap which could enhance CBDRM activities to build resilient communities. Further research could be conducted on the potential of incorporating social protection and CBDRM at the community level.

The resilient livelihoods mechanism operated both in pre-disaster and post-disaster settings and contributed strongly to: bolstering resilience; reducing vulnerability; enhancing incomes, outputs and livelihoods; and promoting education and awareness. This mechanism interacted with many other identified mechanisms in the review, illustrating its importance in strengthening other forms of disaster assistance and building climate resilient communities. This highlights the need for policy

³ Social protection (SP) involves all initiatives that transfer income or assets to the poor, protect the vulnerable against livelihood risks, and enhance the social status and rights of the marginalised (Devereux and Sabates-Wheeler, 2006).

makers and practitioners to place resilient livelihoods at the heart of CBDRM initiatives if they are to be sustainable.

The Sustainable Livelihoods Framework is also of considerable value in enhancing CBDRM and livelihood programming. Aside from the forms of capital elaborated in the framework and explored in this review, the model could usefully be enhanced to more fully reflect both cultural and technological capital. Cultural capital⁴ enhances resilience in communities, and allows the strengthening of social bonds and psychosocial recovery and wellbeing in the community. Technological capital⁵ is also important in allowing linking and networking social capital to be enhanced. It can contribute to strengthening pre-disaster preparedness and human capital through the sharing of information and knowledge on livelihoods and other community activities. These forms of capital also reinforce the range of mechanisms explored, and in particular underpin the ability to facilitate drawing on 'integrated knowledges' and 'actioned agency' if empowerment is to be expressed.

Gender and social equity promotion

Activities associated with the promotion of gendered and social equity exhibited contradictory features and deserve more attention in terms of programming and directions for future research. In some settings, humanitarian relief interventions accentuated social differentiation by being insensitive to who 'won' and who 'lost' from interventions at community level. In other cases, external interventions and initiatives that explicitly promoted gender equity without the required sensitivity to local cultural and social realities increased conflict and contestation within communities. In some circumstances humanitarian agencies themselves adopted discriminatory practices based on the perceived religious affiliations of a community as well as its relative remoteness and ease of access.

Surprisingly, the most common outcomes seen under the broad mechanism of efforts to address gendered and social (in)equity were decreased resilience and increased vulnerability. These adverse outcomes may reflect biases in reporting, including a focus on shorter-term outcomes (given the marked absence of longitudinal studies in given settings). The outcomes noted nevertheless resulted from a number of identifiable factors, briefly elaborated below.

PRESENCE OF GENDERED AND SOCIAL INEQUITY

In the first instance, gendered and social equity was undermined in the presence of strong gender-based and social divisions within a community. These factors increased vulnerability, and in some cases, led to a reduction in resilience, manifest in circumstances where vulnerable groups' needs were inadequately identified and addressed (see Rossing et al. 2010; Matsimbe 2003 and Zaidi et al., 2010 for example). Pre-existing divisions within communities and societies meant that they were not able to effectively organise mitigation, preparedness and response and recovery activities, or were disadvantaged in relation to other social groupings. In this sense, the mechanisms found to be of particular importance, such as socio-economic and livelihood support, 'actioned agency', 'expressed empowerment', and 'integrated knowledges', could not be activated and utilised by disempowered and marginalised groups within affected communities. Disadvantaged communities were forced to focus on daily survival and did not have the extra resources available to accumulate capital or develop long-term livelihood resilience (Rossing et al., 2010).

⁴ Cultural capital has been described as the underlying factors that provide human societies with the means and adaptations to maintain themselves in their environment (Cochrane, 2006).

⁵ Technological capital has been described as the availability of appropriate technical resources, and the effective mobilisation of these resources in ways that can positively impact access to information and upward mobility. Adapted from Yardi (2010).

EXACERBATING GENDERED AND SOCIAL INEQUITY

At times, interventions exacerbated pre-existing social divisions and disadvantage through inappropriate planning and programmatic approaches. In Pakistan, the poorest and most disadvantaged groups were unable to access novel early warning systems because they lacked the means to acquire the technology to do so (telephones and electricity: Dekens, 2007). Similarly the poorest farmers were forced to adapt on the ground to drought in order to survive, given the lack of resources available, whereas wealthier farmers and businessmen could rely on their relationships with government officials and access to additional resources to cope with the consequences of disasters (Selvaraju et al., 2006). Similarly, when cash grants were distributed to affected communities following disasters, agencies established procedures and processes that led to disadvantaged groups, such as female-headed households, elderly women, Dalits and the poor, being excluded from aid payments and resources (Zaidi et al., 2010). Groups that already had significant advantages in this setting, such as young males who were not eligible for certain types of aid, were able to access these resources thus further disadvantaging other more vulnerable groups (Zaidi et al., 2010).

In other cases, programmes that promoted gender and social equity by supporting participation in disaster committees or more generic village leadership roles accentuated existing gendered or social divisions and led to discord within households and communities. This was evident in programmes and interventions which attempted to confront and challenge existing gendered roles and inequalities, as in USAID's CBDRM programme in Mozambique (Matsimbe, 2003). However, these negative outcomes did not hold true in all cases, with some male members of the community, even if initially hostile to the changes, eventually accepting and even welcoming women in these new roles. However, in other households, an increase in social tension and fragmentation developed between men and women.

DISCRIMINATORY PRACTICES IN PROGRAMMING

Service and relief providers themselves exhibited blatant discriminatory practices in some settings. In India, Dalits who were severely affected by the 2004 tsunami initially received inappropriate levels of humanitarian relief because of the unfair practices of service providers, which reflected discriminatory criteria established by the government (Rempel, 2010). In Pakistan-administered Kashmir, disaster risk programmes trained local men in managing and promoting the health and care of cows when it was the women who were responsible for bovine health (Schutte and Kreuzmann, 2011). This led to poor outcomes, both in terms of worsening animal health resulting from a failure to treat conditions such as intestinal worms, and an associated reduction in household income. Humanitarian aid reflected and at times exacerbated pre-existing social tensions based on ethnicity, politics, class, gender and religion in Sri Lanka and India after the 2004 tsunami (Oxfam, 2009).

Social inequalities between communities were widened by the differing levels of relief aid received by communities: those which were more resource-endowed received more support after the 2004 tsunami. Agencies tended to give higher levels of support to communities that were easiest to access, had outspoken leaders who could advocate for assistance and who had a strong history of collective action and strong social capital (Sato, 2010). In this sense, those communities exhibiting the mechanisms which were identified as important within this study, were able to advocate for and attract resources, and indeed to transform their relationships with a range of organisations and institutions which could offer support. Responding only to these more empowered communities and neglecting those most marginalised risks deepening inequalities and vulnerabilities, an issue deserving attention in terms of policy and programming response.

As described above, DRM programming attempts to redress gendered and social imbalances in communities by targeting the most vulnerable groups, such as women, children and scheduled castes, in some instances exacerbating existing social and gendered inequities. Gendered

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

approaches that challenged male power in the household and community organisations reportedly increased social and familial tension and conflict to the detriment of the programme and individuals involved. In other instances, humanitarian aid was distributed based on pre-existing institutional and social differentiation. This also led to increasing tension in communities based on ethnicity, politics, class, gender and religion.

Although many of the organisations active in DRM programming are aware of the potential consequences of inappropriately targeted interventions and the need for local participation in the design, implementation, management and evaluation of programmes, the literature shows that this understanding is not consistent across the sector. Local empowerment, community agency and participatory practices still need to be applied in order for DRM programmes to further support increased resilience and reduced vulnerability.

Communities lacking the material and organisational resources required to effectively gain access to humanitarian aid, services and service providers were relatively worse off than those communities with high levels of resource endowment and a strong history of collective action and solidarity. Oxfam (2009) highlights some of the challenges encountered:

If we aid workers know that community ownership and participation is a good thing, we also know that most communities are not the happy, smiling, and cooperative groups that we pretend they are in our NGO publicity. Like all communities, they can be plagued by bias, feuds, competition, class, and greed. In an emergency, unpleasant and unrepresentative individuals or cliques can ‘capture’ a community and the resources it receives. (Oxfam, 2009: 5)

This places a clear responsibility on service providers, aid agencies and government to ensure that DRM programmes align with the humanitarian imperative and rights-based principles of non-discriminatory, participatory and equitable support of the most vulnerable and those most in need.

Enhanced safety, security and protection

Enhanced safety, security and protection were an important, but not anticipated element in strengthening the value of CBDRM activities. These mechanisms generate more resilient community outcomes and operate through a number of identifiable elements. Further work on understanding these mechanisms and how they operate would be of value; here we draw attention to their importance to the ‘big picture’ outcomes of interest and comment on the ways in which improved safety, security and protection, before, during and after disaster, generate positive outcomes.

SAFETY, SECURITY AND PROTECTION PRIOR TO A DISASTER

The location of settlements can be a fundamental issue in reducing vulnerabilities and building disaster-resilient communities. Low-income households living in informal or illegal settlements in urban centres face the greatest risk from flooding and other disasters (Huq et al., 2007). Nathan (2008) states that communities living in high-risk areas in Bolivia are exposed to a combination of natural and social hazards as residents, community leaders and city planners tend to under-estimate or deny risk. This is also true of communities living in rural areas. For example Lahiri-Dutt and Samanta (2007) show that a large number of vulnerable low-income communities live in chars⁶ all over the world, which are high-risk environments. A lack of resources pushes low-income households to seek habitation in affordable areas, invariably priced lower because they are in high-

⁶ Charlands, also known as bars, river islands and slough, are virgin, low-lying river islands and sandbars occurring in the plains, particularly the deltaic parts of rivers (Lahiri-Dutt and Samanta, 2007).

risk areas. This creates a significant problem where vulnerable communities with limited resources are forced to live in disaster-prone areas.

Practical Action (Ullah et al., 2009) found that working at the individual, household and community level, improving living conditions reduced the vulnerability of communities to hazards and increased resilience. This, coupled with more secure and sustainable livelihood strategies, preparedness and contingency planning, enabled communities to effectively manage hazardous situations and recover more quickly.

An inhibitor to generating positive outcomes related to legal entitlement. Unclear land title is of major ongoing concern to residents. Dodman et al. (2010) draw attention to how communities coped with constant seawater intrusion using landfill, but were unprepared to invest in securing their homes given the ongoing risk of relocation. In such circumstances, communities might invest in reducing risk and vulnerability, only to find that they no longer had title to the land and had wasted precious resources, thus undermining future resilience and increasing their vulnerability.

In addition to the secure location of habitation, there needs to be an adequate level of security and rule of law in the community. Practical Action (2010) reported that activities which contributed to building a culture of community safety were successful, in particular, through mobilising community volunteers to conduct courtyard meetings and to discuss community issues in public spaces. These simple measures can assist in building social capital in the community and enhance safety and security. The risk of gender-based violence in displaced settings has been well described; if people fear for their own security, they may be far less able to participate in activities outside of the home or to risk being more visible.

Access to safe and accessible land both reduces disaster risk and facilitates climate change adaptation. However, the absence of affordable secure land continues to create a situation of vulnerability for low-income communities (Dodman et al., 2010) and exacerbates socio-economic inequalities.

SAFETY, SECURITY AND PROTECTION DURING A DISASTER

Enhancing safety, security and protection during a large-scale disaster is important to ensure that mortality and morbidity rates are limited. Community-based pre-disaster plans can help define safe evacuation routes and identify assembly points in areas with reduced risk. One example that received considerable attention in the literature referred to cyclones and storm surges in Bangladesh and the use of shelters to protect communities.

When access to cyclone shelters were available, there was a reduction in mortality and morbidity rates in high-risk communities (IFRC, 2010; Islam et al., 2011; Paul, 2009); however some challenges were identified.

The location of shelters is important. Paul (2009) showed that a cyclone shelter must be located within 1 mile (1.6 km) of community residences for it to be accessible in emergencies. Those living in dispersed settlements who fail to reach cyclone shelters often take refuge in thatched-roof houses and big-branch trees (Alam and Collins, 2010) which significantly increases their vulnerability to the disaster compared to situations in which a shelter or pre-identified safe evacuation place is accessible.

According to Islam et al. (2011) many people neglected cyclone warnings and failed to evacuate to shelters. This was partly attributable to the threat of theft of personal items and the hesitation of some to leave their livestock. These assets form the basis of family wealth and their ability to stay above the poverty line. Even though cyclone shelters were mostly available to people, the lack of shelters for livestock posed a significant issue to community protection and livelihoods.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

SAFETY, SECURITY AND PROTECTION AFTER A DISASTER

Poor conditions may lead to a deterioration in community safety, security and protection. Mulligan and Nadarajah (2012) noted the lack of privacy with regard to washing and toilet facilities in Sri Lanka in the aftermath of the Asian tsunami of 2004. Such circumstances can contribute to a general lack of security and to the risk of violence.

Men who were left without employment frequently turned to alcohol, and community workers told the researchers that there were rising levels of domestic violence, rape and incest in crowded temporary shelters (Mulligan and Nadarajah, 2012). This highlights the importance of livelihoods and permanent living conditions for community wellbeing.

In the aftermath of a disaster where communities have been displaced and live in crowded temporary shelters, CFW activities can be an important tool to facilitate the successful return of communities. In addition, CFW can inject much-needed funds into the community while communal infrastructure is repaired, which allows for the re-establishment of livelihoods (Doocy et al., 2006). CFW can provide short-term employment, re-establish livelihoods and facilitate the return of communities to permanent settlements and a sense of normality, thus helping to overcome the identified challenges to community safety, security and protection.

Linking with the gendered mechanism, Pittaway et al. (2007: 307) spoke passionately of the gendered dimensions to the 2004 Asian tsunami:

As data on the horrendous death toll from the December 2004 tsunami are finally processed, it has been confirmed that the largest number of people who died were women and girls ... The gender dimensions of the disaster are little acknowledged or understood. During the humanitarian aid and reconstruction efforts the needs of women and girls have been marginalized. They are fighting to have their voices heard in the decision making process. Increases in the prevalence of sexual and gender-based violence (SGBV) and consequences of forced marriage are an ongoing sequel to the disaster. And yet the abuse and its health and social consequences are not often publicly identified or addressed.

Technological innovation and communication

According to Chuku and Okoye (2009) technology is important in building resilience, and a lack of technology limits the range of potential adaptation options. Less technologically advanced regions have high vulnerability.

An example of technological innovation with existing technologies relates to the use of mobile phones. Giri and Yuwan (2011) demonstrated that mobile phones made a critical contribution through providing information and communication in three critical areas: agricultural practices, market prices and disaster early warning. Existing forms of technology, although not always available, can enhance communication between networks, contributing to positive outcomes through both reducing vulnerability to disasters and enhancing livelihoods.

Community radio was a particularly important means of enhancing communication and awareness. Oxfam (2009) approached DRR from a community-empowerment perspective and produced programmes that were significantly more likely to be embraced by community members. The Búzi Community Radio station in Mozambique was successful in warning flood-prone households about rising rivers in ample time and suggested safe places to which community members could evacuate (Matsimbe, 2003). These local language early warnings enabled all members of the community to understand what was happening regarding natural hazards in their areas and to find out what to do or where to go (Matsimbe, 2003). Community radio could play a strong part in accessing local knowledge and stimulating discussion about these and related livelihood strategies. Local radio could also be a very valuable support to facilitating and actioning agency, and becomes even more important in expressing demands and entitlements. Community radio could thus play a valuable role

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

in 'linking up' and 'linking in' initiatives, thus empowering local community structures and enhancing their social and economic resilience.

Mass media can play an important role in enhancing community safety, security and protection, as well as social equality in the aftermath of a disaster. It may do so by providing information of value to networks in improving the quality of agricultural and disaster-related decision making (Giri and Yuwan, 2011).

Technological innovations and communication may also contribute to reinforcing other mechanisms, such as 'expressed empowerment', by enabling community-based organisations to disseminate information relevant to all stages of disaster preparedness, mitigation and response. The establishment of a network connecting upstream and downstream communities using mobile phones led to pre-disaster warnings for downstream communities and enhanced ability to evacuate livestock, property and family. While technological innovation can help improve early warning systems, for such dissemination to be successful at the community level, it must be readily accessible, understandable to all, and able to be effectively utilised at a local level.

New technologies, may, at times, also have negative consequences, however. Dekens (2007) showed that an early warning system which relied on new, centralised technologies was unsuccessful in reaching isolated communities. The same study also found that those communities that were reached became more dependent on external technologies and experts, and that this contributed to reducing flexibility, adaptability and creativity. This may undermine knowledge and use of traditional early warning systems, which may be forgotten and replaced by less context-adapted and functional approaches.

Linking mechanisms: 'linking up' and 'linking in'

Linking mechanisms contributed to, reinforced and in many ways underpinned the operation and power of many of the other mechanisms reported here. As described earlier, linking mechanisms operated through two strategies, individually or together: 'linking up' different mechanisms with one another thus reinforcing and strengthening their net effect, and/or 'linking in' community-based agencies and organisations with structures and institutions operating at other levels.

Many of these linking mechanisms focused on, and highlighted, the role of informal social networks (kinship, friends and community members), community disaster committees, inter-village communications and other social and economic linkages. All these types of social capital enhanced disaster preparedness, response and coping capacity of communities and community organisations (Dodman et al. 2010; Luna 2001; Matsimbe 2003; Mulligan and Nadarajah 2012; Oxfam 2009; Practical Action 2010; Tougiani et al. 2009; USAID 2011).

Linking mechanisms were mostly associated with social capital and the ability of communities not just to form connections at local level but also to connect – 'linking in' – with other communities, local and national governments, INGOs and international organisations and donors. These kinds of linkages and interconnections strengthen communities, empower their members and generate individual and collective agency. If communities lack linking mechanisms because they are poor, marginalised or particularly vulnerable, then their ability to cope with and adapt to the consequences of natural disasters is greatly diminished.

The studies clearly show that many poor and vulnerable communities have insufficient linking mechanisms in play that could facilitate access to higher levels of the government hierarchy, service providers and humanitarian relief agencies. This in turn causes communities to be left behind and to be forced to engage in more precarious livelihoods, as well as to suffer from increasing levels of poverty and vulnerability. If DRR agencies are able to support, develop and facilitate social, economic, cultural and institutional linkages, then communities will be much better off in the long term.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

These powerful linking up and linking in mechanisms connect different activities, stakeholders and processes, with resources, institutions and knowledge, to transform and shape ideas and outcomes; their existence underlines the many elements that need to work together if sustained positive outcomes are to be achieved. Enhanced institutional capacity, improved humanitarian co-ordination and the development of enabling institutional and political environments all contribute to increased resilience to disasters (Berke and Beatley, 1997; Bhattacharjee et al., 2010; Dekens, 2007; Matsimbe, 2003; Pelham et al., 2011; Rossing et al., 2010; Selvaraju et al., 2006; Tougiani et al., 2009) and build on these 'linking up' and 'linking in' mechanisms.

Effective community social capital led to more effective warnings as well as improved community access to services and service providers; these contributed to reduced community vulnerability to disasters (Leone and Gaillard 1999; Oxfam 2009). Strong linkages and relationships between villages, service providers and enabling institutions supported livelihood adaptation and sustainable programming (Mulligan and Nadarajah, 2012; Selvaraju et al., 2006). In addition, having strong connections with family and neighbours built up a community's psychological wellbeing and led to a reduction in mental health presentations and psychosocial distress (Dekens, 2007).

The main constraining factor is the lack of bridging or linking social capital that enables communities to access additional resources (such as information, knowledge, cash, 'voice', or other forms of support) outside of their immediate kinship networks and community. In response to, and recovery from large-scale disasters and crises, bonding and indeed bridging and linking social capital may be compromised as a result of the acute needs present. Bridging and linking social capital enable communities to access relief and services outside of their immediate social and familial circles, contributing to improved overall resilience and reduced poverty.

In the absence of communities themselves articulating their demands for support, through 'actioned agency' and 'expressed empowerment', and without actively supporting these various interrelated forms of capital and the underlying mechanisms which build them up and reinforce them, positive outcomes will be much less likely to occur.

According to Ullah et al. (2009), a typical low-income family in Bangladesh was vulnerable in the following ways:

1. dependency on a single source of food and income with no savings, and no alternative livelihood options;
2. living in a vulnerable, low-lying area, in a weakly constructed home;
3. no social safety nets, such as wider family support, or other networks;
4. inability to influence institutions to help them prepare for or recover from flooding;
5. children particularly vulnerable as they are weaker and more dependant; and
6. couples do not have other skills to use to get an income.

As evident above, vulnerability in low-income communities is a multidimensional issue that requires a multifaceted approach to address the underlying challenges of continued poverty. It is important to ensure that limited resources are not used on only one aspect of DRM/DRR and poverty reduction, where development gains could be destroyed due to outstanding vulnerabilities that have not been addressed.

This review has shown that 'resilient livelihoods' is central to any sustainable intervention as it allows people and communities to earn and accumulate their own resources which can be used to reduce risks and build resilience. However, other aspects, such as the mechanisms identified above, also need to be 'linked in and linked up' with resilient livelihoods. By examining the above points in relation to the review-identified mechanisms, we can form a basis for reducing each aspect of the identified vulnerabilities of a typical low-income family in Bangladesh:

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

1. Resilient livelihoods – by diversifying into one or more of the strategies identified in the previous sections, this could assist in overcoming the over-dependence on a single source of food and income, as well as establishing community-based saving institutions to provide a safe place to keep and expand savings.
2. Enhanced safety, security and protection should be addressed by assisting communities to move away from high-risk areas, or to undertake housing and infrastructure improvements to limit the negative effects of disasters. This could be done by channelling resources into communities to allow for housing and infrastructure upgrades or through other forms of assistance, such as legalising land tenure, which was found to be a determining factor in communities undertaking upgrading activities with their own resources.
3. Social capital needs to be strengthened in communities to provide social safety nets. This can be accomplished through activities that bring together communities and form/enhance relationships and networks. This could potentially be strengthened through all identified mechanisms as they target different activities, although enhancing ‘expressed empowerment’ and ‘actioned agency’ could be the strongest.
4. ‘Expressed empowerment’ and ‘actioned agency’ could create the necessary collective action and community-based institutions to be able to influence institutions to help them prepare for, or recover from, flooding or other disasters.
5. As children are particularly vulnerable because they are young and weaker than the adults, adequate resources need to be set aside for child welfare, both at the household and community levels. At the household level, enhancing resilient livelihoods could help families increase incomes and savings to be used when children fall ill. Enhanced safety, security and protection need to be established to ensure safe living conditions, and technological innovation and communications could be used to assist families seeking affordable medical advice. At the community level, enabling and facilitating communities to pool resources and to establish committees and institutions to lobby governments to expand basic services will enhance agency and ultimately empower them.
6. Enhancing human capital through skills training could assist couples to gain the necessary skills to successfully establish and operate resilient livelihoods.

In addition to the above, integrated knowledges is essential for integrating community knowledge and experience with external expertise to produce enhanced or shared understanding of risks, vulnerabilities and actionable responses. This is essential, as communities have fundamental knowledge about their own risk and needs, which, combined with external expertise gained from successful interventions in other areas, would form the basis for any successful programme.

Developing or promoting an enabling environment for gender and social equity through institutional, organisational and programmatic activities and operations is also vital to assist with the equitable reduction in risks and increase in resilience. Gender and social equity promotion should be a core focus of any intervention.

6.2 Strengths and limitations of the review

This review and associated mapping report are the first to comprehensively assess the literature on the strengths, limitations and significance of CBDRM. The realist approach allowed particular attention to be focused on identifying the underlying mechanisms through which community-based disaster risk reduction activities produce valuable outcomes – reduced risk and vulnerability, enhanced socio-economic and livelihoods security, increased resilience, enhanced community capability and capacity, and improved financial and social capital, amongst others.

The extensive literature searches undertaken and the range of databases examined generated a massive volume of studies covering a multitude of disciplinary perspectives on the community interface with DRM in LMICs. These were pared down by applying standardised inclusion and

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

exclusion criteria to assess rigour and relevance. The literature was categorised to explore developments within the field over time, including changing regional focus, type of disaster, programmatic activities, types of studies, scale of operation and urban-rural focus.

The subset of studies operating at the interface of socio-economic and livelihood support, along with more 'classic' community-based DRM programming, formed the core of the realist review.

Through adopting a realist approach to synthesising the evidence, this review emphasises the importance of context in determining outcomes, and of specific mechanisms in generating one or more of the outcomes of interest. A range of mechanisms were postulated early on to generate important outcomes (described earlier as 'candidate theory'); as the study unfolded and more detailed analysis was undertaken, this list was supplemented by additional mechanisms which interact with context, and one another, to trigger outcomes of importance. The realist approach allows assessment not only of whether a given type of intervention works, but how it does so, in what circumstances and contexts, and through what mechanisms. It thus provides a rich and textured analysis which is of value in shaping future policy and practice in the field.

The review was not without limitations, as is the case with all such exercises. The scope of the review was limited by the databases searched and the requirement that studies be published in English and post-1995. The literature search was nevertheless extensive, covering numerous specialist databases across a range of geographic and disciplinary areas; furthermore most of the literature has been published in the past decade. To supplement the databases, websites of key agencies and a number of journals were searched by hand.

A number of challenges were encountered while working with electronic databases. Each has its own syntax, requiring careful definition of search terms and their interaction with one another. The Research Team worked extensively through these and assessed the products of searches to make sure that the lists of publications generated were appropriate to the research question. The team used EPPI-Reviewer and developed tools to assess studies in terms of their quality, relevance to the study and ability to provide insights into outcomes and therefore also into the mechanisms which generate the outcomes of interest. In the final stages of the analysis, studies were coded using Nvivo-9 to enable identification of data of relevance to core areas of enquiry, and to facilitate examination of the interaction of variables of interest.

Additional limitations reflect some general and some more specific issues:

1. Realist reviews focus on defined outcomes of interest; the search and scope of the review, while having some flexibility, is focused on these outcomes.
2. Literature assessed is largely based on traditional programme description or evaluation models and not designed to inform realist reviews – context, outcomes and mechanisms are often reported in limited detail.
3. While a given intervention generates a range of outcomes depending on the context, publication biases⁷ result in most reviews being biased towards the positive outcomes reported, thus restricting the ability to analyse failed interventions in the same depth.
4. Importantly, as the original focus was on fast-onset disasters, some key terms relating to slow-onset disasters were omitted from the search strategy and we therefore do not suggest that the review is fully representative of the literature on that subset of CBDRM-related studies.

Any review requires focus in order to produce meaningful insights. In consultation with AusAID and the Reference Group, our team identified a subset of studies through which to explore mechanisms

⁷ 'Publication bias' arises because studies demonstrating a 'positive' outcome are more likely to be reported and published, despite the fact that we should be equally interested in negative outcomes and failed interventions.

and their association with context and outcomes. These studies of particular interest operated at the interface of socio-economic and livelihood support and community-based DRM activities. The earlier stages of the study and mapping generated a range of study subsets that could also benefit from in-depth examination and which would build on the substantial investment in building the database from which the studies analysed were drawn.

Here we discuss further our analysis and draw out its implications. Importantly, many of the selected studies described the context in rich ('thick') detail allowing context to be linked with the mechanisms uncovered. This relationship between context and mechanisms can be seen at the intersection of fragile ecosystems with a local and traditional knowledge of the environment ('integrated knowledges'), which enables communities to develop and strengthen adaptive capacities and strategies.

However, in other studies, the impact of operating environments was not adequately discussed in terms of how this affected the programme or intervention being investigated. This meant that in terms of the realist approach, it was not always possible to link the context in which programmes were operating to the mechanisms identified. If the authors did not elaborate these issues, but the review team were able to discern these contextual factors, these connections were made, but where this was not possible, the discussion is silent on these aspects. The discussion in Chapters 5 and 6 of this review therefore come with some caveats, as described above.

7. Implications, recommendations and conclusions

This chapter outlines the key implications of the review for policy, practice and further research. Mapping the literature addressing DRR and CBDRM in LMICs is of considerable value. To the best of our knowledge, this is the first review to systematically search, map and analyse CBDRM and the associated socio-economic and livelihoods-related literature. It provides decision makers, policy makers and practitioners with valuable insights and analyses of such programmes and their component parts, and identifies the underlying mechanisms through which outcomes, whether positive or negative, are produced. These insights, if applied, are of potential value to practice, and to informing policy with evidence (Bowen and Zwi, 2005).

7.1 Implications for policy

The studies reviewed highlight the importance of a dynamic and multifaceted approach to managing disaster risk and climate change adaptation if positive outcomes are to be generated. While at the broadest level, the outcomes have been framed as the reduction of the social and economic costs of disasters, we have also identified what we term the ‘foundation outcomes’ upon which these broader outcomes rest. These include the importance of reducing the risk of disaster occurrence, and of reducing vulnerability to such phenomena and their associated negative impacts. In addition, such ‘foundation outcomes’ include enhanced resilience and capacity, at a variety of levels, to adapt, mitigate and respond to disaster events.

We identified also a number of common mechanisms that operated across a variety of contexts to produce positive outcomes. ‘Integrated knowledges’ – a blending of traditional, experiential and scientific insights – was found to be a fundamental mechanism through which positive outcomes resulted from CBDRM and livelihood initiatives. A pair of closely related mechanisms – ‘actioned agency’ and ‘expressed empowerment’ – were also key to many studies in which positive outcomes were observed. This pair reflects individual and collective organisation and action that demonstrate the value of organisation and institutions, so as to enhance options and choice, and ultimately to facilitate change and transform relationships, power dynamics, ideas and/or the availability of resources. A fourth core mechanism was also invariably present in almost all of the studies revealing successful outcomes: the promotion of ‘resilient livelihoods’. As described above, this mechanism operated both in pre- and post-disaster settings and contributed strongly to bolstering resilience, reducing vulnerability, enhancing incomes, outputs and livelihoods, and promoting education and awareness. The ‘resilient livelihoods’ mechanisms interacted also with many of the others identified in this review.

Three further mechanisms were found to generate positive outcomes; these were ‘enhanced safety, security and protection’, ‘technological innovation and communication’ and ‘linking mechanisms’. This last mechanism operated in at least two ways – it facilitated ‘linking up’ different mechanisms to add value through their synergy and interaction, and it promoted ‘linking in’ the community with institutions, actors and resources operating at higher levels. Both forms of linkage contribute to reinforcing and transforming the power and influence that can be mobilised at community level.

One mechanism was associated with negative outcomes, a surprising finding on some levels, but predictable on others. Overambitious ‘gender and social equity promotion’ was found to often leave women and those least powerful worse off, at least in relation to reducing vulnerability and enhancing capacity and resilience. This mechanism operated negatively in the presence of influential conservative structures that perceived a threat or challenge from programmes which enhanced the visibility and voice of women and marginalised groups. Given that the usually male-dominated conservative structures and actors in many of these contexts were powerful, they were able to

undercut the ambition, influence and actions of emergent groups and retain control of the relationships with other institutions and the inflow of additional resources.

The essence of the literature examined reveals that supporting, building and enabling local capacity, knowledge and livelihoods must be at the centre of CBDRM programming. These capacities ('actioned agency' and 'expressed empowerment') will be most effective when linked also to the integration of different forms of knowledge and reinforce the underlying importance of strengthening livelihoods. Interventions that facilitate community-based savings and loans that acknowledge and integrate traditional livelihood strategies and experience, will greatly strengthen and facilitate the diverse forms of community capacity and capability. By recognising and facilitating local agency and empowerment, CBDRM programmes can enhance long-term sustainability and resilience against natural disasters and climate change. Development partners should carefully examine their programmatic approaches so as to avoid discriminatory practices and ensure a fair and equitable distribution of aid and relief, and do so with a high degree of sensitivity to culture and context.

These insights reinforce the importance of long-term engagement with community-sensitive policy makers, services and organisations if initiatives are to promote the desired positive outcomes. Specifically, policy makers should focus on the following:

1. Interventions should be multifaceted, seeking to promote, as relevant, expressed empowerment and actioned agency; resilient livelihoods; enhanced safety, security and protection; technological innovation and communication; and 'integrated knowledges' within programming. This requires textured insights into community functioning and political economy, so that interventions contribute ultimately to doing more good than harm.
2. Local context and settings should be understood so as to design and implement successful, focused interventions.
3. A key focus should be on linking to established community-based savings and loans institutions or facilitating the creation of informal savings and loans associations to allow for the safe storage of savings that are easy to access in times of crisis. It is also important for these formal and informal institutions to have the financial resources to make affordable loans to members to restart livelihoods promptly if a significant shock occurs.
4. Initiatives should incorporate traditional livelihood activities with other enhanced livelihood strategies to diversify income bases while still ensuring that traditional livelihoods are retained and practised as a 'safety net'.
5. Interventions should not be designed in perpetuity, but rather focused on strengthening the resource basis through enhancing resilient livelihoods and building local capacity to ensure that communities can take control of programmes following a staged exit after a consolidated period of investment and support.
6. Building resilient communities should reinforce five core areas of the Sustainable Livelihoods Framework (social, financial, physical, natural, and human). They should also reinforce two more forms of capital: technological and cultural that were also highlighted in our review
7. Existing local and traditional knowledge of the natural environment, climate and extreme weather events, as well as of local responses should be acknowledged, in order to promote long-term sustainability and resilience.
8. Communities at times require external assistance to further advance, reinforce and occasionally accelerate or propel 'actioned agency' and 'expressed empowerment' of their members in order to better access and work with external agencies such as government departments, INGOs and international organisations. Interventions should help 'link in' community-based initiatives with those operating at other levels, such as local government.
9. Efforts should always be made to 'link up' the range of different activities and interventions operating in these complex environments. No mechanism will perform optimally in isolation

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

from others. Each is insufficient in its own right to achieve the positive benefits that are possible when these important mechanisms 'link up' and act in synergy with one another.

Good practices to include:

10. Initiatives should strengthen local capacity in all stages of programming, thus increasing the chance of sustainability after the intervention.
11. DRM/DRR agencies need to be fair, equitable and just in their distribution of aid and in their approach to programming.

7.2 Implications for practice

The implications of these insights for practice are profound. They highlight the centrality of enhanced community engagement and participation if positive outcomes are to be achieved. Practitioners, service providers and development partners must facilitate and build on local agency and capacity at all stages of the programme cycle. Careful identification of partners, astute assessment of the local political economy, and ensuring that planning is sensitive to conflict, culture and context more generally, are crucial.

A comprehensive assessment and analysis of potential markets and their operation and sensitivities are essential for CBDRM interventions that are based on diversifying livelihood strategies. Programmes need to bolster existing autonomous coping capacities and local knowledge so that communities can be actively engaged in, and sustain support for programme activities. Programme planning, implementation and evaluation need to incorporate an understanding of pre-existing social inequities so that agencies do not exacerbate levels of vulnerability but instead, over time, support the organisation and capacity of marginalised social groups to effect change. Earlier work by our team in conflict-affected settings resulted in the Health and Peacebuilding Filter (Zwi et al., 2006); this highlighted important sensitivities to culture, conflict and context, but also to promoting trust, social cohesion, gender equity, social justice and psychosocial support, while demonstrating good governance of the projects in question. The review reinforces and examines many of these issues in more detail in disaster-prone and related settings.

Development partners should recognise and build on cross-cutting approaches that can act as a catalyst for other programme elements and strategies. Facilitating more coherent action by 'linking up' initiatives and 'linking in' community stakeholders with 'higher' levels is likely to increase the prospect of positive impacts.

Specifically, practitioners should consider the following:

1. Ensure that interventions 'link up' and reinforce the effective mechanisms identified, and 'link in' communities with other agencies.
2. Incorporate livelihood diversification activities into CBDRM and livelihood programming and base this on careful planning and a comprehensive market assessment.
3. Investigate and incorporate new technologies which are appropriate to context and can sit alongside traditional methods to improve community resilience. Communities should be encouraged and supported to innovate. The wider availability of cheap and readily accessible new technologies offers opportunities for trialling new approaches to disaster risk management that can be actioned and controlled by community structures.
4. Integrate local and traditional knowledge with external, technical knowledge.
5. Assess whether communities already have high levels of existing agency in order to support and enable it, and support its consolidation as 'expressed empowerment'. Where absent, seek context-sensitive approaches to building organisation and capacity so as to build community confidence and ability to act collectively and interact with other stakeholders.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

6. When promoting or developing local agency, DRM interventions need to understand existing forms of social inequity and rely on local participation in order to develop effective, long-term strategies.
7. DRM programmes should understand and strengthen mechanisms that intersect and underpin the operation of other mechanisms so as to enhance resilience.
8. Facilitate fine-tuned social analysis to help avoid unintended harms which may result from responding only to those who are already more empowered and neglecting those most marginalised; this risks deepening inequalities, vulnerabilities, grievances and distrust.

Good practices to include:

9. Build local capacity and work actively to identify pre-existing systems, capacity and traditions which can be further strengthened and enhanced through community-related interventions.
10. Donors funding interventions should routinely build in adequate resources to ensure that careful evaluation is undertaken and lessons made available to facilitate learning.

7.3 Implications for research

This review has highlighted the growth, over the past decade, of programming and literature on disaster risk reduction and management and climate change adaptation. The English language literature is geographically focused on Asia and Africa, and the quality of published research varies, with a minority documenting outcomes.

The field needs to undertake research, using the insights gained here, into the impact and outcomes of DRM/DRR programmes. As DRM/DRR may incorporate similar strategies to CCA programming, this research supports evidence for successful local community-based CCA programming; this, however, could be more fully examined in the field. Applying the emerging insights around mechanisms in programme design and evaluation will build deeper understanding, further elucidate the concepts presented, and maximise learning.

A number of additional research needs have been identified. These include researching cultural capital as well as the relationship between different kinds of capital found in this review (social, financial, physical, natural, human, technological and cultural). Field-based research should examine social differentiation and inequity and their role and influence in disasters and disaster programming.

This review has also identified a powerful set of studies from which more learning can be derived. The Research Team focused attention on a core segment of this literature – the overlap between ‘classic’ CBDRM programmes and livelihood interventions. While this is a crucial interface, there are also other areas of analysis that could build on the extensive literature search and mapping undertaken. This would be a cost-effective investment, enabling more insights and lessons to be derived from the work undertaken to date.

The team have identified a wide range of additional studies which relate to the mechanisms identified, but these could not be examined fully here given time and resource constraints. Issues identified, such as the value of cultural capital or the usefulness of local community radio, and how these work to reinforce the mechanisms identified, would be of value. Studies on particular types of disasters or on specific countries or regions could deepen understanding of context and assist policy and programming.

Specifically, research effort could focus on the following:

1. Facilitating open access publication and reflection to ensure accessibility of succinct and rigorous analyses from the field.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

2. Explicitly identifying the proposed impact and outcomes of DRM programmes so as to make these more explicit in baseline studies, evaluations, research and other analyses seeking to assess outcomes of DRM/DRR programming.
3. Supporting CBDRM initiatives to investigate the deep inequalities and vulnerabilities in the contexts in which they operate, so as to identify how to support those most vulnerable without increasing risk and inequalities.
4. Field-based analyses drawing on the insights gleaned from this review, and building these into planning and programming to enable careful evaluation.
5. Research and analyses of the more detailed underlying theory underpinning the many effective mechanisms identified here.
6. Understanding the role of CBDRM in building community resilience for long-term protection against slow onset disasters.
7. Research and reflection on the influence of social differentiation (gender, caste, religion, disability, socio-economic status) on the outcomes of DRM programming.
8. Identifying the role of cultural capital in building resilience and interacting with the mechanisms identified.
9. Exploring the interrelationships between the seven capitals identified as important (social, financial, physical, natural, human, technological and cultural).
10. Elucidating the sensitivities related to gender, social inclusion, social justice and human rights in CBDRM programming as well as the need to consider existing power structures when effectively implementing CBDRM programmes.
11. Insights regarding the strategies used by agencies to address social differentiation and any resistance to change they may have encountered – much more careful documentation of why interventions fail.

To conclude, this review adds significantly to the available literature and provides important insights as to whether, how, and in what ways CBDRM initiatives reduce the social and economic cost of disasters.

The literature reviewed here demonstrates many instances in which researchers, NGOs, donors and academia have documented the effectiveness of CBDRM in improving the livelihoods, incomes, capabilities and overall quality of life of communities in many LMICs prone to disasters. However, further work needs to be done to integrate CBDRM into broader policy and planning frameworks and to understand the complex interactions of CBDRM initiatives with other community-based development work.

Among our team's recommendations are making widely available these findings through a variety of means, and engaging actively with the policy and practice community to adapt and apply them to work underway or planned, thus promoting evidence-informed policy.

Disaster risk reduction and management, and climate change adaptation, are likely to be among the important sustainable development targets upon which development and humanitarian activities will be focused in the next couple of decades. Such investments **must** be based upon sound evidence if they are to add value. Knowing what works and why, in what circumstances, and through what mechanisms, is invaluable if such investments are to make a difference by contributing to reducing risks and vulnerabilities, enhancing resilience and capacity, and ultimately reducing the otherwise accelerating social and economic costs of disasters.

We believe that the concepts explored and elaborated here could usefully inform interventions on the ground as well as studies to assess their impact. We welcome comment and critique and opportunities to examine these concepts in the field where they can be more rigorously tested and analysed. The HEARD@UNSW Research Team intends to publish and disseminate this work – it is

7. Implications, recommendations and conclusions

through debate, scrutiny and critique that ideas, concepts, policy and practice will be strengthened and refined.

References

References with an asterisk (*) denote studies included in the realist mapping.

Abarquez I, Zubair M (2004) *Community-based disaster risk management: field practitioners' handbook*. Bangkok: Asian Disaster Preparedness Center.

ADB (1996) *Report and recommendation of the President to the Board of Directors on a proposed loan and technical assistance grant to the Republic of Indonesia for the South Java Flood Control Sector Project*. Jakarta: Asian Development Bank.

ADPC (2003) *CBDRM 11 course materials*. Bangkok: Asian Disaster Preparedness Center.

ADPC (2006) *Community based disaster risk management for local authorities*. Bangkok: Asian Disaster Preparedness Center.

ADPC (2008) *Monitoring and reporting progress on Community-Based Disaster Risk Management in the Philippines*. Bangkok: Asian Disaster Preparedness Center.

Alam E, Collins AE (2010) Cyclone disaster vulnerability and response experiences in coastal Bangladesh. *Disasters* 34(4): 931-954.

Alexander D (1997) The study of natural disasters, 1977-1997: some reflections on a changing field of knowledge. *Disasters* 21(4): 284-304.

Alexander D (2002) *Principles of emergency planning and management*, Hertfordshire, England: Terra.ALNAP (2010) *The role of national governments in international humanitarian response to disasters*. 16 - 18 November 2010, Kuala Lumpur. <http://www.alnap.org/events/26th.aspx>, accessed 31 May 2013.

ALNAP (2012) *The urban challenge: adapting humanitarian response to a changing world*. London: Active Learning Network for Accountability and Performance in Humanitarian Action. <http://www.alnap.org/events/27th.aspx>, accessed 6 July 2012.

Anderson R (2007) *The effective and cost-effective use of intermediate, step-down, hospital at home and other forms of community care as alternative to acute inpatient care: a realist review*. SDO protocol, project ref 10/1012/07. Southampton: National Institute for Health Research, Service Delivery and Organisation Programme.

Atran S (1992) L'ethnoscience aujourd'hui. *Social Science Information* 30: 595-662.

*Awotona A (1997) *Reconstruction after disaster: issues and practices*. Brookfield: Ashgate Publishing Company Ltd.

Bankoff G, Frerks G, Hilhorst D (Eds.) (2007) *Mapping vulnerability: disasters, development and people*, London: Earthscan.

*Berke P, Beatley T (1997) *After the hurricane: linking recovery to sustainable development in the Caribbean*. Baltimore and London: John Hopkins University Press in co-operation with the Center for American Places.

* Bhattacharjee A, Bhatt M, Vaux T, Assumptha L, Kotegoda S, Margaretha A, Reddick M, Twigg J (2010) *A review of DRR work by DEC member agencies in response to the 2004 tsunami*. http://reliefweb.int/sites/reliefweb.int/files/resources/87211CB6AC937487C125774300415CEE-DEC_Feb2010.pdf, accessed 15 May 2013.

Bhattamishra R, Barrett C (2010) Community-based risk management arrangements: a review. *World Development* 38(7): 923-932.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

- Black A (2001) *The identification and analysis of indicators of community strength and outcomes*. Occasional Paper No. 3. Canberra: Department of Family and Community Services.
- Bollin C (2003) *Community-based disaster risk management: experience gained in Central America*. Bonn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).
- Bowen S, Zwi AB (2005) Pathways to evidence informed policy and practice: a framework for action. *PLoS Medicine* 2(7): 100-106 (e166).
- Broekhuijsen M (2009) *Towards a resilient future: experiences with community managed disaster risk reduction and climate change adaptation*. The Hague: Cordaid.
- *Care (2011) *Livelihood security in a changing climate: insights from a program evaluation in Timor Leste*. Canberra: Care Australia.
- Carney D, Drinkwater M, Rusinow T, Neefjes K, Wanmali S, Singh N (1999) *Livelihoods approaches compared*. London: DFID.
- Carter, WN (2008) *Disaster Management: A Disaster Manager's Handbook*. Manila: ADB. <http://www.adb.org/sites/default/files/disaster-management-handbook.pdf>, accessed 5 June 2013.
- Chambers R, Conway G (1992) *Sustainable rural livelihoods: practical concepts for the 21st century*. IDS Discussion Paper 296. Brighton: IDS.
- Chuku CA, Okoye C (2009) Increasing resilience and reducing vulnerability in sub-Saharan African agriculture: strategies for risk coping and management. *African Journal of Agricultural Research* 4(13): 1524-1535.
- Cochrane P (2006) Exploring cultural capital and its importance in sustainable development, *Ecological Economics* 57: 318–330.
- Coppola D (2007) *Introduction to international disaster management*. Burlington, MA: Elsevier.
- Correa E, Ramírez F, Sanahuja H (2011) *Populations at risk of disaster: a resettlement guide*. Washington, DC: World Bank and GFDRR. https://www.gfdr.org/sites/gfdr.org/files/resettlement_guide_150.pdf, accessed 31 May 2013.
- Crisp J, Morris T, Refstie H (2012) Displacement in urban areas: new challenges, new partnerships. *Disasters* 36(Suppl. 1): S23–S42.
- Cuny FC (1983) *Disasters and development*. New York: Oxford University Press.
- Darcy J, Hofmann C (2003) 'According to need? Needs assessment and decision-making in the humanitarian sector', *Humanitarian Policy Group Report No. 15*, London: Overseas Development Institute.
- Davies M, Béné C, Arnall A, Newsham A (2011) Promoting climate-resilient livelihoods through adaptive social protection: the case of the agricultural sector in South Asia. Paper presented at: *Social Protection for Social Justice*, Brighton, 13-15 April.
- *Dekens J (2007) *The lost messengers? Local knowledge on disaster preparedness in Chitral District, Pakistan*. Kathmandu: International Centre for Integrated Mountain Development (ICIMOD).
- Devereux S, Sabates-Wheeler R (2006) *Transformative social protection*. IDS Working Paper. Brighton: Institute of Development Studies.
- DfID (2001) Sustainable livelihoods guidance sheets. London: DfID. http://www.efls.ca/webresources/DFID_Sustainable_livelihoods_guidance_sheet.pdf, accessed 4 June 2013.

- *Dodman D, Mitlin D, Co J (2010) Victims to victors, disasters to opportunities: community-driven responses to climate change in the Philippines. *International Development Planning Review* 32(1): 1-26.
- *Doocy S, Gabriel M, Collins S, Robinson C, Stevenson P (2006) Implementing cash for work programmes in post-tsunami Aceh: experiences and lessons learned. *Disasters* 30(3): 277-296.
- Dore M (2002) The importance of measuring the social costs of disasters at a time of climate change. *Australian Journal of Emergency Management, Spring 2002*: 46-51.
- Enarson E (1998) Through women's eyes: a gendered research agenda for disaster social science. *Disasters* 22(2): 157-173.
- Enarson E (2000) *Gender and natural disasters*. Geneva: Recovery and Reconstruction Department, International Labour Organization. http://www.ilo.int/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_crisis/documents/publication/wcms_116391.pdf, accessed 15 March 2013.
- FAO (2011) *Resilient livelihoods: disaster risk reduction for food and nutrition security framework programme*. Rome: Food and Agriculture Organization of the United Nations.
- Gero A, Meheux K, Dominey-Howes D (2010) *Disaster risk reduction and climate change adaptation in the Pacific: the challenge of integration*. ATRC-NHRL Miscellaneous Report 4. Sydney: University of New South Wales and the Australian Tsunami Research Centre, Natural Hazards Research Laboratory.
- *Giri S, Malakar Y (2011) *Using mobile phones to reduce the adversities of climate change in rural Nepal*. Manchester: Centre for Development Informatics (CDI), University of Manchester. http://www.niccd.org/sites/default/files/NICCD_Disasters_Case_Study_MobileNepal.pdf, accessed 3 June 2013.
- Government of the Socialist Republic of Vietnam (2007) *The national strategy for natural disaster prevention, response and mitigation to 2020*. Hanoi: Government of the Socialist Republic of Vietnam.
- Government of Samoa (2011) *National action plan for disaster risk management 2011-2016*. Apia: Government of Samoa.
- Huq S, Reid H, Kovats S, Satterthwaite D (2007) Editorial: reducing risks to cities from disasters and climate change. *Environment and Urbanization* 19(1): 3-15.
- ICSU (2002) *Science and traditional knowledge*. Paris: International Council for Science.
- IFRC (2007) *World disasters report: focus on discrimination*. London: IFRC. <http://www.ifrc.org/PageFiles/89755/2007/WDR2007-English.pdf>, accessed 4 June 2013.
- IFRC (2010) *Empowering communities to prepare for cyclones*. Dhaka: International Federation of Red Cross and Red Crescent Societies.
- INDRDR (1994) *Yokohama strategy for a safer world: guidelines for natural disaster prevention, preparedness and mitigation and its plan of action*. Geneva: International Decade for Natural Disaster Reduction.
- IPCC (2012) *Managing the risks of extreme events and disasters to advance climate change adaptation: a special report of Working Groups I and II of the Intergovernmental Panel on Climate Change*. Cambridge and New York: Cambridge University Press.
- *Islam A, Bala S, Hussain M, Hossain, M, Rahman M (2011) Performance of coastal structures during cyclone Sidr. *Natural Hazards Review* 12(3): 111-116.

Jabeen H, Johnson C, Allen A (2010) Built-in resilience: learning from grassroots coping strategies for climate variability. *Environment and Urbanization* 22(2): 415-431.

Jha AK, Barenstein JD, Phelps PM, Pittet D, Sena S (2010) *Safer homes, stronger communities: a handbook for reconstructing after natural disasters*. Washington, DC: World Bank and GFDRR. <https://www.gfdr.org/sites/gfdr.org/files/SaferHomesStrongerCommunitites.pdf>, accessed 31 May 2013.

Kingsbury D, McKay J, Hunt J, McGillivray M, Clarke M (2008) *International development: issues and challenges*. New York: Palgrave MacMillan.

*Kotowicz DM (2010) *Building resilience to coastal disasters: an assessment of social resilience during recovery after the Indian Ocean tsunami in Thailand*. PhD thesis. Kingstown, RI: University of Rhode Island.

Lahiri-Dutt K, Samanta G (2007) Like the drifting grains of sand: vulnerability, security and adjustment by communities in the charlands of the Damodar River, India. *Journal of South Asian Studies* 30(2): 327-350.

La Trobe S, Davis I (2005) *Mainstreaming disaster risk reduction: a tool for development organisations*, Teddington, Middlesex: Tearfund.

*Leone F, Gaillard JC (1999) Analysis of the institutional and social responses to the eruption and the lahars of Mount Pinatubo volcano from 1991 to 1998 (Central Luzon, Philippines). *GeoJournal* 49(2): 223-238.

*Luna E (2001) Disaster mitigation and preparedness: the case of NGOs in the Philippines. *Disasters* 25(3): 216-226.

McKenzie E, Prasad B, Kaloumaira A (2005) *Economic impact of natural disasters on development in the pacific. Vol. 1: Research Report*. Canberra: AusAID.

*Matsimbe Z (2003) *The role of local institutions in reducing vulnerability to recurrent natural disasters and in sustainable livelihoods development: Central Mozambique*. Cape Town: Disaster Mitigation for Sustainable Livelihoods Programme (DiMP), University of Cape Town.

Mays N, Pope C, Popay J (2005) 'Systematically reviewing qualitative and quantitative evidence to inform management and policy-making in the health field'. *Journal of Health Services Research & Policy* 10(1): 6-20.

Moench M, Dixit A (eds) (2004) *Adaptive capacity and livelihood resilience: adaptive strategies for responding to floods and droughts in South Asia*. Nepal: Institute for Social and Environmental Transition (ISET).

*Mulligan M, Nadarajah Y (2012) Rebuilding community in the wake of disaster: lessons from the recovery from the 2004 tsunami in Sri Lanka and India. *Community Development Journal* 47(3): 353-368.

Nathan F (2008) Risk perception, risk management and vulnerability to landslides in the hill slopes in the city of La Paz, Bolivia. A preliminary statement. *Disasters*, 32(3): 337-357.

Neuman L (1997) *Social research methods: qualitative and quantitative approaches*. 3rd ed. Boston: Allyn and Bacon.

Nussbaum MC (2011) *Creating capabilities*. Cambridge, MA: Harvard University Press.

Oliver-Smith A (2007) 'Theorizing vulnerability in a globalized world: a political ecological perspective', in Bankoff G, Frerks G, Hilhorst D (Eds.) (2007) *Mapping vulnerability: disasters, development and people*, London: Earthscan.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

- *Oxfam (2009) *Collaboration in crises: lessons in community participation from the Oxfam International Tsunami Research Program*. Oxford: Oxfam International.
- Paul BK (2009) Why relatively fewer people died? The case of Bangladesh's Cyclone Sidr. *Natural Hazards* 50(1): 289-304.
- Pawson R (2001) *Evidence based policy II: the promise of 'realist synthesis'*. Working Paper 4. ESRC UK Centre for Evidence Based Policy and Practice.
<http://www.kcl.ac.uk/sspp/departments/politiceconomy/research/cep/pubs/papers/assets/wp4.pdf>, accessed 31 May 2013.
- Pawson R, Tilley N (1997) *Realistic evaluation*. London: Sage.
- Pawson R, Greenhalgh T, Harvey G, Walshe K (2005) Realist review: a new method of systematic review designed for complex policy interventions. *Journal of Health Services Research Policy* 10(Suppl. 1): 21-34.
- *Pelham L, Clay E, Braunholz T (2011) *Natural disasters: what is the role for social safety nets?* Washington, DC: World Bank.
- Pelling M (2011) *Adaptation to Climate Change: from resilience to transformation*. New York: Taylor & Francis.
- Pittaway E, Bartolomei L, Reese S (2007) Gendered dimensions of the 2004 tsunami and a potential social work response in post-disaster situations. *International Social Work* 50(3): 307–319.
- *Practical Action (2010a) *Community preparedness in Bangladesh: learning from Gaibandha, Bogra, Sirajganj districts following the floods of 2007*. Dhaka: Practical Action.
- Practical Action (2010b) *Sustainable and diverse livelihoods: building disaster resilient communities*. Dhaka: Practical Action.
- *Rempel H (2010) The challenge of spending tsunami assistance well. *Journal of the Asia Pacific Economy* 15(2): 106-127.
- Republic of the Maldives (2009) *Strategic national action plan (SNAP) for disaster risk reduction and climate change adaptation 2010–2020*. Malé: Republic of the Maldives.
- Republic of the Philippines (2009) *Climate Change Act of 2009*. Manila: Government of the Philippines.
- Robert E, Riddle V, Marchal B, Fournier P (2012) A realist review of user fee exemption policies for health services in Africa. *BMJ Open* 2(1): 1-7.
- *Rossing T, Rubin O, Brisson I (2010) Building short-term coping capacity and longer-term resilience through asset-based adaptation (directions in development). In: Verner D (ed.) *Reducing poverty, protecting livelihoods, and building assets in a changing climate: social implications of climate change for Latin America and the Caribbean*. Washington, DC: World Bank, chapter 10.
<http://hdl.handle.net/10986/2473>, accessed 15 May 2013.
- Roy N, Thakkar P, Shah H (2011) Developing-world disaster research: present evidence and future priorities. *Disaster Medicine and Public Health Preparedness* 5(2): 112-116.
- *Sato J (2010) Matching goods and people: aid and human security after the 2004 tsunami. *Development in Practice* 20(1): 70-84.
- *Schutte S, Kreuzmann H (2011) Linking relief and development in Pakistan-administered Kashmir. *Mountain Research and Development* 31(1): 5-15.
- *Selvaraju R, Subbiah A, Baas S, Juergens I (2006) *Livelihood adaptation to climate variability and change in drought-prone areas of Bangladesh: developing institutions and options*. Rome: Food and Agriculture Organization of the United Nations (FAO).
- Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?*

Siegel P, Gatsinzi J, Kettlewell A (2011) *Adaptive Social Protection in Rwanda: a No Regrets approach to Increased resilience in a territorial planning context*. Paper presented at International Conference: "Social Protection for Social Justice", Brighton, UK: Institute of Development Studies. Thomas J, Brunton J, Graziosi S (2010) *EPPI-Reviewer 4.0: software for research synthesis*. EPPI-Centre Software. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

*Thorburn C (2009) Livelihood recovery in the wake of the tsunami in Aceh. *Bulletin of Indonesian Economic Studies* 45(1): 85-105.

Tierney K (2007) From the margins to the mainstream? Disaster research at the crossroads. *Annual Review of Sociology* 33: 503-525.

*Tougiani A, Guero C, Rinaudo T (2009) Community mobilisation for improved livelihoods through tree crop management in Niger. *GeoJournal* 74(5): 377-389.

Twigg J (2007) *Characteristics of a disaster-resilient community: a guidance note*. London: DfID.

Ullah B, Farida S, Van Den Dende P (eds) (2009) *Good practices for community resilience*. Dhaka: Practical Action.

UN (2005) *Review of the Yokohama strategy and plan of action for a safer world*. Kobe: United Nations.

UN (2011) *Resolution adopted by the General Assembly, 65/157: international strategy for disaster reduction*. New York: United Nations.

UNDP (2009) *Supporting capacity development: the UNDP approach*. New York: UNDP.

UNFCCC (2007) *Climate change: impacts, vulnerabilities and adaptation in developing countries*. Bonn: United Nations Framework Convention on Climate Change.

UNISDR (2005) *Hyogo framework for action 2005-2015: building the resilience of nations and communities to disasters*. Geneva: United Nations International Strategy for Disaster Risk Reduction.

UNISDR (2006) *A guide to community-based disaster risk reduction in Central Asia*. United Nations International Strategy for Disaster Risk Reduction: Geneva.

UNISDR (2007) *A summary report of the first session of the global platform for disaster risk*. Geneva: United Nations International Strategy for Disaster Risk Reduction.

UNISDR (2009a) *Adaptation to climate change by reducing disaster risks: country practices and lessons*. Briefing Note 02. Geneva: United Nations International Strategy for Disaster Risk Reduction.

UNISDR (2009b) *Terminology on disaster risk reduction*. Geneva: United Nations International Strategy for Disaster Risk Reduction.

UNISDR (2010) *Local governments and disaster risk reduction: good practices and lessons learned*. Geneva: United Nations International Strategy for Disaster Risk Reduction.

UNISDR (2010-2011) *Hyogo framework for action 2005-2015: building the resilience of nations: mid-term review*. New York: United Nations International Strategy for Disaster Risk Reduction.

UNISDR (2011) *Global assessment report on disaster risk reduction: revealing risk, redefining development*. New York: United Nations International Strategy for Disaster Risk Reduction.

UNISDR (2012) *A practical guide to national HFA monitoring and review through a multi-stakeholder engagement process 2011-2013*. New York: United Nations International Strategy for Disaster Risk Reduction.

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

- *USAID (2011) '*SOMRIDDHI*': '*SIDR*'-affected community led action for livelihood restoration and disaster risk reduction: final evaluation report. Washington, DC: United States Agency for International Development.
- Vanholder R, Borniche D (2011) When the earth trembles in the Americas: the experience of Haiti and Chile 2010. *Nephron Clinical Practice* 117(3): c184-c197.
- Warren D (1992) *Indigenous knowledge, biodiversity conservation and development*. Ames, IA: Center for Indigenous Knowledge for Agriculture and Rural Development.
- Wisner B, Blaikie P, Cannon T, Davis, I (2007) (2nd Ed.) *At risk: natural hazards, people's vulnerability and disasters*. New York: Routledge.
- World Bank (2005) *Natural disaster risk management in the Philippines: enhancing poverty alleviation through disaster reduction*. Washington, DC: World Bank.
- World Bank (2010) *Natural hazards, unnatural disasters: the economics of effective prevention*. Washington, DC: World Bank.
- World Bank (2012) *World development indicators*. Washington, DC: World Bank.
- Woolcock M (2000) Social Capital in theory and practice: Where do we stand? *Working paper of the Advanced Institute of Vulnerability to Global Environmental Change*, Washington, D.C.: *Advanced Institute of Vulnerability to Global Environmental Change* STARTIIASA.
- Yardi S (2010) A theory of technical capital. Paper presented at: *TMSP Workshop*, Georgia, 11-12 February.
- Yodmani S (2001) Disaster risk management and vulnerability reduction: protecting the poor. Paper presented at: *Asia and Pacific Forum on Poverty*, Bangkok, 5-9 February.
- *Younus A (2010) *Community-based autonomous adaptation and vulnerability to extreme floods in Bangladesh: processes, assessment and failure effects*. PhD thesis. Adelaide: University of Adelaide.
- *Zaidi S, Kamal A, Baig-Ansari N (2010) Targeting vulnerability after the 2005 earthquake: Pakistan's livelihood support cash grants programme. *Disasters* 34(2): 380-401.
- Zent S (2012) A genealogy of scientific representations of indigenous knowledge. In: Heckler S (ed.) *Landscape, process and power: re-evaluating traditional environmental knowledge*. New York: Berghahn.
- Zwi AB, Bunde-Birouste A, Grove N, Waller E, Ritchie J (2006) *The health and peace building filter and The health and peace building filter: companion manual*. Sydney: School of Public Health and Community Medicine, University of New South Wales. Available from the authors.
- Zwi AB, Spurway K, Marincowitz R, Ranmuthugala G, Thompson L, Hobday K (2013a) *Do community based disaster risk management (CBDRM) initiatives reduce the social and economic cost of disasters?* Protocol, registered with the EPPI-Centre, Social Science Research Unit, Institute of Education, University of London. Available from <http://eppi.ioe.ac.uk/cms/LinkClick.aspx?fileticket=9jSlvCXmJA4%3d&tabid=3174>
- Zwi AB, Spurway K, Marincowitz R, Ranmuthugala G, Thompson L, Hobday K (2013b) *Do community based disaster risk management (CBDRM) initiatives reduce the social and economic cost of disasters?* Mapping report, in preparation.

Appendices

Appendix 1: Search sources

Electronic databases

3ie database of impact evaluations (CA)
 African Journals Online
 Asia Journals Online
 ASSIA
 BHI
 CAB Abstracts
 Campbell Collaboration database
 EBM Reviews: Cochrane Database of Systematic Reviews
 Econlit
 EPPI-Centre Systematic reviews database
 Geobase
 Global Health
 IBSS: International Bibliography of the Social Sciences
 Informit Humanities and Social Sciences and Health Collection
 IPSA (International Political Science Abstract)
 Johanna Briggs systematic reviews
 Latin American Journals Online
 Medline
 PAIS
 Proquest Dissertations and Abstracts (CA)
 PsycINFO
 Scopus
 Sociological Abstracts
 Web of Science

International organisation databases

African Development Bank
 Asian Development Bank
 British Library for Development Studies
 DFID Datasets – R4D (Research for Development)
 Eldis
 FAO databases

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

HRH Global Resource Center

Prevention Web (lists documents from a wide range of DRR/DRM organisations)

Secretariat of the Pacific Community

UN databases (incl. UNISDR, UNDP, UNFCCC, UNEP, IOM)

World Bank (incl. GFDRR)

Websites

ACCRA – African Climate Change Resilience Alliance

Action Aid

Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP)

Asian Disaster Preparedness Center (ADPC)

AusAID

Care

Caritas

CECI – Centre for International Studies and Cooperation

CENESTA – Centre for Sustainable Development, Iran

CIDA

Concern Worldwide

Cordaid

DANIDA

DFID

EU

FAO/CHA

GIZ (previously GTZ)

Global Facility for Disaster Reduction and Recovery

HelpAge International

ICHARM – The International Centre for Water Hazard and Risk Management

ICIMOD – The International Centre for Integrated Mountain Development

IFAD

IFRC

IIED – The International Institute for Environment and Development

International Alert

International Committee of the Red Cross

International Development Research Centre

IOM

IRIN

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

ISET – Institute for Social and Environmental Transition

Islamic Relief

IUCN – International Union for Conservation of Nature

JICA

MercyCorps

NORAD

OECD

Overseas Development Institute

OXFAM

Pacific Disaster Net

Plan

Practical Action

ProVention Consortium

Public Policy Pointers

Relief Web

Save the Children

SIDA

SOPAC

Tearfund

UNCRD

UNDP

UNEP

UNESCAP

UNFPA

UNHABITAT

UNICEF

UNISDR

United Nations

UNU

USAID

WHO

WMO

World Vision

Journals hand searched

World Bank Economic Review

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Community Development Journal
Journal of Disaster Risk Studies (South Africa)

Appendix 2: Keyword search terms

Country list description

The country list below was derived from the World Bank list of LMICs as recorded in the 2011 World Development Indicators report, accessed 14 December 2011: www.data.worldbank.org/ and click on Data Catalog. The list comprises of countries that were classified as: low-income, lower-middle-income and upper-middle-income.

1. First level of search terms: country classification, region and LMIC country name
 - a. (su(Developing Countr* OR "less developed countr*" OR "under developed countr*" OR "underdeveloped countr*" OR "under-developed countr*" OR "transitional countr*" OR "third world" OR "fragile state*" LMIC* OR LAMI*) OR
 - b. all(Africa OR Sahara OR Sahel OR Maghreb OR Asia OR Caribbean OR "West Indies" OR "South America" OR "Latin America" OR "Central America" OR "Middle East" OR Pacific) OR
 - c. all(Afghanistan OR Albania OR Algeria OR Angola OR Antigua OR Barbuda OR Argentina OR Armenia OR Azerbaijan OR Bangladesh OR Benin OR Belarus OR Belize OR Bhutan OR Bolivia OR Bosnia OR Herzegovina OR Botswana OR Brazil OR Bulgaria OR "Burkina Faso" OR Burundi OR Cambodia OR Cameroon OR "Cape Verde" OR "Central African Republic" OR Chad OR Chile OR China OR Colombia OR Comoros OR Mayotte OR Congo OR Zaire OR "Costa Rica" OR "Cote d'Ivoire" OR "Ivory Coast" OR Cuba OR Djibouti OR Somaliland OR Dominica OR "Dominican Republic" OR "East Timor" OR "Timor Leste" OR Ecuador OR Egypt OR "El Salvador" OR Eritrea OR Ethiopia OR Fiji OR Gabon OR "Gabonese Republic" OR Gambia OR Gaza OR Georgia OR "Georgian Republic" OR Ghana OR Grenada OR Guatemala OR Guinea OR Guiana OR Guyana OR Haiti OR Honduras OR India OR Maldives OR Indonesia OR Iran OR Iraq OR Jamaica OR Jordan OR Kazakhstan OR Kenya OR Kiribati OR "Democratic Republic of Korea" OR "North Korea" OR Kosovo OR Kyrgyzstan OR "Kyrgyz Republic" OR "Lao PDR" OR Laos OR Latvia OR Lebanon OR Lesotho OR Liberia OR Libya OR Lithuania OR Macedonia OR Madagascar OR Malaysia OR Malawi OR Mali OR "Marshall Islands" OR Mauritania OR Mauritius OR Mexico OR Micronesia OR Moldova OR Mongolia OR Montenegro OR Morocco OR Mozambique OR Myanmar OR Burma OR Namibia OR Nepal OR "Netherlands Antilles" OR Nicaragua OR Niger OR Nigeria OR Pakistan OR Palau OR Palestine OR Panama OR Paraguay OR Peru OR Philippines OR Romania OR Russia OR Russian OR Rwanda OR "Saint Kitts" OR "St Kitts" OR Nevis OR "Saint Lucia" OR "St Lucia" OR "Saint Vincent" OR "St Vincent" OR Grenadines OR Samoa OR "Samoan Islands" OR "Sao Tome" OR "São Tomé and Príncipe" OR Senegal OR Serbia OR Montenegro OR Seychelles OR "Sierra Leone" OR "Sri Lanka" OR "Solomon Islands" OR Somalia OR Sudan OR "South Sudan" OR Suriname OR Swaziland OR Syria OR Tajikistan OR Tanzania OR Thailand OR Togo OR Tonga OR Tunisia OR Turkey OR Turkmenistan OR Tuvalu OR Uganda OR Ukraine OR Uruguay OR USSR OR "Soviet Union" OR Uzbekistan OR Vanuatu OR Venezuela OR Vietnam OR Viet Nam OR "West Bank" OR Yemen OR Yugoslavia OR Zambia OR Zimbabwe)
2. Second level of search terms: disaster classification and disaster type
 - a. "natural disaster*" OR "environmental emergenc*" OR "natural hazard" OR avalanche* OR earthquake* OR fire* OR flood* OR landslide* OR tsunami* OR volcan* OR catastroph* OR cyclon* OR "tidal wave*" OR tsunami* OR "coastal hazard*" OR lahar OR blizzard OR hailstorm OR hail OR storm OR "heat wave" OR heatwave OR landslide OR hurricane OR typhoon OR tornado* OR wildfire OR "wild fire" OR "wildland fire" OR "bush fire" OR bushfire OR "extreme weather event"
3. Third level of search terms: Key "CBDRM/ DRR/ DRM related terms

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

- a. CBDRM OR “community-based disaster risk management” OR “community based disaster risk management” OR “community based disaster risk reduction” OR “community-based disaster risk reduction” OR “disaster risk reduction” OR “risk reduction” OR “disaster risk management” OR “disaster preparedness” OR “disaster recovery” OR “disaster relief” OR “disaster mitigation” OR “disaster management” OR “disaster prevention” OR “disaster preparedness” OR “disaster planning” OR “disaster response” OR “climate change adaptation” OR “Hyogo Framework for Action” OR vulnerabilit* OR resilien* OR “risk planning” OR “risk analysis” OR “risk assessment” OR “risk management” OR “disaster resilience” OR “disaster loss*” OR “economic aspect*” OR “social risk management” OR “social vulnerability” OR capacity OR “coping capacity” OR “capacity development” OR “capacity building” OR “social protection” OR “indigenous coping” OR “traditional coping strateg*” OR “social capital” OR “indigenous knowledge” OR “local knowledge” OR “traditional knowledge” OR empowerment OR “public participation” OR “community planning” OR
- b. “poverty reduction” OR microinsurance OR “micro-insurance” OR “safety net*” OR microfinance OR externalities OR “multiplier effect*” OR “opportunity cost” OR “cost benefit analysis” OR livelihood OR
- c. “local government” OR “local authority” OR “local leader*” OR municipalit* OR “village leader*” OR “local council” OR “town* council” OR “district council”

Appendix 3: In-depth mapping and review tool

Third Draft: Realist Mapping Tool

The realist mapping will be applied to all 'CBDRM classic programmes and interventions' and 'Socio-economic support/resilience' that have explicit outcomes as identified by the previous mapping. Categories are marked either {EPPI} or {NVIVO} to indicate the software being used to analyse that category.

| Category | Output | |
|---|--|---|
| Author | | |
| Date of report/publication | | |
| Type of document [select one only] {EPPI} | <ul style="list-style-type: none"> - Journal article - NGO report - World Bank report - UN report - Donor report | <ul style="list-style-type: none"> - Independent research report - Master or doctoral thesis - Government report - Other [specify]: |
| Type of study [select one or more] {EPPI} | <ol style="list-style-type: none"> 1. Comprehensive reviews 2. Secondary data analysis 3. Secondary data presentation 4. Descriptive studies (description of DRM/ DRR/ CBDRM implementation/intervention but no explicit outcomes) 5. Theory-practice studies (e.g. a case study used to illustrate DRR/DRM/CBDRM concepts) 6. Primary data collection without outcome evaluation which may include interviews, surveys, case studies, content analyses, that examine participants' behaviour, beliefs, perceptions, cognitive or affective processes concerning the programme/ intervention/ practices studied) 7. Outcome evaluations (or Effectiveness Study or Intervention Study) (explicit outcomes) <p>Comment:</p> <p>.....</p> | |
| Focus of study [select one only] {EPPI} | <ul style="list-style-type: none"> - Programme or intervention - Non-programme or intervention (e.g. Community perceptions, vulnerabilities etc. without examining a specific programme or intervention) <p>Comment:</p> | |
| Study Methodology [select one or more] {EPPI} | <p>Qualitative:</p> <ul style="list-style-type: none"> - Case study - Grounded theory - Phenomenology | |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Category | Output |
|--|--|
| | <ul style="list-style-type: none"> - Historical - Ethnographic <p>Quantitative:</p> <ul style="list-style-type: none"> - Cross sectional - Longitudinal - Case control - Quasi experimental - Experimental <p>Other:</p> <ul style="list-style-type: none"> - Mixed - Unclear - N/A <p>Comment:</p> <p>.....</p> |
| Level of analysis in the article relating to the research method and information relevant to CBDRM [select one only] {EPPI} | <ul style="list-style-type: none"> - Thick analysis⁸ - Medium analysis - Thin analysis <p>Comment:</p> <p>.....</p> |
| Period of the DRR/DRM/CBDRM programme being investigated [select one or more] {EPPI} | <ul style="list-style-type: none"> - 1985-1989 - 1990-1994 - 1995-1999 - 2000-2004 - 2005-2009 - 2010 and after |
| Region of DRR/DRM/CBDRM intervention being investigated {EPPI} | <ul style="list-style-type: none"> - Africa - East Asia and Pacific - Europe and Central Asia - Latin America and Caribbean - Middle East and North Africa - South Asia |
| Country of intervention being investigated {EPPI} | Specify country name: |
| Context [circle response] {NVIVO} | <ul style="list-style-type: none"> - What is the setting of the programme/intervention? Urban/Rural/Both/Unspecified <p>Comment:</p> |

⁸ 'A rich, detailed description of specifics (as opposed to summary, standardization, generalization, or variables) ... It captures the sense of what occurred and the drama of events, thereby permitting multiple interpretations.' (Neuman, 1997: 347).

| Category | Output |
|---|---|
| | <p>..... - Is the area affected by conflict? Yes/No/To some degree/Unclear Comment:</p> <p>..... - Is there a degree of community organization? Yes/No/ To some degree/Unclear Comment: </p> <p>..... - Is there a supportive local government? Yes/No/To some degree/Unclear Comment: </p> <p>..... Other [specify]: </p> |
| Type(s) of 'disaster' addressed [select one or more] {EPPi} | <ul style="list-style-type: none"> - Earthquake - Flood - Fire Related Hazard - Tsunami - Meteorological Storm (cyclones, hurricanes and typhoons) - Landslides - Volcanic Hazards - Other Geological Disasters (not specified above) - Other Hydro- Meteorological Disasters (not specified above) - Climate Related Hazards - Various/Multiple - Other [specify]: |
| Type of population(s) as key focus of investigation | <ul style="list-style-type: none"> - Community members - Local authorities - Service providers/services |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Category | Output |
|--|--|
| [select one or more] {EPPI} | <ul style="list-style-type: none"> - National authorities - Civil Society Organisations - Faith based Organisations (FBO) - Local private enterprise - International Non-Governmental Organisations (INGO) - United Nations agencies - International bilateral or multilateral donor - Multinationals - Other [specify]: |
| Population sub-groups of interest [select one or more] {EPPI} | <ul style="list-style-type: none"> - Sex disaggregated data <ul style="list-style-type: none"> o Male o Female o Male and Female o Not specified - Age <ul style="list-style-type: none"> o Children and adolescents <18 y o Older persons - Disability - Small scale or subsistence farmers - At risk rural communities - Other Vulnerable group [specify]: - None of the above |
| Gendered approach [select one only] {NVIVO} | <ul style="list-style-type: none"> - Does this study provide gendered insights? <p>Yes/No/To some degree/Unspecified</p> <p>Comment:</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| Element(s) of CBDRM classic programme/ intervention [select one or more] {EPPI} | <ul style="list-style-type: none"> - Community capacity building - Community early warning systems - Risk communication, community awareness and disaster education programmes - Pre disaster preparedness or preparation programmes - Long-term disaster mitigation programmes - Disaster response programmes - Disaster recovery programmes - Socio-economic support/resilience - All of the above - Other [specify]: |
| Forms of capital as primary focus of intervention or study addresses [select one or more] | <ul style="list-style-type: none"> - Physical Capital - Financial Capital - Natural Capital - Human Capital |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Category | Output | | |
|---|--|--------------------|--------------------|
| {EPPI} | <ul style="list-style-type: none"> - Social Capital - Unspecified - Other [specify]: | | |
| Overall objectives [list programme/intervention objectives] {EPPI} | <ul style="list-style-type: none"> - What are the overall objectives of the programme/intervention? Comment: - Not a programme/intervention - Unclear | | |
| Assessing outcomes of programme/intervention [specify type] {NVIVO} | Measurement tools | Process indicators | Outcome indicators |
| Post intervention outcomes [specify types of positive and negative outcomes] {NVIVO} | Positive outcomes | | Negative outcomes |
| Anticipated programme impact {EPPI} | <p>Has the anticipated programme impact occurred?</p> <p>Yes/No/To some degree/Mixed impact</p> <p>Comment:</p> <p>.....</p> | | |
| What was the anticipated impact of DRM/DRR programme on target community [list impact types] {NVIVO} | Social | | Economic |
| Reasons for programme impact failure {NVIVO} | <p>What reasons are given for the failure of the anticipated programme/intervention impact?</p> <p>Comment:</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> | | |
| Trigger mechanisms {EPPI} | <p>Do the mechanisms trigger, initiate or facilitate positive outcomes?</p> <p>Yes/No/To some degree/Unspecified</p> <p>Comment:</p> <p>.....</p> | | |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Category | Output |
|---|---|
| | <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>Trigger mechanisms considered to be important [select one or more] {NVIVO}</p> | <ul style="list-style-type: none"> - <u>Integrated local knowledge and experience</u>: with external expertise to produce enhanced/shared understanding of risks, vulnerabilities and actionable responses - <u>Expressed Empowerment</u>: communities able to advocate, mobilise and control extra resources and shape new ideas, and transform relationships with government - <u>Actioned Agency</u>: demonstrable agency which reflects community-based engagement and results in choices or changes to local institutions and structures and through which knowledge and resources may be channelled, transmitted or mobilised to empower the community - <u>Resilient livelihoods</u>: establishing, enhancing or diversifying livelihoods to increase output, incomes or provide a safety net (either monetary (savings) or food stocks (e.g. community food grains due to excess food grown) with the aim to build resilience and reduce the negative effects when a natural disaster strikes - <u>Linking mechanisms</u>: “link up” different mechanisms, activating and triggering them and “link in” community-based organisations with other stakeholders, including different levels of government; they enhance community coping capacity, resilience and sustainable development. - Other trigger mechanisms [specify]:..... |
| <p>Retardant mechanisms {NVIVO}</p> | <p>Do any mechanisms impede, constrain or obstruct positive programme outcomes?</p> <p>Yes/No/To some degree/Unspecified</p> <ul style="list-style-type: none"> - If ‘Yes’ or ‘To some degree’, what are the retardant mechanisms identified? Comment: |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Category | Output |
|---|---|
| | <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>Programme Sustainability {NVIVO}</p> | <ul style="list-style-type: none"> - Does the study highlight the need for sustainability? Yes/No/To some degree/Unclear - How does the study define sustainability? Comment: - How does the study measure sustainability? Comment: - Are there any positive or negative changes shown in the study? Yes/No/To some degree - Other issues [specify]: |
| <p>Sustainability criteria (The more selected the higher the chance of sustainability) [select one or more] {NVIVO}</p> | <p>What criteria does the study use to measure programme/ intervention sustainability? Comment:</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>Scale of programme {EPPI}</p> | <ul style="list-style-type: none"> - Pilot programme or intervention - Small (localised project in one community) - Small/Medium (localised project in multiple communities in one district or subregion) - Medium/Large (project in multiple districts or subregions) - Large (large scale project) - Unclear - Not a programme or intervention |
| <p>Scalability of programme</p> | <ul style="list-style-type: none"> - Has the programme been scaled up? |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| Category | Output |
|---|---|
| {EPPi} | Yes/No/To some degree/Unclear - Was the programme successful once scaled up? Yes/No/To some degree/Unclear Comment: |
| Issues to follow up / examine more closely {NVIVO} | |
| Other comments, insights and emerging themes {NVIVO} | |

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Appendix 4: Rigour assessment tool

| General (to ensure adequacy of previously selected studies) | |
|--|--|
| 1. Is the study relevant to CBDRM & Socio-Economic? | 1. (Yes) / (No) |
| 2. Was the context or setting adequately described? | 2. (Yes) / (No) |
| 3. Are outcomes specified? | 3. (Yes) / (No) |
| Quality appraisal of Qualitative study ⁹ | |
| 1. Is there a clearly focused question or set of questions? | 1. (Yes) / (No) / (Unclear) / (N/A) |
| 2. Are study methods appropriate to answering that/those questions? | 2. (Yes) / (No) / (Unclear) / (N/A) |
| 3. Are sources and forms of data appropriate? | 3. (Yes) / (No) / (Unclear) / (N/A) |
| 4. Is data collection appropriate? | 4. (Yes) / (No) / (Unclear) / (N/A) |
| 5. Is there rigorous data analysis? | 5. (Yes) / (No) / (Unclear) / (N/A) |
| 6. Are findings clearly stated and described in sufficient detail? | 6. (Yes) / (No) / (Unclear) / (N/A) |
| 7. Are alternative explanations considered where appropriate? | 7. (Yes) / (No) / (Unclear) / (N/A) |
| 8. Are the interpretation and conclusions justified by the data? | 8. (Yes) / (No) / (Unclear) / (N/A) |
| 9. Are study limitations described? | 9. (Yes) / (No) / (Unclear) / (N/A) |
| Generic quality appraisal of Quantitative studies | |
| 1. Is there a clearly focused research question(s)? | 1. (Yes) / (No) / (Unclear) / (N/A) |
| 2. Are areas selected appropriate for study? | 2. (Yes) / (No) / (Unclear) / (N/A) |
| 3. Is sampling or selection strategy unbiased? | 3. (Yes) / (No) / (Unclear) / (N/A) |
| 4. Is the sample size adequate? | 4. (Yes) / (No) / (Unclear) / (N/A) |
| 5. Were the data collection methods standardised and unbiased? If not, have they made this apparent? | 5. (Yes) / (No) / (Unclear) / (N/A) |
| 6. Is there an unbiased measurement of data? | 6. (Yes) / (No) / (Unclear) / (N/A) |
| 7. Are analytic procedures appropriate and unbiased? | 7. (Yes) / (No) / (Unclear) / (N/A) |
| 8. Are results presented with appropriate estimates of precision (p, OR, CI)? | 8. (Yes) / (No) / (Unclear) / (N/A) |
| 9. Is there a clear description of the findings? | 9. (Yes) / (No) / (Unclear) / (N/A) |
| 10. Are the results interpreted appropriately? | 10. (Yes) / (No) / (Unclear) / (N/A) |
| 11. Are study limitations described? | 11. (Yes) / (No) / (Unclear) / (N/A) |
| Quality appraisal of Other studies not included above | |
| 1. Is there a clearly focused question? | 1. (Yes) / (No) / (Unclear) / (N/A) |
| 2. Is there an evidence based presentation? | 2. (Yes) / (No) / (Unclear) / (N/A) |
| 3. Is there appropriate reflection? | 3. (Yes) / (No) / (Unclear) / (N/A) |
| 4. Is the conclusion dependable? | 4. (Yes) / (No) / (Unclear) / (N/A) |
| General – Relevance and related issues | |
| 1. Replicability | 1. (Comprehensively) / (To some extent) / (Not at all) / (N/A) |
| 2. Scaleability | |
| 3. Sustainability of program considered | 2. (Comprehensively) / (To some extent) / (Not at all) / (N/A) |
| 4. Monitoring & Evaluation considered | |
| 5. Policy implications considered | |

⁹ For mixed method studies apply both qualitative and quantitative criteria

Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| | |
|--|--|
| 6. Feasibility considered 7. Applicability to community based systems 8. Overall: is what the researchers did clear? | 3. (Comprehensively) / (To some extent) / (Not at all) / (N/A) 4. (Comprehensively) / (To some extent) / (Not at all) / (N/A) 5. (Comprehensively) / (To some extent) / (Not at all) / (N/A) 6. (Comprehensively) / (To some extent) / (Not at all) / (N/A) 7. (Comprehensively) / (To some extent) / (Not at all) / (N/A) 8. (Comprehensively) / (To some extent) / (Not at all) / (N/A) |
| Overall | |
| Do we include study in realist review? | <ul style="list-style-type: none"> • Yes • No • Maybe |

Appendix 5: Exclusion and inclusion criteria for mapping based on title and abstract

| Category | Notes to reviewer |
|--|--|
| Type of document [select one] | <ul style="list-style-type: none"> - Journal article - NGO report - World Bank report - Donor report - Independent research report - Master or doctoral thesis - Other |
| Type of study [select one] | <ol style="list-style-type: none"> 1. Theoretical/conceptual overviews (no outcomes) 2. Systematic reviews and general secondary data analysis 3. Descriptive studies (description of DRM/DRR/CBDRM implementation/intervention but no explicit outcomes) 4 Theory-practice studies (e.g. a case study used to illustrate DRR/DRM/CBDRM concepts) 5. Primary data collection which may include interviews, surveys, case studies, content analyses, that examine participants' behaviour, beliefs, perceptions, cognitive or affective processes concerning the program/intervention/practices studied) 6. Outcome evaluations (or Effectiveness Study or Intervention Study) (explicit outcomes) 7. Other/None of the above [describe briefly] |
| Type of research design used | <ul style="list-style-type: none"> - Qualitative - Quantitative - Mixed - Other - n/a |
| Level of analysis in the article relating to the research method and information relevant to CBDRM | <ul style="list-style-type: none"> - Thick analysis¹⁰ - Thin analysis - n/a |
| Location of DRR/DRM/CBDRM intervention being investigated urban/rural | <ul style="list-style-type: none"> - Africa; East Asia & pacific; Europe & Central Asia; Latin America & Caribbean; Middle East & North Africa; South Asia - Specify country name - - Urban or Rural |
| Period of the DRR/DRM/CBDRM program being investigated [select one or more] | <ul style="list-style-type: none"> - 1985-1989 - 1990-1994 - 1995-1999 - 2000-2004 - 2005-2009 |

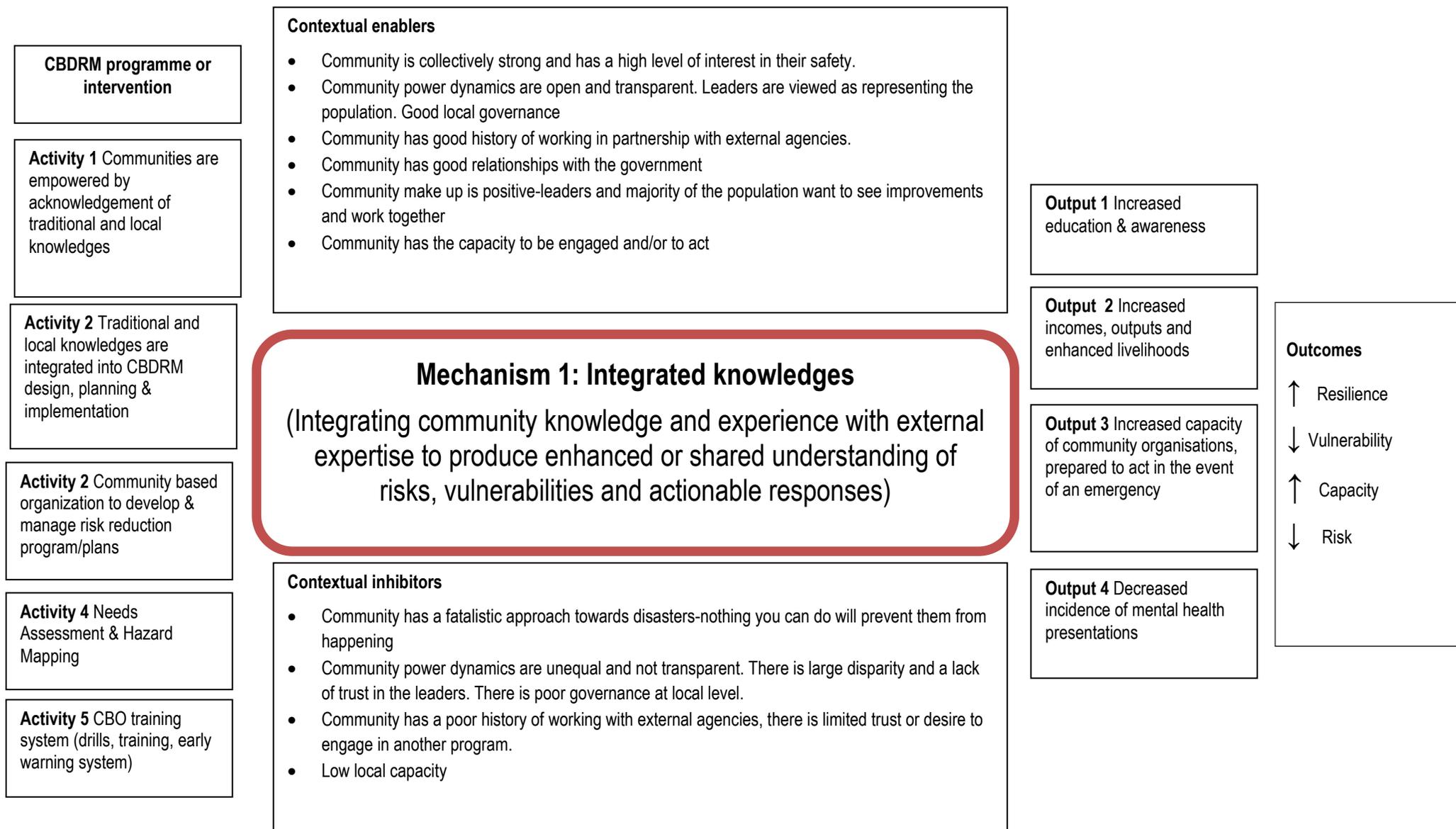
¹⁰ A rich, detailed description of specifics (as opposed to summary, standardization, generalization, or variables)... It captures the sense of what occurred and the drama of events, thereby permitting multiple interpretations." (Neuman, L. 3rd Edition 1997 *Social research methods: Qualitative and quantitative approaches*, Allyn and Bacon: Boston, p. 347).

| | |
|--|---|
| | - After 2010 |
| Type(s) of 'disaster' addressed [select one or more] | Avalanche, earthquake, fire, flood, landslide, tsunami, volcanic eruption, typhoon, cyclone, tidal wave, tsunami, coastal hazard, lahar, blizzard, hailstorm, storm, heat wave, hurricane, tornado, wildfire/bushfire, mudflow, extreme weather event, natural disaster, environmental emergency, natural hazard, catastrophe, climate related hazard, various/multiple or other. |
| Principal program or sector(s) being investigated [select one or more] | <ul style="list-style-type: none"> - CBDRM classic program/ intervention - Community development program - Poverty reduction program - Economic support - Climate change adaptation - Community vulnerability assessment - Social capital - Community perceptions of adaptation - Other |
| Type of population(s) being investigated [select one or more] | <ul style="list-style-type: none"> - Community members - Local authorities - Service providers/services - National authorities - Civil Society Organisations - Faith based Organisations (FBO) - Other |
| Study focus group(s) [select one or more] | <ul style="list-style-type: none"> - Gender (male or female) - Age (<18 y – children; adults; older persons) - Disability - Ethnicity - Religion - Other grouping (homeless, low income, OVCs etc) - None of the above |
| Element(s) of DRM/DRR/CBDRM program highlighted [select one or more] | <ul style="list-style-type: none"> - Community capacity building – eg provide evacuation training; what to do in emergency; best place to evacuate etc. - Community early warning systems and networks – eg radio stations; local alarm systems; warning sirens; etc. - Risk communication, community awareness and disaster education programs - Pre disaster preparedness or preparation programs: includes those activities undertaken by disaster management programmes that make sure that there are sufficient resources and services available to meet the demands of the emergency situation (EMA, 1998: 88). These activities include measures to protect the physical well-being of communities such as evacuation of populations at risk, the strengthening of flood levies, the sandbagging of vulnerable businesses and houses, creation of fire breaks, etc. - Disaster response programs: address the immediate effects of the disaster, involving activities such as search and rescue, the protection of human lives as well as addressing immediate disaster survivor needs, etc. |

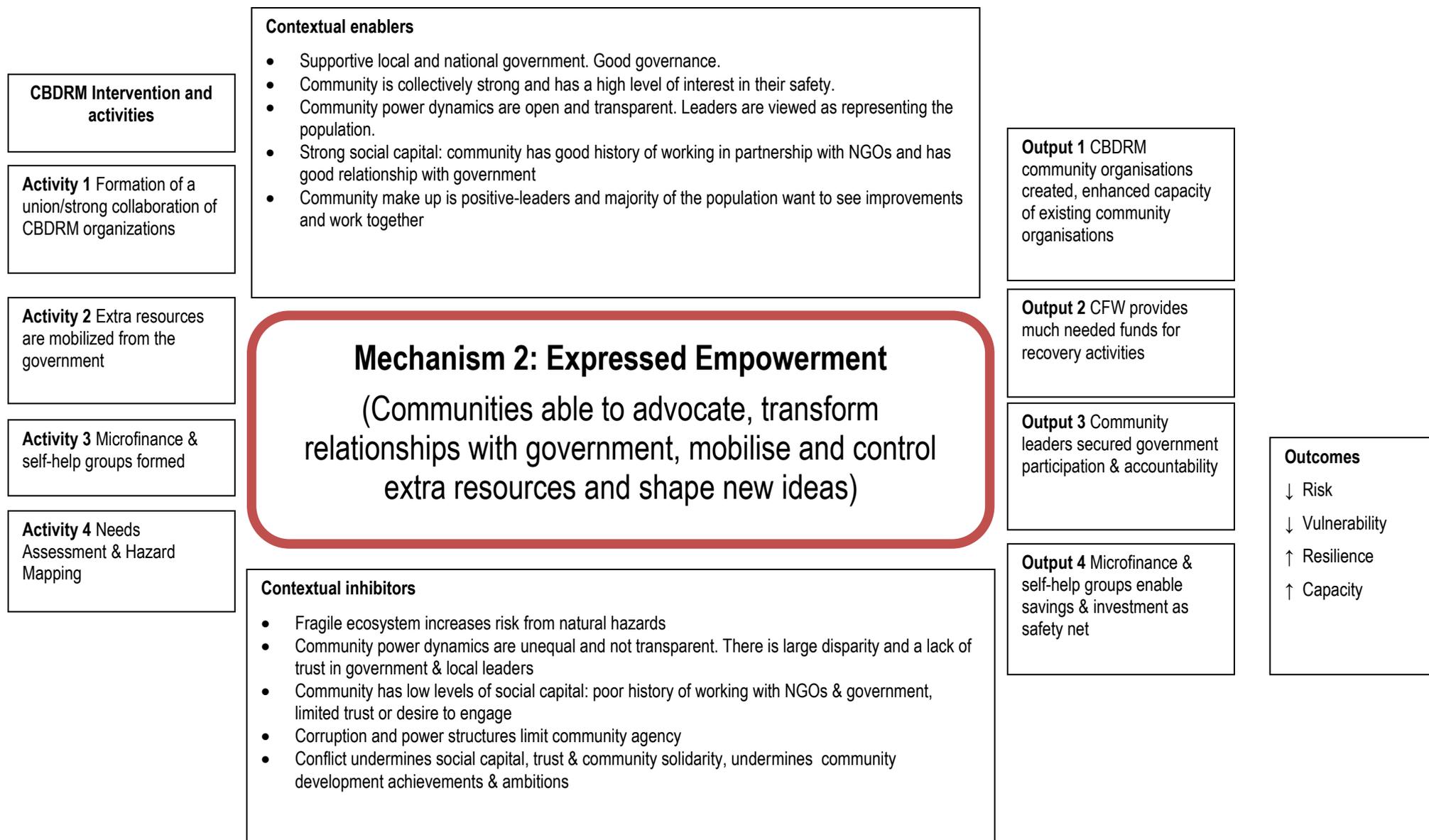
Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

| | |
|---|--|
| | <ul style="list-style-type: none"> - Disaster recovery programs: repairing damage, restoring services and reconstructing facilities after disaster has struck; survivor care & assessment, psychosocial interventions; community mobilisation to reconstruct, etc. - Long-term disaster mitigation programs: more long-term strategies developed to deal with both structural mitigations which are intended to make changes to the physical or built environment as well non-structural policy interventions including mandated changes to social processes or structures that might increase vulnerability to disaster such as upgrading community buildings; building defensive infrastructure, such as planting trees, creating fire breaks, areas to put canoes, etc. - Socio-economic support/resilience: risk sharing/pooling; community based funds; microfinance groups; microinsurance; social protection; livelihoods; (traditional) safety nets; etc. - All of the above - Other |
| Scale of DRM/DRR/CBDRM program [select one] | <ul style="list-style-type: none"> - Small (localised project in one community) - Medium (localised project in multiple communities) - Large (large scale project at national level) - Unclear - Other |
| Issues to follow up / examine more closely; | <ul style="list-style-type: none"> - n/a - open text |
| Other comments, insights and emerging themes. | <ul style="list-style-type: none"> - n/a - open text |

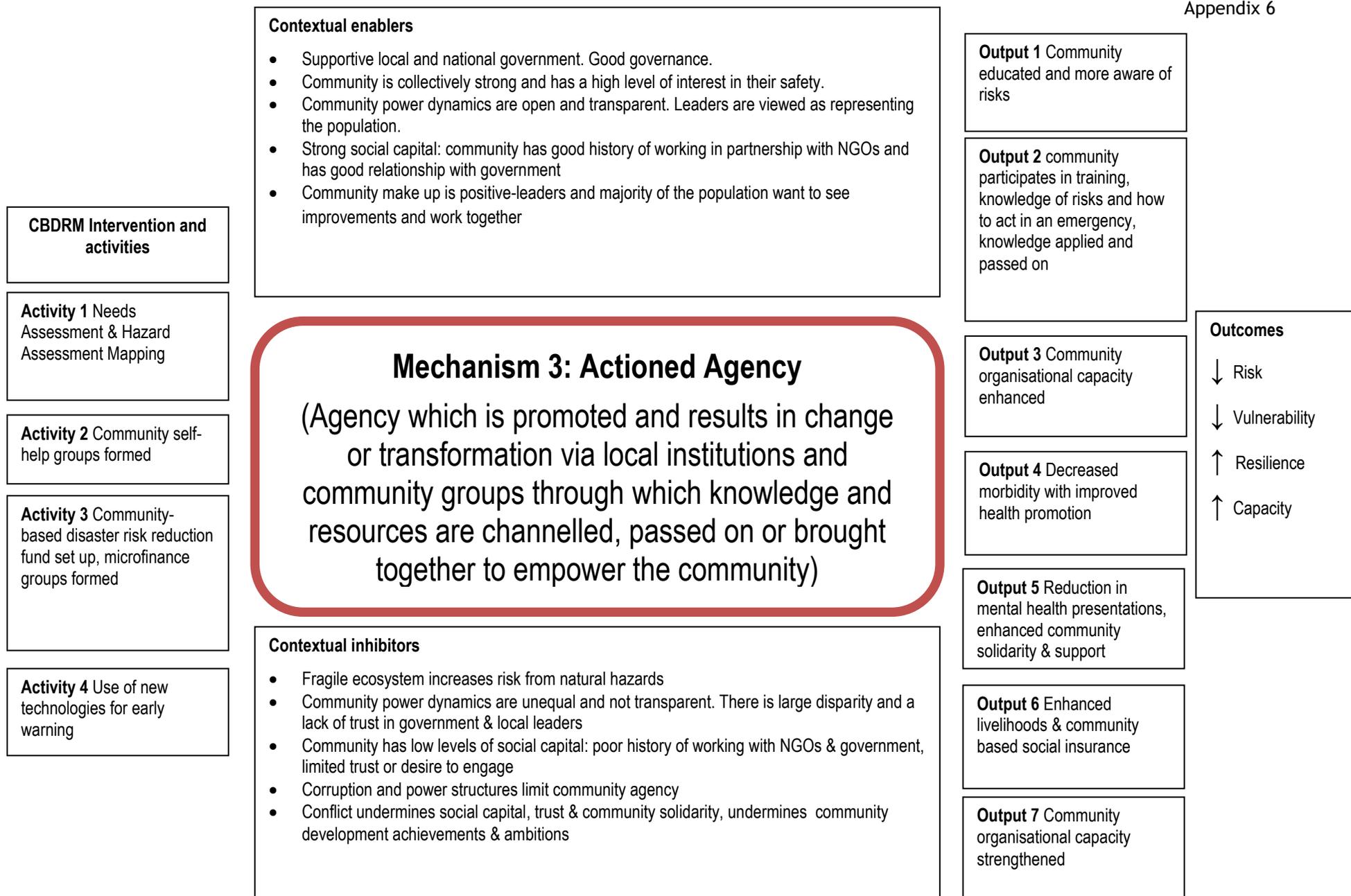
Appendix 6: Mechanisms, context and outcomes



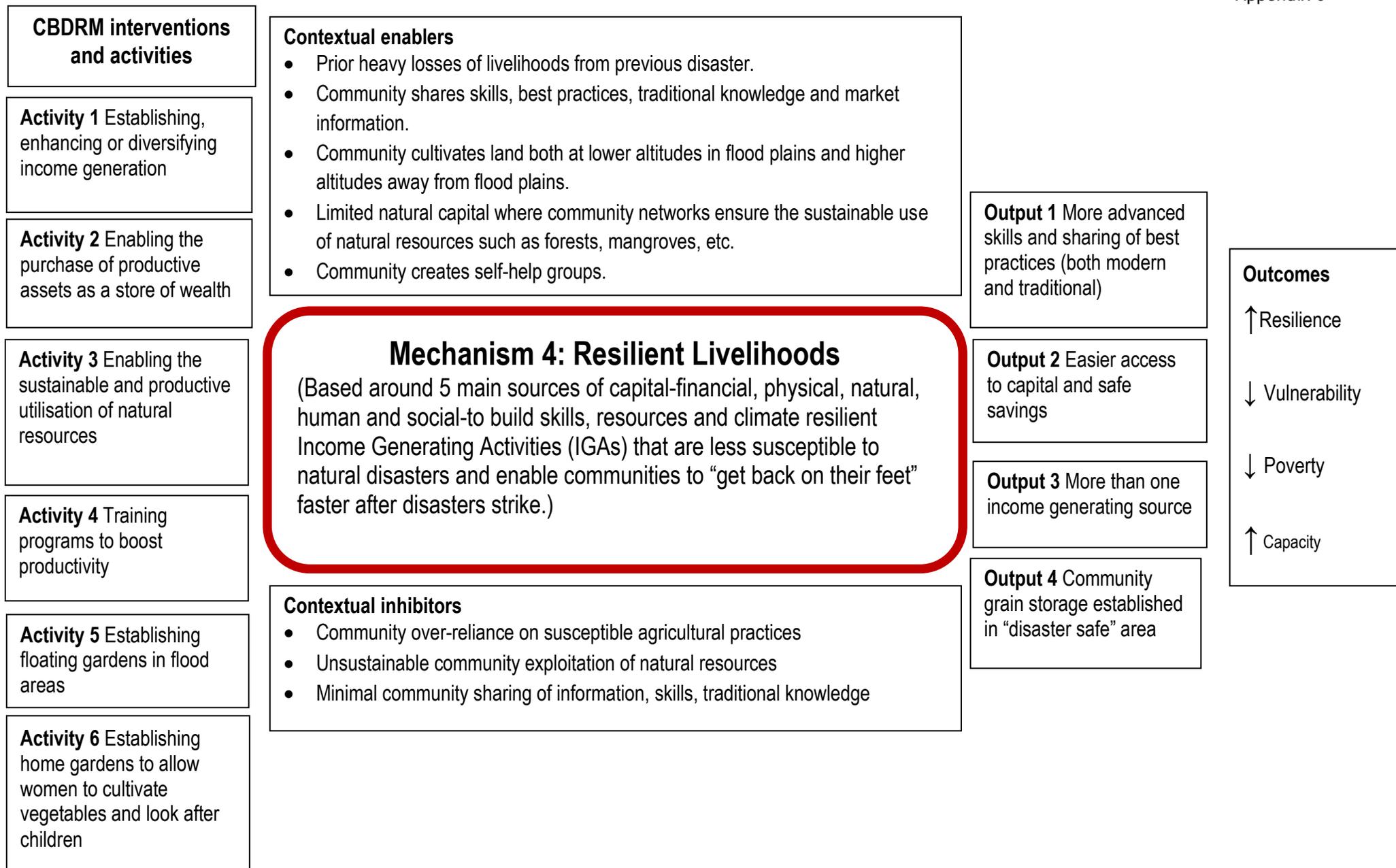
Do CDBRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?



Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?



Do CBDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?



Do CbDRM initiatives impact on the social and economic costs of disasters? If so, how, why, when and in what way(s)?

Other mechanisms identified

Gender and social equity promotion: enabling environment through institutional, organisational and programmatic activities and operations.

Enhanced safety, security and protection: minimal level of physical, mental and legal safety, security and protection required to enable communities to progress and invest in their future.

Technological innovation and communication: application of existing and new technologies and networks to strengthen social capital (networking and bridging), enhance preparedness, response and recovery and build resilience through human capital (skills and knowledge)

Linking mechanisms: these link up different mechanisms, activating them and linking in community-based organisations with others; they enhance community coping capacity, resilience and sustainable development.