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Managing Urban Disaster Risk

Analysis and Adaptation Frameworks for Integrated Settlement Development Programming for the Urban Poor

Christine Wamsler

THESIS

Lund University

The City of Lund was established in the 10th century when the region of Skåne was ruled by Denmark. The 1658 Treaty of Roskilde ceded the region to Sweden. Lund University was established in 1666 and is Scandinavia's largest institution for education and research. It has 40,000 students and 6,000 employees. Lund University cooperates extensively with other universities, colleges and research institutes around the word. It is one of 14 institutions in Sweden and Denmark that make up the regional Öresund University, which has 140,000 students.

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- Gender aspects in planning and design of housing and the built environment;
- Housing segregation;
- Risk management for settlement development in regions prone to 'natural' disasters;
- Building design with consideration for climate, comfort and energy consumption;
- User participation in housing processes; and
- Environmentally aware and cost-efficient construction.

Managing Urban Disaster Risk

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LUND UNIVERSITY

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Architecture and Built Environment
Lund University, Sweden, 2007

'Perhaps we cannot raise the winds. But each of us can put up the sail, so that when the wind comes we can catch it' – or, when it gets too strong, form wind breaks and cover the slopes.

Schumacher, E.F. (1973), amendment by the author of this doctoral thesis

Doctoral thesis (N°4 of HDM thesis series)

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The **cover photograph**, taken by the author, shows a low-income settlement situated in a risk area in San Salvador. Disaster risk management measures are carried out in this settlement within the framework of an upgrading programme implemented by the non-governmental organisation FUNDASAL (Fundación Salvadoreña de Desarrollo y Vivienda Mínima), whose work and dedication is indispensable to the urban poor.

Keywords: adaptation, development assistance, disaster, disaster risk management, El Salvador, mainstreaming, mitigation, poverty reduction, prevention, risk accumulation, risk reduction, settlement development planning, social housing, urban planning, vulnerability.

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Dedicated to all those who have lost their lives in 'natural' disasters or whose lives are endangered by them.

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Executive summary

Context and problem definition

Over the past decades, the frequency of so-called 'natural' disasters has grown significantly worldwide. In fact, their number has quadrupled during the last 30 years, resulting in escalating human and economic losses (UNISDR 2006). In this context, it is the developing countries that bear the highest burden in terms of the human lives and proportion of gross domestic product lost as a result of disasters.

The urban poor are particularly vulnerable to 'natural' disasters, such as earthquakes, floods, landslides, windstorms, volcanic eruptions, wild fires, water surges, and droughts. Their settlements are often located on marginal land near rivers or on steep slopes and have substandard housing and infrastructure. Among other risk factors are leaking sewage pipes from better-off settlements that pass through slum areas; lack of water and waste management services; limited access to information; and overcrowding. While poverty reinforces people's vulnerability to natural hazards, disasters make their already precarious living conditions worse, creating a vicious circle of poverty. Currently, more than one billion people worldwide live in slums (UN-HABITAT 2003a). It is estimated that their number will double over the next 25 years, thus strongly increasing the number of people forced to accept living conditions that are dangerous and beneath human dignity. The threat of climate change presents an even more worrying outlook in this context (IPCC 2007a,b).

To address these challenges, increasing attention has been given to the need to reduce disaster risk through development work so as to bring about sustainable poverty reduction. One of the aims of the Millennium Declaration, to achieve a significant improvement in the lives of at least 100 million slum dwellers by 2020, alludes to this need; and the Hyogo Framework for Action 2005–2015 urges governments to address the issue of disaster risk in their sector development programming (UNISDR 2005a). However, in practice little attention has been paid to urban settlement development in comparison with other development sectors. Consequently, urban development actors (including donor and implementing organisations) still struggle to effectively tackle disaster risk through their everyday work (Woiwode 2002, 2007).

Research focus and methodology

The research is driven by the need to provide a better understanding of the challenges of increasing risk and its impact on the living conditions of the urban poor, as well as to provide new conceptual and strategic approaches to face those challenges. Such approaches are especially required within the pre-disaster context. Technically speaking, they come under the heading of 'adaptation' or 'ex ante disaster risk management' and include measures both for risk reduction and risk financing. With this in mind, the overall research objective is to enhance and

develop new knowledge and innovative ways in which urban development actors can contribute more effectively to disaster risk management, thus demonstrating their role and potential within this field. The overall research question can thus be framed as: how can disaster risk management be properly integrated into settlement development programming (i.e. social housing, upgrading and/or local urban governance programmes)? To answer this question, the following three areas were investigated: (a) the existing interlinkages between disasters and urban settlement development, more specifically, between disasters and building and planning practices related to low-income settlements; (b) the current relationship between the working fields of disaster risk management and settlement development planning; and (c) the possibilities for overcoming existing challenges and gaps in order to increase the potential of settlement development programming to reduce and transfer or share risk.

The research paradigm selected lies within the tradition of so-called 'Mode 2' knowledge production (Gibbons et al. 1994; Dunin-Woyseth and Nielsen 2004), which takes as its starting point the identification and experience of local problems and aims to produce knowledge that is intended to be directly useful or applicable. On this basis, an innovative research methodology was developed and used that combines case studies (Yin 2003), grounded theory (Glaser and Strauss 1967) and systems analysis (Sterman 2000; Hördur 2004). Case studies and an analysis of their context were carried out to assess the situation and the efforts being made at different research levels: *the local household, municipal, national and global level*. The Central American state of El Salvador, which is located in one of the most disaster-prone regions in the world, was the focus country for the cases studied. The cases analysed comprise four aid programmes, implemented in 15 disaster-prone slum communities, that to some extent integrate settlement development planning and disaster risk management. The outcomes of the different level analyses were complemented and generalised with a series of investigations in other countries. In fact, research trips were made to various locations in the United Kingdom; as well as to Geneva, Switzerland; Manila, the Philippines; Manizales, Colombia; Rio de Janeiro, Brazil; Stockholm, Sweden; and Washington DC, USA. Collaboration was established with the Salvadoran non-governmental organisations (NGOs) CEPRODE, FUNDASAL and FUSAI, and with the United Nations Human Settlement Programme (UN-HABITAT).

Data gathering methods included interviews, group discussions, walk-through analyses, observations, text reviews, questionnaires, as well as research workshops and 'hands-on' practice. At the global level, 64 key programme managers and operational or academic staff from 33 organisations were interviewed; at the national and municipal level 71 programme managers and operational staff from 40 organisations; and at the local level 62 households, comprising 331 persons, living in the 15 disaster-prone slum communities of the case study areas. For the data analysis, literal reading, grounded theory, systems analysis, and cultural theory were applied.

Main findings and analysis

The research reveals that while urban development actors have the responsibility for developing secure and sustainable settlements, they nevertheless unconsciously contribute to the increase in disaster risk and disasters. In fact, the research shows that urban settlement development and related practices are not only affected by disasters but are also one of their main causes, in that they can:

- Increase vulnerability;
- Increase exposure to existing hazards;
- Intensify/magnify urban hazards and create new ones;
- Subject vulnerability and hazards to constant change (thus making them virtually impossible to control);
- Reduce coping capacities at national and municipal level; and
- Reduce the local coping capacities of low-income households and communities.

To make matters worse, it was identified that the key variables that underlie the complex system of risk and disaster occurrence in slums, are not only closely linked to settlement development planning, but also reinforce each other. Increasing risk through urban settlement development thus strongly fosters the already existing vicious circle of poverty in which people find themselves trapped.

Unfortunately, neither urban development actors nor disaster risk management professionals have, as yet, effectively addressed the two-way and multifaceted relationship between disasters and urban settlement development. Four interconnected issues were found to drive this situation, creating barriers to effective disaster risk management and to its integration into development work:

1. Limited recognition and understanding of the nexus between disasters and urban settlement development. This can result in denial that urban development actors actually have an important role, influence and responsibility in preventing disasters or in reducing their impacts on households and communities at risk.

2. Separation between the working fields of disaster risk management and settlement development planning from the local to the global level – as well as among these levels. This separation is reflected in a number of instances of mutual incompatibility between these fields: in their respective stakeholders, programmes and institutional structures, in the discourses of their experts and practitioners, and in their working priorities, concepts, terminology and tools. The underlying causes lie in the disciplinary roots of the two fields and in the historical developments within each. Moreover, the separation is made even wider by the low priority assigned to both disaster risk management and settlement development programming on the agendas of aid organisations, and national and municipal authorities.

3. Increasing, but as yet unsustainable, efforts to mainstream disaster risk management within settlement development programming. In fact, whenever intolerable conditions and needs on the ground push forward such an integration proc-

ess (as was the case in El Salvador after Hurricane Mitch in 1998 and the 2001 earthquakes), it is often supported and implemented in such a way that it results in an unfruitful overlapping of the two fields, in other words, in only temporary improvements or even increased competition between and duplication of the efforts of different organisations.

4. Substantial gap between what households and communities need or do to deal with risk and disasters and the way in which urban development actors support them. One example is the insufficient consideration given to people's local coping strategies. The research found more than 100 coping strategies that the urban poor use to deal with risk and disasters. These coping strategies were analysed and, on this basis, categorised into coping strategies for risk reduction, self-insurance, and recovery. It was further revealed that the expenses that people incur in reducing risk and preparing for the annual rainy season account for an average of 9.2 percent of a household's yearly income. However, such local efforts and their financial impacts are generally unknown to urban development actors.

Apart from revealing the challenges, gaps and incompatibilities just described, the research also ascertained that *urban settlement development, and related programming, offer a potentially powerful platform for disaster risk management*. In fact, programmes designed to promote adequate building and planning practices (that incorporate disaster risk management) have the potential not only to substantially contribute to reducing risk and disasters, but also to achieve more sustainably poverty reduction. This potential was furthermore identified within the organisational structures and mechanisms for social housing provision and financing that are at the disposal of urban development actors. However, current conceptual and strategic approaches, and thus financial support and programmes are, as yet, inadequate in terms of tapping into this potential.

To counteract this problem, the following complementary frameworks were developed to provide knowledge on how disaster risk management could be integrated more effectively into the work of urban development actors:

Comprehensive descriptions and analytical frameworks. These assist in understanding and systematising the current situation and capacities at local household and institutional levels. The frameworks thus provide the knowledge base required for appropriate action to be taken. They address aspects, such as:

- The nexus between disasters and urban settlement development;
- The relationship between disaster risk management and settlement development programming;
- The enabling factors, pitfalls, and effects of existing processes aimed at integrating disaster risk management into settlement development programming;
- The key variables, and their causal relations, that influence risk and disaster occurrence in slums;

- The ways in which the lives and livelihoods of slum dwellers are affected by disasters;
- The local coping strategies for dealing with risk and disasters; and
- Urban (as opposed to rural) vulnerability and other risk factors.

Conceptual and strategic integration frameworks. These frameworks build on the analytical frameworks in providing conceptual and theoretical guidance regarding the integration of disaster risk management into settlement development programming. They show the relevant changes that need to be achieved through:

- Complementary strategies for disaster risk management integration for implementation at both local household level and related institutional levels;
- Complementary measures to reduce risk that possibly match with local heterogeneity regarding people's coping strategies and patterns of social behaviour;
- Coordinated and complementary integration procedures of both development and relief organisations;
- Improved financing mechanisms for disaster risk management integration; and
- Improved housing microfinancing mechanisms (i.e. microcredits, subsidies and savings) to become integral ex ante tools for disaster risk management.

Operational analysis and integration framework. This framework offers an extended understanding by 'translating' some aspects of the analytical, conceptual and strategic frameworks into practical guidance. It illustrates how organisations can, step by step, initiate and pursue the integration of disaster risk management into development programming. In fact, it provides a comprehensive indicator system, as well as sector-specific reference activities and recommendations.

Main outcome – 'Analysis and Adaptation Model'

On the basis of the set of frameworks described above, an 'Analysis and Integration Model' was elaborated. This provides a comprehensive understanding regarding the meaning and scope of disaster risk management integration and can assist in both analysing organisations' work and taking action to improve programme implementation. The model and the frameworks developed address policymakers, researchers, programme managers and operational staff of both governmental and non-governmental organisations that work at local household, municipal, national and/or international levels.

At the core of the 'Analysis and Adaptation Model' are *seven complementary strategies elaborated for the integration of disaster risk management* that are combined with *five complementary measures to tackle disaster risk*. In the following, first the strategies and then the measures are briefly presented.

For programme implementation at the local household level, three integration measures are distinguished within an organisation's programming: (*I*) direct stand-alone disaster risk management; (*II*) direct integrated disaster risk management; and (*III*) programmatic mainstreaming of disaster risk management (see

Table 1). *Strategies I* and *II* refer to the integration of disaster risk management programming into the work of an organisation, while *Strategy III* refers to its mainstreaming (i.e. the adaptation of an organisation's core work). Depending on the core mandate of an organisation, as well as the concrete context of a specific programme, certain types of programme measures would be defined as programming or mainstreaming activities. For example, a slum upgrading programme, which includes planning measures to reduce the inhabitants' exposure to risk, is clearly in line with the mainstreaming role of urban development actors. Facilitating, within the same programme, the distribution of leaflets on disaster occurrence and related early-warning mechanisms is not usually associated with slum upgrading. These activities would thus fall within *Strategy II*, as specific disaster risk management measures are 'added on'.

The research indicates that, currently, most funding for disaster risk management is directed at 'add-on' programmes or components (i.e. is in line with *Strategies I and II*). In fact, where NGOs or government politicians and leaders have been mobilised to act as champions in responding to disasters and disaster risk, this has seldom been about considering how they could contribute through their core work of service delivery (which would correspond to *Strategy III*). However, given the role of NGOs, and of national and municipal governments as planners and implementers (and, more recently, facilitators) of urban settlement development, their response should, at the very least, be a mainstreaming one. Remarkably, this was not identified as what most have sought or have been urged to seek by international and/or national organisations.

To back up the three strategies described, additional strategies are required that tackle related aspects at the institutional level. In fact, the research shows that – in the best cases – it is the (partial) changes at programme level that are currently supported, while institutional changes are put aside, resulting in merely temporary and thus unsustainable disaster risk management. This failure relates not only to (a) the programmes' implementing organisations, but also to (b) related donor organisations, (c) other implementing organisations that are not directly involved in the programme, and (d) universities and other training institutions working in settlement development planning. Based on these research findings, *Strategies IV and V* were designed to relate to both implementing and donor organisations; *Strategy VI* tackles the cooperation between these organisations and other implementing organisations; and *Strategy VII* deals with related training institutions (see *Table 1*).

To sum up, *Strategies I–VII* reflect the main lessons learned from the different level analyses of this research:

First, integrating disaster risk management is not necessarily – or only – about implementing additional disaster risk management measures. Its main aim is to search for ways of (better) managing risk through the organisation's core work.

Second, integrating disaster risk management involves changes not only at the local household level, but also, importantly, at the institutional level of the related implementing, cooperating *and* funding organisations.

Table 1: *Overview of the complementary strategies for analysing and integrating disaster risk management (DRM) into settlement development programming.*

Strategies		***Description/aim***	***Main question to be analysed by an organisation (working in settlement development planning)***
N°	**Type**		
I	Direct stand-alone DRM	DRM programming	What dedicated programmes can be implemented separately from and additionally to the organisation's core work to specifically address risk and disaster occurrence?
II	Direct integrated DRM	Adding DRM programming elements to core activities	What dedicated programme measures can be added to the organisation's core work to specifically address risk and disaster occurrence within existing programme areas?
III	Programmatic mainstreaming of DRM	DRM mainstreaming within programme implementation	What can be done within the core work of the organisation to reduce risk and increase the capacities of programme beneficiaries to cope with risk and disasters? (Or, at least, to ensure that risk is not increased and capacities not reduced).
IV	Organisational mainstreaming of DRM	Institutionalisation of DRM mainstreaming (and programming)	What can be done to sustain and back up DRM mainstreaming (and programming)?
V	Internal mainstreaming of DRM	DRM for reducing the organisation's own risk	What measures can be taken so that the organisation (i.e. its offices and staff) becomes more disaster-resilient?
VI	Synergy creation for DRM	Coordination and complementation for improved DRM integration	How can DRM mainstreaming (and programming) activities of the organisation be coordinated with and made complementary to the work of other (implementing) organisations?
VII	Educational mainstreaming of DRM	Shift towards non-conventional settlement development planning to integrate DRM into the philosophies that drive urban planning	What has to be done so that universities and other training institutions (decide to) facilitate the sustainable integration of DRM into the sphere of activity of urban development actors?

To achieve holistic and thus sustainable disaster risk management, five different measures to tackle disaster risk would have to be considered and combined within each of the seven integration strategies already described. These measures should match the local needs, capacities and dimensions of risk and – where appropriate – build on people's coping strategies. Related knowledge and analyses are thus required on the part of urban development actors. The measures include:

- *Prevention,* which aims (to increase the capacity) to avoid or reduce the potential intensity and frequency of natural hazards that threaten households, communities, and/or institutions;

- *Mitigation*, which aims (to increase the capacity) to minimise the vulnerability of households, communities, and/or institutions to 'natural' hazards/disasters;
- *Preparedness*, which aims (to increase the capacity) to establish effective response mechanisms and structures for houseseholds, communities, and/or institutions so that they can react effectively during and in the immediate aftermath of potential hazards/disasters;
- *Risk 'financing'*, which aims (to increase the capacity) to transfer or share risk so as to establish a 'security system' (safeguard) for households, communities, and/or institutions that comes into force after potential hazard/disaster impacts and helps obtaining 'readily available' compensation.
- *Stand-by for recovery*, which aims (to increase the capacity) to establish appropriate recovery mechanisms and structures for households, communities, and/or institutions that are accessible after a potential hazard/disaster. This includes mechanisms and structures for both rehabilitation and reconstruction.

In comparison to the 'Analysis and Adaptation Model', the research revealed that, in practice, urban development actors often consider only two out of the seven strategies identified for disaster risk management integration, and two (but only in part) of the five measures ascertained to sustainably tackle disaster risk.

Concluding remarks

The empirical and theoretical knowledge developed by this research is of intra-, trans- and interdisciplinary/intersectoral nature. In fact, based on the analysis of the nexus between disasters and urban settlement development, and of related programming, the research contributes to the advancement of knowledge in: (a) disaster risk management; (b) settlement development planning; (c) the interface and interconnection between the two fields; (d) related disciplines (i.e. architecture, urban planning, development and disaster studies); and (e) related research methodology appropriate for addressing similar intersectoral and interdisciplinary research fields.

All in all, the main contribution of this research is the development of conceptual and strategic approaches to integrating disaster risk management into (urban) development programming. With escalating disasters worldwide, these approaches are crucial for the sustainable reduction of both risk and poverty and can thus contribute to the achievement of the Millennium Development Goals (MDGs). They show how (urban) development actors could counteract the failure of current approaches, related financial support and programmes, and exploit their potential to more effectively reduce the disaster risk of the urban poor. Importantly, while the focus of this research is on settlement development planning and programming, most of the analytical, conceptual, strategic and operational outcomes can also be applied to other development sectors, as well as within disaster relief, rehabilitation and reconstruction.

Preface and acknowledgements

Every PhD has a history and is a long journey in which many people help along the way. In the following, I would like to briefly tell my 'backstage story' and give my deepest gratitude to all of those who supported me.

Looking back, this PhD was a logical step that built on my preceding studies and working experiences. During my undergraduate studies and MSc in architecture and urban planning in France and Germany, I specialised in the field of construction and planning in developing countries, with Togo, West Africa, being the focus of my final thesis. After graduation, I worked in different developing programmes around the world. I was engaged, amongst other things, in the establishment of a craftsmen's association in Togo, solid waste management in Mexico City, slum upgrading in Chile, and post-earthquake reconstruction in India. In 2001 after a master's degree in 'International Humanitarian Assistance', which included training on disaster risk management, the German Agency for Technical Cooperation (GTZ) offered me the opportunity to work in a regional disaster risk management pilot programme in Central America.[1] The headquarters were located in Guatemala, and the national counterpart was the Guatemalan National Emergency Committee (COEN). The pilot programme was one of many disaster risk management initiatives, which in this period – and with the support of international agencies – started to 'spring up like mushrooms' in Central America and worldwide. My task was to investigate how measures in the field of settlement development (including social housing and urban planning) could be included within the framework of GTZ's pilot programme in order to address the striking lack of knowledge about how to interface disaster risk management and settlement development planning (Wamsler 2001, 2002). I conducted related training for masons, assessed relevant programme measures, and, most importantly, worked at the local household level with people living at risk, trying to understand their perspectives, their most pressing needs and their efforts to cope with disaster risk. This on-the-ground work and experience was the first link in the chain that led towards the present PhD work. I was convinced of its importance, and there was no doubt in my mind that I wanted to continue in this direction.

The very welcome next opportunity came with subsequent consultancy work for GTZ. My task was to systematise how disaster risk management was integrated into reconstruction projects in El Salvador and Peru (GTZ 2003a,b). Again, the direct experience of people's needs and the lack of an adequate body of knowledge on how to address them was obvious and reinforced my desire to go into the topic more deeply.

1 See, for instance, www.gtz.de/de/dokumente/en-community-based-drm.pdf and www.gtz.de/de/dokumente/es-riesgo-el-salvador.pdf.

Whilst searching for further opportunities, I received an offer from Johnny Åstrand, director of Housing Development and Management (HDM), to give lectures on 'disaster risk management for settlement development planning'. This important 'next link in the chain' was followed by HDM's support for a related PhD proposal, which was presented to the Swedish International Development Cooperation Agency (Sida). Sitting in front of a malfunctioning computer in Peru, I received an e-mail about the funding decision. After having restarted the computer about a million times, I was sure that I had read it correctly. The answer was positive – and the starting point of this PhD research!

As my knowledge was mainly based on practical working experiences at the local level, this research on 'managing urban disaster risk' was designed to start by 'taking a step backwards' (i.e. acquiring a broader and more scientific/academic perspective) through a gradual analysis of the challenges and gaps at global, national and municipal levels. This approach allowed me to obtain a fresh and objective perspective before going back to the local household level studies, thus closing the loop (cf. section 1.5 and *Figure 3*).

Whilst the elaboration of this PhD went smoothly and according to plan most of the time, there were three short moments of 'uncertainty', caused ironically by 'natural' disasters. The first was my personal experience of an earthquake, which disrupted an interview in El Salvador in 2004. The second was when my partner was cut off during hurricanes and earthquakes in Taiwan in 2005. The third was caused by area-wide floods in United Kingdom in 2007, which affected my external tutor and thus delayed his revision of this thesis. In the end, none of the three occasions posed any real danger, but the feeling remained that this research was anything but theoretical or distant from my personal life.

For the successful elaboration of this PhD, I am deeply grateful to many colleagues and friends. For their insight and the time spent commenting on draft versions of this thesis and related articles, I would like to thank Johnny Åstrand, Kerstin Barup, Alfredo Stein and my other colleagues at HDM, Lund University; Joanne Bayer of the International Institute for Applied Systems Analysis (IIASA); Ian Davis of Cranfield Resilience Centre and Centre for Development and Emergency Practice (CENDEP), Oxford Brookes University; Jorge Gavidia of UN-HABITAT-ROLAC (United Nations Human Settlement Programme, Regional Office for Latin America and the Caribbean); Mohamed Hamza of the Stockholm Environment Institute; Rolf Johansson of the Swedish University of Agricultural Sciences and the Royal Institute of Technology in Stockholm; and Michael Thompson of the University of Bergen and Musgrave Institute, London. Helena Molin Valdez of the United Nations International Strategy for Disaster Reduction (UNISDR) and John Twigg of the Benfield Hazard Research Centre, London, were crucial for making first contacts and accessing information.

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ACSA (Asociación Salvadoreña de Empresas de Seguros); AMUVASAN (Oficina de Planificación de la Asociación de Municipios del Valle de San Andrés); CARE El Salvador; CHF El Salvador (Cooperative Housing Foundation); COEN (Comité de Emergencia Nacional); COMURES (Cooperación de Municipalidades de El Salvador); FEDECACES (Sistema Cooperativo Financiero); FEDECREDITO (Federación de Cajas de Crédito); FISDL (Fondo de Inversión Social para el Desarrollo Local); FONAVIPO (Fondo Nacional de Vivienda Popular); Fundación Habitat; Fundación Techo para un Hermano; FUNDE (La Fundación Nacional para el Desarrollo); GTZ El Salvador (German Agency for Technical Cooperation); HFH (Habitat for Humanity); IDB El Salvador (Inter-American Development Bank); INTEGRAL; MARN (Ministerio de Medio Ambiente y de Recursos Naturales); OFDA El Salvador (Office of US Foreign Disaster Assistance); OPAMSS (Oficina de Planeación del Área Metropolitana de San Salvador); PAHO/WHO (Pan American Health Organization, regional office of the World Health Organization); PRISMA (Programa Salvadoreño de Investigación sobre Desarrollo y Medio Ambiente); national Red Cross; RTI (Research Triangle Institute); SNET (Servicio Nacional de Estudios Territoriales); Seguros Futuros; UCA (University José Simeón Cañas, department of engineering and department of architecture); SISA (Seguros e Inversiones Sociedad Anónima); UNDP El Salvador (United Nations Development Programme); VMVDU (Vice-Ministerio de Vivienda y Desarrollo Urbano); World Geologists El Salvador; World Vision El Salvador and the municipalities of Sacacoyo, San Salvador, Santa Tecla and Talnique.

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UK; GTZ (German Agency for Technical Cooperation), Germany; Graduate Institute of Development Studies (IUED), University of Geneva, Switzerland; IDB (Inter-American Development Bank), USA; IDEA (United Institute of Development Studies), Colombia; IDRM (International Institute for Disaster Risk Management), the Philippines; IFRC (International Federation of Red Cross and Red Crescent Societies), Switzerland; ITDG (Intermediate Technology Development Group), UK; IIED (International Institute for Environment and Development), UK; ILO (International Labour Organization), Switzerland; Oxfam International, UK; OMPAD (Oficina Municipal de Prevención y Atención de Desastres), Colombia; PAHO (Pan American Health Organization), USA; PRDU (Post-war Reconstruction and Development Unit), University of York, UK; ProVention Consortium, Switzerland; Sida (Swedish International Development Cooperation Agency), Sweden; Tearfund, UK; UNDP–BCPR (United Nations Development Programme, Bureau for Crisis Prevention and Recovery), Switzerland; UN-HABITAT (United Nations Human Settlements Programme), Switzerland; UN-HABITAT-ROLAC (United Nations Human Settlements Programme, Regional Office for Latin America and the Caribbean), Brazil; UNISDR (United Nations International Strategy for Disaster Reduction), Switzerland; UNOPS (United Nations Office for Project Services), Switzerland; USAID (United States Agency for International Development), USA; the World Bank, USA; and WSP International Management Consulting Ltd, UK.

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Lund, December 2007 *Christine Wamsler*

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Abbreviations*

C	Capacity to respond to disasters
CBOs	Community-based organisations
CEPRODE	Centro de Protección para Desastres [Disaster protection centre]
DRM	Disaster risk management
FUNDASAL	Fundación Salvadoreña de Desarrollo y Vivienda Mínima [Development and Social Housing Foundation]
FUSAI	Fundación Salvadoreña de Apoyo Integral [Integral Social Action Foundation]
GDP	Gross domestic product
GIS	Geographical Information System
GTZ	Gesellschaft für Technische Zusammenarbeit [German Agency for Technical Cooperation]
H	Hazard(s)
HDM	Housing Development and Management, Lund University
LC/LC_{Res}	Lack of capacity to respond to disasters
LC_{Rec}	Lack of capacity to recover from disasters
M	Mitigation
MDGs	Millennium Development Goals
PAR	Pressure and Release
P_{Rep}	Preparedness
P_{Rev}	Prevention
R	Risk
R_F	Risk 'financing'
Sida	Swedish International Development Cooperation Agency
S_R	Stand-by for recovery
SWAp	Sector-Wide Approach
UN-HABITAT-ROLAC	United Nations Human Settlement Programme, Regional Office for Latin America and the Caribbean
UNISDR	United Nations International Strategy for Disaster Reduction
V	Vulnerability

* Note that only recurrent abbreviations and variables are listed.

CHAPTER

ONE

1 Introduction: research setting

1.1 Context and problem definition

Over the past decades, the frequency of so-called 'natural' disasters[2] has grown significantly worldwide. In fact, the number of disasters has quadrupled during the last 30 years, resulting in escalating human and economic losses (UNISDR 2006). From the 1950s to the 1990s, related economic losses were reflected in their 15-fold increase reported by the World Bank (2006a). More recent years have been characterised by a rapid succession of major catastrophic events, including the Indian Ocean tsunami in 2004 and the South Asian earthquake centred on Kashmir in 2005. In 2005 alone, more than 360 disasters were reported,[3] with around 92,000 people being killed and another 160 million suffering adverse impacts; direct material losses were of the order of US$160 billion (UNISDR 2006). In this context, it is the developing countries that bear the highest burden in terms of the human lives and proportion of gross domestic product (GDP) lost as a result of disasters.

The urban poor are particularly vulnerable to 'natural' disasters, such as earthquakes, floods, landslides, windstorms, volcanic eruptions, wild fires, water surges, and droughts. Their settlements, or so-called 'slums', are often located on marginal land near rivers or on steep slopes and have substandard housing and infrastructure. Among other problems that put them at heightened risk are leaking sewage pipes from better-off settlements that pass through slum areas to discharge into nearby rivers; lack of water and waste management services; limited access to information; and overcrowding. While poverty reinforces people's vulnerability to natural hazards, disasters make their already precarious conditions worse. This creates a vicious circle that may result in poverty traps. Currently, more than one billion people worldwide live in slums and are forced to accept living conditions that are both dangerous and beneath human dignity. It is estimated that their number will double over the next 25 years (UN-HABITAT

2 The increase in number relates to the changed frequency and intensity of weather-borne hazards, as well as to the increased vulnerability and reduced coping capacity of the population facing such hazards. The former is closely linked to climate change (IPCC 2007a). Related definitions of technical key terms such as 'disaster', 'hazard', 'coping capacity', 'risk', 'vulnerability', etc., are listed in the glossary of appendix 1 and are discussed in chapter 2.

3 This number includes, apart from the 'natural' disasters mentioned in the former footnote, 44 epidemics and two insect infestations, neither of which form part of the focus of this study. Other disaster-related data/numbers that are included in the following text do not include these two types of hazardous events.

2003a). Moreover, the threat of climate change presents an even more worrying outlook (IPCC 2007a,b).[4]

As a result of the situation just described, during the last two decades increasing attention has been given by international and national organisations to the field of disaster risk management (DRM), at first mainly within the context of emergency relief (DFID 2004). It is only in recent years that more consideration has also been given to the need to reduce disaster risk through development work so as to attain sustainable poverty reduction. One of the aims of the Millennium Declaration, to achieve a significant improvement in the lives of at least 100 million slum dwellers by 2020, alludes to this need;[5] and the Hyogo Framework for Action 2005–2015[6] urges governments to address the issue of disaster risk in their sector development programming (UNISDR 2005a). In practice, however, little attention has been given to urban settlement development in comparison with other development sectors. Consequently, international, national and municipal organisations working in settlement development[7] still struggle to effectively tackle disaster risk through their everyday work because of the lack of related knowledge and tools (Woiwode 2002, 2007).

While architects, planners and other urban development actors[8] have the responsibility for developing secure and sustainable settlements, this research hypothesises that they actually contribute to the increase in disaster risk and disasters. Disasters occur when a hazardous event strikes a vulnerable human settlement, with the coping capacity of its inhabitants further influencing the extent and severity of the impacts caused. Unfortunately, there is some indication that settlement development planning may negatively affect both hazard(s) and vulnerability (Aysan and Davis 1992; Mitchell 1999). Hence, related programmes need to be urgently re-evaluated to provide better solutions. With disasters being a product of past developments (DFID 2004), responding and adapting effectively to disaster risk is inherently complex. The conventionally recognised need to incorporate better knowledge into settlement development programming about how to make houses and infrastructure safer is thus just one of many issues that need to be addressed. In fact, the task of developing secure settlements cannot be achieved unless (a) the interlinkages between disasters and urban settlement development – that, to date, have been little investigated – are thoroughly under-

4 In the past, from the 1950s to the 1990s there has been a 50 percent rise in extreme weather events associated with climate change (UN-HABITAT 2007).

5 See www.unmillenniumproject.org.

6 The 'Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters' was adopted at the United Nations World Conference on Disaster Reduction held in January 2005 in Kobe, Hyogo, Japan. It resolves to pursue a substantial reduction of disaster losses, in terms of lives and the social, economic and environmental assets of communities and countries by 2015.

7 From now on, the umbrella terms 'social housing/planning organisations' and/or 'urban development actors' will be used for this type of organisation (see glossary of appendix 1).

8 From now on, the umbrella term 'planners' will be used for the professional groups including architects, urban planners, engineers and other settlement developers (see glossary of appendix A1).

stood; and unless (b) based on this, holistic approaches and strategies are developed to effectively integrate disaster risk management into settlement development programming.

1.2 Research purpose and objective

This research is driven by the need to provide a better understanding of the challenges of increasing disaster risk and its impact on the living conditions of the urban poor, as well as to provide new conceptual and strategic approaches to face those challenges. Such approaches are especially needed, and thus sought, within the pre-disaster (i.e. development) context. Technically speaking, they come under the heading of 'adaptation' or 'ex ante disaster risk management'[9] and include measures for both risk reduction and risk financing.[10] With this in mind, the overall research objective is to enhance and develop new knowledge and innovative ways in which urban development actors can contribute more effectively to disaster risk management, thus demonstrating their role and potential within this field. The research is thus highly intersectoral and interdisciplinary. Being embedded at the disciplinary interfaces of architecture, urban planning, disaster studies, and development studies, it tackles the nexus between the working fields of disaster risk management and settlement development planning.

1.3 Research questions

In line with the research purpose and objective, the overall research question is defined as: how can disaster risk management be properly integrated into settlement development programming (see *Figure 1*)? The expected research outcome is thus the provision of knowledge, concepts and strategies to increase the potential of settlement development programming for disaster risk management, in order to assist in decreasing urban risk – and thus post-disaster destructions, forced evictions and relocations – and poverty.

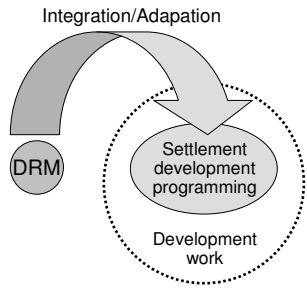

Figure 1: *Illustration of the overall research question.*

Underlying the overall research question is the search for a better understanding of the existing interlinkages between disasters and urban settlement development, more specifically, between disasters and the building and planning practices re-

9 'Ex ante' refers here to the period before a disaster strikes. From now on the terms 'ex ante disaster risk management' and 'disaster risk management' will be used as synonyms (see also glossary of appendix 1).

10 Risk financing includes risk transfer and risk sharing measures taken in a pre-disaster context (see glossary). Note that the focus of the thesis was firstly only on risk reduction (as conventionally defined), not including risk financing. In the course of the investigation, however, research outcomes made it obvious that risk financing is an important aspect that needed to be included in the research.

lated to low-income settlements. This is crucial, as these interlinkages can and should become 'translated' into improved settlement development programming. To respond to the overall research question, the research further seeks answers regarding: (a) the current relationship between the working fields of disaster risk management and settlement development planning; and (b) how related challenges and gaps can be overcome to increase the potential of settlement development programming to reduce and transfer or share risk. *Figure 2* provides an overview of the main research questions.

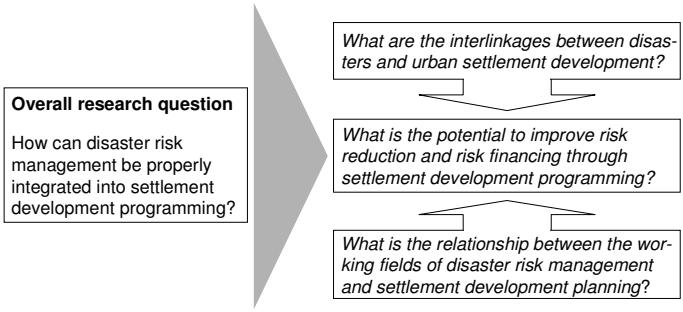

Figure 2: *Overview of main research questions.*

As described in the following, the three research questions illustrated are interconnected in the sense that their respective contents, investigations, and expected outcomes build upon each other.

Preparing the ground – linking disasters and urban settlement development. The first research question is: what are the interlinkages between disasters and urban settlement development? Or more specifically: what are the interlinkages between disasters and the building and planning practices related to low-income settlements? It will be argued that it is a two-way and multifaceted relationship that, to date, has not been well understood and theorised. The expected outcomes are new analytical frameworks that allow this relationship to be better viewed and analysed.

'Reality' versus current practices. The second research question is: what is the relationship between the working fields of disaster risk management and settlement development planning? And, thus, what efforts are being made to address, respectively, the identified interlinkages between disasters and urban settlement development? The relationship between the two fields and the efforts being made will be analysed mainly by looking at the existing separation or integration of respective aid programming, as well as related development processes of mainstreaming and/or divergence.[11] The analysis covers projects, programmes and stakeholders, the discourses of experts and practitioners, their working priorities,

11 Generally, 'mainstreaming' is a specific way of integrating a specific aspect, or working field, into another field. In fact, it signifies the modification of a specific type of core work (e.g. of a specific type/sector of development assistance) in order to take a new aspect into account and to act indirectly upon it (see annexed glossary).

concepts, terminology and tools, as well as the historical development of both working fields. The outcome is expected to be the identification and systematisation of (a) the related challenges and gaps at (and between) the global, national, municipal and local household levels; and (b) the relation between organisations' current efforts and the 'reality' of urban low-income settlements.

A way forward – interfacing disaster risk management and settlement development planning. The third research question is: what is the potential to improve risk reduction and risk financing through settlement development programming? To find the right answers, the following two questions are analysed: first, what risk reduction and risk financing measures are feasible in the field of settlement development planning? This relates to measures already implemented, as well as further potential measures that can be identified with the help of the two previous research questions. Second, how might these measures be successfully combined or integrated to meet existing challenges and gaps? The expected outcomes are conceptual, strategic and operational frameworks/models that provide new knowledge and guidance as to how international, national and municipal organisations engaging in settlement development planning can adopt a more proactive approach towards disaster risk management.

1.4 Geographical focus

Central America is one of the most disaster-prone areas in the world (Lavell 1994).[12] This fact became tragically obvious after Hurricane Mitch in 1998, which impacted nearly 11 percent of the total Central American population (IDB 1999; ECLAC 1999). Before Mitch, between 1960 and 1996, the 43 principal disasters of the region caused more than US$1.021 billion in economic damage and affected around eight million people (IDB 1999). Nevertheless, these numbers reflect only a small part of 'reality'. In the past three decades the US Agency for International Development's Office of Foreign Disaster Assistance (USAID/OFDA) actually registered approximately 70 major disasters in Central America (IDB 1999). But while it is these large-scale events that attract international attention, the region also suffers hundreds of small- and medium-scale disasters each year that have a tremendous impact in terms of damage, disruptions and fatalities, particularly within poor communities. A pilot study in the three Central American countries of Costa Rica, El Salvador and Guatemala registered over 2,400 small-scale disasters from 1990 to 1995 (IDB 1999).

Within Central America, El Salvador was chosen as the research focus country. Its capital San Salvador was destroyed by earthquake nine times between 1575

12 The Isthmus of Central America, forming a bridge between North and South America lies atop five tectonic plates, with active fault systems and 27 active volcanoes. It is located at the eastern extreme of the Caribbean hurricane belt and is hence regularly hit by severe winds and intense rainfall. Flanked by the Pacific and the Atlantic oceans, Central America's coastline is constantly battered and eroded. With mountainous terrain and complex river basin systems, landslides and flooding are also common. The combination of the hazards and the region's highly vulnerable social and economic setting produces a dynamic context of risk, with the permanent threat of disaster.

and 1986. More recently in January 2001, two severe earthquakes affected urban areas in El Salvador, which resulted in around 272,000 houses being damaged (equivalent to 20 percent of El Salvador's existing housing units) and losses of around US$2 billion (equivalent to 15 percent of El Salvador's GDP) (UNDP 2004a; Pleitéz and Acevedo Flores 2005). During the time frame of this research, within only one week in early October 2005, El Salvador was tragically hit by several disasters, namely, Hurricane Stan, floods, mudslides, an earthquake, and the Ilamatepec volcano eruption.[13]

Apart from the frequency and diversity of hazards and disasters that occur, El Salvador is an interesting case because of its very high population density. In comparison, the other Central American countries have – in relative terms – a more rural character. In El Salvador, population density rose from 170 persons per square kilometre in 1970 to about 328 in 2006. In the same year, San Salvador itself had around 3,660 persons per square kilometre.[14] In fact, El Salvador is the most crowded country in the whole of Latin America.[15] Although its high rate of population growth was, and is, similar to that of other Central American countries, its very limited national territory has aggravated the social and political effects of the population increase, one of which is the high concentration of urban poor living in risk areas. The demographic situation has actually exacerbated the problems associated with the inequality of national resource distribution, with around 54 percent of the urban households living in slums in 2002 (Ávalos and Trigueros 2005).[16] Nevertheless, compared to other Central American countries, El Salvador is economically better off, with per capita gross national income of US$2,000 (Garau et al. 2005) and a certain social and economic dynamism which has also been useful in helping to promote new ideas, including disaster risk management.[17]

A further criterion for the selection of El Salvador as the research focus country was the existence of operating and well-established non-governmental social housing/planning organisations with years of experience in the field. Examples of these organisations are the two NGOs called FUSAI (Fundación Salvadoreña de Apoyo Integral) and FUNDASAL (Fundación Salvadoreña de Desarrollo y Vi-

13 See, for instance, International Herald Tribune, 8 October 2005, at www.iht.com/articles/2005/10/08/america/web.flood.php.

14 The total population of El Salvador was around 6.9 million in 2006 on a territory of 21.040 km^2. The total population of San Salvador was around 2.2 million on a territory of 601 km^2.

15 See statistics of the Salvadoran Government at www.digestyc.gob.sv/ or www.marn.gob.sv/gis/sig/MAP_REF.htm, as well as country studies such as those at www.country-data.com/frd/cs/svtoc.html#sv0032 or CIA (2007).

16 For comparison, see the year 2001 statistics of the Salvadoran Government at www.digestyc.gob.sv/Objetivos Milenio/resumen.pdf, as well as country level statistics at http://millenniumindicators.un.org/unsd/mdg/Data.aspx and www.unhabitat.org/list.asp?typeid=44&catid=150.

17 Since the 1986 earthquake, and especially since Hurricane Mitch and the 2001 earthquakes, emergency and development organisations have gained increasing experience of disaster risk management networks and programmes (see Paper III of appendix B).

vienda Mínima).[18] In fact, the country offered a good infrastructure, as well as information richness as a result of the existence of settlement development planning and disaster risk management programmes. Moreover, some locally operating NGOs, municipalities, national agencies, and international organisations had a certain amount of experience in both fields of activity. Good access to information and collaboration could also be guaranteed through already-existing contacts[19] and newly established formal cooperation with FUSAI and UN-HABITAT-ROLAC (United Nations Human Settlement Programme, Regional Office for Latin America and the Caribbean).[20] Furthermore, and because of the country- and context-specific aspects just described, El Salvador provided a challenging opportunity for this study, as research outcomes were expected to have, comparatively speaking, good potential for evaluation and testing and, subsequently, for influencing programmes and policies.

Apart from the studies in El Salvador, field studies were carried out in several other countries (cf. sections 3.2 and 3.3). Field studies in the Philippines at the beginning of the research served as pre-studies for initial information gathering, which provided critical input in terms of specifying the research setting. The Philippines was selected as it is one of the most disaster-prone countries in the world (UNDP 2004a)[21] and because it provided significant information richness and years of experience of measures and programming related to disaster risk management, including innovative urban disaster risk management initiatives.[22] Looking at the disaster risk indices established by UNDP (2004a), El Salvador and the Philippines, while different in size and situated in very different geographical contexts, are also to some extent comparable.[23] Both are multi-hazard countries. From 1980 to 2000, the average annual number of people per million inhabitants dying from hazard-related events was 19.01 in El Salvador and 17.49 in the Philippines; the average Human Development Index was 0.701 and 0.749 respectively; and the annual average proportion of the population exposed to earthquake hazard was around 26.8 percent in El Salvador and 27.3 percent in the Philippines. Finally, minor field studies were also carried out in Manizales,

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18 FUNDASAL was created in 1968 (see www.fundasal.org.sv/); ASAI, the predecessor of FUSAI, was founded in 1989 (see www.fusai.org.sv/).

19 Before starting this research, the author of this thesis carried out consultancies in Central America. Hence, good contacts with different organisations were already established, facilitating access to information. HDM's capacity building program in Latin America, PROMEHSA, provided further contacts. FUSAI is one of its cooperation partners, which supports an average of 5,000 low-income families per year to improve their housing conditions (Garau et al. 2005).

20 The access to general disaster information was also guaranteed through the inclusion of El Salvador in the national level disaster databases DesInventar (www.desinventar.org/) as well as EM-Dat (www.em-dat.net/).

21 See also the related database at http://gridca.grid.unep.ch/undp/.

22 One example are the national demonstration projects initiated by the Asian Urban Disaster Mitigation Programme (UNDP 2004a).

23 See UNDP (2004a) and related country profiles at http://gridca.grid.unep.ch/undp/. The respective disaster risk indices and data enable experts to measure and compare physical exposure to hazard, vulnerability, and risk among countries and demonstrate a clear link between human development and death rates following 'natural' disasters.

Colombia, because of its information richness as regards the focus of this research.

1.5 Methodological approach

The research had its genesis in the author's practical 'on-the-ground experience' of working for different development programmes, amongst others, a disaster risk management pilot programme in Central America (see preface to this thesis). Based on this direct engagement with people at risk, as well as pre-studies at local household and institutional levels in the Philippines, the present research was developed and designed in a circular way (see *Figure 3)*. It started by 'taking a step backwards'; that is, a broader and more scientific/academic perspective was taken to gradually analyse the challenges and gaps at global, national and municipal levels. Then, the loop was 'closed' as the research returned to the local household level. However, it should be noted that a number of minor household level studies were already carried out simultaneously with the analyses at national and municipal level.

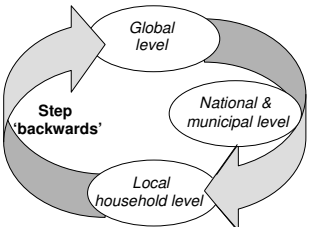

Figure 3: *Basic methodological research approach.*

On the basis of the circular approach described, the research is composed of case studies – and their context analysis – of programmes that integrate settlement development planning and disaster risk management to some extent. This type of research design was most appropriate for the development of this intersectoral and interdisciplinary research. It permitted a multi-level and multi-perspective analysis of an interconnected system from the local to the global level, as well as the consideration of the voices and perspectives of related actors and the interaction amongst them. The research methods for data gathering included interviews, group discussions, walk-through analyses, observations, text reviews, questionnaires, as well as research workshops and 'hands-on' practice (cf. section 3.3). Based on the analysis of the cases and their context, the focus of this research was on developing a grounded theory on the situation/system encountered and on how this situation/system could be improved (i.e. positively influenced). Hence, for the data analysis a combined 'grounded theory–systems analysis approach' was selected (cf. section 3.4).

Close contact with different development organisations, such as the formal cooperation partners (cf. section 1.4), as well as CEPRODE (Centro de Protección para Desastres), FUNDASAL, and Plan International, operating in El Salvador

and the Philippines, were crucial both for the data gathering process and for validating and generalising the research outcomes (cf. sections 3.2–3.4).

1.6 Target group

A differentiation must be made between the bottom line beneficiaries and the direct target group of this research. The bottom line beneficiaries are the urban poor who, if the outcomes are effectively 'translated' into practice, should benefit from the research. This is also reflected in the methodological research approach, which has its starting and end point at the local household level (cf. section 1.5 and *Figure 3*). In contrast, the direct target group (i.e. the persons directly addressed by the research), are policymakers, researchers, programme managers and operational staff of both governmental and non-governmental organisations working in settlement development planning at international, national, municipal and/or local levels.[24] However, the research outcomes also proved to be to some extent applicable by implementing and funding organisations engaged in other sectoral development work, as well as in relief, rehabilitation and reconstruction.

1.7 Limitations and delimitations

Disaster risk management is essential – and can be promoted and implemented – before, during and after large- and small-scale disasters. Yet, the focus in this research is mainly on measures that can be applied in the pre-disaster context of development programming. This limits the scope of the research so as to permit a focus on the most neglected and under-researched context. In fact, in contrast with the post-disaster phase of large-scale disasters, the pre-disaster context provides a wide range of challenges as regards advocacy, funding and knowledge of potential strategies and measures in terms of tackling disaster risk.

The study further focuses on settlement development planning for the urban poor, a field that, as yet, has been of comparatively little interest in the ongoing discussions on mainstreaming (or integrating) disaster risk management into development planning.[25] The emphasis here is less on general urban development, and mainly on social housing, upgrading, settlement planning and local urban governance programmes that have the potential to directly influence the 'reality' of the most vulnerable. In this context, the study concentrates on the conceptual, strategic and operational aspects of these programmes. Compared to structural disaster-resistant construction measures, which have been widely researched, these aspects have been somewhat neglected and are not restricted to a specific type of 'natural' hazard or disaster.

The research was further limited to the risk related to natural, small- or large-scale triggers (so-called 'natural hazards'), such as earthquakes, floods, land-

24 Non-governmental organisations include here both private profit and private non-profit institutions.

25 Development sectors, for instance, that have received more attention to date are rural development, agriculture, health, and education.

slides, windstorms, volcanic eruptions, wild fires, water surges and droughts.[26] Although these hazards are called 'natural', it is fully recognised that they can be closely linked to human-induced factors. So-called 'man-made risks', for instance wars, internal unrest or accidents, were not part of the enquiry. Accordingly, the case studies in El Salvador were carried out only in areas where the inhabitants identified and prioritised the risk related to 'natural' hazards/disasters as being the most pressing.[27]

Finally, it should be noted that the last year of research, in strong contrast with the first years, was characterised by a boom in academic and non-academic writings related to the integration of disaster risk management into general development work. Hence, only the literature that was the most relevant to the research focus, as described, could be included in this thesis.[28]

1.8 Content and outline of the thesis

This thesis consists of a research summary presented in seven chapters, as well as a compilation of eight reviewed papers (i.e. six journal articles, a book chapter and an operational framework in the form of a working paper), which were published between late 2004 and early 2008. Because of its size, the working paper has been enclosed on a separate CD.

Subsequent chapters are as follows. First, the conceptual framework of the study is presented (chapter 2), followed by a description of the research theory and methodology (chapter 3) and the cross-case findings (chapter 4). The latter comprises, on the one hand, a systematisation and synthesis of the key research findings included in the different papers mentioned above and, on the other hand, an analysis of related outcomes. These outcomes are then incorporated into a comprehensive model for integrating disaster risk management into settlement development programming. The main conclusions and final remarks follow (chapter 5), as well as a list of references and four appendices (chapters 6 and 7). Importantly, the first appendix is a glossary containing the technical key terms that are crucial for understanding this study. After the different chapters just described comes a chronological compilation of the eight papers listed below.[29] These pa-

26 The difficulty of disentangling the threat of natural hazards from other threats to lives and livelihoods is frequently commented upon by disaster researchers (e.g. Burton et al. 1993; Wisner et al. 2004; Tobin and Montz 1997; Mitchell 1999). However, the utility of an approach that singles out individual threats can be justified for research and policy (Pelling 2003a).

27 Slum dwellers were asked about existing types of risk, which ones had the highest priority, and also about their views on the underlying drivers of disasters and disaster risk (cf. section 3.2.3). This bottom-up approach influenced the change of focus of this research so that it included not only large-scale one-off events but also small-scale everyday hazards/disasters.

28 This thesis can today be considered as falling within current 'streamline thinking' as regards the integration of disaster risk management into development work. This was quite the contrary when it was proposed and outlined at the beginning of 2002 and when the research started in 2003. At that time, the research focus described was highly innovative. However, and as mentioned above, within the field of settlement development planning the integration of disaster risk management has remained, and thus still is, an under-researched area.

29 'Chronological' refers here to the date of writing, and not the date of publishing.

pers build on each other by proceeding methodologically through the different research levels (i.e. the global, national, municipal and local household level) to answer the research questions presented in section 1.3.

- **Paper I:** Wamsler (2004) 'Managing urban risk: perceptions of housing and planning as a tool for reducing disaster risk', *Global Built Environment* (GBER) 4(2):11–28.
- **Paper II:** Wamsler (2006) 'Mainstreaming risk reduction in urban planning and housing: a challenge for international aid organisations', *Disasters* (Journal of Disaster Studies, Policy and Management) 30(2):151–77.
- **Paper III:** Wamsler (2006) 'Integrating risk reduction, urban planning and housing: lessons from El Salvador', *Open House International* (OHI) 31(1):71–83, special issue on 'Managing urban disasters'.
- **Paper IV**: Wamsler (2006) 'Tackling urban vulnerability: an operational framework for aid organisations', *Humanitarian Exchange* (HE) 35:24–26, special issue on 'Humanitarian action in urban contexts'.[30]
- **Paper V:** Wamsler (2006) 'Understanding disasters from a local perspective: insights into improving assistance for social housing and settlement development', *TRIALOG* (Journal for Planning and Building in the Third World), 91(4):4–8, special issue on 'Building on disasters'.
- **Paper VI:** Wamsler (2007) 'Bridging the gaps: stakeholder-based strategies for risk reduction and financing for the urban poor', *Environment and Urbanization* 19(1):115–142, special issue on 'Reducing risks to cities from climate change and disasters'.
- **Paper VII:** Wamsler (2008) 'Planning ahead – before disasters strike', book chapter in: *Hazards and the built environment: attaining built-in resilience*, Lee Bosher (ed.), Taylor and Francis Publications.

The eighth publication included in this thesis, enclosed as a separate CD, is:

- **CD:** Wamsler (2006) *Operational framework for integrating risk reduction for aid organisations working in human settlement development*, Disaster Studies Working Paper No. 14 (revised version published in December 2007, Benfield Hazard Research Centre (BHRC), London.

The following publications and working papers also present research outcomes; however, they could not all be included in this thesis work:

- Wamsler (2003) 'Local disaster risk management and the possible integration of GIS (Geographical Information System)', working paper, GIS-centre, Lund University, July 2003.

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30 This paper was published not in an academic but in a practitioners' journal. However, as this research was being carried out within the tradition of so-called 'Mode 2' knowledge production (cf. section 3.1.1), with the bottom-line beneficiaries being the urban poor (cf. section 1.6), including it was considered vital.

- Wamsler (2004) 'Local disaster risk management for low-income settlements', European Network of Housing Research (ENHR) International Housing Conference on Housing Growth and Regeneration, Cambridge, July 2–6, 2004, proceedings, p.213.
- Wamsler (2004) 'Fieldwork and case study in El Salvador: a research strategy report', conference paper, European Network of Housing Research (ENHR) International Housing Conference on Housing Growth and Regeneration, Cambridge, July 2–6, 2004.
- Wamsler (2005) 'Preventing post-disaster destructions and forced evictions: integrating risk reduction, urban planning and housing in El Salvador', conference paper, N-AERUS Conference on Promoting Social Inclusion in Urban Areas Policies and Practice, Lund, September 16–17, 2005.
- Wamsler (2006) 'Conferencia mundial sobre la reducción de desastres', *PROMESHA Boletín* 1/2006:1–2.
- Wamsler (2006) 'Managing urban disasters' (Editorial), *Open House International* (OHI) 31(1) 2006:4–9, special issue on 'Managing urban disasters'.
- Wamsler (2006) *Marco operativo para la integración de la gestión del riesgo para organizaciones trabajando en el desarrollo de asentamientos humanos* [Operational framework for integrating risk reduction for aid organisations working in human settlement development], Disaster Studies Working Paper No. 14, Benfield Hazard Research Centre (BHRC), London.
- Wamsler (2006) 'Operational framework for integrating risk reduction for aid organisations working in human settlement development', International Disaster Reduction Conference, Davos Switzerland, August 27 – September 01, 2006, proceedings Vol. 3:626–629.
- Wamsler (2006) 'Building on disasters' (Editorial), *TRIALOG* (Journal for Planning and Building in the Third World) 91(4):2, special issue on 'Building on disasters'.
- Wamsler (2007) 'Coping strategies in urban slums', in: *State of the world 2007: our urban future*, chapter 6 on 'Reducing natural disaster risk in cities', p.124, The World Watch Institute, Norton & Company, New York.
- Wamsler (2007) 'Integrando la gestión del riesgo, planificación urbana y vivienda social: lecciones de El Salvador' [Integrating risk reduction, urban planning and housing: lessons from El Salvador], *INVI* (International Journal of the Institute of Housing, Faculty of Architecture and Urban Planning, University of Chile), 59:93–114.

In the following text of this thesis, references are included only if the content is based on work other than the author's.

CHAPTER

TWO

2 Conceptual framework

The intersectoral and interdisciplinary setting of this research is reflected in its conceptual framework, which is shaped by existing approaches to the fields of both disaster risk management and settlement development planning. In accordance with the research focus, the emphasis of this twofold framework is on those concepts that have influenced, and are influencing, related development programming.[31] The changing discourses and paradigms within both fields of activity are analysed in sections 2.1 and 2.2, which show how they have evolved on a largely independent basis, as well as their temporary convergences and divergences. Concrete examples from El Salvador illustrate some of the developments described. Within each section, a subsection describes the current shortcomings of each field, and where this research is positioned within the conceptual developments described. Note that the key technical terms mentioned are defined in the annexed glossary.

2.1 Changing discourses in disaster risk management

The key concept underlying (disaster) risk management is the notion of risk. In general terms, risk can be understood as the probability of adverse effects, and (disaster) risk management is thus seen as the reduction of that probability in order to minimise or prevent those adverse effects. The way in which different research communities and stakeholders define risk dictates how risk management is addressed. Slovic (1999:689) states that 'whoever controls the definition of risk controls the rational solution to the problem at hand. If risk is defined one way, the one option will rise to the top as the most cost-effective or the safest or the best. If it is defined another way, perhaps incorporating qualitative characteristics and other contextual factors, one will likely get a different ordering of action solutions. Defining risk is thus an exercise in power, as is its management.'[32] Similarly, Douglas (1992) promotes the idea that 'risk language' has a social

31 Due to the lack of interdisciplinary work and theory connecting both fields (Woiwode 2002, 2007), various concept maps were elaborated during the course of the research (cf. Maxwell 2005). These assisted the analysis of the interrelation between the two fields, as well as how this interrelation is linked to a range of other fields of activity, disciplines, and related concepts.

32 There are many political aspects to disaster risk management and these are present at all levels (i.e. from the local, municipal, national to the global level). Who gets or doesn't get related aid/support is often politically driven (Wisner and Walker 2006), and generally little effort is put into pre-disaster risk reduction as it is a field of activity which is not politically 'sexy', unlike, for instance, relief or reconstruction. Related aspects are explicitly commented on in the annexed Papers I, II, III, V and VI.

function in that it is often used to express blame and to accept or reject responsibility.

Before turning to the focus of the research, that is, the risk of disasters and the management of that risk within an urban context (sections 2.1.2 and 2.1.3), the following section 2.1.1 will give a brief background regarding general risk (management) research. In section 2.1.4 the relation between disaster risk management and adaptation to climate change is then explained. Finally, the shortcomings of the discourses in disaster risk management are highlighted and the resulting conceptual positioning of this study is described.

2.1.1 Risk (management) research

Risk research or science has a long tradition in sociology, psychology, philosophy, economics and other disciplines. It had its genesis around the 1950s, and since then has undergone a constant development that has generated various disciplinary trends, risk definitions and theories (Persson 2007a). In this context, it is mainly 'outcome risk' that is researched, that is, the consequences of certain well-defined events (Sahlin and Persson 1994).

Contemporary conceptions of risk researchers are typically agent-centred. These conceptions entail that risk emerges in a decision situation (e.g. Luhmann 2005) and/or is man-made (e.g. Douglas 1992; Beck 1992).[33] It is argued that a specific risk for a person exists or emerges only with his/her decision and that this risk is 'manufactured' and not of external, natural origin. Other risk researchers, such as Starr (1969), Rescher (1983) and Persson (2007b), disagree with these conceptions. In fact, they identify a so-called 'risk-taker fallacy', pointing out that there are also risks that people do not take, but (unintentionally) run. This recognises that 'risk runners' are not necessarily synonymous with 'risk takers'. Against contemporary conceptions, Persson (2007b) further argues with the so-called 'risk production fallacy', stating that not all risk that has to be managed is man-made. He thus suggests that risk – man-made or natural – has to be manageable in order to be called risk (as opposed to hazards, which Persson [2007b] defines as unmanageable).

2.1.2 Disaster risk (management) research and practice

In contrast with risk and risk management research, disaster risk management is still a relatively new field of knowledge and activity that has undergone its own seemingly independent evolution. The field is developing slowly, as is its multifaceted process of institutionalisation (cf. Twigg 2004). The analysis of existing literature shows that disaster risk management seems to have emerged and is

33 Beck is the founder of the social theory called 'risk society', which describes the production and management of risk in modern society. The theory focuses mainly on 'manufactured' risk and not 'external' risk. The latter includes risk produced by 'natural' disasters, which are seen to be caused only by non-human forces (see, for instance, http://en.wikipedia.org/wiki/Risk_society).

evolving, not so much from theory and science, but based on different working experiences. In fact, it has been evolving mainly through the practical use, and related analyses, of different approaches to managing risk carried out and evaluated by the humanitarian, development, environmental and climate change communities (cf. Wijkman and Timberlake 1984; Maskrey 1989).

Furthermore, disaster risk management seems to have developed in the opposite direction to risk research, as described in section 2.1.1. In disaster risk management, risk was first understood and dealt with as a purely natural issue, although according to contemporary perceptions, there is no such thing as a 'natural' disaster. The first understanding is referred to as the 'naturalistic paradigm' (Ferrero and Gargantini 2006) or 'technocratic approach' (Bankoff et al. 2004); the contemporary perceptions fall within the 'multidisciplinary paradigm', which states that all disasters are of socio-natural origin (Ferrero and Gargantini 2006). The different components that are considered to be part of disaster risk, and thus characterise the definition of risk, have evolved over time in different ways and within different communities (Pelling 1997; Adger 2006). However, within the framework of this thesis, in the following only the development of disaster risk management research and practice, as a whole, will be described in detail.

1960s–1970s. Traditionally, discussions about disasters took place in the humanitarian emergency relief arena (Twigg and Steiner 2002). Until the 1970s, the dominant view was that (the risk of) a 'natural' disaster was synonymous with a natural event (or so-called hazard), such as an earthquake, flooding, landslide, windstorm, volcanic eruption, wild fire, water surge or drought. Risk (R) was thus equated with hazard (H):

$$R = H \tag{2.1}$$

In other words, a natural hazard was, ipso facto, seen as a disaster. The magnitude of a disaster was thus considered to be a function of the magnitude of the hazard, with the latter being considered as an inevitable one-off event (Twigg and Steiner 2002). Consequently, the emphasis of researchers, as well as of national governments and the international community, was on pure disaster management, that is, searching for ways to improve the reaction to disasters and, in the best-case scenario, making preparations in advance to improve existing response capacities (Aysan and Davis 1992). Consequently, in many countries of the developed and developing world, national emergency agencies were established or restructured during this period.[34] From the early 1970s onwards, planners began to get involved in the ongoing disaster discussions, first, because of the need for adequate shelter in times of emergency and reconstruction (Davis 1975), and second, because it was found that the same natural hazard can have varying im-

34 For instance, in 1978 the Federal Emergency Management Agency of the United States of America (FEMA) was created to house civil defence and disaster preparedness (see www.fema.gov). El Salvador's National Emergency Committee COEN was founded in 1976 (Decreto No. 498, see www.coen.gob.sv).

pacts on the built environment. A general trend thus evolved to associate disasters more with their physical impact than with their natural trigger. This promoted conventional engineering and settlement development planning as an important means of mitigating disasters, mainly for formally built areas (UNDP 2004a).[35] However, in many countries efforts to reduce risk by these means have been minimal because of their high financial cost (UNDP 2004a).

1970s–1990s. Beginning quietly in the 1970s, but with an increased emphasis during the 1980s and 1990s, researchers in the social sciences triggered a shift in thinking by pointing out that the impact of a natural hazard depends mainly on the vulnerability of the people affected (Maskrey 1993 and 1989; Wijkman and Timberlake 1984; Blaikie et al. 1994). In fact, with the advent of the term 'disaster risk management' (replacing the term 'disaster management'), the focus of attention moved to social and economic vulnerability[36] and was further reinforced by the mounting evidence that natural hazards have widely varying impacts in different countries and on different social groups within those countries (UNDP 2004a). The idea that risk (R) is equated with hazard (H) and vulnerability (V) now started to be promoted by different researchers (e.g. Blaikie et al. 1994):

$$R = H + V \tag{2.2}$$

From the early 1990s onwards, a growing literature has also been emerging in Latin America and the Caribbean, Asia and Africa, born of increasing working experiences in disaster reduction and related social science research carried out by developing country researchers and institutions. In Latin America, for instance, researchers joined forces through the social studies and disaster prevention network 'La Red', created in 1997. Literature related to this network forms the basis of many of the contemporary approaches to disaster risk management being discussed and advocated at the international level.[37] In parallel, after a quiet beginning in the late 1970s, but mainly during the 1990s, engineering and settlement development planning was gradually removed from the disaster risk management agenda. This development took place because most socially oriented authors (and programme managers) accorded only secondary importance to the built environment and related planning practices. Indeed, they commonly neglected planning (including social housing and infrastructure development), perceiving it not as a vitally important risk reduction measure, but as a purely

35 An example from this period is UNDRO (1976), which focuses on physical planning, settlement management and building measures. Exceptional for this period is its focus on the pre-disaster context.

36 Until the 1980s 'vulnerability' received little attention as a distinct concept and then started to evolve from a very restricted concept measured by reference to physical indicators, to a broad and complex process (Pelling 1997). One of the first uses of the term 'vulnerability' was around the 1980s (cf. Chamber 1983). 'Eakin and Luers (2006), Bankoff et al. (2004), Pelling (2003a), Füssel and Klein (2006), Cutter (2003), Ionescu et al. (2005) and Kasperson et al. (2005), for example, present significant reviews of the evolution (…). These build on earlier elaborations by Liverman (1990), Dow (1992) (…) and others (…)' (Adger 2006:269). See also annexed glossary.

37 See, for instance, Lavell (1994, 1999); Martínez López (1999) and other publications of 'La Red' listed under www.desenredando.org/public/libros/index.html, www.desenredando.org/public/articulos/index.html and www.desenredando.org/public/revistas/index.html.

physical measure dealing only with the symptoms of the problem and not the causes (UNDP 2004a).

1990s–2000s. During this period many pilot programmes in the field of disaster risk management emerged in developing countries (see also preface to this thesis). This was prompted by the International Decade for Natural Disaster Reduction (IDNDR) between 1990 and 1999 and a number of highly destructive large-scale disasters that occurred at the end of the 1990s,[38] which resulted in increased resources being made available by international agencies. However, despite the start of a shift away from disaster management towards the reduction of risk, the post-disaster context (i.e. emergency relief, rehabilitation and reconstruction) remained the focus of research and intervention, with a few exceptions, such as those mentioned by Aysan and Davis (1992). In El Salvador, for instance, several programmes from this period, and the research related to them, emphasised the importance of integrating disaster risk management into reconstruction programmes (e.g. GTZ 2003a,b).

The new millennium. During recent years, the growing experience gained within the above-mentioned pilot programmes in the field of disaster risk management, combined with ongoing conceptual developments (see, for instance, Cuny [1983] and Anderson [1985]),[39] resulted in the gradual evolution of a common understanding. In fact, disaster risk management is now generally seen as a cross-cutting topic, and the causal factors of disasters are understood to be directly linked to development processes, which generate different levels of vulnerability (UNDP 2004a).[40] Hence, the integration of disaster risk management into development planning (i.e. the pre-disaster context) has become the main focus (cf. Lewis 1999). The United Nations International Strategy for Disaster Reduction (UNISDR), established in 2000, has helped to raise the profile of related discussions. UNISDR promotes the idea that the reduction of disaster risk requires a long-term engagement in development processes (including settlement development) and hence an increased engagement of international organisations in this field.[41] This shift in thinking is reflected not only in the literature, but also on the ground. Examples are:

(a) The move away from emergency organisations towards development organisations as the national counterparts for disaster risk management. Lavell (1999:1) states that: 'one of the results if not one of the causes of the growing concern for

38 Between 1997 and 2001 there were major floods in, for instance, East Africa, Latin America, the Caribbean and South and Southeast Asia; Hurricanes Georges and Mitch in Central America and the Caribbean; mudslides and debris flows in Venezuela; a cyclone in India (Orissa); and earthquakes in Turkey, El Salvador and India (Gujarat).

39 'Cuny provided a first systematised and comprehensive series of ideas on the ways disasters may interrupt development processes, whilst, at the same time, offering opportunities for future development' (Lavell 1999:1); Anderson (1985), whilst focusing on disaster response, provides a reconceptualisation of the linkages between disasters and long-term development, as well as related capacities and vulnerabilities.

40 Note that already 'since the early 1970s, the issue of the relationship of disasters and development has been a topic of intermittent writing and discussion;' however, it 'fade[d] repeatedly as increased demand for emergency action has focused on necessarily short-term responses' (Lewis 1999:xiv).

41 See, for instance, www.unisdr.org/eng/about_isdr/isdr-mission-objectives-eng.htm.

the development impact of disasters has been an increase in the number and types of institutions involved with the disaster problematic. These are no longer limited to the humanitarian preparedness and response organisations as was essentially the case towards the end of the last decade.'

(b) The 'disappearance' of pilot programmes on disaster risk management since disaster risk management has no longer been understood as a separate working field or sector, but has become a cross-cutting topic for all types of development sector programmes.

(c) The inclusion of special (and mainly added-on) disaster risk management components within different development sector programmes, with sectors such as rural development, agriculture and health seemingly being more 'popular' than settlement development planning.[42]

Recently, there have been further discourses to the effect that development processes are not only generating different patterns of vulnerability, but also altering patterns of hazard (UNDP 2004a; Chafe 2007). This argument is causing increasing concern, especially as evidence mounts regarding the potential impact of global climate change (IPCC 2007b).

Today, disaster risk management is considered to be a constantly evolving and integral paradigm that not only incorporates most of the different trends and perceptions mentioned above, but is also indispensable for cost-effective development and sustainable poverty reduction.[43] Within this framework, risk is defined by UNISDR (n.d.[a]) as: 'the probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions.'[44] Accordingly, risk is conventionally expressed by:

$$R = H * V \tag{2.3}$$

Compared to the equation 2.2, this representation has improved as, from a mathematical point of view, probabilities are multiplied and not summed.[45] The multiplication further clearly illustrates that even if the hazard is small, the resultant risk can become multiplied and thus be extremely high. The 'Pressure and Release (PAR) Model' of Blaikie et al. (1994) looks in detail at the two different risk components, hazard and vulnerability. The model conceptualises the role of hazard and of vulnerability in the production of risk and allows a theoretical

42 For El Salvador, all three changes listed are illustrated in detail in Paper III (see appendix B).

43 In this context, changing discourses in development studies also effected that 'poverty' has been deconstructed, revealing its economic, political, social, psychological and environmental components, and then reconstructed around the concept of vulnerability (Pelling 1997).

44 Compared to risk research, such a definition turns away from an agent-centred approach (i.e. mostly looking at the consequences of being exposed to specific agents that – in conjunction – create a risk environment).

45 In the second edition of Blaikie et al. (1994), that is, in Wisner et al. (2004), the equation 2.2 originally used and included in the 'Pressure and Release' (PAR) Model was changed to equation 2.3.

chain of explanation to be constructed between global and local forces. Entitled the 'progression of vulnerability', this chain has three main levels: global 'root causes'; intermediate 'dynamic pressures'; and local 'unsafe conditions'. Root causes, acting at the most remote, macro level, are best seen as the dominant structures that underlie the allocation and distribution of resources and power. Unsafe conditions are the most visible producers of vulnerability and can be seen acting at the local household level. Examples could be substandard buildings or inadequate local economies and structures. Acting between the global and local forces are the intermediate, dynamic pressures 'that "translate" the effects of root causes into the vulnerability of unsafe conditions' (Blaikie et al. 1994:24).[46] Dynamic pressures can be, for instance, urbanisation as well as inadequacies in training, institutional systems, or government standards.

The growing interest of some researchers and practitioners in linking risk further with the positive capacities (*C*) of people to respond to disasters is reflected in the following extended risk equation (UNISDR 2002): [47]

$$R = H * V / C \qquad (2.4)^{48}$$

Here, 'capacities' refers to people reacting suitably during and in the immediate aftermath of disasters. In both definitions (i.e. equations 2.3 and 2.4), vulnerability is today generally understood as the opposite or antithesis of resistance (Benson and Twigg 2007) and can be experienced both individually and collectively.[49]

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46 In the second edition of the book, the sentence fragment was slightly changed to 'that "translate" the effects of root causes both temporally and spatially into unsafe conditions' (Wisner et al. 2004:53).

47 'The use of the concept of capacity emerged in response to the negativity of the term vulnerability (…)' (Davis et al. 2004:2).

48 This illustration is unfavourable as it may give the impression that only the variable *V* is directly related to people's capacity to respond (see also section 2.1.5). Note that in the revised version from UNISDR (2002) (i.e. UNISDR [2004]), there is no longer any mention of this extended equation. This probably relates to the fact that the 'distinction between vulnerability and capacity has been criticised by certain authors as being unnecessary (…)' (Davis et al. 2004:2). This view relates to the fact that some researchers and practitioners consider people's response capacity in terms of responding to disasters implicitly as a component of vulnerability in the preceding equation 2.3. UNDP (2004a:11) states, for instance, that a 'natural disaster is understood to be an outcome of natural hazard and human vulnerability coming together, coping capacity of society influences the extent and severity of damages received.' Only very few exceptions, such as Benson and Twigg (2007) include coping capacity to respond to disasters more explicitly as part of vulnerability. The majority of other literature does not consider response capacity as being part of the risk equation. Hence, the variable 'capacity' in this equation was, and is, generally only understood (a) to be related to vulnerability, not hazard(s) (which was eventually not the original idea), and (b) to be counteracted by the increase in people's capacity to respond during and in the immediate aftermath of disasters (i.e. not by the increase in people's capacity to recover). The latter is probably based on the fact that it was relief organisations that first started to work in the disaster risk management field. In the course of this research, limitations of this definition were demonstrated (see sections 2.1.5 and 5.2.1).

49 Individual and collective vulnerability are deeply interlinked. Individual vulnerability is determined by asset profiles which are composed of, for instance, access to economic, social and physical resources and claims on social and political influence. Collective vulnerability of urban communities, settlements or nations is understood as being determined by institutional and market structures such as the mechanisms chosen for physical infrastructure provision (Pelling 1997).

2.1.3 Urban disaster risk management

The conceptual disaster risk management framework described above has evolved with a rural bias. In the main, related concepts (such as risk and vulnerability) and tools (such as vulnerability and capacity assessment tools) were actually developed with a focus on the rural environment and based on related working experiences (Pelling 1997; Davis et al. 2004).[50] Only recently have increasing attempts been made to 'translate' these concepts and tools to the urban context. The need to do this has been recognised by different researchers such as Moser et al. (1996) who have attributed higher vulnerability to the urban than to the rural poor. It has also been promoted by Pelling (2003a:vii), who has argued that 'urbanisation looks set to be one of the most forceful drivers for and contexts of social change that will prefigure disaster risk in the medium and long term.'

The near absence of urban disaster risk management is a subgroup of the failure to mainstream disaster risk management in development (Pelling 2003b). In this context, especially little research can be found that looks at the interface between disaster risk management and urban settlement development planning or programming (Woiwode 2002, 2007).[51]

2.1.4 Relation to the climate change adaptation approach

The terminology used by the disaster risk management community to define emerging experiences and research related to risk and disaster management is interpreted in vastly different ways by climate change scientists and practitioners (UN IATF/DR 2006; Schipper and Pelling 2006). In fact, specific climate change and disaster risk discourses have hardly ever overlapped (UNDP 2002), and it is only recently that the connection between them has been made in earnest (cf. Sperling and Szekely 2005; Satterthwaite et al. 2007). The scientists and organisations examining the problem of global climate change have gradually expanded their approach from initial concerns regarding the causes of climate change, through a desire to model its potential effects, to a concern with how societies and economies can adapt to changing climatic conditions. 'With this gradual turn to adaptation considerations and an increase in its salience, the climate change adaptation community has clearly commenced to take up on a topic that is very close and complimentary to the traditional preoccupations of the risk and disaster community. How to live with and adapt to climatic extremes and how to promote more resilient and secure communities are questions that are at the centre of concerns for both communities' (UNDP 2002:14).[52] Given this development, measures of adaptation and disaster risk management can, today, for the most part be

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50 An exception to this is Aysan and Davis (1992) who focus on experiences and developments in urban contexts.

51 This also relates to the fact that the existing body of knowledge is mostly in the form of independent case study literature of NGO disaster reduction initiatives, evidence that often remains in agency files (Benson and Twigg 2004). For more details see also Paper I and II.

52 Note that within the framework of this research, this shared concern of the two communities was also expressed and highlighted by calling one of the main research outcomes the 'Analysis and Adaptation Model'.

seen as synonymous. Thus, an international trend has recently evolved that promotes the integration of the disaster risk and climate change concerns of the related 'Hyogo and Kyoto communities',[53] as well as the integration of their combined concerns into poverty reduction efforts.[54]

2.1.5 Shortcomings and conceptual positioning

Based on the foregoing sections, three main shortcomings and the related positioning of this research are highlighted as follows.

The first shortcoming is that hardly any alternative strategies for settlement development planning have been developed to replace the conventional engineering and planning practices that, from the late 1970s onwards, were gradually 'deleted' from the disaster risk management agenda (cf. section 2.1.2). Recently, these practices have once again started to be recognised as important risk reduction measures (cf. UNISDR 2005a; UNDP 2004a). However, their pitfalls and deficits, which were identified during the 1980s (such as their cost and the fact that they failed to meet the needs of the most vulnerable), have still not been tackled. This situation is reflected in the lack of comprehensive literature on the topic: (a) general disaster studies still tend to focus only on the hazards themselves and hence mainly address related scientific and structural aspects and solutions (e.g. high-tech structures and prediction systems) (cf. section 2.1.2); (b) more socially oriented disaster studies look principally at the (social) causes of vulnerability, thereby usually neglecting settlement development planning (cf. section 2.1.2); (c) only a few publications fully recognise urban disasters (cf. section 2.1.3); and hence (d) little literature is dedicated to finding improved planning practices for integrated and sustainable settlement development planning. Such literature would ideally address: (a) the pre- rather than the post-disaster context (i.e. not emergency relief, rehabilitation or reconstruction); (b) aspects of planning that are not primarily physical/structural; and (c) the most vulnerable who often live in informal slum areas. The present study was designed to address this gap.

The second shortcoming is that, despite the homogenisation of the disaster risk management framework described (cf. section 2.1.2), there are hints of the frustration and confusion that still exist on the part of many researchers and practitioners (Lavell 2003). In fact, at times risk reduction or disaster risk management is seen and used as if it is equivalent to vulnerability reduction, and risk and vulnerability are understood to be synonymous with each other and not separate 'reali-

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53 The term 'Hyogo community' refers to the disaster risk management community that committed itself to the Hyogo Framework for Action 2005–2015 (UNISDR 2005a). The term 'Kyoto community' refers to the climate change (mitigation) community that committed itself to the Kyoto Protocol (established in 1997 and entered into force in 2005), an agreement made under the United Nations Framework Convention on Climate Change (UNFCCC).

54 See, for instance, 'Stockholm Plan of Action for Integrating Disaster Risks and Climate Change Impacts in Poverty Reduction' (http://gfdrr.org/docs/StockholmPlanOfAction.pdf), established on 24 October 2007 during a workshop in Stockholm, Sweden, organised jointly by Sida, the World Bank and UNISDR under the Global Facility for Disaster Reduction and Recovery (GFDRR).

ties'. The author's belief, which was later confirmed by this research, is that this relates to the fact that the different components of risk and the respective measures designed to tackle them are seldom kept separate from each other and hardly ever systematised.[55] This often results in a poor understanding of and inadequate approaches to disaster risk management (and thus also to disaster risk management integration). In this context, from the beginning of this research the extended definition of risk was used, with only a slight change in its notation to better illustrate and thus separate the three equally important components of risk (cf. section 2.1.2):

$$R = H * V * LC \qquad (2.5)^{56}$$

where *LC* represents lack of capacity to respond to disasters. Equation 2.5 is mathematically identical to the equation 2.4 (i.e. $R=H*V/C$) presented above, but does not mix factors/variables with positive and negative connotations (which are all defined as ≥1). The separation of the different components of risk allowed a more systematised search for strategies to manage urban risk. The separation of vulnerability and capacity in this equation is, for instance, also supported by Davis et al. (2004) who propose such a distinction for the sake of clarity. Compared to the perception of Persson, described above (cf. section 2.1.1), some components of the equation contain both manageable and unmanageable elements. In this context it has to be noted that while, in the literature, the term 'disaster risk reduction' is increasingly replacing the term 'disaster risk management', the latter is the one that is used in this study. This is because the research revealed measures to tackle risk that do not avoid, prevent or minimise the established risk components as indicated and described in the commonly used equations 2.3 and 2.4 (i.e. $R=H*V$; $R=H*V/C$) (cf. sections 2.1.2 and 5.2.1). However, as this was one of the final research results, the term 'risk reduction' was used in several of the attached papers. This was also partly because of the trends then being dictated by the journals in which they were published and by different international agendas.

The third and most important shortcoming is that while the integration of disaster risk management into development work is the declared aim of many (international) aid agencies (and is thus commonly included as an indicator in their tools for monitoring and evaluating the progress in disaster risk management), the con-

55 For instance, by including capacity in vulnerability, while 'capacity and vulnerability cannot always be considered as two ends of a spectrum' (Davis et al. 2004:2), or by including within the definition of disaster risk management and disaster risk reduction the related 'measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards' (UNISDR n.d.[a]) without, however, relating them to the different risk components so that they become understandable and applicable on the ground.

56 Lack of capacity refers here to the capacity to respond effectively during or in the direct aftermath of disasters. Based on the research outcomes, the limitations of this definition were demonstrated and an adapted version proposed (see section 5.2.1). It is acknowledged that there can be a slight overlap between factors related to vulnerability and the capacity to respond. However, there are issues that clearly relate to only one or the other component. Thus, the advantages of the differentiation prevail, especially in the context of settlement development planning and programming, where vulnerability tends to be strongly associated with physical/structural issues.

cept is not yet fully developed.[57] In fact, there is hardly any grounded theory on disaster risk management integration/mainstreaming. Moreover, there is insufficient research and knowledge on the ground as to how different development sectors could, in concrete, practical terms, reduce disaster risk and as to how a sustainable process of integrating disaster risk management could be achieved (Tearfund 2005). In addition, the few investigations[58] that have recently advanced the related body of knowledge do not specifically address social housing/planning organisations and related settlement development planning, and are thus, for the most part, not applicable within this context.[59] In the course of this research it also became obvious that existing discourses on disaster risk management integration, and the tools related to them, are often limited in one or several of the following ways:

- They confuse mainstreaming with disaster risk management programming; or, in other words, they do not differentiate between 'integrating' and 'mainstreaming' disaster risk management;[60]
- They look at disaster risk management integration only at the local household level *or* only at the institutional level;
- They focus mainly on risk reduction through hazard and vulnerability reduction and thus do generally not consider other measures to manage risk;
- They make reference only to the physical/structural aspects related to settlement development planning (if, indeed, settlement development planning is mentioned at all); and
- They are based on knowledge gained from a top-down approach and/or the rural context.[61]

57 As a result, such indicators are commonly phrased as, for instance, 'development of a strategy which mainstreams disaster risk management within the organisation's development operations', without indicating what such a strategy consists of and/or could look like in practice, and without providing assistance for implementing organisations working in the field.

58 Important recent publications are, for instance, Benson and Twigg (2006); IDB (2004a,b); IDEA/IDB (2005); Mitchell (2003); Tearfund (2005); UNDP (2004a); UNDP/UNISDR (2006); and UNISDR (2003, 2005b).

59 There is even one tool developed by IDB (2004a) that had originally included housing and settlement issues; however, because of this sector's complexity, it was later excluded (see also Papers I and II). Benson and Twigg (2007) and Rossetto (2006) include some general aspects regarding construction design, building standards and site selection.

60 Compared to other cross-cutting issues, such as gender or HIV/AIDS, it was identified that the idea of mainstreaming disaster risk management is widely underdeveloped and/or misunderstood. Generally, 'mainstreaming' signifies the modification of a specific working field (within, for instance, development or relief work) so as to take a new aspect/topic into account and to act indirectly upon it. Thus, the term 'mainstreaming' does not mean to change an organisation's core functions and responsibilities, but instead to view them from a different perspective and to carry out any necessary alterations, as appropriate.

61 As was later revealed by this research, the limitations listed relate, amongst other things, to a lack of interconnections, coherence and knowledge transfer between and among the global, national, municipal and local level, as well as related theoretical discussions, tools and practice.

2.2 Changing discourses in settlement development planning

The second conceptual framework in which this thesis is embedded is settlement development planning.[62] Just as the definition of risk dictates how disaster risk management is addressed, so the definition of the housing problem determines the course of settlement development planning and programming. In fact, as Gilbert (2001) notes, the way the housing problem is defined can help justify and promote actions to prevent land invasion, hold down the level of rents, generate employment through housing, and/or improve shelter in informal settlements. Further, as with disaster risk management, settlement development planning is a politicised area, as both development and the built environment, and especially housing provision, are influenced by political decisions – and corruption (Broadbent 2001; Transparency International 2005).[63]

The following two sections (2.2.1 and 2.2.2) describe the change in the discourses and paradigms on settlement development planning and programming that have influenced related social housing, upgrading, settlement planning and/or local urban governance programmes in developing countries, including El Salvador. Temporary convergences and divergences that have occurred in terms of the discourses on disaster risk management are pointed out. Finally, section 2.2.3 highlights the shortcomings of the discourses in settlement development planning and describes the conceptual positioning of this study. For a definition of the technical terms used, see appendix A1.

2.2.1 Urban planning theory and practice

Originally, one of the main functions of the city was to provide defence, not against 'natural' disasters but against human threats from the 'outside', such as wars, armed conflicts and other depredations.[64] With the population growth that took place during the Neolithic Revolution,[65] urban communities became increasingly exposed to natural forces, such as 'natural' disasters, famine and diseases. In order to 'bring them under control, the king gathered himself extraordinary sacred powers. (…) Urban man [thus] sought to control natural events his more primitive forerunners once accepted with dumb grace' (Mumford 1961:40). In defiance of this view, subsequent urbanism was marked by the development of

62 For a definition of the term 'settlement development planning', please see glossary (appendix A1). Note that some of the annexed papers use alternative terms.

63 Related aspects were identified at all research levels (i.e. the global, national, municipal and local level), and are explicitly mentioned in the annexed Papers II, III, V and VI.

64 Mumford (1961:35–36) writes that in: 'the final creation of the city, the "little city", the citadel, towered above the village and overwhelmed the humble village ways. (…) The primitive citadel was (…) a holding point, where the chieftain's booty, mainly grain and possibly women, would be safe against purely local depredations – safe, that is to say, against attack by the resentful villagers (…). Once war became an established institution there is no doubt that the stronghold more and more served this fashion [i.e. the citadel being mainly a defensive place].'

65 The Neolithic Revolution is a term for the first agricultural revolution, and describes the transition from nomadic hunting and gathering to agriculture and settlement, as first adopted by various independent prehistoric human societies, in numerous locations on most continents between 10,000 and 12,000 years ago.

cities that were wracked by both human and natural threats. Mumford (1961:467) states that during the 18th century '(…) it was only by a continual influx of new life from the country that the cities so hostile to life could survive at all.'

During the colonial era, poor planning strongly fostered the vulnerability of Latin American cities.[66] In fact, cities were commonly sited for reasons of economic access and production rather than safety, making them cases of risk by origin. In addition, some cities were – and are – built according to imported colonial building codes and planning systems/mechanisms that are inappropriate for their locations (Pelling, 2003a; World Watch 2007). Moreover, the subsequent institutionalisation of urbanisation in Latin America, which began during the 1930s, was strongly influenced by foreign 'experts' who acted as advisors (Almandoz 2006). As a result, from the 16th to the 19th century, European planning theory and practice is reflected in Latin American city plans, and vice versa (Hardoy 1983).

Looking at the more recent planning theory and practice, during the last decades three paradigm shifts can be identified, with each shift in turn implying a change in the kinds of skills or techniques considered appropriate to settlement development planning and related programming.[67]

1940s–1960s. Between 1945 and 1965, urban planning theory and practice were dominated by a conception that essentially purported to be an exercise in physical design, thereby intimately connecting architecture and planning (Taylor 1999). Master planning was the approach promoted, and it was also introduced in the developing world (Jenkins et al. 2007). The modernist model of planning of this period can further be equated with a 'top-down' state-directed approach (Taylor 1999). In line with the original idea of cities being a defensive place against external human threats, Meurman (1947) coined the term 'protective city planning' for protection against fire and threats from the air. He suggested that vulnerable facilities should be 'deconcentrated' and isolated from the rest of the city.[68] Since the architectural modern movement, more inner-city (man-made) threats, such as assaults and accidents, have been actively factored into the vulnerability equation, with a move towards greater protection of cities through physical means and electronic surveillance. In this context, the term 'defensible space' was created in the 1970s by Newman (1972).

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66 Information on informal and formal planning and settlement development by the local population during the pre-colonial time is contradictory. Positive views seem to prevail. For example, Hardoy (1975) points out the selection of ecologically favourable areas for urbanisation during the pre-colonial period, as opposed to an 'ignorance of the characteristics of sites chosen' during the colonial period (Hardoy 1975:16). Other researchers, such as Vitale (1983), emphasise that it was the original inhabitants of Latin America who initiated the gradual process of environmental degradation (although being energetically auto-sustainable), leading to increasing disaster risk. Nevertheless, there seems to be general agreement that the environmental degradation escalated during the 16th century, the colonial period (cf. Vitale 1983).

67 Compared to other researchers, Taylor (1999:327) calls the developments that occurred not 'paradigm shifts' but 'outstanding changes in planning' or 'significant developments which "filled out" and enriched the rather primitive town planning theory which existed half a century ago'.

68 Meurman was the first teacher of urban planning at Helsinki Technical University in 1936 and the first professor of the discipline in 1940.

1960s–1970s. Since the 1960s the physical- and design-based view was increasingly complemented by the view of cities as systems. Planners were concerned with methods of analysing these systems, including their social and economic effects, with the aim of taking instrumentally rational planning decisions (Taylor 1999). This development towards systems thinking was in reaction to the rigidity and limited scope of master plans in the 1950s and 1960s, which were now being replaced by so-called structure plans (Jenkins et al. 2007). Where large-scale hazard maps existed, they were consulted and/or included in structure plans to avoid infrastructure development in high-risk areas.

1970s–the new millennium. Throughout the 1970s and 1980s planners were increasingly viewed less as technical experts than as facilitators and managers of planning decision-making processes. This shift was combined with an increased ideological commitment to participation in order to integrate the public as well as the marginal groups into these processes. In parallel, the private sector became more influential. With planning emphasising the task of facilitating or enabling decisions about appropriate policies and plans over that of taking action, a concern emerged with implementation. In response, 'action planning' became a central preoccupation of some planning theorists, and postmodernists promoted the move towards community-based bottom-up planning (Taylor 1999). Several new issues also began to emerge. Wider awareness of environmental issues during the 1980s, for instance, led to a new focus on environmental urban management, as well as discussions on the 'green' sustainability agenda and the 'brown' environmental health agenda (Jenkins et al. 2007). Related studies, such as 'nature ecology' and 'urban ecology', give consideration to planning that ensures compatibility between urban planning and the natural environment. However, the emphasis there is on physical/structural aspects that deal mainly with the conservation of the environment and/or climatic design features (i.e. the emphasis is not on aspects of 'natural' disaster reduction). Another increasing body of knowledge and related literature, prompted by a range of large-scale disasters at the end of the 1990s (cf. section 2.1.2), is devoted to the post-disaster context and focuses on the physical/structural aspects related to emergency relief, rehabilitation and reconstruction.[69] More recently, there have been some discourses on integrated and preventive urban planning, indicating the need for planning as a tool to help adjust urban areas to increasing disasters and climate change. However, related theory and practice are mainly concerned with 'greenhouse gas mitigation'. In fact, most literature focuses on the improvement of buildings and related construction processes so that they become more energy-efficient (e.g. Mazria 2003;

69 The surge in related conferences, related professional papers and special issues of international journals was, and is, indicative of this still continuing focus. Current examples of international conferences are, for instance, 'Earthquake Disaster Risk Reduction: Engineering Challenges after Recent Disasters', 14–15 April 2008, Jakarta, Indonesia; or the 4th Conference of the International Group for Research and Information on Post-Disaster Reconstruction (I-Rec) entitled 'Building Resilience: Achieving Effective Post-Disaster Reconstruction', 30 April – 2 May 2008, Christchurch, New Zealand.

Roaf et al. 2004; Smith 2005). Publications dealing with the adaptation of settlement development planning to disaster occurrence are an exception to this. However, these have, to date, mainly focused on the purely physical/structural aspects of the formally built environment of developed countries (e.g. EMA 2002).

2.2.2 Planning trends and practice of international agencies

The developments described in the previous section are reflected in the programmes and planning schemes promoted by international agencies engaging in settlement development planning in developing countries. In the following, the related discourses and paradigms are analysed. It is shown how these evolved on a mainly independent basis from disaster risk management concerns and how they indirectly supported or hindered the integration of the two fields. Examples from El Salvador are cited to illustrate the impacts of some of the developments on the ground.

1940s–1960s: government as architect.[70] The period after World War II was marked by massive public housing programmes and the eradication of informal settlements.[71] Most of the former, also called 'conventional public housing programmes', had to be declared unsuccessful. The reasons included unaffordable prices, corrupt procedures and favouritism, inaccessibility for the poor, and low quality caused by a lack of maintenance (Tannerfeldt and Ljung 2006). In El Salvador, state interventions in social housing began in the early 1960s, with new and completed housing units being constructed on subsidised land. These housing programmes were promoted and executed by the central government and through the autonomous national Urban Housing Institute (IVU: Instituto de Vivienda Urbana).[72]

1960s–1970s: government as planner and provider. As the conventional public housing programmes were not very successful,[73] several new developments occurred. In the late 1960s and early 1970s protagonists such as John Turner began to advocate the improvement of informal settlements as the way forward, and 'self-help' became a paradigm in housing in the developing world (Jenkins et al. 2007). As regards private residential housing, self-help was the corollary of a growing housing deficit, caused by the inability of the formal sector to provide sufficient shelters (Gilbert 2001).[74] In line with this, from the mid-1970s to the

70 The subtitles characterising the different periods were partly taken from the 'urban development timeline', elaborated by the Planning and Development Collaborative International (PADCO) (www.urbantimeline.org).

71 During the 1950s and 1960s, further typical initiatives supported in the developing world were the setting up of building research establishments for testing housing materials, techniques and designs (UN-HABITAT 2005).

72 In the early 1990s, IVU went bankrupt. The proceeds of its sale became investment capital for new institutional frameworks that emerged as the result of structural adjustment policies (Stein and Vance 2007).

73 In El Salvador, in the 1960s, an average of 10,000 new families were counted each year in the urban areas of El Salvador, but the formal public and private housing programmes only produced 2,600 units per year. By 1972, about 55 percent of the existing formal urban housing solutions available on the market could only be afforded by the richest 40 percent of the population (Bamberger et al. 1982).

74 Gilbert (2001:26) states that 'the proliferation of self-help housing has greatly increased access to home ownership in Latin American cities.'

mid-1980s, the World Bank introduced the 'sites-and-services' scheme (World Bank 1993), and related programmes were subsequently promoted by most international agencies. Through 'anticipating urban development by providing organised areas for settlement', this approach had the potential to 'prevent the occupation of hillsides or of low-lying land liable to flood, both of which are dangerous for the settlers and expensive to service' (Gilbert 2001:45). From 1972 onwards, the emphasis shifted to so-called 'squatter upgrading' or 'slum upgrading'.[75]

Other related trends that evolved during the 1960s and 1970s were 'bottom-up' approaches, the 'intermediate technology' concept (Schumacher 1973; see also citation at the beginning of this study), and a first recognition of the informal sector. Regarding the bottom-up approaches, urban community-development workers have championed participatory methodologies at the settlement level since the 1960s. Because of the failure of conventional urban (master) planning and of planners' lack of responsiveness to the fast-changing needs of developing cities, Otto Koenigsberger (1964) introduced the concept of 'action planning' (i.e. community-based schemes supported by government agencies) (cf. section 2.2.1).[76] This approach was subsequently further developed by Hamdi into 'community action planning' or so-called 'microplanning' (Hamdi and Goethert 1997). 'Methods and tools from community action planning have been used in various parts of the rapidly urbanising world – often as part of international agency-funded urban planning and management projects' (Jenkins et al. 2007:140), such as sites-and-services and slum upgrading programmes. The acceptance of participatory approaches/programmes such as these represented an important paradigm shift in theoretical and normative aspects of development. Their operationalisation has also been achieved through changes in the funding strategies of the international donor community, through the rise of social movements, and through the increasing influence of NGOs and community-based organisations (CBOs) in urban management in the South (Mitlin and Thompson 1995).

In El Salvador, several massive sites-and-services programmes (providing a minimal core house and infrastructure on 'greenfield' sites) and slum upgrading programmes (to improve conditions in unserviced settlements) started in the 1970s (UN-HABITAT 2005). The civil war in the first part of the 1980s interrupted this process. A subsequent restructuring process enabled different institutions to develop further site-and-services programmes during the period 1985–1987. In spite of their generally recognised success,[77] by the late 1980s the im-

75 Skinner et al. (1987) analysed upgrading programmes across the developing world, concluding that they tend to benefit low-income communities, which stimulated substantial individual home improvements.

76 Koenigsberger is one of today's acknowledged 'gurus' of self-help housing, together with Abrams, Mangin and Turner (Gilbert 2001). The action planning approach attempts to identify key issues that could be affected by immediate action and interventions and that would also be within the resources of the relevant authorities (Jenkins et al. 2007).

77 It has to be noted that occasionally such housing programmes were also introduced to remove a problematic slum. However, this was exceptional and often related to an emergency caused by 'natural' disasters (Gilbert 2001).

plementing NGOs, including FUNDASAL, faced the following two main problems: (a) they had been unable to influence national housing policy changes; and (b) the sites-and-services programmes were, for the most part, only reaching the higher income groups amongst the poor (UN-HABITAT 2005; Stein and Vance 2007). These problems were also common in the sites-and-services and upgrading programmes of other countries, as were difficulties with replicability and cost recovery. These were partly due to (a) the programmes' top-down approach; (b) their 'bypass' implementation structures (i.e. their realisation without the adequate involvement of the local authorities and communities); and (c) the fact that the programmes usually did not include institutional capacity building (Tannerfeldt and Ljung 2006). However, as regards upgrading, these constraints were step by step lessened as aid organisations became more experienced, and thus a more holistic upgrading approach was achieved. In fact, upgrading programmes increasingly began to involve different stakeholders, most importantly municipal governments and beneficiaries, and they gradually came to embrace non-physical/non-structural forms of slum improvement (Gilbert 2001). In the 1980s, for instance, employment activities and institutional capacity building started to be included (Jenkins et al. 2007; UN-HABITAT 2005).

Apart from the developments during the 1960s and 1970s in terms of sites and services and slum upgrading, in the early 1970s planners began to get involved in discussions on disaster risk management. Interest was growing in the design and implementation of ways to mitigate disaster losses through physical and structural measures (for example, by building levees and flood defences or by increasing the resistance of structures) (UNDP 2004a). However, in line with the changing conceptual understanding of disaster risk management, the role of planners within this field soon diminished yet again (cf. section 2.1.2).

1980s–1990s: government as enabler. From the early 1980s to the 1990s at the national and city levels, structural adjustment programmes (SAPs) were introduced by the World Bank and the International Monetary Fund (IMF). Public sector expenditure on housing was reduced and the state's role as a provider/developer changed into that of an 'enabling' agent, whose main function was now to remove the market-related bottlenecks that impeded the supply of inputs at the city level by private production agents (UN-HABITAT 2005). Subsequently, 'the World Bank increasingly drew on innovations in the creation of housing credit institutions' (Jenkins et al. 2007:168). This also initiated a shift from project-oriented lending to lending for housing finance, which was intended to lead to sector reforms (UN-HABITAT 2005). UN-HABITAT (2007), Moser et al. (1996), and Hamza and Zetter (1998) highlight that structural adjustment increased, and even caused, the present-day vulnerability of the urban poor. Structural adjustment had, for instance, the effect of marginalising urban planning by decreasing the influence and political role of planners and national planning units. An example of this was Jamaica after Hurricane Gilbert in 1988, where the Jamaican planning and housing sectors were blamed for the losses,

some of which were related to structural adjustment policies that had resulted in poor maintenance of rental property and non-compliance with building regulations (Ford 1989 in Wisner et al. 2004).

In short, from the 1980s to the 1990s, a shift from 'delivering' to 'enabling' housing and settlements took place. This 'enabling approach' involved the participation of a wide range of multi-sectoral actors, including the state, whose task was not to provide housing but to create legal, institutional and economic frameworks for housing provision. This shift towards policy intervention rather than project/programme activities, together with the increased role of the private sector, actually made it even more difficult to promote and implement disaster risk management measures. The 'enabling approach' can thus be viewed not only as a cause of urban vulnerability, but also as an obstacle to integrating disaster risk management into urban settlement development planning. During the 1990s, this situation was further aggravated by (a) a decline in interest on the part of international organisations in settlement development planning as an important means of poverty reduction, and thus a decline in related funding (Tannerfeldt and Ljung 2006); and (b) the occurrence of a number of large-scale disasters which resulted in international organisations diversifying their shelter portfolio away from slum upgrading and towards post-disaster relief (World Bank 2006b).

In El Salvador, during the 1980s and 1990s, the international approach towards 'enabling' and 'structural adjustment' influenced the way that housing policies and programmes were designed and implemented. The state of El Salvador deregulated its economy and privatised the banking system. In 1992, the National Fund for Popular Housing (FONAVIPO: Fondo Nacional de Vivienda Popular) was created to mobilise state resources to authorised financial intermediaries with the aim of addressing the demand for shelter credit from low-income families working in the informal sector. New organised settlements, so-called NAOs ('nuevos assentamientos organisados'), most of them situated far away from city centres, were the outcome. As the investment capital from FONAVIPO for financing housing subsidies was derived from selling the assets of the above-mentioned national Urban Housing Institute, housing support of this kind is now coming to an end (Stein and Vance 2007). Whilst, during the same period, in El Salvador, too, shelter portfolios tended to be diversified towards post-disaster relief (World Bank 2006b), Sida allocated more than SEK 419 million (about US$52 million) to support settlement development planning programmes in Central America. The Sida programmes were executed through a variety of actors, including central and local governments, NGOs, private conventional and non-conventional financial institutions and CBOs (Stein and Vance 2007). In El Salvador, the resources provided by Sida were channelled through FUSAI, which is one of the cooperating partners in this research.

1990s–2000s: government as regulator. During this period, globalisation became a powerful trend, and whilst governmental stimulation/regulation of market

forces grew at the national and local levels, at the same time advocacy groups and civil society became stronger. With the Habitat Agenda (on 'Adequate Shelter for All and Sustainable Human Settlements Development in an Urbanising World')[78] being established in 1996 in Istanbul, a new basis was created for national and international housing and urban policy. Urban poverty, the social aspects of housing, good governance, alliance building, community participation, local government involvement, environmental sustainability and also, in this context, disaster prevention, became more salient issues (Tannerfeldt and Ljung 2006; Jenkins et al. 2007). Regarding the former, during the 1990s new approaches to the study and assessment of urban poverty were also developed, including the concept of 'vulnerability' (Moser 1996).[79] As regards environmental sustainability, another important framework was, and still is, Agenda 21 adopted during the 1992 United Nations Conference on Environment and Development in Rio de Janeiro. Chapter seven of Agenda 21 deals with human settlements and environmental planning. In parallel, since the early 1990s settlement development support for countries affected by disasters has increasingly become more than just an occasional type of intervention on the agendas of the World Bank and other aid organisations. This has gradually also led to the development of some programmes that are attempting to reduce housing vulnerability *before* disasters occur (World Bank 2006b); however, most of these programmes focus only on physical/structural aspects. In Central America after Hurricane Mitch in 1998 – as well as in various other regions that were hit by large-scale disasters during the 1990s – disaster risk management programmes were increasingly supported, but in most cases independently of support for settlement development programming (cf. section 4.2.2).

The new millennium: government as partner and facilitator. Since 2000 most international and national development agencies have been pursuing the Millennium Development Goals (MDGs). These goals represent a global partnership designed to respond to the world's main development challenges by improving the coherence of efforts focused on poverty reduction. Whilst aspects of urban development and 'natural' disaster concerns seem to be underrepresented in the MDGs, these goals are closely connected to both settlement development planning and disaster risk management (cf. Garau et al. 2005; UNISDR n.d.[b]; UN-HABITAT 2007). Most importantly, MDG 7, target 11, to improve the lives of at least 100 million slum dwellers by 2020 (many of whom live in risk areas), involves appropriate urban development and an improved understanding of disaster risk in densely populated areas (UNISDR n.d.[b]).[80] To promote sustainable set-

78 See, for instance, www.unhabitat.org/downloads/docs/1176_6455_The_Habitat_Agenda.pdf.

79 See also footnotes 43 and 179.

80 This target is also stated in the Millennium Declaration itself and reflects the goal set by the 'Cities without Slums Action Plan' in 1999. Note that the United Nations Millennium Project Task Force on Improving the Lives of Slum Dwellers reformulated MDG 7, target 11 as: 'by 2020, improving substantially the lives of at least 100 million slum dwellers, while providing adequate alternatives to new slum formation' (Garau et al. 2005:3). Target 10 of the same

tlement development, the 1999 'Cities without Slums Action Plan', developed by the Cities Alliance, defines key actions to meet MDG 7, target 11.[81] To the same end, the World Bank published its new urban strategy called 'Cities in Transition: A Strategic View of Urban and Local Government Issues' in 2000.[82] The actions that this strategy promotes are built upon successful community-based slum upgrading programmes, yet they mainly address the broader policy and institutional issues that often constrain(ed) the sustainability of such programmes. They focus, for instance, on expanded assistance and scaling-up of services for the poor, institutional in-country capacity building, and urban national/city strategies. The importance of direct support to local-level in situ improvements was, however, strongly emphasised by the United Nations Millennium Project Task Force on Improving the Lives of Slum Dwellers, which also states that: '(…) barring exceptional circumstances, such as those deriving from irreversible environmental hazards, informal settlements must be protected from forced evictions and regularized with the active consent and participation of the interested population' (Garau et al. 2005:4).

In parallel to the developments described above, social housing microfinancing has further evolved and is now perceived as a key issue for poverty reduction that should be addressed in the field of settlement development planning (UN-HABITAT 2005). Such housing microfinancing can be, and is increasingly being, provided through NGOs – as is also the case in El Salvador. In recent years, and in accordance with the above-mentioned shift towards sector reforms through housing finance (that is partly combined with subsidies), the World Bank has almost completely ceased lending for specific slum upgrading programmes (World Bank 2006b). Other connected trends of the new millennium are expressed in the title of the 2005 'Paris Declaration on Aid Effectiveness, Ownership, Harmonization, Alignment, Results and Mutual Accountability', which aims to push the continuous shift from project and programme funding towards: (a) basket funding; (b) Sector-Wide Approaches (SWAps);[83] and even further to (c) general budget support. With this, international organisations' responsibilities appear to be ever-more blurred, as it has become nearly impossible to link individual programme measures to specific donors. This is also true of programmes that aim at the development of disaster resilient and sustainable social housing and settlements.

MDG 7 ('ensure environmental sustainability') is to reduce by half, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.

81 See www.citiesalliance.org/activities-output/topics/slum-upgrading/action-plan-about-ca.html.

82 See http://wbln0018.worldbank.org/External/Urban/UrbanDev.nsf/3f4821145a56d40c8525688700750ae8/4accee4613282d0f852568c000503ca3/$FILE/CitiesSummary.pdf.

83 Further milestones which pushed the SWAps forward – apart from the 2000 MDGs and the 2003 Rome Declaration on Harmonisation – were the 1995 Social Development Summit in Copenhagen, the 1996 Highly Indebted Poor Countries (HIPC) Initiative, and the 2002 Conference on Financing for Development in Monterrey.

Finally, one month before this PhD thesis was finalised, the Global Report on Human Settlements 2007 was released, which focuses on 'Enhancing urban safety and security'. The report encompasses a wide range of concerns, amongst other issues, the risk of 'natural' disasters. In this context, it emphasises that 'international assistance for disaster risk reduction should not focus on recovery and reconstruction efforts alone, but also on longer-term development objectives' (UN-HABITAT 2007:xxxii).

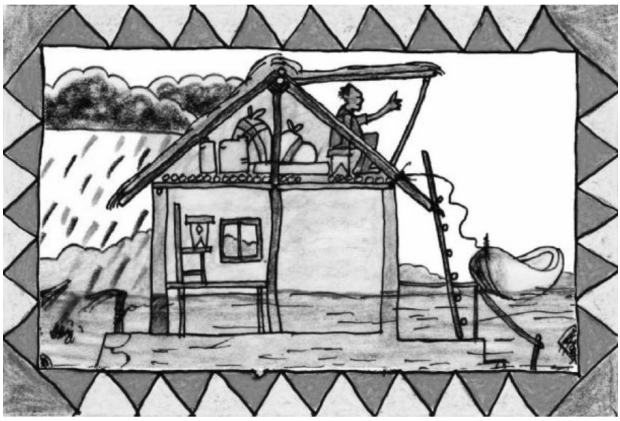

Figure 4: *Example of a playing card associated with the 'Handbook: learning how to live with floods' (Feuerhake 2004a), elaborated within the framework of a UN-HABITAT upgrading programme in Mozambique. This programme can be considered as having evolved from developments during the 1990s–2000s, when disaster risk management began to become a more salient issue, partly also within the context of settlement development planning (see sections 2.1.2 and 2.2.2). Note that the card shows a variety of ways in which people could adapt their housing and living environment so as to better cope with risk and disasters.*

2.2.3 Shortcomings and conceptual positioning

Based on the previous sections, three important shortcomings are now highlighted that support the positioning of this research in terms of its focus and conceptual framework.

First, following the MDGs – and the outcomes of the World Summit on Sustainable Development, held in Johannesburg, South Africa, in 2002 – international donors are again promoting the private sector as a leading provider for settlement development, such as urban infrastructure and services (cf. section 2.2.2)[84]. 'In recent years, for example, increasing private sector involvement in water and sanitation utilities has been put forward as a widely applicable means of water and sanitation provision' (UN-HABITAT 2003c:xxii). Unfortunately, this also signifies: (a) that programmes with a focus on settlement development planning

84 This is mainly related to the agreed target to halve, by the year 2015, the proportion of people who are unable to reach or to afford safe drinking water, as well as the proportion of people who do not have access to basic sanitation (as was already outlined in the Millennium Declaration and MDG 7, target 10).

again tend towards one-sided physical/structural improvements, thus obstructing more holistic planning that would include disaster risk management; and (b) a move away from officially promoted poverty alleviation (i.e. the support for the poor who are most in need, including those living at risk) (World Bank 2006b). In Latin America, the currently poor economic performance, the rising inequalities and growing disaster risk, in combination with the extent of the shelter problem, certainly cast doubt on the efficacy of such a market-led model, reminding us that some form of national and local government intervention and civil society support in urban matters is essential (cf. Hasan et al. 2005; Garau et al. 2005).[85] In this context, the failure of the evolving approaches to settlement development planning in developing countries, which developed after self-help and bottom-up planning, means that the latter is still valid and thus a sound basis/focus of this research. In fact, Jenkins et al. (2007) state that support for self-help and bottom-up approaches is indispensable, at least for complementing other programmes or sector support. However, whilst related pre-disaster social housing, upgrading and governance programmes have a powerful potential to reduce disaster risk, current action plans, strategies and programmes to achieve effective urban development generally lack adequate and comprehensive approaches to disaster risk management (integration).[86] Such challenges underpin the need for this research.

Second, whilst the interest of international organisations in settlement development planning, and consequently in funding related to it, decreased during the 1990s (cf. section 2.2.2), the concept of SWAps is again augmenting the role of planning as the task of facilitating, developing and harmonising appropriate sectoral policies, related programming and budgeting. In theory, the integration of different actors and cross-disciplinary/sectoral aspects is a logical consequence of related preparatory sector assessments and could assist in more integrated planning (including disaster risk management). However, as this research will later reveal, little is being done on the ground in this respect. This demonstrates not only the timeliness of the present research, but also the need to show how such SWAps might look in practice.

Third, and building on the former point, the shift towards SWAps described above demonstrates that planning today is less about 'plan-making' as an activity

85 'From the 1950s to the middle 1970s, market failure was seen as the principal cause of underdevelopment in Latin America. During the 1980s, the blame shifted to government failure. Only since the early 1990s, has the debate become a little more balanced. Today, most authorities accept that there is an appropriate role for both the market and the state and the issue today is about the balance between the two' (Gilbert 2001:35). Nevertheless, in Latin America, there is currently still too much confidence in the power of market forces, as the market does not always work well, and land and housing markets often work much less well than other markets (Gilbert 2001). During the 1990s, El Salvador devoted around 3.7 percent of its GDP to construction, the majority of which was on housing. However, government expenditure on housing has been much lower (i.e. less than 0.2 percent between 1985 and 1994) (Gilbert 2001).

86 Giving increased emphasis to the post-disaster phase is, for instance, still current practice. Though the World Bank has carried out occasional disaster relief projects since 1972, disaster relief became a regular component of the shelter loans in 1986 and now accounts for approximately 25 percent of the annual shelter portfolios. In fact, the share of disaster relief projects increased from 11 percent during the first 15 years shelter lending to 25 percent during the last 18 years (World Bank 2006b).

fixed in time or strict regulatory control, but, in fact, a form of action planning that can respond to change, that is open to negotiation, and that goes far beyond the sectoral/disciplinary issues of housing and urban planning. Such a shift 'has widened the scope of action for planning and housing professionals enormously in principle, although many continue to work in quite narrow professional areas' (Jenkins et al. 2007:202). An important step forward to widen these 'narrow professional areas' is to develop knowledge on how disaster risk management could – in practice – be integrated into the working sphere of planning and housing professionals. Knowledge of this kind is also urgently needed to counteract the lack of literature in this regard: only a small amount of systematic research has been carried out on the interdisciplinary/intersectoral aspects in relation to disasters and urban settlement development, and more specifically, in relation to disasters and preventive building and planning practices associated with informal low-income settlements. In fact, there is a large amount of literature emerging from the planning field that deals purely with construction-related issues in the post-disaster scenario of mainly large-scale disasters (cf. section 2.2.2). Only very few publications, however, are based on a more proactive (rather than reactive) attitude and also include non-physical/non-structural aspects. Exceptions to this are publications on cities and general development issues with an ecological and health-centred approach. Nevertheless, these mainly cover the above-mentioned 'green' and 'brown' sustainability agendas, thus taking account of, but not specifically focusing on, broader disaster risk reduction measures. The recent report of UN-HABITAT (2007) on 'Enhancing urban safety and security' is a step further in the search for new knowledge and related approaches on how disaster risk management could be integrated into settlement development planning.

2.3 Interfacing the twofold conceptual framework

Sections 2.1 and 2.2 presented the twofold framework in which the research is embedded. They showed the separation of the disaster risk management and settlement development planning discourses, related concepts and paradigms, and how the two fields evolved mainly on an independent basis over time. The convergences that occurred, which were also highlighted, were not sustainable (as they were only temporary and/or not of a holistic nature).

The twofold discourses described, and their related concepts and paradigms, were crucial for defining the conceptual basis of this research. The fact of their separation further guided the research setting, directing it towards the construction of a grounded theory (hitherto lacking) for adequately interfacing disaster risk management and settlement development programming. The methodology selected to develop such a theory is presented in chapter 3 and is followed by a description of the research results and conclusions. The latter build directly on the twofold framework presented in this chapter by further advancing both the sector-specific body of knowledge related to it and the interface between the two.

CHAPTER

THREE

3 Research theory and methodology

This chapter is divided into five sections. The theoretical positioning of the research is described first (i.e. its underlying philosophical paradigms and disciplinary premises). This situates the study within the general 'research landscape'. Second, the overall design of the research is presented, which confronts and responds to the challenges resulting from the research's theoretical positioning. Sections 3.3 and 3.4 then describe how the overall research design was 'translated' into strategies and procedures for data collection and data analysis. Finally, the last section discusses key aspects related to research ethics and data validity and reliability.

3.1 Theoretical positioning

The theoretical positioning of the research was determined to be in accord with its purpose and objectives, the questions it raises, as well as its intersectoral and interdisciplinary field of enquiry and conceptual framework (cf. chapters 1 and 2).

3.1.1 Research paradigm

Philosophical positioning (epistemology and ontology).[87] The underlying philosophy of the research is post-positivist critical realism.[88] This is the belief that there is an external reality (independent of an individual's own view of reality), that every observation is fallible, and that all theory is thus revisable. In line with this, the research is further predicated on constructivist thinking, according to which everybody constructs his/her own view of the world based on personal perceptions. Hence, objectivity is not a characteristic of the individual, but rather an inherently social phenomenon that is achieved through discussions among multiple individuals (Trochim and Donelly 2006). In other words, the research is based on the belief that there is no single shared reality, thus emphasising: (a) the social construction of theory and concepts; and (b) the importance of qualitative approaches and triangulation to achieve knowledge through appropriate approximation (Guba 1990).

87 Epistemology is the philosophy of knowledge or how we come to know. Ontology involves the philosophy of 'reality'. Epistemology thus addresses how we come to know that reality, while methodology identifies the particular practices used to attain knowledge of it.

88 One of the main supporters of post-positivism was Karl Popper (see, for instance, http://en.wikipedia.org/wiki/Postpositivist).

'Mode 2' knowledge production. Apart from the philosophical positioning described, the research is further positioned within the spheres of academic science and actual practice. In fact, as far as permitted by the research setting, the selected research paradigm lies within the tradition of so-called 'Mode 2' knowledge production. This entirely new mode of knowledge production, which began to emerge during the last decade, is slowly gaining prominence over an older mode of knowledge production, 'Mode 1' (Gibbons et al. 1994; Nowotny et al. 2001).[89] In accordance with Walther-Jacobsen (2004) and Dunin-Woyseth and Nielsen (2004), the 'Mode 2' approach starts the research initiative from the identification and experience of local problems. These problems take the centre stage of the research, as the aim is to produce knowledge that is directly useful or applicable at the local level. The context of the application thus drives the form and content of the knowledge sought, while at the same time the research is 'predicated on the synergies between science and social mission' (Nowotny et al. 2001:91).[90] 'Mode 2' generally stems from the experience that problems have surfaced that are too complex for specialised academic-based science to solve. Their solution requires transdisciplinarity in the sense that the traditional boundaries between disciplines must be crossed, and a heterogeneous set of practitioners and experts must be involved if relevant new knowledge in more than one discipline is to result (Dunin-Woyseth and Nielsen 2004; Gibbons et al. 1994; Walther-Jacobsen 2004). Hence, 'Mode 2' provides an effective approach to the challenges of this intersectoral and interdisciplinary research.

Qualitative research paradigm. The choice of a qualitative research approach, which is part of social science, is directly related to the philosophical positioning of this study (see above).[91] As such an approach does not assume that there is a universal and shared view of a single unitary reality, it acknowledges the perceptions of individuals. Consequently, it (a) accepts and deals with potential research bias through the researcher's own perceptions; and (b) puts the researcher's own interpretation of the information at the centre (as opposed to a numerical focus). This orientation was also crucial in terms of finding satisfactory answers to the research questions presented in section 1.3. These required not statistical conclusions, but mainly the analysis of qualitative data related to the studied multi-level system and the various related sources and stakeholders. (cf. sections 1.5 and 3.2;

89 'Mode 1', which for many investigators is still the ideal model for university research, is also known as basic research, where problems are set, examined, and solved in a context governed by the academic interests and codes of practice of a single disciplinary community. In the words of Patton (1990:12), 'the purpose of basic academic research is to generate theory and discover truth, that is, knowledge for the sake of knowledge. The purpose of applied research and evaluation is to inform action, enhance decision making, and apply knowledge to solve human and societal problems.'

90 Nowotny et al. (2001:90–91) state that 'if the shift from Mode 1 science to Mode 2 knowledge production is accepted, it is accompanied, inevitably, by a more contentious phenomenon, the rise of contextualised science' and '(…) a more holistic perspective [of universities], predicated on the synergies between their science and social mission'.

91 As Trochim and Donelly (2006) point out, the 'qualitative-quantitative debate' lies primarily at the level of the underlying assumptions of a piece of research rather than at the level of the data. Hence, the qualitative research paradigm does not preclude the use of quantitative methods and data.

Figures 3 and 5). This search for a contextual/systemic understanding is in line with the underlying idea of qualitative research, namely, that the best way to understand a phenomenon is to view it in its context. In other words, one small part of 'reality' cannot be viewed separately without the importance of the whole being lost (Trochim and Donelly 2006). Given the mainly explanatory and exploratory nature of this research, the qualitative research approach was also essential in that it allowed flexibility and questions to emerge (which would not have been the case with a constructed and predetermined measurement instrument). The qualitative research approach was further seen as appropriate, as its aim is both to broaden the perspective from subject–object orientation, and to include the dimensions of social relations and organisational structures that this study required (Holme and Solvang 1996; Maxwell 2005).[92] Moreover, this approach was identified as being the most appropriate way of assessing complexity, while at the same time being flexible and also capable of spanning different disciplines (Capjon and Kvarv 2002).

During the course of the research, the qualitative research paradigm (i.e. the search for a contextual/systemic understanding based mainly on qualitative methods, data and salient theory) led to the development and use of an innovative combination of: (a) grounded theory (Glaser and Strauss 1967); (b) systems theory (von Bertalanffy 1950), in particular systems analysis (Hördur 2004; Sterman 2000); and (c) a form of evaluation theory (Patton 1990/2002), more specifically, case studies (Yin 2003; Stake 1995). The latter are a valuable and recognised evaluation tool and one possible design of qualitative inquiry (Yin 2003; Patton 1990, 2002). The emphasis of this combined 'case studies–grounded theory–systems analysis approach' was on developing a grounded theory on the situation/system encountered and on how this situation/system could be improved (i.e. positively influenced). For further details see sections 3.2 and 3.4.

3.1.2 Research in the 'Making Disciplines' – in developing countries

Research-to-praxis continuum. The present research was carried out – and provides knowledge – within the so-called 'making professions' of architecture and urban planning.[93] Hence, it has to comply with demands of two worlds: its own professions and the academic field. 'While the main criterion of viability in the former world is its relevance to the practice of the profession[s], in the latter it is the ability to fulfil the criteria of science (…)' (Dunin-Woyseth and Michl 2001:2). However, this does not cause any conflict, as the research is based on the belief that there is a continuum from scientific research to creative application that can link knowledge gained from academic investigation and practical experi-

92 See also www.qual.auckland.ac.nz/

93 The applied aesthetic fields such as architecture, urban planning and design, industrial design and art are establishing themselves as academic disciplines under the name 'The Making Disciplines' (Dunin-Woyseth 2003; Dunin-Woyseth and Michl 2001).

ence. This is in line with 'Mode 2' knowledge production described above in section 3.1.1.

Disciplinary identity making and interdisciplinarity. Because of the focus of this research and the methodology needed for its development, the research is embedded in the interface between different disciplines, as will now be described. First, architecture and urban planning, being part of the 'making disciplines', have only recently started to establish their academic and disciplinary identity and thus lack proper scientific research strategies. In fact, although architecture and urban planning are developing and advancing towards an academic and disciplinary positioning, their methodologies and methods are generally 'borrowed' from the social sciences.[94] Second, the focus of the research lies between the disciplinary borders of architecture, urban planning, disaster studies, and (international) development studies. As there is no common understanding of theories, concepts and methods across these disciplinary borders that would allow communication among them, a rigorous and transparent research logic/approach was imperative for this study in order to facilitate cross-disciplinary cooperation and communication. Cross-disciplinary cooperation and communication here relates both to the implementation of the research and the distribution and realisation of its findings.

The relation of the research to development studies and its implementation in developing countries entails additional methodological challenges. In fact, Sumner and Tribe (2004:1, 22) state that 'many generic concerns in social science concepts and methods are amplified in a developing country context (…).' 'For example, concerns over the validity of research, the extent to which the results are representative, the reliability of data, and the subjectivity and interpretation of results are particularly problematical in developing countries (…).' Hence, the above-mentioned rigorous and transparent research approach required had to be based on logical processes that link the research from start to finish with a coherent thread throughout, with each stage informing the next (see *Table 3* for this research).

Sections 3.2–3.4 describe the conduct of the research, which corresponds and responds to the challenges resulting from its theoretical positioning, as presented. This conduct is described by discussing, in each section, both the conceptual basis of the different implementation strategies/methods and their practical realisation within the research context.

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94 It has to be emphasised and acknowledged that there is a history of design-based research in architecture and urban planning, such as urban history studies (e.g. Benevolo 1971); picturesque studies (e.g. Cullen 1961); image studies (e.g. Lynch 1960); environment-behaviour studies (e.g. Whyte 1980; Gehl 1987); place studies (e.g. Jacobs 1993); material culture studies (e.g. Jackson 1984); typology-morphology studies (e.g. Moudon 1986); space-morphology studies (e.g. Hillier and Hanson 1984); and nature-ecology studies (e.g. Hough 1995). However, the design-based research mentioned also mainly uses and reverts to other disciplinary methodologies and methods. In addition, academic research coming from the architecture and/or urban planning field that focuses on developing countries and related management and policy issues is less frequent (cf. Hrushowy 2004).

3.2 Overall research design: case studies and context analysis

The overall research design is a logical and strategic plan that defines how to get from 'here' to 'there', where 'here' may be defined as the initial set of research questions and 'there' as a set of conclusions concerning these questions (i.e. answers and theories) (Yin 2003). It further links the study's theoretical positioning, presented in section 3.1, to the practical conduct of the research by 'translating' and adjusting it to the specific research context and setting.

The overall research design of this study is based on (qualitative) case studies[95] and the analysis of their context at different levels. This multi-level system was studied using an 'onion-peel strategy' (see *Figure 5*).[96] This gradual analysis of the cases' broader surrounding environment at global, national, municipal and household levels allowed a holistic multi-perspective analysis that included the voice and perspective of the various stakeholders, as well as the interaction between them. In fact, Feagin et al. (1991) stress that case studies provide a good tool for analysing a variety of different perspectives, including those of the 'powerless' and 'voiceless'. The case studies and context analyses carried out were, however, not only subject-focused (i.e. they did not just analyse people's perceptions), but were also object-focused. In fact, aspects such as risk-generating processes and the content and limitations of different programmes were studied in detail.

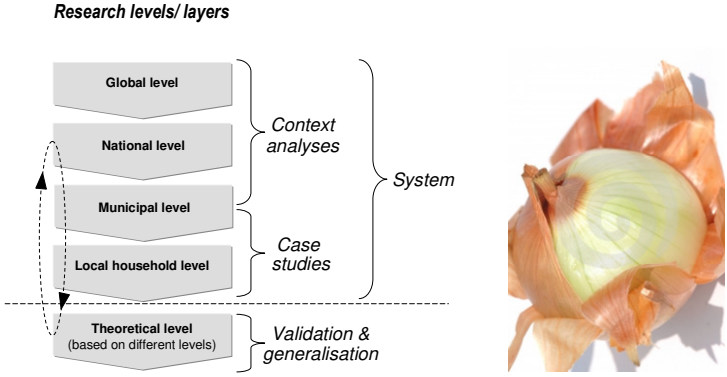

Figure 5: *Overall research design composed of case studies and their context analysis to study the system to be investigated through a multi-layered 'onion-peel strategy'. The circular, dotted arrow indicates the iterative nature of the research analyses, assisting the adequate selection of the cases, as well as the constant refinement and adaptation of the outcomes.*

95 Case studies have a long history. Their origins lie in the disciplines of philosophy, theology and law, and were widely used during the 1920s, 1930s and 1940s. During the next decades they lost their importance but regained their role in the mid-1980s (Kraimer 2003). The most well known published case study is 'The street corner society' by von Whyte (1943), which analysed street gangs in a slum called Cornerville in the USA.

96 Note that the term 'onion-peel strategy' is not a technical term. It was invented by the author. The multi-layered approach to investigating defined units of analysis and their context can also be described as a 'layered case study approach' (Patton 1990:385; Patton 2002:297, 447, 448).

The case study approach is in full accordance with the setting of this research. Its aim is to reconstruct the world both holistically and realistically by identifying significant characteristics and regularities of a (scientific) problem in its entirety (Lamnek 2005). It is based on the assumption that generalities can be created through the particularity of a case (Fatke 1997). Case studies were also appropriate for this research in terms of answering questions that aim primarily to: (a) gain an understanding of the underlying reasons for an existing and contemporary phenomenon within its 'real-life' context, where the boundaries between that phenomenon and its context are not clearly evident; (b) provide insight into the setting of related problems; and (c) generate possible ideas for solutions and recommendations that cannot a priori be foreseen (Yin 2003; Maxwell 2005). To find the best possible answers to the research questions, the case studies carried out were mainly explanatory, which is appropriate for studies on causal relationships and the development of theory building (Tellis 1997); they were also to some degree exploratory and descriptive (see research matrix included in appendix A2).

3.2.1 Unit of analysis – the case

The unit of analysis is the so-called 'case'. Within the framework of this research, the 'cases' to be studied are programmes that target urban slum dwellers living in disaster-prone areas and that integrate to a certain extent two fields of activity, namely, settlement development planning and disaster risk management. The selection of programmes as the unit of analysis is in line with the case study methodology, which is a valuable and recognised tool for project/programme evaluation (Yin, 2003; Patton 1990, 2002).[97] The main components of the unit of analysis to be studied, and thus the focus of this enquiry, were: (a) the selected programmes and programme measures; (b) their beneficiaries; (c) implementing organisations; and (d) geographical focus areas.

3.2.2 Context analysis of cases

Before making a final selection of the specific programmes to be studied, the general context of the programmes was analysed. The aim of this context analysis was to: (a) gain an understanding of the particular environment of the cases (for instance, the support available to them, their development context, as well as their design and implementation process); and (b) to search for causal explanations and conditions regarding the setting of this context. In practice, after a short

97 According to Patton (1990) and Merriam (1988), case studies have become a mainstay of evaluation, and evaluation research and theory, and recognised as such by investigators and international agencies. Evaluation research is further in line with 'Mode 2' knowledge production as described under section 3.1.1. However, in the context of this research, compared to conventional evaluations, the case studies were used less to explain the presumed causal links in 'real-life' interventions that are too complex for survey or experimental strategies (thus linking programme implementation with project outcomes and impacts); they were here used mainly to understand and describe programmes and analyse their 'real-life' contexts (i.e. prerequisites and conditions for their development at different levels, implementation processes, follow-up, match with local conditions and needs, etc.).

pre-study in the Philippines (cf. sections 1.5 and 3.2.6), the empirical research began at the global level. International aid organisations play an important role within the research framework in that they influence national and local agendas and policies related to urban development, social housing, and disaster (risk) management (cf. chapter 2). Thus, those international organisations that support or carry out programmes in the fields of settlement development planning and/or disaster risk management were the initial focus of the enquiry at the global level. Subsequently, the national and municipal context in El Salvador was studied.

The context analyses at the different levels determined the final choice of the specific cases to be studied (i.e. programmes implemented at the local household and in parts at the municipal level) (see *Figure 5*). The local level studies were begun in parallel with the national and municipal level analyses. These initial studies were then followed up by gradual and in-depth research of a more limited number of at-risk slum communities (15 in total, being the implementation areas of four programmes). This procedure was followed so that the most appropriate cases could be identified at an early stage of the research and, most significantly of all, to ensure that the research was based on the problems and risk as perceived by the urban poor themselves (cf. section 3.2.3). The initial outcomes of the context analyses and the case studies were subsequently compared, validated and further generalised to reach a higher theoretical level (see *Figure 5*).

In a sense, the design of the research as described follows the basic logic of the PAR model (cf. section 2.1.2), allowing the analysis of a chain of understanding and explanation to be constructed between global and local forces. Within the framework of this research, the identification of such a 'progression of vulnerability' or, better, a 'progression of risk', focuses on the nexus between disasters and urban settlement development and, specifically, on the related working fields of disaster risk management and settlement development programming.

3.2.3 Purposeful or theoretical sampling of cases

The search for the most information-rich cases (as regards the research objectives and questions) guided the research process. In fact, the selection of the programmes to be analysed was not based on their statistical representativeness but on their potential to increase knowledge as regards the focus of the research.[98] This procedure – originally developed within the framework of grounded theory (Glaser and Strauss 1967) – is a consecutive and cumulative procedure in the course of which additional cases are selected to confirm, control, modify, relativise and expand the outcomes of the cases selected previously (Ludwig-Mayerhofer 1999).[99] The gradual selection of specific programmes was thus

98 '"Rich" thus refers to the fact that 'a great deal can be learned from a few exemplars of the phenomenon in question' (Patton 1990:54).

99 Yin (2003) calls the procedure of selecting new cases that are expected to confirm (or to falsify) the findings from previous ones 'replication logic'.

based mainly on: (a) their content (i.e. the existence of a certain level of integration of settlement development planning and disaster risk management); (b) their context (i.e. their implementation in an urban environment); and (c) the type or character of the respective implementing organisations in terms of matching the direct target group of the research (cf. section 1.6). The selection was furthermore based on the risk perception of the programme beneficiaries, that is, the identification and prioritisation of the local risk by the inhabitants of the slum communities in respective programme areas. Only areas where 'natural' hazards/disasters were seen as one of the main risk to lives and livelihoods were selected. Finally, access to information was another selection criterion. For further details on the sampling of the cases, see the next paragraph. The sampling of the interviewees in the case study areas is described in section 3.3.1.

Based on the first three selection criteria described, namely, programme content, context, and implementing organisations, a total of eight programmes were initially assessed at local household and institutional levels (i.e. from the perspectives of the programme beneficiaries and the representatives of the implementing organisations). Four of these eight programmes were implemented by the social housing/planning organisations FUSAI and FUNDASAL, three by the development organisation CEPRODE, and one by the relief organisation The Red Cross.[100] This original selection can be seen as a nearly 100 percent sample, as hardly any other programmes could be identified that fulfilled the established selection criteria, especially as programmes that integrate(d) to some degree settlement development planning and disaster risk management were, and are, rare. On the basis of the increased knowledge gained of the eight initially selected programmes in terms of their information richness, and of their compliance with the fourth and fifth selection criteria established (i.e. access to and risk perception of programme beneficiaries), four of the eight programmes were selected for the case studies.[101] In-depth evaluations were then carried out of these four programmes and within the 15 slum communities where they were implemented.[102] *Table 2* provides an overview of the selected cases/programmes and related slum communities, both of which are described in detail in Papers V and VI.

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100 The categorisation of the three types of organisations is based on the products and services they offer, as well as their main objectives (i.e. construction of social housing and/or planning, development in general, or emergency relief). Whilst social housing/planning organisations can also be seen as development organisations, for the purpose of this study, it was necessary to categorise them separately. Relief organisations are commonly also called humanitarian aid organisations or emergency organisations. The term 'aid organisations' is used as an umbrella term for all three types of organisations. See also annexed glossary.

101 According to Lamnek (2005), the selection criteria for different cases can be: similar, characteristic/specific, particularly concise or contrastive. Fatke (1997) and Bude (2003) state that the selected cases should not represent the normal and average but something characteristic/specific. In line with this, the selected programmes, combining the working fields of disaster risk management and settlement development planning, are special and unusual, and differed from each other as regards the characteristics of their concrete project measures, implementing organisations and the geographical features and historical background of the implementation area. Within the terminology used by Patton (1990:170, 2002:233), the sampling strategy applied can be called 'extreme case sampling' as those cases were selected from which one 'could learn the most from'. See also footnote 98.

102 Eisenhardt (1989:545) mentions that while there is no ideal number of cases, somewhere between four and ten cases usually works well.

Table 2: *Selected cases studied in El Salvador.*

Name of programme	*Implementing organisation /supporting int. organisation(s)*	*Programme type*	*Slum communities involved in programme implementation (total=15)*	*N° of beneficiaries/ N° at high risk in 2005 (=research target population)*	*N° of interviewed beneficiaries at high risk*	*Period and approx. project costs (US$)*
1) 'Mejoramiento de las comunidades de los Manantiales'; short form: **'Los Manantiales'** ['Improvement of the communities called The Wellsprings']	FUNDASAL, supported by German federal government KfW development bank and GTZ	Slum upgrading (including offer of housing credits)	La Chacra, Llanos de la Charcra, Quiñones Privado, Quiñones Municipal, San Martín Privado, San Martín Municipal, Casitas del Coro, Coro Nuevo, San Luis Portales, Bolívar, Granjero II and Nueva Esperanza, forming the slum area 'Los Manantiales' in San Salvador	1,439 households* (≈6,400 people). Of these, ≈40 households at high risk in 2005	23 households (=113 people)	2003–2006 ≈6,700,000
2) 'Rehabilitación de viviendas y prevención de desastres en el barrio José Cecilio del Valle'; short form: **'Cecilio del Valle'** ['Housing rehabilitation and disaster prevention in the neighbourhood called José Cecilio del Valle']	CEPRODE, supported by DIAKONIE Germany	Slum upgrading (including construction of 66 social houses)	José Cecilio del Valle, situated in San Salvador	108 households* (≈1000 people). Of these, ≈30 households at high risk in 2005	22 households (=115 people)	2001–2002 (to be continued) ≈100,000
3) 'Rehabilitación de la comunidad Divina Providencia'; Short form: **'Divina Providencia'** ['Rehabilitation of the community Divina Providencia']	CEPRODE, supported by Lutheran Church	Slum upgrading (including construction of 50 social houses)	Divina Providencia, situated in San Salvador	103 households* (≈1,034 people). Of these, ≈20 households at high risk in 2005	11 households (=74 people)	2002–2003 (to be continued) ≈200,000
4) 'Fortalecimiento de la sociedad civil y creación de infraestructura básica y de vivienda'; short form: **'El Refugio'** ['Strengthening civil society and development of basic infrastructure and social housing'/'The refuge']	FUSAI, supported by Sida	Social housing settlement development (including construction of 165 social houses)	Refugio, situated in and made up of people from slums of the Bálsamo region	150 households* (≈650 people). Of these, ≈10 households at high risk in 2005	6 households (=29 people)	2004–2006 ≈1,240,000

* See appendix A1 (glossary) for a definition of 'households'.

3.2.4 Mode of enquiry

The mode of enquiry for the case studies and their context analysis was an iterative process of both induction and deduction. As Strauss and Corbin (1998:22) state: 'at the heart of theorizing lies the interplay of making inductions (…) and deductions (…).'[103] To focus and narrow down the research, tentative propositions or preconceptions were established.[104] These were constructed using elements of pre-existing theoretical and conceptual models in conjunction with emerging theory from initial data collection and analysis (e.g. pre-studies and theoretical desktop work). Based on these propositions or preconceptions, deduction was applied with an emphasis on manifest facts, such as risk generation, the inter-correlation between the working fields of settlement development planning and disaster risk management, as well as their respective risk reduction potential. During the research process, and based on the emerging data/information, new preconceptions or propositions were continuously established and tested in a cyclical process, with the final objective being to create theory. In contrast to deduction, induction, which is by its very nature more open-ended and exploratory, was an important means of looking into the meaning of the phenomena and perceptions encountered at the different research levels, of understanding them, and of finding solutions to them. The use in this research of an adapted and advanced grounded theory approach, as described, to allow the generation and testing of theory, is supported by the 'adaptive theory' of Layder (2005). It supports the interchange and dialogue between pre-existing and emergent theory. In line with this, 'prior theoretical concepts and models suggest patterns and "order" in emerging data while being continuously responsive to the "order" suggested or unearthed by the data themselves' (Layder 2005:27). The resulting theory is not only grounded but can also be 'general' and thus of 'universal' character (Layder 2005).

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103 Induction starts with specific data collection, followed by the detection of patterns and regularities; some tentative preconceptions that can be explored are then formulated, and finally general conclusions and theories are developed. Compared to induction, which aims at generating theory, deduction aims to test a theory, propositions or preconceptions.

104 According to Yin (2003), it is crucial that the research design embodies a 'theory' of what is being studied to provide a sufficient blueprint for the research. These theoretical propositions, explained by Sutton and Staw (1995) as hypothetical stories about why acts, events, structure, and thoughts occur, provide strong guidance in terms of determining what data to collect and the strategies for analysing them. For this reason, theory development prior to the collection of any case study data is an essential step in doing case studies. This role of theory development, prior to the conducting of any data collection, is one point of difference between case studies and related methods such as grounded theory (Strauss and Corbin 1998). However, Glaser and Strauss (1980) acknowledge that it is possible to discover and work with prior/tentative theoretical frameworks, which they also call 'substantive theory' (as opposed to 'formal theory') (Layder 2005:20). Note that there is also a group of (mostly German) case study researchers that – unlike Yin – do not work with theoretical propositions but in an exclusively 'reconstructive' manner (cf. Bude 2003; Fatke 1997; Kraimer 2000, Schütze 1993, and Oevermann 2000).

3.2.5 Validation and generalisation

Case studies are generalisable to theory or theoretical propositions, especially if multiple case studies are carried out (Yin 2003).[105] The outcomes, obtained through the multi-layer analysis at global, national, municipal and household level, were first evaluated, validated and generalised within the Salvadoran context. This was achieved mainly through interviews, questionnaires, walk-through analyses, workshops and their direct use within programme planning and implementation (cf. sections 3.3 and 3.4). Thus, the academic analyses of the research were re-introduced into the 'real-life' context in El Salvador.[106] In parallel, the outcomes were also introduced to other geographical areas as well as to other disciplinary/sectoral professionals working in both development and humanitarian assistance (cf. *Table 3* and section 3.3.6). This helped to further validate and generalise the analyses of each research level, thus increasing their 'universal' validity. The last research phase was the theoretical generalisation of all research outcomes, presented in the form of a conceptual and strategic 'Analysis and Adaptation Model' that complements and combines the generalised outcomes from the analyses at different levels (see section 4.3). The way aid organisations have already adapted these generalised research outcomes to their own specific institutional and programmatic settings and objectives is also evidence of their transferability.[107]

3.2.6 Research 'roadmap'

To correspond and respond to the challenges resulting from the theoretical positioning (cf. section 3.1), a logical step-by-step research plan was elaborated. This so-called 'roadmap' is based on the overall research design and illustrates the outcomes and rationale behind each research phase and related subphases (see *Table 3*). It helped to guide a rigorous and transparent research logic.[108] In this context, the use of propositions or preconceptions provided a good precondition for such a rigorous process (Yin, 2003). Unlike Yin (2003), Eisenhardt (1989) discusses how to induce theory from case study research and elaborates a 'roadmap' based on: (a) qualitative research (Miles and Huberman 1994); and (b) grounded theory (Glaser und Strauss 1967).[109] *Table 3* draws on the same

105 As cases are conventionally not sampling units, only analytical and not statistical generalisation can be used. The case study approach is based on the assumption that general (i.e. 'universally' valid) conclusions can be drawn from the analysis of characteristic cases. However, within the 'universe' of the selected cases, statistical procedures can also be pursued (see also section 3.3.1).

106 These analyses were summarised in both research articles and an operational framework.

107 An example of this is the conceptual strategy for disaster risk management of the international organisation German Agro-Action (*Deutsche Welthungerhilfe*), which was developed based on some of the outcomes of this research (Amend et al. 2006:60–66).

108 According to Sumner and Tribe (2004), if other researchers can ultimately see when and why certain choices were made and if these choices can be intellectually defended, then in an imperfect world the research journey demonstrates transparency and 'rigour'.

109 According to Yin (2003), a research plan (i.e. 'roadmap') has not been developed to date for case study research. The use of grounded theory for theory testing and development of 'universal' theories is further in line with the described 'adaptive theory' of Layder (2005).

sources, revising and adapting them to match the specific setting and design of this research. Based on the emerging research outcomes and field study protocols developed during the timeline of this study, the logic and coherence of the 'roadmap' were repeatedly revised.[110] The main research phases, as described in the 'roadmap', can be summarised as follows:

Research phase 1: definition of the research setting and design. The personal experience of working directly with people living at risk was the starting point of this research. This assured that the research was anchored in existing local problems. On this basis, the research plan for phase 1 included pre-studies in the Philippines at the local household and related institutional levels, as well as theoretical desktop work, thus going beyond personal experiences and local contexts (cf. section 1.5 and *Figure 3*).

Research phase 2: context analysis at global level. The empirical research had its genesis at this level so as to gain a better understanding of the global environment of the research. This provided a first general overview of the research field.

Research phase 3: context analysis and case studies in El Salvador. An iterative analysis process was established to gain better understanding of the selected cases and their context at national, municipal and household level. This iterative nature of the analyses in El Salvador assisted in the selection of the most appropriate cases, as well as with the constant adaptation and refinement of the research outcomes.

Research phase 4: validation of research outcomes. This was achieved through the re-introduction of the academic analyses into the 'real-life' context. In fact, the research outcomes (systematised in the form of analytical, conceptual, strategic and operational frameworks) were tested and validated at the local household and related institutional levels.[111]

Research phase 5: generalisation of outcomes and closure. Outcomes were generalised by combining the validated results from the different level analyses and checking their applicability outside the geographical, disciplinary and/or sectoral focus of the research. This was followed by the closure of the research process, despite outcomes continuing to be tested. In fact, according to Glaser and Strauss (1967), the strategy of comparative analysis for generating theory puts a high emphasis on theory as a process, that is, theory as an ever-developing entity, not as a perfect product.

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110 The field study protocols elaborated include the following: an overview of the case study approach (objectives, case study issues, relevant readings about the topic being investigated, etc.) and field procedures (methodology and methods for data gathering and analysis, related interview guides, access to the case study 'sites', general sources of information, procedural reminders, etc.). Field study research protocols were, for instance, discussed and reviewed during a PhD seminar at the school of architecture in Copenhagen entitled 'Environmental Design Research Methods' in early 2004, and during an international conference of ENHR (European Network of Housing Research) held in Cambridge, 2–6 July 2004.

111 During the third phase, the studies at local household level were initiated in parallel to the analyses at national and municipal level and then finalised after subsequent in-depth studies. The latter were carried out in parallel to the validation of former research outcomes.

Table 3: *Research 'roadmap', indicating the phases and process of building a grounded theory on the system analysed in this study.*

Phase	Subphases	Outcome	Rationale[112]
1. Research setting and design	**1.1** Review of general theoretical and technical literature – combined with information from pre-studies, key informants, as well as personal knowledge/experience –	Identified key informants (snowball and purposeful sampling). Analysed general research context and problems (partly with help of concept maps). Defined purpose of research. Defined main and subresearch questions. Established first preconceptions/theoretical propositions. Defined geographical focus area (mainly through literature review and questionnaires addressed to potential cooperation partners). Established institutional cooperation.	Focusing of efforts and narrowing down of research scope. Sharpening internal and external validity Delimitation of research.
	1.2 Analysis of philosophical research paradigms	Positioning of research within the general research environment.	Questioning existing paradigms. Developing a coherent research approach.
	1.3 Elaboration of overall research design	Defined research design: case studies and context analysis Defined units of analysis and their context (i.e. defined criteria for the selection of cases). Identified potential journals for dissemination of research outcomes. Elaborated research matrix (see appendix A2).	Finding and focussing on cases which are useful (i.e. can generate theory). Developing a coherent research approach. Planning of the distribution of research outcomes to achieve further internal and external validity.
2. Context analysis at global level	**2.1** Preparation: logic linking of data collection and preconceptions/theoretical propositions	Literature/documents reviewed. Identified key interviewees/organisations at global level (snowball and purposeful sampling). Elaborated interview protocols: two sets for (a) general interviewees and (b) key informants. Elaborated method matrix (i.e. research matrix including methods and sources needed to answer research questions).	Increasing internal validity. Increasing reliability.
	2.2 Data collection	Flexible adaptation of methods. Combination and use of multiple data collection methods and sources of evidence. Elaborated field 'memos'. Elaborated interview transcripts.	Improving/adjusting data collection strategy. Data triangulation. Method triangulation. Facilitating data analysis.
	2.3 Data analysis	Existing programmes analysed (measures, strategies, methods, preconditions, overlapping, etc.). Coded data (through open, axial and selective coding and comparison of coding outcomes from transcripts, field notes, memos, diagrams, etc.). Comparison of data and identified patterns. Pattern-matching. Causal loop diagrams (systems analysis). Outcomes discussed with experts, key informants, and the target group.	Initiating 'formal' theory and explanation building and enhancing internal validity through: - Searching for categories, patterns and subpatterns; - Searching for connections/interrelations between them by analysing conditions, causes, contextual conditions and consequences of the studied system, including feedbacks; - Looking beyond initial impressions, see evidence through multiple lenses; - (Data and) theory triangulation.

112 The conventional terms, such as 'internal validity', 'external validity', 'reliability' and 'objectivity' used as the criteria for judging quantitative research (within the positivist paradigm) could be 'translated' to the qualitative research criteria as 'credibility', transferability', 'dependability' and 'confirmability' (Hoepfl 1997; Guba and Lincoln 1989). These four criteria are partly also grouped under the term 'trustworthiness' (Lincoln and Guba 1985; Guba and Lincoln 1989). However, the conventional terms are also commonly used for qualitative research, with it being known that in this context they each have a different connotation. In addition, note that the term 'transferability' is partly misleading as, in common with this investigation, qualitative research outcomes can not only be transferred to other cases but can also lead to generalisation (i.e. theories of 'universal' validity). Note that in addition to the four criteria mentioned, some researchers have established complementary criteria for qualitative research, such as 'authenticity' (Guba and Lincoln 1989).

(cont.)	**2.4** Data completion/verification	Confirmed information/citations. Theoretical sampling (search for additional organisations, related programmes, aspects, sources, etc. for filling data gaps). Theoretical saturation. More detailed preconceptions/theoretical propositions. Comparison of outcomes with conflicting and/or similar literature. Discussed and disseminated preliminary results (published articles in journals within both related working fields [i.e. disaster risk management and settlement development planning]). First validations and generalisations (included in every publication).	Continued 'formal' theory and explanation building and enhancing internal validity through: - Confirming, extending and sharpening of preconceptions/theoretical propositions; - Ending of process when marginal improvement becomes small; - First generalisations, raising theoretical level.
3. Context analysis and case studies in El Salvador	**3.1** Preparation: logic linking of data collection and preconceptions/theoretical propositions	Literature/documents reviewed. Purposeful selected programmes/cases through theoretical sampling (information richness). Identified organisations and interviewees at national, municipal and local household level (snowball, purposeful, stratified and random sampling). Elaborated field study research protocol. Elaborated interview protocols. Extended method matrix (for national, municipal and local household levels).	Increasing internal validity. Increasing reliability. Focusing efforts on theoretically useful cases.
	3.2–3.4 See subphases 2.2 to 2.4	See subphases 2.2 to 2.4. Repeated procedure of subphases 2.2 to 2.4 (including comparison of outcomes from different levels as well as related generalisation).	See subphases 2.2 to 2.4. Refining and adapting research outcomes from different levels.
4. Validation of research outcomes	**4.1** Re-introduction of the analyses' outcomes in the 'real-life' context in El Salvador and other countries	Systematised and combined research outcomes within different analytical, conceptual, strategic and operational frameworks. Test and validation of these frameworks within the 'real-life' context in El Salvador through both workshops and 'hands-on' practice. Revised frameworks to match better existing needs and capacities. Complemented former findings from different levels through additional review of research data and literature.	Questioning research outcomes, including related theories. Refining research outcomes and thus theory and explanation building. Further building of internal validity.
5. Generalisation and closure	**5.1** Comparison of the different emerging theories, comparison with existent literature, as well as their 'survival' in different geographical, disciplinary and/or sectoral contexts	Introduction and validation of the frameworks developed in other geographical, disciplinary and/or sectoral contexts (e.g. the Philippines; educational programmes). Synthesised and generalised outcomes in form of theoretical propositions, and finally a grounded theory ('Analysis and Adaptation Model'). Comparison of theory developed with conflicting and similar frameworks/models and literature, linking back to the original preconceptions/theoretical propositions.	Further building of internal validity. Building external validity (and transferability, for instance its potential to adapt to specific programmatic and institutional settings). Sharpening of generalisation (i.e. illumination, understanding and extrapolation to similar situations).
	5.2 Reaching closure	Final reports/outcomes reviewed by key informants who have been studied and final discussions with them. Theoretical saturation. Results and findings brought to closure, despite continuous testing of related frameworks/model. Disseminated combined, final and generalised outcomes (published book chapter and dissertation).	Finalising process of explanation and theory building when marginal improvement becomes small and theoretical saturation not further possible.

3.3 Methods of data collection

One of the strengths of the research being designed around case studies is that this allows (and necessitates) the use and mix of many different techniques for collecting and analysing empirical data. The selection of the specific methods used was dictated by the research setting, the research's theoretical positioning and design, and the resulting data requirements. The latter were defined with the help of a research matrix, which divided the main research questions into manageable subresearch questions. These, in turn, allowed the information needed to be determined (see appendix A2). In addition, method matrixes were developed for the different research phases, presented in *Table 3*, in order to link each type of information requirement directly to specific data collection methods, related sampling techniques, information sources, key organisations and informants, and time frames.

The data collection methods selected for this research are described in the following sections. They include interviews, walk-through analyses, observations, text reviews, questionnaires as well as research workshops and 'hands-on' practice. These methods were all applied to discover: (a) the interlinkages between disasters and urban settlement development, more specifically, between disasters and the building and planning practices related to low-income settlements; (b) the current practices in the working fields of disaster risk management and settlement development programming – and the relationships between them; and (c) the opportunities for overcoming existing challenges and gaps so as to increase the potential of settlement development programming to reduce and transfer or share risk (cf. section 1.3 and *Figure 2*).

3.3.1 Interviews

Interviews are usually one of the most important sources of case study information (Tellis 1997), especially as they are excellent tools for understanding complex phenomena, beliefs and attitudes in less well known research domains (Hastings and Chad 2000). Interviews were further crucial because of the limited literature available on the specific topic of this research, as well as its multi-perspective nature. Because of their importance at all research levels, numerous and different types of interviews were conducted and the outcomes of their analyses highlighted in the research papers that are annexed to this study.

Interviewees at global level. Individual interviews for the context analysis at the global level were carried out with 64 key stakeholders, consisting of programme managers, operational or academic staff working at 33 multilateral and bilateral aid agencies and governmental and non-governmental organisations, including developmental or financial organisations, consultancies and research institutions working at the international level. Of these 33 organisations, eight could be clas-

sified as social housing/planning organisations, six as humanitarian relief organisations and 19 as general development organisations.[113] The respondents were selected in a balanced way: 25 interviewees had a disasters background, 26 an architecture or planning background, and 13 a general developmental background. The interviews at global level, presented in Papers I and II,[114] were mainly conducted between November 2003 and August 2004. Related research stays were carried out in Geneva, Switzerland; Stockholm, Sweden; Manila, the Philippines; Rio de Janeiro, Brazil; Manizales, Colombia; London and Oxford, United Kingdom; and Washington D.C., USA. These places were strategically selected either because specific key organisations are located there (e.g. research cooperation partners or precursors in research-related aspects), or because they represent a geographical concentration of several important international organisations.

Apart from the individual interviews at global level, focus group discussions were carried out within the framework of several research workshops in El Salvador, Costa Rica and Sweden (see below and section 3.3.6).[115] The workshops' 125 participants were from key stakeholders from Africa, Asia and Latin America working in settlement development planning and some also in disaster risk management.

The interviews at the global level aimed mainly to analyse global perspectives and practices as regards the three main aspects investigated by this research (see above; cf. interview protocols in appendixes A3–1; A3–2 and A3–3). As related information accumulated, a kind of inventory of research-related organisations, programmes and key aspects could be established that assisted in gradually delimiting the focus and direction of the research to be continued at different levels in El Salvador.

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113 The categorisation of the three types of organisations is based on the main products and services they offer, as well as their main objectives (i.e. construction of social housing and/or planning, development in general or emergency relief). These were mainly defined by the interviewees themselves, partly influenced by their affiliation to a specific department within the respective organisation(s). See also footnote 100.

114 Note that Paper II was complemented with data from the national, municipal and household level in El Salvador (and partly Colombia). The additional data permitted the verification, validation, and complementation of the outcomes of the international level with national and local perspectives and helped to develop a conceptual framework presented at the end of the second paper.

115 The Spanish-speaking workshop in El Salvador was carried out with 35 participants in San Andrés, within the framework of a course entitled 'Vinculación de la Gestión del Riesgo a Procesos de Desarrollo Urbano y Programas de Vivienda de Interés Social' [Interfacing Disaster Risk Management with Urban Development Processes and Social Housing Programmes], organised by FUSAI. Note that the participants were mostly from El Salvador, but some also came from other countries. The workshop in Costa Rica was called 'Disaster Risk Management for Settlement Development Planning'. It was held in English at the Faculty of Architecture, University of Costa Rica, San José. It was open for all interested organisations and offered as an optional course for the participants of the 'International Training Course: Organised Self-help Housing – Planning and Management', organised by HDM and FUPROVI (Fundación Promotora de Vivienda). 32 professionals participated. The first workshop in Sweden at HDM was carried out during the advanced international training programme on 'Shelter Design and Development', on 2 May 2006, with 31 professionals. During the second workshop in Lund within the same training programme, on 8 September 2007, including 27 professionals, no group discussions were held. The participants of the four workshops were mainly from NGOs and municipal authorities. During 2008 an additional workshop, including focus group discussions, will be held in the Philippines, in cooperation with Plan International.

Interviewees in El Salvador. For the studies at national and municipal level, interviews were carried out with 71 programme managers and operational staff from 40 organisations, including 11 social housing/planning organisations, three humanitarian relief organisations, 19 development organisations, four (housing) finance institutions, and three insurance companies.[116] At the local household level, during the initial case studies of eight programmes (cf. section 3.2.3), focus group discussions of around 35 beneficiaries were held. These were followed up during 2006 with in-depth studies of four cases, which included single interviews with 62 households, comprising 331 persons, living in 15 disaster-prone slum communities. In addition, within the context of a research workshop in El Salvador, focus group discussions were held with around 20 professionals from key stakeholders, both governmental and non-governmental (see below and section 3.3.6).

The interviews at national, municipal and local household level in El Salvador were held between August 2004 and March 2006 (and are presented mainly in Papers III, V and VI). These aimed to analyse the different-level perspectives and practices of the three aspects investigated (see above; cf. interview protocols in appendixes A3–4, A3–5 and A3–6). After the first field study trip, the research-related organisations, programmes and geographical areas were screened and the most important/relevant ones identified. In addition, the integration process of settlement development planning into disaster risk management after Hurricane Mitch in 1998 and the 2001 earthquakes was analysed in terms of driving forces, convergences and divergences, and results. During the second field study trip, the initial interviews were followed up and further directed at (a) the evaluation and validation of preliminary research outcomes (especially their limitations and possible ways of solving them); (b) the identification of financial means of supporting the integration of disaster risk management; and, most importantly; (c) the perspectives, needs, capacities and efforts of people, households and communities living at risk (cf. interview protocol in appendix A3–6).

Semi-structured interviews.[117] Most of the interviews were semi-structured – this is the type of interview generally used and recommended for case study research (Yin 2003; Rubin and Rubin 1995). Semi-structured interviews are embedded in the contradictory context between qualitative interviews and structured interviews (i.e. questionnaires), and are based on the assumption that 'relation-free' interviews do not exist (i.e. the relationship between researcher and interviewee is part of the research process). The interviews were based on interview protocols elaborated on the basis of the research questions (see appendix A3). These protocols were adapted for different purposes, such as the different research levels of

116 The categorisation of the four types of organisations is based on the main products and services they offer, as well as their main objectives (i.e. construction of social housing and/or planning, development in general, emergency relief or insurance). These were mainly defined by the interviewees themselves, partly influenced by their affiliation to a specific department within the respective organisation(s). See also footnote 100.

117 Also called 'structured open-ended interviews' or 'structured open-response interviews'.

this study. They were further adapted to the respective interviewee(s) and, when needed, updated with new findings (by adding new aspects and/or deleting irrelevant ones). Although a consistent line of inquiry was pursued, the interviews appeared, in practice, to be guided conversations rather than structured queries (Rubin and Rubin 1995; Yin 2003). Throughout the interview process, two aspects were considered: (a) to follow the defined line of inquiry, while (b) at the same time asking (conversational) questions in an unbiased manner that were relevant to the defined line of inquiry.[118] One challenge of the interviews was to ask questions about working fields and terms such as 'disaster risk management', 'urban planning' and 'settlement development planning' that were understood and used in various ways by the respondents.

Focused interviews.[119] Eight focused interviews were held with key informants from the different research levels.[120] The objective of these was to speed up the research process by obtaining necessary insights and background information to narrow down the research focus and discuss specific information in detail. Compared to the semi-structured interviews, the focused interviews were also open-ended and were conducted in a conversational manner. However, they were more of a direct cards-on-the-table type of discussion of the research topics (Merton et al. 1990). See, for instance, appendix A3–3.

Focus group discussions. Group interviews in the form of semi-structured discussions were conducted with beneficiaries of the eight initially selected programmes. Only a 'loose' interview guide was established, as the conditions at local level could not really be controlled and differed strongly from each other. The group interviews were held during programme visits, partly spontaneously, and partly organised beforehand by operational programme staff. As there is a danger in such interviews of people sometimes not expressing their 'real' belief or opinion, they were subsequently cross-checked and substantiated by interviews with key individuals from the respective groups. Information and/or initial conclusions obtained from the group interviews were thus verified. Group interviews were further held during different research workshops in El Salvador, Costa Rica and Sweden to discuss specific research outcomes (cf. section 3.3.6).[121] During these workshops, the participants were divided into small groups of around five people each. The group discussions and interaction generated additional data and insights that would not have been likely to emerge in the course of single interviews (Frechtling and Sharp 1997).

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118 Yin (2003:90) states that 'for instance, you may want (in your line of inquiry) to know "why" a particular process occurred as it did. Becker (1998:58–60), however, has pointed to the important difference in actually posing a "why" question to an informant (which in his view creates defensiveness on the informant's part) in contrast to posing a "how" question – the latter, in fact, being his preferred way of addressing any "why" question in an actual conversation.'

119 Also called 'key informant interviews'.

120 As Kraimer (2003) points out, for case study research, informants play an important role during both data gathering and data analysis.

121 See also footnote 115 for more information on the different workshops.

Sampling of interviewees at different levels and theoretical saturation. Purposeful sampling was used to select interviewees for the context analyses and case studies in a balanced way. Chain (or snowball) sampling was initiated with the help of key literature, as well as information obtained from research cooperation partners and key informants. Key informants also helped to establish initial contacts, most of which were the first elements of the chain. The chain was then pursued based on the suggestions of the first respondents regarding either other key persons or other sources of evidence. Something which made following the chain difficult at the institutional level, was the fact that the author was frequently guided towards relief specialists as appropriate contacts, whilst interviewees in sector development divisions and/or with an architecture or planning background were, in general, initially hesitant about discussing 'natural' disaster issues. At the global level, no further interviewees were identified (i.e. the chain was not pursued further) once the interviewees started to repeat the same issues and did not provide new relevant information. Naturally, the number of interviews conducted also related to the time and resources available for organising, holding, transcribing and analysing the interviews.

Compared with the global level, at the institutional level in El Salvador, the selected interviewees are a nearly 100 percent sample. In fact, key representatives from almost all organisations relevant to the research were interviewed (i.e. organisations which carry out programmes that, to a certain degree, integrate disaster risk management and settlement development planning in an urban context (cf. section 3.2.1).

At the local household level, the sample of the interviewees selected for the four case studies was also large in size in relation to the defined target population. This target population, consisting of 100 households, was purposely selected and defined as the households located within the extreme high-risk areas of the 15 slum communities studied (see *Table 2*). Those households most at risk were defined as the ones that were most affected during winter 2005, a recent disaster season characterised by a tragic combination of Hurricane Stan, floods, landslides, small-scale earthquakes and the eruption of the Ilamatepec volcano. The 100 households had been identified by censuses conducted locally and/or post-disaster evaluations carried out by the aid organisations working within these communities. To obtain significant, credible and further representative responses, 62 of the 100 households were interviewed,[122] providing, at a confidence level of 95 percent, a maximum margin of error of around 8 percent.[123] The selection of these 62 households (comprising 331 people), and also of the representative(s) of

122 The distribution of the 62 households as regards the four programmes/cases analysed is illustrated in *Table 2* (see 'N° of interviewed beneficiaries at high risk').

123 The confidence level indicates how sure one can be. It is expressed as a percentage (generally set at 95 percent) and represents how often the true percentage of the population (who would choose an answer) lies within the confidence interval. The margin of error expresses the amount of the random variation underlying a survey's results. See www.surveysystem.com/sscalc.htm.

each household interviewed, was based on a combination of stratified and random sampling: with the help of programme staff and local key informants, the most information-rich (i.e. knowledgeable and varied) households and household members were identified within the different high-risk areas in the 15 slum communities, trying to not leave out any subgroups. This procedure was followed by random sampling within each group to make a final selection of the households to be interviewed.[124] This sampling procedure was carried out with the help of, amongst other things, maps of each programme area and the numeration of the respective households (which allowed random selection of local households on a numerical basis). In practice, the sampling procedure described was time-consuming and difficult to follow rigorously all the time. Thus, some improvisation and flexibility were necessary.[125] For instance, in the end many interviews were held with more than one household member, who assisted from the beginning or were called when needed to provide, for instance, additional information as regards expenses, income and/or the specific coping strategies used. In addition, and in order to deal with bias in the selection of households and interviewees, different types of triangulation were used (see section 3.5).

Recording data. All the interviews were recorded, transcribed and then analysed (cf. section 3.4)

3.3.2 Walk-through analyses

In parallel with the national and municipal level studies, walk-through analyses were carried out in seven of the eight case study areas selected initially (cf. section 3.2.3).[126] Two to five local key informants participated in each case study area. Together with the implementing organisations, these informants were selected because of their information richness, that is, their knowledge of the programmes and the respective implementation area and beneficiaries. By walking through the areas and recording the inhabitants' explanations, observations and impressions along the way, initial assessments could be carried out. Aspects analysed were, for instance, the programmes' content, context and main features (both successful and unsuccessful), as well as local risk perceptions, needs and capacities. These initial 'walk throughs' provided important input for the selection of the four main case study areas (cf. section 3.2.3), which were then fol-

124 In line with Patton (1990:173, 2002:235) the approach described for selecting the households to be interviewed could be called a 'combination or mixed sampling'. This started here with 'homogeneous samples' ('to describe some particular subgroup in depth', that is, inhabitants living at high risk), and was finalised through a random selection process.

125 Some of the multiple reasons were: (a) the inexistence of (updated and adequate) digital maps and/or area photographs; (b) difficulties in accessing programme-related maps through the implementing organisation; and/or (c) lack of information on the households and their members.

126 Little theory is available on the walk-through analysis, and there are different methodological approaches. Most information is available from practitioners and implementing organisations engaged, amongst other things, in urban settlement development. See, for instance, the 'Urban Design Toolkit' at www.mfe.govt.nz/publications/urban/urban-toolkit-apr07/html/page4.html. Exceptions from a more theoretical/academic approach are, for instance, de Laval (1994, 1997).

lowed up by more in-depth analyses to complement and validate initial research findings. The 'storage' of the information obtained by the walk-through analyses was in the form of tape recordings, supported by memos or field notes and photographs.

Walk-through analyses were also used during the participatory research workshop in El Salvador (cf. section 3.3.6). Here, it was possible to select the composition of the guiding groups independently, thus ensuring that important members of society were not excluded. In fact, the workshop participants were divided into five groups and then guided through the settlement in question by either a group of local women, children, builders, men, or members of the resident development committee. In this way, it was assessed if the research outcomes (here, mainly the 'Operational Analysis and Integration Framework') adequately reflect as well as match the needs of both the local dwellers and the professionals working in comparable programmes and/or programme areas.

3.3.3 Questionnaires

To select the focus country for the case studies of this research, a first questionnaire was developed (see appendix A4–1), which addressed seven potential cooperation partners working in Bolivia, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, and Peru.[127] On the basis of this questionnaire, and in combination with the personal experience and information obtained from key informants and the review of literature, El Salvador was selected (cf. section 1.4). A second questionnaire was used for minor and basic background studies at the beginning of and throughout the research to assess the general disaster risk management knowledge of planners (see appendix A4–2). The target group of this questionnaire were around 100 professionals from Africa, Asia and Latin America, who had participated in different further educational training courses at HDM (e.g. courses on 'Urban Management and Development', 'Urban Housing Management and Housing' and 'Inner City Revitalisation').

Towards the end of the research, two more questionnaires were drawn up. The third questionnaire was developed to (a) help validate and refine the research outcomes presented in the 'Operational Analysis and Integration Framework' and (b) assist in reaching a higher level of generalisation and transferability of the outcomes to other geographical, disciplinary/sectoral or institutional and programmatic settings (see appendix A4–3). The fourth questionnaire was on financial mechanisms for social housing and disaster risk management and was used to

127 In May 2003, the questionnaires were given to representatives of IIA-UMSS, Instituto de Investigaciones de Arquitectura, Universidad Mayor de San Simon (Bolivia); IPUR-UCSG, Instituto de Planificación Urbana y Regional (Ecuador); FUSAI (El Salvador); MejorHa, Associación para el Mejoramiento Habitacional de Guatemala (Guatemala); CEDAC, Centro de Diseño, Arquitectura y Construcción (Honduras); HABITAR, Centro de Investigación y Promoción del Hábitat (Nicaragua); and Desco, Centro de Estudios y Promoción del Desarrollo (Peru). These organisations offered a good possibility of cooperation as they are counterparts of HDM within the capacity building programme PROMESHA (Programa de Capacitación para el Mejoramiento Socio Habitacional). Sida finances the majority of the activities through a general agreement with HDM. See www.hdm.lth.se/PROMESHA/INDEX.HTM.

analyse the importance and possible inclusion of financing issues within the different research outcomes presented in the form of analytical, conceptual, strategic and operational frameworks (see appendix A4–4). Both questionnaires A4–3 and A4–4 were distributed to selected operational staff and programme managers of different (aid) organisations, most of whom were working in settlement development planning. These mainly included the 67 participants of the workshops held in Costa Rica and El Salvador,[128] as well as some of the interviewees at national and municipal level in El Salvador. To reach a broader audience, the two questionnaires were further included – together with the 'Operational Analysis and Integration Framework' – on different Web sites (e.g. of the Benfield Hazard Research Centre, UK; CEPRODE in El Salvador; HDM, Sweden; as well as within CARE's intranet 'Livelink'). However, compared to the return rate of the questionnaires A4–1 and A4–2, which was 100 percent, the return rate of A4–3 and A4–4 was very low. Hence, the information obtained through these questionnaires could not be analysed statistically, but was used to triangulate the information obtained from other data collection methods.

3.3.4 Observations

Observation was of great importance for the case studies. In fact, during the visits to the case study areas, a range of aspects crucial to the research could be observed. Examples of such aspects are the 'real-life' context of the cases/programmes; the way they were implemented; the quality of structural mitigation measures (quality of workmanship, technologies and techniques applied); success and/or failure factors; local relevance and acceptance of programme measures; accessibility; social relations; physical conditions and layout of settlements; local capacities, efforts and needs; as well as existing risk factors. Observation was especially important for crosschecking/triangulating information from other sources, for instance, that obtained from interviewees who overemphasised the programmes' merits and strengths or downplayed their weaknesses.

Compared to the case studies, observation was a method of lower importance for the context analyses at global, national and municipal level and was limited to 'participant observation' during interviews, research workshops, and specialised conferences on disaster risk management. Regarding the interviews, examples of the aspects that could be observed were the interviewees' behaviour, the availability and accessibility of information, the (physical) interconnection of different departments, and how many staff were employed in each. As regards the conferences, aspects such as their target groups, invitees and participants, their behaviour, interrelations, and way of arguing could be observed.[129]

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128 See footnote 115.

129 A crucial conference for this research was held by the NGO Tearfund in London, UK, in November 2003. It was entitled 'Supporting Natural Disaster Risk Reduction', and was based on a research on policy and practice of institutional donors on disaster risk reduction (Tearfund 2003). Conference participants identified and prioritised methods of mainstreaming risk reduction into institutional practice. Two other important conferences for analysing trends and

The 'storage' of the data gathered by observation was in the form of memos or field notes and was supported by photographs.

3.3.5 Text reviews

The review of 'grey' and 'white' literature was conducted constantly during the research process with the aim of identifying relevant past and present studies, research-related theories, appropriate research methods, and experts in the field. It was further crucial for determining preconceptions or propositions, the elaboration of interview protocols, and the triangulation of information obtained through other research methods.

The review of the accessible 'white' literature at the beginning of the research turned out to be difficult, as most publications did not meet the established search criteria.[130] In fact, while there was an immense, even overwhelming, amount of literature on the physical/structural aspects of reconstruction, little could be found with a focus on pre-disaster settlement development programming that tackled aspects related to (integrating) disaster risk management (cf. sections 2.1.5 and 2.2.3). This situation influenced the research approach and methodology in the following ways: (a) interviews were initiated during the early stage of the research process as a sort of 'shortcut' to access the information being sought (cf. section 3.3.1); (b) induction was an important mode of enquiry (cf. section 3.2.4); and (c) additionally, non-conventional data collection methods were used to find research-related information. These non-conventional methods included data gathering through participation in online conferences and specialised networks, as well as through the work of organising and editing two special issues on managing urban disasters for the professional journals *Open House International* and *TRIALOG* (Journal for Planning and Building in the Third World). The special issues were designed to assist in the identification of new and relevant studies within the research work. However, even so, the search for relevant studies and research articles proved difficult, serving to confirm that relatively little research has been carried out within the focus of this research.

As regards 'grey' literature, the following documents were gathered and reviewed: programme documentation, institutional and national policies, regulations, interview transcripts and notes, transcripts of presentations held during conferences,[131] observation memos and field notes, as well as e-mails circulated by the participants of online conferences organised by UNISDR[132] and special-

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observing the above-mentioned aspects were the World Conference on Disaster Reduction (WCDR), Kobe, Japan, 18–22 January 2005, and the ProVention Consortium Forum 2007 on Making Disaster Risk Reduction Work: Building Safer Communities in Africa and Worldwide, Dar es Salaam, Tanzania, 13–15 February 2007.

130 This situation was encountered despite the fact that specialised libraries were consulted (e.g. of different specialised organisations or universities such as Charles Sturt University, Australia).

131 See footnote 129.

132 The UNISDR through its Secretariat invited, for instance, to an online dialogue from 15 June to 15 July, 2004 to discuss 'priority areas for further action to implement disaster risk reduction 2005–2015'. A second online dialogue

ised risk reduction networks, such as the 'Disaster Risk Reduction Education Network' or RADIX[133] (Radical Interpretations of Disasters).

Once the first research outcomes were obtained, literature review was again crucial for their theoretical validation and systematisation, for instance, in the form of an operational framework for disaster risk management integration (see Paper IV and enclosed CD). In this context, a range of research-related frameworks, models and tools were critically assessed to analyse their scope, target group, structure, format, indicators and applicability. These included frameworks for: (a) assessing progress in disaster risk management; (b) mainstreaming HIV/AIDS in sector development planning; (c) designing appropriate humanitarian aid or development programmes (related to settlement development planning and/or disaster risk management); and (d) adapting to climate change impacts.[134]

3.3.6 Research workshops and 'hands-on' practice

In line with 'Mode 2' knowledge production, which aims to produce research outcomes that are directly useful or applicable at the local level, research workshops and 'hands-on' practice were essential for this research, for both data gathering and analysis (see also section 3.4.2). Research workshops and 'hands-on' practice assisted in: (a) testing the outcomes against 'reality' (i.e. the perceptions and needs of the direct and indirect research target groups); (b) refining and adapting them where needed; and (c) assessing their potential generalisation and transferability to other disciplines/sectors, as well as to other geographical, institutional and programmatic settings.

Research workshops are part of participatory research methods, also known as 'knowledge workshops', 'field action workshops' or 'participatory research workshops'. The participants of four workshops, totalling 125 professionals, were drawn from key urban development actors, both governmental and non-governmental, working in Africa, Asia and/or Latin America. The workshops combined practical exercises to apply research outcomes at local household level (e.g. the 'Operational Analysis and Integration Framework') with horizontal exchange between the participants, other potential beneficiaries of the outcomes (e.g. people living at risk), and the author. Such exchange was supported by, for instance, interviews, focus group discussions, and walk-through analyses (cf. sections 3.3.1 and 3.3.2; see *Figure 6*).

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was organised from 12 September to 10 October 2005 to discuss the key elements for 'assessing progress towards disaster risk reduction within the context of the Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters'.

133 Radix is meant as a home for discussion, working papers, opinion pieces, resources and links that can help to develop radical interpretations of, and radical solutions to, all disasters in every part of the world. It is a resource base for those who are studying and working on these issues.

134 Examples of frameworks analysed were Benson and Twigg (2006, 2007); Diakonia (2004); Foro Ciudades Para La Vida (2002); FUSAI (2005); Holden (2004); IDB (2004a,b); IDEA/IDB (2005); Mitchell (2003); Tearfund (2005); The Sphere Project (2004); UNDP (2004a,b); UNDP/UNISDR (2006); UN-HABITAT (2004); UNISDR (2003, 2005b); and World Bank (2002).

The first workshop in Costa Rica, with 32 participants, took place on 15 February 2006; the second in El Salvador, with 35 participants, from 20–22 February 2006; and the third workshop in Sweden, with 31 professionals, on 2 May 2006. During the workshops, the participants assessed, amongst other things, if the research outcomes, in particular, the 'Operational Analysis and Integration Framework', was comprehensible, comprehensive/complete, relevant and applicable/useful. They also analysed if there were any financial, political or institutional threats that could hamper the use and implementation of the framework (i.e. the 'risks' to the framework itself), and how these could be overcome (cf. section 3.4.2). To carry out similar assessments of the final 'Analysis and Adaptation Model', a fourth and final workshop was held in Sweden on 8 September 2007, with 27 participants. A further workshop will be held in the Philippines in 2008 in cooperation with Plan International.[135]

Figure 6: *Workshop in El Salvador in February 2006: exercise in applying the 'Operational Analysis and Integration Framework' in the field (i.e. where one of the case studies was carried out). The picture shows the workshop participants interviewing inhabitants of the low-income settlement 'Refugio' to identify existing risk and – with the help of the framework – to develop possible disaster risk management activities.*

Apart from the practical exercises during the workshops, some of the research outcomes have been tested in a 'real-life' situation in programme implementation. This 'hands-on' practice was carried out in Central America by CEPRODE, FUNDASAL, FUSAI, and UN-HABITAT-ROLAC, as well as in El Salvador and the Philippines by Plan International.[136] Moreover, the strategic concepts developed for disaster risk management integration are also being used by other organisations, such as CARE and the Red Cross, within their ongoing main-

135 For further information on the different workshops see 115.

136 Aspects of the 'Operational Analysis and Integration Framework' and other research outcomes (especially those presented in Paper VI) are: (a) applied by FUSAI in different programmes in Colón, La Libertad and Usulután (information obtained from Luis Castillo, director, on 8 November 2006); (b) used as a point of reference by FUNDASAL for reconstruction projects and their upgrading programme (information obtained from Edín Martinez, director, on 29 and 30 August 2007); (c) applied by CEPRODE within all programmes, and currently for the extension of their programmes analysed by this study (see *Table 2*) (information obtained from Lidia Castillo, director, on 16 May 2007); (d) used by UN-HABITAT-ROLAC in different Central American projects (e.g. within the 'Programa fortalecimiento de capacidades locales en cuatro países en America Central') (information obtained from Ileana Ramírez Quirós, regional coordinator, on 17 March 2006); and (e) implemented by Plan International in their programme to integrate disaster risk reduction into Plan's work and systems, especially in the Philippines and El Salvador (information obtained by Nick Hall, disaster risk management coordinator, on 16 June 2006).

streaming processes.[137] While this re-introduction of academic analyses into the 'real-life' context did provide feedback, and thus input for the improvement of the research outcomes, the iterative progression of implementation and refinement is an ever-developing process, and thus is still ongoing.

Finally, it must be mentioned that initial research outcomes were also presented and discussed during different workshops/seminars, which assisted in refining and integrating them further. Examples are the European Network of Housing Research (ENHR) International Housing Conference on Housing Growth and Regeneration, Cambridge, 2–6 July 2004; the N-AERUS Conference Promoting Social Inclusion in Urban Areas Policies and Practice, 16–17 September 2005 Lund, Sweden; the TRIALOG 2006 conference entitled Planning in Need – Need for Planning, 20–21 October 2006, Technical University, Vienna, Austria; and the ProVention Forum 2007 on Making Disaster Risk Reduction Work, 13–16 February 2007, Dar es Salaam, Tanzania.

3.4 Methods of data analysis

On the basis of the data collected through the case studies and their context analysis, the emphasis of this research was on developing a grounded theory on the situation/system studied and on how this situation/system could be improved (i.e. positively influenced). For this purpose, and in line with the research's setting and theoretical positioning, for the data analysis and interpretation a combination of literal reading, grounded theory (Glaser and Strauss 1967; Strauss and Corbin 1990) and systems analysis (Sterman 2000; Hördur 2004) was applied. Cultural theory was also partly used (Thompson et al. 1990). These methods are described in the following.[138]

3.4.1 Literal reading

The analysis of 'white' literature throughout the research was mainly done through literal reading, which is the assessment of the information provided in relation to the research focus. This is an iterative analysis process, using constant comparison of information from different literature (Booth 2001). The outcome of this analysis verified and complemented information from other sources, and is reflected in the setting of the research, its conceptual framework, and the literature reviews included in the different research articles (mainly Papers I, II, III and VI). Other documents, such as programme documentation, institutional and national policies, regulations, and partly also the transcripts of interviews with key informants, were analysed in this 'straightforward' way.

137 Information obtained from staff by e-mail (in December 2006) and orally (in February 2007), respectively.

138 Note that the author participated in special PhD courses on case studies, systems analysis and grounded theory so as to guarantee its correct use and combination, resulting in this research's innovative 'case studies–grounded theory–systems analysis approach'.

3.4.2 Grounded theory

As stated in sections 3.1 and 3.2, the overall research design was influenced by grounded theory. Written down and systematised in the 1960s by Glaser and Strauss, this theory helps researchers to look systematically at data that have been gathered. Kraimer (2003) mentions grounded theory as a suitable data analysis strategy for case study research.[139] Through a permanent comparison, coding and categorisation process, the data gathered are conceptualised and thus a theory is generated that has a higher level of abstraction than the initial data description.

Within the framework of this research, the different texts mentioned in section 3.3.5 were first read and, where needed, interview recordings were played to cross-check transcripts and reorganise and rewrite interview notes. A combination of open coding, axial coding, and selective coding was then applied, which is described below. Compared to quantitative research, the goal of this coding process is not to count things, but to 'fracture' the data, and rearrange them into categories (Strauss 1987). This facilitates comparison among items in the same category and helps to develop theoretical concepts (Maxwell 2005).

Categorising strategy – open coding.[140] The focus of open coding is on similarities that could be used to sort data into categories (Maxwell 2005). Data are compared, and similar incidents are grouped together and given the same conceptual label. This process of grouping concepts at a higher, more abstract, level is termed categorising. Based on the research setting and related preconceptions or propositions, organisational categories were often established prior to the interviews, observations or review of documents. These functioned as primary 'bins' for sorting the written/transcribed data for further analysis. The categories often formed the first skeleton for the outline of the annexed research papers. Parts of the data were then copied and pasted within the respective categories. During this process of matching empirical evidence and predictions/propositions, categories sometimes needed to be changed or complemented. However, some of the categories are still reflected in the articles' final chapters or sections.

Pattern matching – axial coding. Whereas open coding fractures the data into concepts or categories, the axial coding process puts those data back together in new ways by making connections between a category and its subcategories. Thus, within the established organisational categories, patterns were identified through a comparison of the different empirical data. The patterns were established during, and not before, the analysis process, based on their occurrence throughout the different texts. To avoid the accumulation of unanalysed field notes and transcripts, the analysis began often immediately after the interviews. Thus, during the initial listening to interviews and the reading of the different texts, notes were

139 Although Glaser (1978) has pointed out that the method is uniquely suited to fieldwork and qualitative data, it can easily be used as a general method of data analysis.

140 The categorising strategy can also be referred to as 'thematic analysis' (Booth 2001).

already being written to develop tentative ideas about patterns and their relationships. During the process of axial coding, both substantive and theoretical patterns were identified. The substantive patterns are mainly descriptive, stay close to the data analysed, and can in a further step be used to develop theory. The theoretical patterns place the data into a more abstract framework, which is derived (a) from an inductive developed theory (i.e. the concurrent development of concepts and theories from emerging data) (Maxwell 2005); or (b) from deductive theory (i.e. based on the research propositions made). Theoretical patterns were, for instance, based on the theoretical classification of interviewees' perceptions, in contrast with the denoting of interviewees' own concepts (i.e. concepts being understood and expressed in the interviewees' own words). The coexistence of substantive and theoretical patterns is clearly visible in most of the annexed research publications.

The so-called 'linear paradigm model' is commonly used for axial coding. Its basic purpose is to enable the researcher to systematically analyse data and relate them in complex ways by dividing data into 'causal conditions', 'phenomenon', 'context', 'intervening conditions', 'action/interaction strategies', and 'consequences'. In the context of this research, the linear paradigm model was expanded by the broader systems analysis approach described in section 3.4.3, to allow the analysis of more complex (i.e. non-linear) interrelations, including feedbacks.

Theory building – selective coding. The final step, called selective coding, was the identification of connections and relationships through a comparison of different categories and patterns. This last step was crucial for identifying the underlying reasons for the situation/system identified and, finally, for theory building.

Paper III can be used as an example to illustrate the process of categorising and pattern matching. The paper analyses the integration process of disaster risk management into settlement development planning after Mitch in 1998 and the 2001 earthquakes. At first, changes regarding this integration process were analysed only within the defined categories 'implemented projects', 'national and municipal legislation' and 'institutional structures'. During the analysis process, 'operational instruments' and 'organisational structures' were added. Within these five categories, substantive patterns of change were identified (listed at the beginning of each section within chapters 2–4 of Paper III). Finally, the search for theoretical patterns and for causal links (presented in chapter 5 of Paper III) helped to identify the underlying drivers and the strengths and weaknesses of the process identified, which led to the generalisation of the research outcomes. This generalisation to theory is presented in the form of a strategic/methodological framework for integrating disaster risk management, urban planning and housing, included at the end of Paper III.

Certainly, during the analysis of categories and patterns to develop theory, attention was always given to the context of the texts to be analysed, as they were

'produced' under certain conditions. Hodder (1994) states that there is always a tension between the text and context. Within the framework of this research, such contexts were, for instance, false expectations of the interviewees at household level from the interviewer (i.e. the author of this study), and at institutional levels, the need of organisations to protect their reputation by overemphasising the programmes' merits and strengths or by downplaying their weaknesses.

Refinement of theory. Glaser (1998) suggests two main criteria for judging how well the emerging theory performs, namely (a) that it must fit the place studied and, thus, be suitable; and (b) that it works (i.e. it helps people in a particular situation not only to make sense of their experiences, but at the same time to help better manage their situation). Thus, with the aim of extending and/or sharpening the emerging theory by filling in categories that might need further refinement and/or development, workshops were held with the research's target group to present and evaluate the outcomes that were developed initially (cf. section 3.3.6). During the workshops, the participants assessed, amongst other things, if the 'Operational Analysis and Integration Framework' elaborated is comprehensible, comprehensive/complete, relevant and applicable/useful (see *Figure 7*). On average, the participants of the two workshops in Costa Rica and El Salvador rated all four aspects between four and five, on a scale of one to five, five being the best. After the revision of the research outcomes on the basis of the participants' evaluations and of further inputs received during additional field studies, the outcomes were again compared and complemented with existing literature to examine what was similar, what was different, and why (cf. section 3.4.1). Eisenhardt (1989:545) states: 'overall, tying the emergent theory to existing literature enhances the internal validity, generalisability, and theoretical level of the theory building from case study research (...).'

Figure 7: *Workshop in El Salvador in February 2006: exercise to evaluate research outcomes (e.g. the 'Operational Analysis and Integration Framework') as regards their comprehensibility, completeness, relevance and applicability.*

Citations and references: the use of citations/references from interviews is a special feature of Papers I and II to illustrate the categories or patterns identified. These references were selected as being representative of specific themes and were all confirmed by the interviewees. The publications that followed Paper I and II have made only little use of such citations/references, mainly to protect the

different interviewees at the institutional and household levels in El Salvador (c.f. section 3.5).

3.4.3 Systems thinking and analysis

The overall research design of this study, composed of case studies and their context analysis (cf. section 3.2), implies systems thinking. In fact, in line with systems thinking and theory,[141] and in comparison with traditional and commonly used analyses, this study looks at how the matter under study interacts with other parts of the system,[142] and analyses complex matters that involve a great variety of actors and their interactions.

According to Laws and McLeod (2004), the combined 'case study–grounded theory approach' breaks new ground in systems research, providing valid and reliable research outcomes based on rich and detailed data. Within the framework of this research, the use of systems analysis tools for data analysis can be further seen as an extension of the linear paradigm model of grounded theory used during axial coding (cf. section 3.4.2). In fact, in contrast to the linear paradigm model, systems analysis offers better tools for conceptualising and constructing circular connections, which is especially useful for research related to sustainable development (Haraldsson 2004). Systems analysis was thus crucial throughout the whole research.

Systems thinking has been evolving and developing over the last 60 years and is having increasingly more influence on scientific research.[143] It is a field of science that deals with the organisation of logic and integration of disciplines for understanding patterns and relations of complex problems (i.e. complex systems in nature, society, and science). It embeds 'system dynamics', a term coined in the 1960s by Jay Forrester at Massachusetts Institute of Technology (MIT) (Forrester 1961). System dynamics refers to the re-creation of the understanding of a system including its causal factors and feedbacks. Causal loop diagrams are used to map out the structure and the feedbacks of a system so that its mechanisms can be understood (see *Figure 8*).[144] This can, importantly, further help in developing strategies to counteract the mechanisms that have been identified (e.g. undesired behaviour) (Hördur 2004).

Causal loop diagrams were explicitly used at the local household level in this research. In fact, in the elaboration of Papers V and VI, they were used to de-

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141 Systems theory generally refers to the 'science of systems' that resulted from von Bertalanffy's 'general system theory' (von Bertalanffy 1950) and was then further developed, also within social sciences (e.g. Bateson 1979).

142 In the words of von Bertalanffy (1950:134), 'in the past centuries, science tried to explain phenomena by reducing them to an interplay of elementary units which could be investigated independently of each other. In contemporary modern science, we find in all fields conceptions of what is rather vaguely termed "wholeness".' This kind of systems thinking is thus certainly in line with case study research (cf. section 2.1).

143 Only recently has its importance also been discussed for risk assessments (Benson and Twigg 2004).

144 The computer programme Vensim© was used to support the creation of the diagrams/models. These models can be used as a basis for computer simulations. See www.vensim.com.

velop illustrative models of the key variables and their causal relations that underlie the complex system of risk and disaster occurrence in slums. A causal relation between two variables is portrayed by an arrow with a plus sign (+) or a minus sign (-) (see *Figures 8* and *12*). A plus (+) or a minus (-) sign indicates the type of change that occurs if variable *A*, at the beginning of the arrow, increases. A positive symbol (+) shows that the increase in variable *A* affects the increase in *B*. However, a negative symbol (-) means that the increase in *A* results in a decrease in *B*. The inclusion of non-linear relationships is one of the most important advantages of causal loop diagrams compared to conventional models, such as the above-mentioned linear paradigm model or flow charts. They are also valuable in that they can identify reinforcing loops that can represent vicious circles – and thus the search for ways of interrupting and/or balancing them. Reinforcing loops consist of two or more variables, all of which are connected by arrows of the same polarity (i.e. plus or minus signs) going in the same direction, and are generally highlighted through bold arrows (see *Figures 8* and *12*).

Although causal loop diagrams were explicitly only used at the local household level, systems thinking was crucial throughout the PhD work. It is also reflected in the final outcome of this research, the 'Analysis and Adaptation Model', which (a) brings together the different key stakeholders that 'run' the system, and (b) indicates ways of 'breaking' negative reinforcing loops that were identified in the current system (cf. sections 4.3 and 5.1).

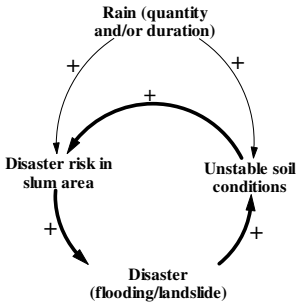

Figure 8: *Example of a basic causal loop diagram showing some natural key variables underlying risk and disaster occurrence in slums (cf. Figure 12).*

3.4.4 Cultural theory

Cultural theory was originally developed in anthropology and political science to explain risk perception. In fact, cultural theory aims to understand why different people and social groups view, and hence react, differently to risk. Four basic social patterns were established by Thompson et al. (1990) to explain the key differences in perception and behaviour: individualistic, communitarian/egalitarian, hierarchical and fatalist. These can also be applied to other, non-risk-related fields. For this research, these patterns were explicitly used to analyse the data gathered on: (a) institutional approaches to (and related measures of) disaster risk

management and settlement development planning; and (b) slum dwellers' behaviour to cope with disaster risk and disasters. As regards the local coping strategies, individualistic behaviour can be characterised by the use of self-help to fix things without assistance from people outside one's own household; communitarian behaviour is based on the belief that everybody sinks or swims together and is hence characterised by community efforts; hierarchical behaviour relates to the belief in authority structures for assistance, control and organisation, including strong prescriptions; and fatalist behaviour is a non-strategy for survival based on the idea that taking action or not taking action has the same (negative) result. As identified by cultural theory, under certain conditions the different patterns can move from the underlying social pattern of one strategy to another pattern (Thompson and Wildavsky 1986). Hence, cultural theory was further crucial to analysing if the programme measures studied helped or hindered such transitions, and if they were in line with the ways in which people actually cope with risk and disasters (see annexed Paper VI).

3.5 Validity, reliability and research ethics

To obtain a good approximation of 'reality', and thus reliability, and to deal with threats to the validity of the conclusions, like bias in the selection of cases/programmes and self-report bias by the interviewees, different types of triangulation were used. These include data, methodological, theoretical and investigator triangulation, as described below (Harvey and MacDonald 1993; Flick 2006).

Data triangulation was applied by comparing the information gathered by the same research method, either obtained from different information sources or even the very same source (e.g. comparing data from interviews with different stakeholders, or comparing data from different interview questions put to the same interviewee). *Methodological triangulation* was applied by cross-checking the information gathered using one method (e.g. interviews) with other data collection methods (for instance, walk-through analysis, observation and text review). Thus, information collected, such as interviewees' beliefs and perceptions, was accepted as true unless discrepancies in evidence were encountered in contradictory information obtained from the same person, other interviewees, or additional data collection sources.

Theoretical validation was achieved by checking resulting theories and concepts through: (a) searching for alternative explanations and negative evidence; (b) comparing them with initial expectations as well as already existing theories/concepts; and (c) holding regular meetings, presentations and workshops to discuss them with key informants, experts, and the target group of the research ('member check') (Ratcliff 1995). Theoretical triangulation was further achieved by distributing preliminary research outcomes through publications (in the form

of paper copies and online postings), with the aim of having them critiqued by a broader audience of researchers and practitioners.[145] The journals, books and working paper series for publishing the outcomes were selected to achieve a good match of their respective readerships with the target group of this research, as well as to distribute the findings within the different disciplines and working fields that are related to the research (i.e. urban settlement planning, disaster risk management, development and disaster studies, and humanitarian assistance). Finally, the framework of this research permitted only to a limited extent the application of *investigator triangulation*. The data analysis process, but not the data collection itself, was subject to revision and critical feedback from other investigators from different research institutions.[146]

In addition to the different types of triangulation described, listening to recordings of interviews and reviewing data on multiple occasions increased the reliability of the research. However, as the social context in which this research is embedded is constantly in a state of flux and development, its replicability is limited. However, importantly, this does not affect the high validity of the research and the analytical generalisation and transferability of its outcomes.

When it comes to research ethics, the question to be asked is if the research could harm. Organisations implementing the programmes studied within the field of disaster risk management and/or settlement development planning took a chance in that the research findings could show their performance to be less good than they thought it was or not as they would like it to be seen. However, first, all the programmes selected can be seen as positive precursors in the sense that they have, compared to usual programmes, already initiated the integration of settlement development planning and disaster risk management. Second, interviewees could decide if they wanted the information provided to be treated anonymously; and third, the research renounced the detailed description and explicit inter-institutional comparison of the programmes analysed. This also helped to obtain more accurate answers to the questions asked. To avoid harm to the programme beneficiaries, their identities were generally kept confidential.[147] In addition, all possible efforts were made not to generate unrealistic expectations on the part of the different stakeholders targeted by the research.

The idea of the research was to seek not Western knowledge, but mainly the existing (local) knowledge, perceptions, capacities, needs and practices of the different stakeholder groups. This approach was based on the author's conviction that a more effective means of responding to disasters and disaster risk is the

145 Feedback was received from a broad audience mainly from Latin America and Europe, but also from Africa, Asia and North America in the form of conversations, e-mails and conventional mail.

146 For instance, the data analysis for the elaboration of Papers V and VI was carried out during 2006 in consultation with investigators at the International Institute for Applied Systems Analysis (IIASA), Austria.

147 The aim of keeping beneficiaries' identity confidential was also a reason for not including in this study the maps of the case study regions indicating the location of the households that were interviewed (cf. section 3.3.1).

positive and intelligent participation of those who are most at risk or otherwise directly involved in the management of disaster risk (cf. Hewitt 1997). This general approach to the topic studied reduced the risk of unethical behaviour and procedures during the elaboration of the research.

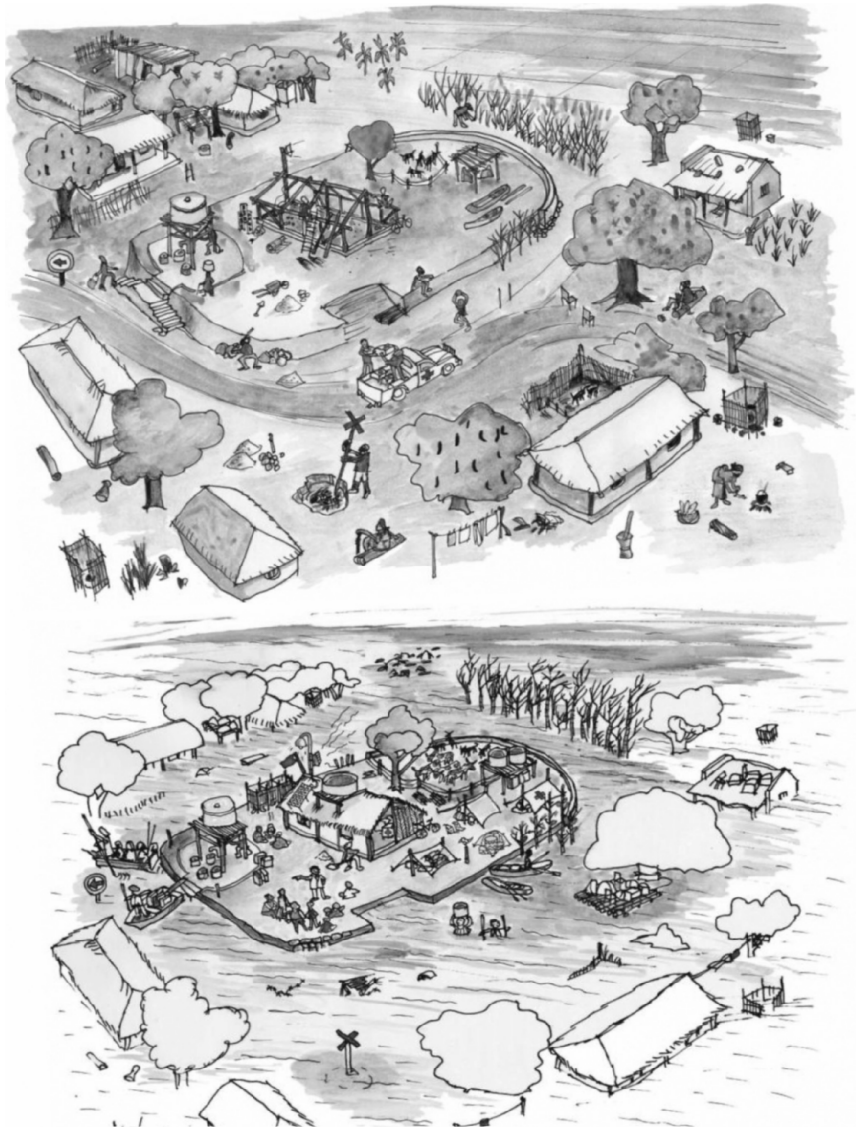

Figure 9: *Illustration taken from the poster series 'Learning how to live with floods' (Feuerhake 2004b), elaborated within the framework of a UN-HABITAT upgrading programme. It shows strategies that could be adopted by low-income settlements to better cope with risk and disasters, for instance, through the establishment of an elevated platform/land area that lies above the water table.*

CHAPTER

FOUR

4 Cross-case findings and analysis

This section highlights the main findings and analysis of the papers included in the appendices of this thesis. In accordance with the research objective, all papers focus on demonstrating the role and potential of urban development actors within the field of disaster risk management (cf. section 1.2). They provide new knowledge and innovative ways that would allow these actors to more effectively tackle disaster risk through their everyday work.

Section 4.1 elaborates on how the different papers relate to and build on each other. Section 4.2 synthesises and analyses their cross-case and multi-level findings. Finally, section 4.3 presents the analysis of related outcomes by incorporating them into a new analytical and conceptual model for integrating disaster risk management into settlement development programming (the 'Analysis and Adaptation Model').

4.1 The 'red thread'

The 'red thread' of the annexed research publications, that is, the way that they relate and build on each other, reflects the overall research design. In fact, the global, national, municipal and local household level gradually became the focus of the enquiry (see *Figure 10*; cf. sections 1.5 and 3.2). Initial generalisations ascertained at each level were included in the related paper(s) and are mainly presented in the form of different analytical, conceptual and strategic frameworks. After the publication of the first three papers (I–III), which summarise the research at global, national and municipal levels,[148] the different research outcomes were for the first time interlinked and raised to a higher level of abstraction/generalisation (see *Figure 10*). The resulting 'Operational Analysis and Integration Framework' was published in its full length within a working paper series of the Benfield Hazard Research Centre and in the form of a summary description in an international journal (both on enclosed CD and in Paper IV). These first outcomes were subsequently revised, validated and complemented. This was mainly achieved through: (a) additional interviews, questionnaires, and workshops with the research target group (cf. sections 3.3.1, 3.3.3 and 3.3.6); and (b) additional in-depth studies at the local household level of the selected cases/programmes (cf. section 3.2). The latter are summarised in Papers V and

148 Note that Papers II and III, while focusing on the global or national and municipal level, respectively, also include research outcomes from other levels, including outcomes of the initial household level studies (see *Figures 10* and *11,* cf. section 1.5).

VI. Finally, Paper VII systematises, complements and interlinks most of the main research outcomes of the preceding papers, again reaching a higher level of generalisation (see *Figure 10*). The additional findings complementing the preceding papers were based on further desktop studies during 2006/7, when the newly emerging literature was analysed and interview transcripts and analyses were once again being revised. The resulting 'Analysis and Adaptation Model' (also included in Paper VII) is thus, on the one hand, the further development and generalisation of the key finding of all the different level analyses and, on the other hand, resumes them in one illustrative and all-encompassing framework. The model, however, does not replace the analytical, conceptual, strategic and operational frameworks that preceded its elaboration. In fact, its realisation within a specific programme/organisation would require a consideration and also a partial application of these frameworks. To better support and complement the model, at the end of the research the 'Operational Analysis and Integration Framework' was updated to take new research outcomes into account.

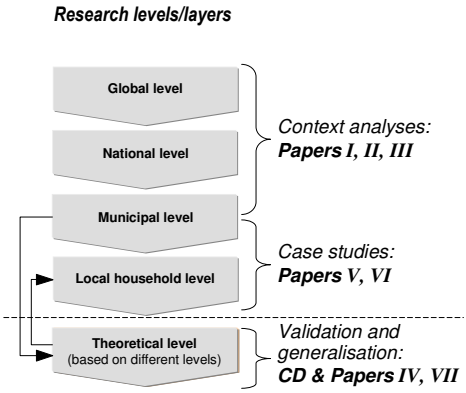

Figure 10: *Link between the research design and the sequence of publications (cf. Figure 5). The black arrows indicate that before the in-depth studies were carried out at local household level, the outcomes from the global, national and municipal level were firstly combined, validated and generalised. After the studies at local household level, the resulting frameworks were then complemented, further validated and generalised.*

Table 4 and *Figure 11* provide a more detailed overview of the interlinkages between the research design and the sequence of the eight publications included in this thesis. They illustrate how the publications build on each other as regards their focus, key aspects and outputs.

Table 4: *Sequence of elaborated publications in time and their interlinkages, building on each others focus, key aspects and outputs (cf. Figure 10 and 11).*

N° of paper/title *(N° according to respective elaboration in time)*	**'Red thread' linking the different research papers**			**Published in**
	Focus *(research levels/layers)*	***Analysed and systematised key aspects***	***Main outputs and contributions*** *(mainly in the form of analytical, conceptual, strategic and operational frameworks)*	
I) Managing urban risk: perceptions of housing and planning as a tool for reducing disaster risk	Global level	Current practices as regards the interconnection between disaster risk management and settlement development programming. Non-integrated and integrated programmes promoted by international organisations. Interlinkages between disasters and building and planning practices.	Identification of the relationship between disaster risk management and settlement development programming at global level and the fact that the separation encountered can lead to increased risk faced by the urban poor. First approximation and demonstration of the nexus between disasters and the building and planning practices from a global perspective.	*Global Built Environment* (GBER), 2004, 4(2):11–28
II) Mainstreaming risk reduction in urban planning and housing: a challenge for international aid organisations	Global level	Underlying reasons (barriers, problems, etc.) for the separation identified between disaster risk management and settlement development programming: - Generic challenges of mainstreaming disaster risk management within general development planning/programming; - Additional sector-specific barriers to the integration process into settlement development planning/programming. Ways of overcoming the barriers/problems identified in order to achieve better integration. Interlinkages between disasters and building and planning practices.	Analytical framework for the systematisation of the underlying reasons/causes of the separation identified at global level (see above). Introduction of the connection between disaster risk management and forced evictions. Conceptual and strategic framework for guiding an educational shift (from conventional to non-traditional urban settlement planning) needed for the sustainable integration of disaster risk management into settlement development planning and programming.	*Disasters,* 2006, 30(2):151–177
III) Integrating risk reduction, urban planning and housing: lessons from El Salvador	National and municipal level, El Salvador	Current practices as regards the interconnection between disaster risk management and settlement development programming. Integration/divergence process of disaster risk management and settlement development planning/programming in El Salvador after recent disasters (Hurricane Mitch in 1998 and 2001earthquakes); Underlying drivers, strengths and weaknesses of the integration process identified. Ways of overcoming persisting separation so as to achieve better and sustainable integration.	Identification of the relationship between disaster risk management and settlement development programming at national and municipal level and the fact that the separation encountered can lead to an increased risk on the part of the urban poor. Identification and systematisation of the integration process of disaster risk management and settlement development planning/programming at national, municipal (and local household) level in the form of an analytical framework. ⇒Ways in which (and with what effect) disaster risk management is currently integrated at national, municipal and local levels, as well as enabling factors and pitfalls.	*Open House International,* 2006, 31(1):71–83

(cont.)	(cont.)	Interlinkages between disasters and building and planning practices.	Systematisation of the underlying reasons for the persistent separation. Strategic/methodological framework for an improved (i.e. coordinated and complementary) integration process of disaster risk management and settlement development programming, carried out by development and relief organisations (as regards programme components, implementing structures, maps, plans and legal frameworks). Strategic framework for improved (international) financing of the integration process through development resources that target both local household and institutional levels (including operational instruments, institutional and operational structures and legislation).	(cont.)
CD) Operational framework for integrating risk reduction for aid organisations working in human settlement development	Theoretical level (based on different levels)	Further generalisation of outcomes of Papers I–III. Existing operational frameworks for mainstreaming disaster risk management (or other cross-cutting issues) into development planning/programming. Related organisational/institutional aspects of non-governmental social housing/planning organisations. Possible 'translation' of outcomes into an operational framework applicable to development organisations, more specifically to organisations working in settlement development planning.	'Operational Analysis and Integration Framework' that provides understanding and guidance for organisations to initiate and gradually pursue the process of integrating disaster risk management into their sectoral work, including different conceptual and strategic frameworks for: - Improved and comprehensive disaster risk management integration at local household level (including three different types of integration) - Improved and comprehensive disaster risk management integration at institutional level (including two different types of integration)	Benfield Hazard Research Centre, Working Paper Series, first version February 2006, revised version December 2007
IV) Tackling urban vulnerability: an operational framework for aid organisations	Theoretical level (based on different levels)	Summary of the 'Operational Analysis and Integration Framework' elaborated for practitioners. Internal and external validation strategy of the operational framework.	Concise illustration of the strategic and conceptual ideas of the operational framework	*Humanitarian Exchange*, 2006, 35:24–26
V) Understanding disasters from a local perspective: insights into improving assistance for social housing and settlement development	Local household level and general programme level	Aspects of what drives risk and disaster occurrence in slums, that is, the key variables and their causal relations underlying the complex system of risk and disaster occurrence, thereby also looking into: - Related practices as regards disaster risk management and settlement development planning, as well as their interconnection. - Interlinkages between disasters and building and planning practices.	Analytical framework and methodology for viewing, understanding and systematising disaster risk in slum communities (i.e. its key variables and causal relations), thus identifying the interlinkages between disasters and the building and planning practices at local household level. Analytical framework for systematising the ways urban slum dwellers' lives and livelihoods are affected by disasters.	*TRIALOG* 91 (Journal for Planning and Building in the Third World), 2006, 4:4–8

(cont.)	(cont.)	Ways in which urban slum dwellers' lives and livelihoods are affected by disasters.	(cont.)	(cont.)
VI) Bridging the gaps: stakeholder-based strategies for risk reduction and financing for the urban poor	Local household level and general programme level	Needs, capacities, efforts and perspectives of slum communities and the urban development actors servicing them (including related microfinancing and insurance institutions). Gap between the respective needs, capacities and efforts. Local coping strategies to deal with disasters and risk. Complex system of social housing provision, financing and insurance and its relationship to disaster risk management. Related aspects of how the existing gaps between, and challenges at, household and institutional levels can be overcome.	Identification of the expenses of slum dwellers for reducing risk and preparing for the seasonal disaster period. Identification of the reasons for urban (as opposed to rural) vulnerability (by identifying causes of weak coping in slums). Complementation of the former integration frameworks that focus on risk reduction (i.e. prevention, mitigation and preparedness) with additionally identified disaster risk management strategies (i.e. risk 'financing' and stand-by-for-recovery measures). Analytical framework (and definitions) for local coping strategies (i.e. strategies identified for risk reduction, (self-)insurance and recovery). Analytical framework for extending social housing financing mechanisms for disaster risk management (so that they can become an integral ex-ante tool for disaster risk management). Analytical and strategic framework for analysing and supporting local coping strategies through settlement development programming (assisting in the selection of adequate programme measures (that match local coping and local heterogeneity).	*Environment and Urbanization*, 2007, 19(1):115–142
VII) 'Planning ahead' – before disasters strike	Theoretical level (based on different levels)	Different-level key outcomes presented in the previous papers. Additional research outcomes in order to complement the previous studies at different levels (e.g. analysis of the interlinkages between disasters and building and planning practices).	Summary of former outcomes and frameworks. Analytical framework for viewing the interlinkages between disaster and urban settlement development at different levels, more specifically between disasters and the building and planning practices (related to low-income settlements). Comprehensive 'Analysis and Adaptation Model' addressing how disaster risk management could be better integrated into settlement development programming.	Book chapter 16 in: *Hazards and the built environment: attaining built-in resilience,* 2008

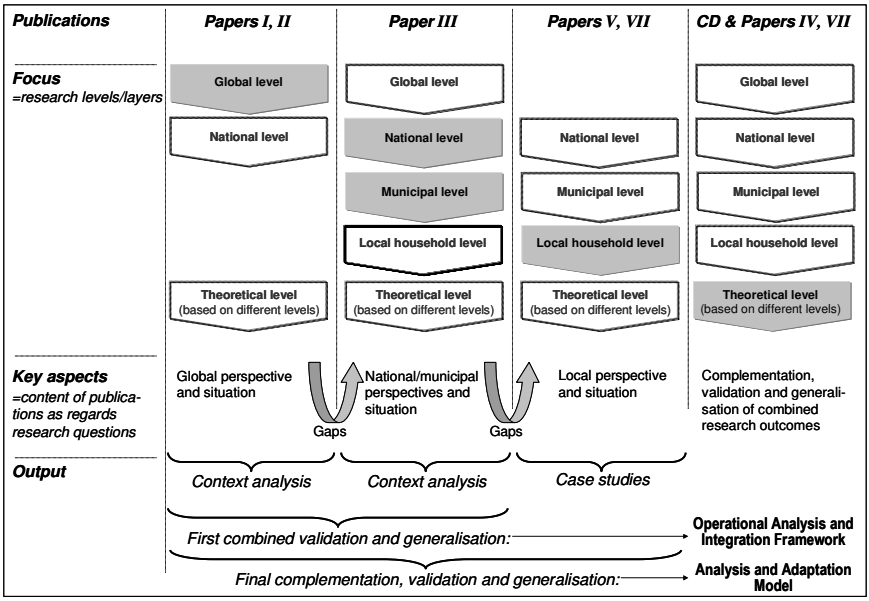

Figure 11: *Focus, key aspects and output of publications in relation to the research design (cf. Figures 5 and 10). The grey fields are the main focus while those with a grey border are tackled to a lesser extent. Note that all papers include a first generalisation of the respective outcomes (i.e. have a theoretical level).*

4.2 Key findings and synthesis of Papers I–VII[149]

This section synthesises and interlinks the main research findings presented in Papers I–VII by gradually analysing them in relation to the three main research questions: (a) what are the interlinkages between disasters and urban settlement development?; (b) what is the relationship between the working fields of disaster risk management and settlement development planning?; and (c) what is the potential to improve risk reduction and risk financing through settlement development programming?

4.2.1 Preparing the ground – linking disasters and urban settlement development

Underlying the whole research was the pursuit of a better understanding of the nexus between disasters and urban settlement development, more specifically, between disasters and the building and planning practices related to low-income settlements. Related findings, presented in the following, are summarised in analytical frameworks elaborated to assist in viewing this relationship (cf. Papers V–VII).

149 This section presents to some extent a synopsis of Paper VII, which incorporates in a systematised way most of the key research outcomes presented in the preceding publications (i.e. Papers I–VI and framework on enclosed CD). However, since its elaboration, the related contents presented here have been adapted, improved, synthesised and further developed.

Disasters ⇒ urban settlement development. On the one hand, 'natural' hazards and disasters have widely varying negative impacts on urban settlement development and related practices. In fact, the research shows that disasters can:

- Disrupt city functions;
- Intensify urban hazards and create new ones;
- Increase urban inequalities and poverty;
- Create new (ever-changing) challenges for future settlement development;
- Create barriers to sustainable settlement development; and
- Negatively impact the resources invested in the built environment.

These extensive effects, which are analysed in detail in *Tables 1–6* of Paper VII, are of a physical, socio-economic, environmental, organisational and institutional nature. Unfortunately, they are not only short-lived, but can – over decades – negatively impact the urban poor, as well as municipal and national development. The information obtained by slum dwellers, presented in Paper V, in fact suggests that disaster impacts can be classified as (a) immediate and short-lived; (b) immediate and long-lasting; (c) delayed and short-lived; and (d) delayed and long-lasting.

Urban settlement development ⇒ disasters. On the other hand, the reverse analysis indicates that inadequate urban settlement development, and related practices, can constitute one of the main causes of disasters, and not only in terms of generating increased vulnerability. In fact, it was revealed that it can:

- Increase vulnerability; and also
- Increase exposure to existing hazards;
- Intensify/magnify urban hazards and create new ones;
- Subject vulnerability and hazards to constant change (thus making them virtually impossible to control);
- Reduce coping capacities at national and municipal level
  - because of inadequate disaster risk management systems, or
  - because of inadequate urban management/governance systems; and
- Reduce local coping capacities of low-income households and communities.[150]

Tables 7–13 of Paper VII illustrate in detail how the related physical, socio-economic, environmental, organisational and institutional effects can be gener-

150 The negative impacts listed can also be caused by inadequate settlement development programmes supported by international and national aid organisations. Examples which were identified in El Salvador are, for instance: (a) increased economic vulnerability as a result of people losing sources of income and increased costs for living (for instance, due to new settlements being further from former working places and schools); (b) the creation of a false impression of security by improving only physical/structural aspects (without providing a broader understanding of risk); (c) the resettlement of people from one disaster-prone area to another one, for instance from an earthquake affected area after the 2001 earthquakes, to areas prone to landslides and flooding; (d) the lack of institutional capacity building; and (e) the creation of barriers for people to obtaining future formal or informal emergency or recovery credits as programme beneficiaries usually cannot use assisted programme housing as collaterals. For further examples see Papers III, V and VI.

ated. They clearly show that disasters are not one-off events caused solely by natural hazards but are generated by interacting development processes in which building and planning practices play a major role. Moreover, the in-depth analysis at local household level, presented in Papers V and VI, demonstrates that the key variables underlying the complex system of risk and disaster occurrence in slums are both directly and indirectly interlinked with settlement development planning. It also shows that disasters are the outcome of a non-linear development process, in which those key variables reinforce each other (see *Figure 12*).[151] Increasing risk through inadequate settlement development planning (and disaster occurrence) thus, not only makes the already precarious conditions of slum dwellers worse, but can also create vicious circles, of which 'poverty traps' can be the outcome. With growing urbanisation and climate change impacts, the two-way and multifaceted relationship described is becoming increasingly alarming.

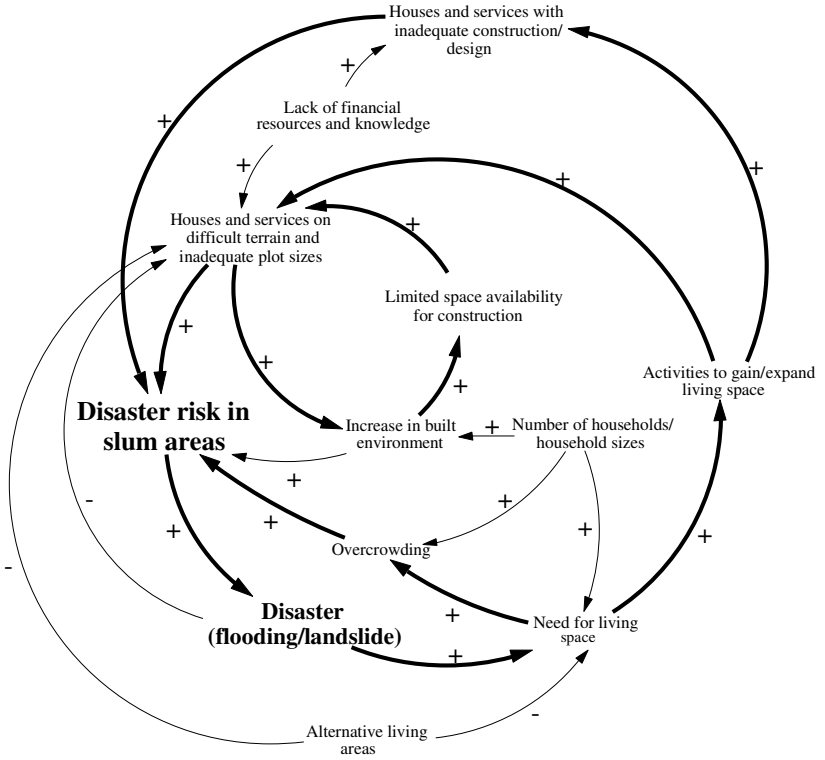

***Figure 12**: Example of space-related key variables underlying the complex system of risk and disaster occurrence in slums, reinforcing each other. Note that the other variables identified were categorised into the following groups: socioeconomic, institutional, organisational, natural/environmental, and infrastructure related (see Paper V).*[152]

151 Poverty has been identified as one of the key factors driving this reinforcing process. In turn, poverty has also been revealed as being negatively affected by this reinforcing process. (For an analysis regarding the interlinkages between settlement development planning and poverty in San Salvador, see also Ávalos and Trigueros [2005]).

152 For a general explanation of causal loop diagrams, see section 3.4.3.

4.2.2 'Reality' versus current planning practices

The interlinkages presented in the previous section indicate the importance that (support for) adequate urban settlement development could have in terms of assisting the reduction of disaster risk, disasters, and thus poverty. However, the comparative analysis of: (a) the interlinkages that were encountered between disasters and urban settlement development with (b) the current practices and efforts in the field of disaster risk management and settlement development planning, revealed that these interlinkages have, to date, not been effectively confronted by either planners or risk management professionals. The result is inadequate risk management and thus increasing risk faced by the urban poor.

One of the main reasons for the situation in question is the unfruitful separation, and even tension, identified between the working fields of disaster risk management and settlement development planning. The separation of these two fields was encountered at all the levels studied (i.e. the global, national, municipal and local household levels) and finds expression in their respective incompatibilities in terms of:

- Stakeholders and institutional structures;
- Sector-specific programmes;
- Discourses of experts and practitioners;
- Their working priorities, concepts, terminology and tools used; and
- Related literature.

All these five areas were analysed in detail in Papers I–VII and are summarised in section 3.1 of Paper VII.[153] The underlying causes for the separation described can be found in the disciplinary roots and the subsequent historical developments of the two respective working fields (cf. chapter 2 and Paper VII).

Three crucial and interconnected aspects further contribute to the separation identified by creating barriers to the integration of disaster risk management into settlement development planning. They are:

- The limited recognition and understanding of the nexus between disasters and urban settlement development (Papers I–VII);
- The marginal role of disaster risk management and settlement development programming on the agendas of both aid organisations and national and municipal authorities (Papers I–VII); and
- The fact that the increasing efforts to mainstream disaster risk management within settlement development programming are, as yet, supported and developed in such a way that they are neither sustainable nor successful (Paper III and operational framework on enclosed CD).

153 Note that some of the aspects analysed are part of the generic challenges to mainstreaming/integrating disaster risk management into settlement development planning. However, settlement development planning also faces additional sector-specific barriers.

Regarding the latter, the case of El Salvador demonstrates that disasters and the distress caused in their aftermath can push forward efforts to mainstream/integrate disaster risk management and settlement development planning. In fact, an integration of the two fields took place after Hurricane Mitch in 1998 and the 2001 earthquakes. Changes towards increased integration were mainly identified within the programmes that were implemented by different stakeholders at local household levels, but they were to some extent also identified in national and municipal legislation, organisations' operational instruments, and institutional and organisational structures. This was the case for organisations working not only in social housing and planning, but also in other development fields and in emergency relief.[154] However, the changes were supported and implemented in such a way that they often resulted in an unfruitful overlap of disaster risk management and settlement development planning. In fact, in many cases the integration process resulted in: improvements that were only temporary; increased competition; duplication of small-scale efforts (e.g. training in disaster management, research efforts into hazard-proof construction); higher investment costs; and mutual incompatibility of programme measures (e.g. the plans and maps developed, and the hazard-proof construction standards promoted). The reasons for this relate to the misinterpretation of the concept of 'mainstreaming' disaster risk management by most of the organisations involved, as well as to a lack of coordination among the different donor and implementing organisations.

In addition to the challenges and incompatibilities encountered at each research level (i.e. the global, national, municipal and local household level), a substantial gap was identified between the needs and efforts to manage disaster risk carried out by stakeholders at different levels. Examples can, for instance, be found in the needs of governmental and non-governmental organisations in El Salvador and the support and input they received from international aid organisations (Papers III, VI and on enclosed CD). In addition, at local level a substantial gap was encountered between what households need or do in order to deal with disasters and risk and how urban development actors support them. As described in Paper VI, at the household level in El Salvador more than 100 crucial but somewhat weak coping strategies were identified.[155] It was further revealed that, on average,

154 Characteristic changes implemented by organisations working in settlement development planning were: (a) the 'adding-on' of new disaster risk management programmes or programme components to their normal project work, which were not related or linked to their core activities. These programmes/programme components were, for instance, aimed at establishing emergency committees, capacity building for disaster management and the elaboration of local risk maps for awareness raising; and (b) the implementation of only a few adaptations within their core work. These were in most cases purely focused on physical/structural aspects at the local household level.

155 These coping strategies are vital for people to deal with risk and disaster. However, they are also somewhat weak. It was revealed that the reasons for weak coping in urban areas in El Salvador are, first, reduced solidarity and reciprocity among households because of (a) urbanisation and the related and increasing ease of mobility that enable households to 'default' on their obligations to relatives and neighbours; (b) different income levels (ranging between US$120 and US$750 per household and US$30 and US$500 per worker), which foster individualistic behaviour, with the better-off households opting out of mutual and hierarchical arrangements; (c) the persistent experience of bad living conditions over a period of years experienced simultaneously by most of the households; and (d) loss of trust in both community solidarity and hierarchical structures (due, amongst other reasons, to corruption and factionalism). Reasons for households' weak coping are, second, related to a lack of knowledge and resources that is due to (a)

households spend 9.2 percent of their yearly income on reducing disaster risk and preparing for the following disaster period (i.e. annual rainy season).[156] However, it was discovered that people's efforts and the financial impacts of these were both generally unknown to, and hence little considered by, urban development actors. In fact, while people's way of coping is holistic in terms of including strategies for risk reduction, self-insurance, and recovery (see *Figure 13*),[157] urban development actors look mainly at how to mitigate physical vulnerability and how to prevent imminent hazards (such as landslides). To make matters worse, some urban development actors even implement measures that create future hindrances to coping. Risk- and loss-financing are, for instance, not usually integrated into their housing finance mechanisms (i.e. government and non-government subsidies, microcredits and family savings) and assisted programme housing cannot be used by beneficiaries as collateral for future credits. Another important barrier to effective disaster risk management identified between different research levels is the fact that slum dwellers have little trust in community solidarity and hierarchical structures, and also fear being hoodwinked by national and municipal planning authorities.

Despite the situation just described, Paper VII demonstrates, importantly, that adequate urban settlement development, and hence programmes that aim to improve current building and planning practices, offer a potentially powerful platform for effectively tackling risk and disasters. This potential was furthermore revealed within the organisational structures and mechanisms for social housing provision and financing that are at the disposal of urban development actors (e.g. housing microcredits, subsidies, family savings, and mutual or self-help).[158] Related measures are described in detail in Paper VI.

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rapidly changing contexts; (b) professional specialisation to compete economically that makes coping through livelihood diversification difficult; (c) possession of few assets that could be sold to help themselves or others; (d) some of the inhabitants feeling a lack of attachment to their settlement/location because of being frequently relocated, which in turn lessens their instinctive coping ability and/or leads to poorly developed coping strategies.

156 Ranging from 0 to 75 percent. An average of 9.2 percent equals US$26 out of an average monthly household income of US$284.

157 For definitions on coping strategies for risk reduction, self-insurance and recovery, see glossary (appendix A1). Examples of these coping strategies are (a) risk reduction through prevention: stabilisation of soil through planting (b) risk reduction through mitigation: better elimination of rain and waste water through improved guttering or use of plastic sheets; (c) risk reduction through preparedness: establishment of local information systems combined with mutual help, so that, for instance, children of people living in high-risk areas can, in anticipation of a disaster, be sent to other families in more secure areas; (d) self-insurance: purchase, use and maintenance of construction materials that could be sold if needed (e.g. corrugated iron for the roofing not nailed down so that it can be sold after disaster impact); (e) recovery: diversification of people's income after disaster occurrence, for instance temporarily taking on a more profitable job in the construction sector.

158 This potential refers to both implementing *and* financing disaster risk management measures. This outcome was based on the in-depth study of the capacities, efforts and perspectives of organisations servicing slum communities at risk, as well as the comparative analysis of these organisational capacities/efforts vis-à-vis the capacities, efforts and needs of slum dwellers (Paper VI).

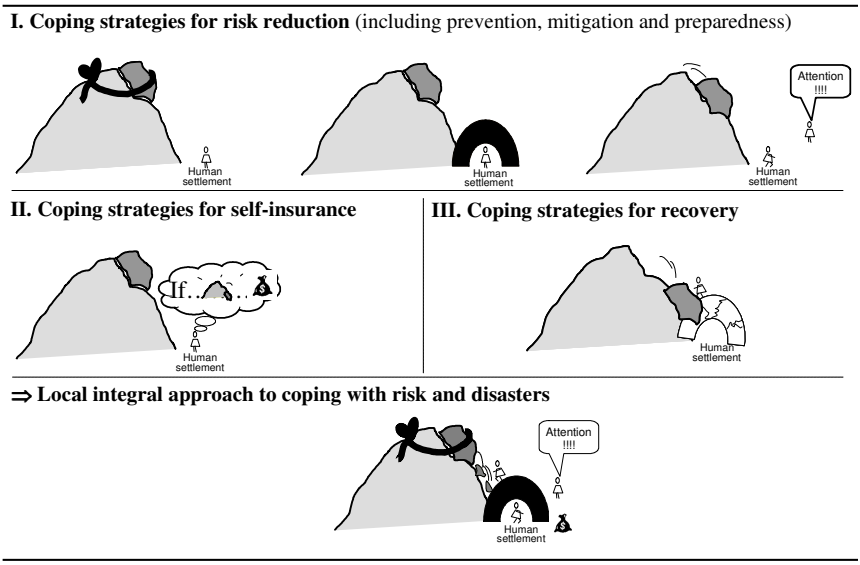

Figure 13: *Simplified illustration of the local integral approach of people to coping with disaster risk and disasters, including strategies for risk reduction, self-insurance and recovery (see glossary for definitions of these).*

4.2.3 A way forward – interfacing disaster risk management and settlement development planning

The two previous sections briefly presented the analysis of three important research findings: (a) the reciprocal and complex way in which disasters correlate with urban settlement development; (b) the fact that this correlation is not given enough (or proper) attention by international, national, municipal and local stakeholders engaging in either disaster risk management or settlement development planning; and (c) the incoherence and incompatibility identified at and among the different levels analysed. The result is unsustainable management of disaster risk (and thus increasing risk) caused by, first, the implementation of programmes that focus only on settlement development planning *or* disaster risk management; and second, the lack of initiatives, which properly integrate and combine the two fields.

While the research further ascertained that implementing and donor organisations working in settlement development planning are increasingly demanding strategic, conceptual and operational guidance on how to sustainably integrate disaster risk management within their core work, these organisations in fact confirmed that no adequate sector-specific and praxis-oriented tools are available.[159]

159 This is a paradox, as at a global level a fast-increasing number of tools for assessing progress in disaster risk management was encountered, most of them developed as a result of top-down processes created by international (and national) organisations (cf. sections 1.1 and 2.1.5, and working paper included on enclosed CD).

Based on the research findings and their analysis, an operational framework was thus developed for integrating disaster risk management into development programming, in order to counteract the situation described.[160] First published in 2006, this 'Operational Analysis and Integration Framework' drew mainly from the research outcomes of Papers I–III. Based on its validation and complementation with subsequent research outcomes, the framework was further developed during 2006–2007.[161] It supports organisations with concrete tools and guidance to:

- Evaluate the relevance of integrating disaster risk management within their organisation;
- Identify and prioritise the different possible strategies for integrating disaster risk management into their work;
- Formulate activities and measures to implement the selected strategies;
- Evaluate possibilities for financing these; and
- Define a step-by-step implementation plan (see also sections 4.3.1 and 4.3.2).

Apart from the 'Operational Analysis and Integration Framework', complementary analytical, conceptual and strategic frameworks were developed, all of which assist in better interfacing disaster risk management and settlement development planning. The analytical frameworks provide the knowledge base needed for suitable action to be taken; whilst the conceptual and strategic frameworks provide theoretical guidance for the integration of disaster risk management into settlement development programming. The different frameworks are listed in *Table 4*, are summarised in the executive summary and presented in Papers I–VI.

4.3 'Analysis and Adaptation Model'[162]

After the gradual studies at the global, national, municipal and local household levels, the different research findings and related generalisations (in the form of the above-mentioned frameworks), were further systematised, analysed, and then incorporated into one framework (see *Figure 14*; cf. *Figure 11* and *Table 4*). The outcome is a new and comprehensive 'Analysis and Adaptation Model' that addresses how disaster risk management might be better integrated into development programming at both the local household and institutional levels (Paper

160 Compared to most tools already in existence, it was developed in close collaboration with practitioners and with a focus on sector-specific, programme-level implementation. Based on growing experiences with its application in the field, it could also assist in creating over time a bottom-up development capable of nurturing the development of proper monitoring and evaluation tools for assessing progress in disaster risk management at both the national and international levels (cf. operational framework on enclosed CD).

161 After the operational framework's first publication in February 2006 by the Benfield Hazard Research Centre, a revised version was published in December 2007, incorporating the ideas and concepts underlying the 'Analysis and Adaptation Model' that had been developed in the meantime (cf. section 4.3). Both versions are included on the enclosed CD.

162 This section presents to some extent a synopsis of Paper VII, which incorporates in a systematised way most of the key research outcomes presented in the preceding publications (i.e. Papers I–VI and enclosed CD). However, since its elaboration, the related contents presented here have been adapted, improved, synthesised and further developed.

VII). The model thus reflects and combines the key findings and analysis, presented in the different research papers, in order to meet the current challenges and respond to the incompatibilities, gaps, and incomplete approaches to disaster risk management integration that were identified at and between the different research levels (cf. sections 4.2.1 and 4.2.2). It provides a comprehensive understanding of the meaning and scope of disaster risk management integration and can assist in both analysing an organisation's work and taking action to improve programme implementation. It is applicable to different contexts and working fields. While its focus is on settlement development planning and programming, many of its strategic concepts can actually also be applied within other development sectors and the working fields of disaster relief, rehabilitation and reconstruction. Its realisation within a specific context (i.e. a programme and organisation) would require consideration and also partial application of the analytical, conceptual, strategic and operational frameworks described in *Table 4,* the executive summary and section 4.2.3.

At the 'heart' of the model is a series of seven conceptual strategies for integrating disaster risk management into development planning. Three of the strategies relate to the integration of disaster risk management into programme implementation at local household level, two to the integration of disaster risk management at the institutional level of the implementing and donor organisations, and the remaining two to the promotion of sustainable disaster risk management in the work of other related implementing and training institutions. These seven strategies are presented in the subsequent sections 4.3.1 and 4.3.2 (summarised in *Table 1* and illustrated in *Figure 14*). The model is furthermore based on five complementary measures that were ascertained to be crucial in tackling disaster risk, namely, prevention, mitigation, preparedness, risk 'financing' and stand-by for recovery, to be considered within each of the seven integration strategies. These measures are presented in section 4.3.3.

4.3.1 Conceptual integration strategies at local household level

As mentioned above, the first three strategies present possible ways of integrating disaster risk management (DRM) into programme implementation at the local household level (see *Figure 14*, left side). The development of these three conceptual strategies was based mainly on the analysis of the research findings presented in Paper III and, to a certain extent, in Paper VI.

Strategy I: direct stand-alone DRM. This is the implementation of specific programmes for disaster risk management that are explicitly and directly aimed at tackling disaster risk. These stand-alone programmes are distinct, and they are implemented separately from other existing work carried out by the implementing development actors, such as social housing/planning organisations. Examples of these would be programmes aiming to: (a) establish early-warning systems or organisational structures for risk reduction (e.g. specialised disaster risk management committees); (b) construct mitigation structures (e.g. levees and em-

bankments to reduce floods); or (c) offer independent disaster insurance (i.e. insurance policies not included in housing financing schemes being offered to the poor).

Strategy II: direct integrated DRM. This is the implementation of specific disaster risk management activities/components alongside, and as part of, other sector-specific programme work. The only difference from *Strategy I* is that this work is carried out in conjunction with other programme components. An example would be the establishment of a local disaster risk management committee or the offer of capacity building for socio-economic risk reduction within the framework of a self-help housing project. Another example would be the implementation of disaster awareness campaigns and simulations alongside a slum upgrading programme.

Strategy III: programmatic mainstreaming. This is the modification of sector-specific programme work in such a way as to reduce the likelihood of any programme measures actually increasing risk and also to maximise the programme's potential to tackle risk. Hence, the objective of programmatic mainstreaming is to ensure that the ongoing core work is relevant to the challenges presented by 'natural' disasters. In contrast to the two strategies described above, in this case the programme's main objective is not disaster risk management as such. The modifications and/or the modified activities can be of a physical/structural, environmental, institutional and organisational nature. An example of this strategy could be a slum upgrading programme that adjusts its loan system to meet the specific needs of vulnerable households at risk (e.g. offering smaller credits with more lenient conditions attached to them or offering integrated risk insurance that take into account beneficiaries' limited capacity to pay). Programmatic mainstreaming can also result in the elaboration of new activities within the organisation's working field that are needed to take existing risk into account. An example of this would be a social housing organisation becoming engaged in land use planning and local urban governance programming for risk reduction, or the offer of risk- and loss-financing schemes through their existing housing financing mechanisms.

The 'Operational Analysis and Integration Framework' can assist an organisation in 'planning ahead' before disasters strike, by guiding the selection and prioritisation of the appropriate *Strategies I–III* (cf. section 4.2.3). Once the strategies are selected, the framework provides matrixes for the formulation of related programme measures. These matrixes include: (a) input and process indicators to get the integration process started; (b) input and process indicators in the form of benchmarks (i.e. the operational state that an organisation should seek to achieve); and (c) output indicators. The matrixes are organised into different subsections. Those for *Strategies I–III* include indicators related to human resources and capacity building; risk identification and community research; and physical, socio-economic, environmental, institutional and organisational programme

components. Furthermore, for each of the *Strategies I–III*, the 'Operational Analysis and Integration Framework' offers a list of sector-specific reference activities and recommendations for organisations working in settlement development planning. See chapter 5, Papers IV and VII, and enclosed CD for concrete examples.

4.3.2 Conceptual integration strategies at institutional levels

In contrast with *Strategies I–III*, presented in section 4.3.1, the following four conceptual strategies (i.e. *Strategies IV–VII*) do not directly refer to the integration process at local household level, but were developed to deal with the challenges, incompatibilities and incomplete approaches identified at institutional levels (see *Figure 14*, right side). The latter relate to the institutional levels of: (a) implementing organisations; (b) donor organisations; (c) other implementing organisations that are not directly involved in the programme; and (d) universities and other training institutions working in settlement development planning. The development of *Strategies IV and V* was mainly based on the research findings presented in Papers III, V and VI; *Strategy VI* relates to Paper III, and *Strategy VII* to Paper II.

Strategy IV: organisational mainstreaming of DRM. This means modification of the organisational management, policy, working structures and tools for programme implementation in order to back up and sustain (direct and/or indirect) disaster risk management at the programme level and to further institutionalise it. In fact, if integrating disaster risk management into programme work is to become a standard part of what an organisation does, then organisational systems and procedures need to be adjusted. The objective is to ensure that the implementing and donor bodies are organised, managed and structured to guarantee that risk reduction and risk financing are sustainably integrated within their core programme work. This includes, for instance, the adaptation of institutional objectives as well as programme planning tools.[163] Moreover, organisational mainstreaming also means that new tools must be adopted to properly integrate disaster risk management into (settlement) development programming. Examples are risk mapping or causal loop diagrams for analysing the key variables, and their causal relations, underlying the complex system of risk and disaster occurrence.

163 Examples are logical and results-based frameworks or vulnerability and capacity analyses. To date, social housing/planning organisations are using capacity analysis during programme preparation; however, this tool is applied only in respect of people's existing capacities for housing financing and construction and not for coping with risk and disaster occurrence. A summary of changes to be taken into account in the programming, identification and appraisal stages of construction projects are also presented by Benson and Twigg (2007) and Rossetto (2006).

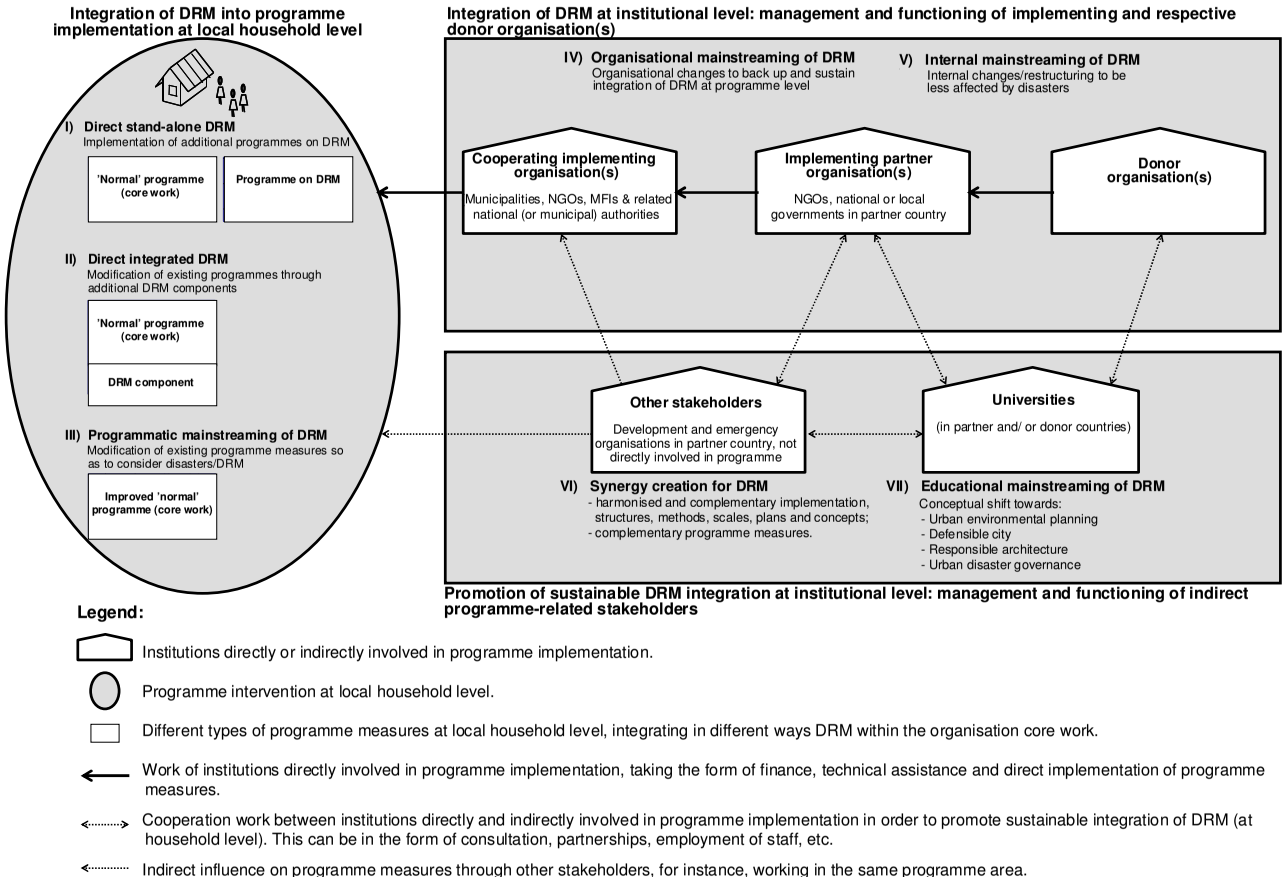

Figure 14: *'Analysis and Adaptation Model' for integrating disaster risk management (DRM) into (settlement) development programming.*

Strategy V: internal mainstreaming of DRM. This means modification of an organisation's way of functioning/operating and of its internal policies, so that it can reduce and transfer or share its own risk in terms of impacts created by disasters. The focus is on the occurrence of disasters and their effect on the organisation itself, including staff, head office and field offices. The objective is to ensure that an organisation can continue to operate effectively both during and after a disaster takes place. In practice, internal mainstreaming has two elements: (a) direct disaster risk management activities both for staff and for the physical aspects of the organisation's offices, for instance, the establishment of emergency plans and retrofitting; and (b) modification of how an organisation is managed internally, for example, in terms of personnel planning and budgeting.

Strategies IV and V refer foremost to implementing organisations that include both the donors' national counterparts and their national/municipal implementing partners. The latter are often governmental authorities, together with microfinancing institutions (MFIs). *Strategy IV* has direct relevance to programme implementation at the household level (as opposed to *Strategy V*, which is only indirectly related to it). In the case of governmental implementing organisations, for instance, housing and planning ministries and municipalities, organisational mainstreaming (i.e. *Strategy IV*) importantly includes the following activities: (a) revision (or creation) of national or municipal legislation and policies; (b) the formal standardisation of methods and approaches to elaborating maps and plans for settlement development planning and disaster risk management; and (c) the creation of improved institutional structures between the national and municipal levels and among the respective disaster risk management bodies.

Importantly, the organisational and internal mainstreaming strategies (*IV and V*) also apply to international donor organisations (see *Figure 14*, right side, top). In fact, donor organisations that wish to promote the integration of disaster risk management through and within their partner organisations need, themselves, to be committed to disaster risk management and its integration. This is a precondition if they wish to support their partners effectively in doing the same. Thus, not only the national partners and their cooperating implementing organisations, but also donor organisations, would have to integrate risk reduction and risk financing within their work. One important organisational change within a donor organisation (to be effected as part of the organisational mainstreaming process) would be the allocation of (primarily) development resources to push forward the integration of disaster risk management into urban settlement planning. Essentially, as described in Paper III, these resources would need to be channelled in such a way that they do not just promote integration in programme implementation at the household level; indeed, it is equally crucial to promote integration at the institutional levels of the implementing governmental and non-governmental organisations, which would affect related national and municipal legislation, operational instruments and internal structures (without separate ones necessarily being added).

As with *Strategies I–III*, for each of the *Strategies IV* and *V* the 'Operational Analysis and Integration Framework' offers further guidance. In fact, the matrixes for organisational and internal mainstreaming (i.e. *Strategies IV and V*) include indicators regarding human resources and capacity building; risk identification and staff research; working structure and procedures, policy and strategy; financial management; and external relations. For each of these topics, the following is provided: (a) input and process indicators to get the integration process started; (b) input and process indicators in the form of benchmarks (i.e. the operational state that an organisation should seek to achieve); (c) output indicators; and (d) sector-specific guidance for organisations working in settlement development planning through the provision of specific reference activities and recommendations (see operational framework on enclosed CD).

Two additional strategies (*VI, VII*) complement the five described thus far (*I–V*). As mentioned in section 4.2.2, the separation between the distinct working fields – in conjunction with misinterpretation of the concept of 'mainstreaming' disaster risk management and a lack of coordination – can result in competition with other implementing organisations; the duplication of small-scale efforts; higher investment costs; and mutual incompatibility of programme measures. Unsustainable disaster risk management is the outcome. *Strategy VI* aims to counter this situation.

Strategy VI: synergy creation for DRM. This is the promotion of 'harmonised' risk reduction and risk financing within the management and functioning of different (implementing) organisations, including both relief and development organisations.[164] The idea is to create synergies instead of competition among these organisations by fostering coordination and complementation of each other's work (see *Figure 14*, right side, bottom). As described in Paper III, coordination of the work of different organisations could be achieved by: (a) working with unified implementation structures (e.g. municipal committees for local development along with political and operational focal points for programme implementation); (b) the standardisation and unification of methods, scales and contents for the development of specific maps and plans; (c) the standardisation or flexible adjustment of the concept of disaster risk management within the different organisations; and (d) the coordinated inclusion of activities for capacity building and socio-economic development in terms of disaster risk management. Complementation and compatibility can be achieved by: (a) working through different municipal/local commissions (e.g. for relief, disaster risk management, project implementation); (b) the development of compatible products and services, such as maps and plans with different contents and scales; and (c) the implementation of additional sector-specific activities (that take risk indirectly into account).

164 This also includes institutions such as schools, police, etc.

Disaster risk management was shown to be a working field where interaction or cooperation between academia and practice can (and must) complement each other so that sustainable solutions for the urban poor can be developed. This can be by means of partnerships, by consultation, or by employing professional staff. Thus, in parallel to the integration strategies and related processes described above, a complementary process is required in order to: (a) generate a more proactive approach on the part of planners towards disaster risk management; and (b) shape their work so that it meets, and is thus relevant to, the current challenges of settlement development. In fact, such a process is indispensable if their work is to achieve a sustainable integration of disaster risk management. Hence the focus of *Strategy VII* is universities and other training institutions (see *Figure 14*, right side, bottom).

Strategy VII: educational mainstreaming of DRM. This means support for a conceptual shift in the philosophy that drives settlement development planning towards non-conventional planning in order to allow disaster risk management to be incorporated into planners' spheres of activity. In fact, the research indicates that planners require a different knowledge base and radically different skills to take on the task of developing secure settlements. Such a change also assists in bringing together planners and disaster risk management professionals by helping them to move towards an understanding of the risk faced by urban dwellers. The four concepts briefly presented below form an important basis on which to promote such a shift. They are explained more thoroughly in Paper II and section 4.6 of Paper VII. Donor organisations could promote this conceptual shift directly by supporting, for instance, universities or ministries of education as their counterparts. A more bottom-up approach would be the involvement of universities and training institutions in local programme implementation.

- *Urban environmental planning.* This concept expresses the need for interconnection between settlement development planning and broader environmental development aspects, thereby incorporating large-scale and everyday small-scale disasters.
- *Defensible city.* This concept expresses the need to make protection against 'natural' disasters a key aspect of settlement development planning.
- *Responsible architecture.* This concept encapsulates the need for urban planners to engage not only in large-scale structural improvements of the formally built environment, but also to target informal settlements, thereby combining large-scale structural improvements with structural and non-structural small-scale measures.
- *Urban disaster governance.* This concept contains the idea of the combined domain, where disaster and settlement development planning are coordinated, mediated and altered through joint governance practices. To facilitate timely, equitable and strategically coherent decisions in resource mobilisation and supply, it is important to identify those governance tools that will be likely to si-

multaneously benefit disaster risk management and settlement development planning.

4.3.3 Complementary measures to tackle disaster risk at local household and institutional levels

To achieve holistic disaster risk management, the analysis of the research findings identified five complementary measures to tackle risk that all need to be considered within each of the seven integration strategies presented. They are:[165]

- *Prevention:* measures to avoid or reduce the potential intensity and frequency of natural hazards that threaten households, communities, and/or institutions;
- *Mitigation:* measures to minimise the vulnerability of households, communities, and/or institutions to 'natural' hazards/disasters;
- *Preparedness:* measures to establish effective response mechanisms and structures for households, communities, and/or institutions so that they can react effectively during and in the immediate aftermath of potential hazards/disasters;
- *Risk 'financing':* measures to transfer or share risk so as to establish a 'security system' (safeguard) for households, communities, and/or institutions that comes into force after potential hazard/disaster impacts and helps obtaining 'readily available' compensation (both monetary and non-monetary).[166]
- *Stand-by for recovery:* measures to establish appropriate recovery mechanisms and structures for households, communities and/or institutions that are accessible after a potential hazard/disaster. This includes mechanisms and structures for both rehabilitation and reconstruction.

Organisations can, importantly, carry out the measures mentioned directly and/or improve the related capacities of the respective households, communities and/or institutions to develop and implement them. With reference to the conventional understanding of risk (cf. sections 2.1.2 and 2.1.5), the first three measures aim to (increase the capacity to) reduce risk. In other words, they aim to reduce the three risk components: hazard(s), vulnerability, and the lack of capacity to respond to 'natural' hazards/disasters. In contrast, the last two measures aim to improve the capacity to recover from hazard and/or disaster impacts, that is, to 'bounce back' quickly and to a reasonable level. See also annexed glossary.

As described in Paper VI, while it is impossible to provide universal guidance for integrating disaster risk management into settlement development planning that would fit all types of programmes, most organisations would probably need to, first, analyse the content and scope of their (direct or indirect) risk reduction

165 Risk assessment is also part of conventional disaster risk management, as suggested by different organisations (e.g. GTZ 2002). It is not listed separately here as this activity is understood as an inherent part of all measures (i.e. needed for the identification and planning of related measures).

166 Note that the term risk 'financing' has an extended connotation compared to its conventional meaning. This is indicated by writing the term 'financing' in quotation marks. See definition included in annexed glossary.

measures so as to improve their potential to better reduce (and certainly not increase) disaster impacts at the local household and institutional levels. Second, they would need to identify complementary risk 'financing' and stand-by-for-recovery mechanisms. At the local household level, special consideration has to be given to ensuring combined implementation of measures that work *during and also after* programme implementation with others designed to come into effect *after* programme implementation. This is especially crucial given the incremental development processes that are characteristic of slum communities. Examples of the disaster risk management measures listed can be found in chapter 5, the annexed papers and the 'Operational Analysis and Integration Framework' (on enclosed CD). Further illustrations are provided in Wamsler (2007).

4.3.4 (De-)limitations of the proposed model – and related frameworks

The development of an appropriate model and related frameworks, including concepts, guidelines and policy recommendations, is not in itself sufficient to stimulate the integration of disaster risk management into sector-specific development programming. It is, in relative terms, quite a simple task to ensure that such instruments are available, compared with other issues needed for their 'translation' into practice – which are mainly outside the sphere of influence of this research. In this context, the general conditions required for the implementation of technical policy instruments are: (a) scientific input and (b) political will/commitment (Benson and Twigg 2004). Within the context of this research, 'scientific input' refers, for instance, to information on existing risk, related local needs and capacities, the evolution of past disaster impacts, and knowledge on how to develop/support more disaster-resistant systems. Regarding 'political will', the political commitment of international and national (aid) organisations, national and municipal authorities, and civil society for the issue of disaster risk management and its integration into development planning is critical. It is a precondition for the promotion of the 'Analysis and Adaptation Model', and the related frameworks, in practice. However, the model itself (i.e. the proposed conceptual strategies and resulting activities) could help in the following regards:

- There are many competing demands on the resources of national and municipal governments and aid organisations that can negatively influence political commitment regarding disaster risk management. However, the model supports the perception of disaster risk management as a working field and cross-cutting topic that should – as a matter of good practice – be incorporated into (settlement) development planning and programming; it is not viewed as an additional area of investment that is directly competing for funding. This research and other available data suggest that disaster risk management of this nature could possibly be achieved at relatively little additional cost, while significantly increasing levels of achievement and success (Benson and Twigg 2004). In addition, different financing strategies for the promotion and 'translation' of the 'Analysis and Adaptation Model' into practice are described in Papers IV and

VI and the 'Operational Analysis and Integration Framework' (see annexes and enclosed CD).

- The successful implementation of the model's conceptual strategies would directly follow a number of policy strategies and instruments[167] – at national and municipal levels and at the institutional levels of aid organisations – to promote the integration of disaster risk management into (settlement) development programming, without duplicating efforts and resources. Ideally, it would also lead to agreements on principles of good practice in (settlement) development programming that include disaster risk management objectives, thus further pushing political commitments.

Training on the model and its related frameworks is furthermore crucial, not only for its promotion, but also to influence political will. The participants in the research workshops held in El Salvador (cf. section 3.3.6) indicated that it would be important for such training to address, to an increasing degree, not only technical staff but also decision makers, such as aid organisations' executive managers and mayors.[168] However, the distribution of the theoretical research outcomes, which are combined with practical and operational aspects, in conferences and workshops, both in English and Spanish, is already assisting its 'translation' to and 'infiltration' into the sphere of aid organisations (cf. Twigg and Steiner 2002).[169]

Finally, at international and national level, the ongoing linking of disaster risk management to existing priority political commitments, such as the MDGs or climate change adaptation, and the creation of specific targets, can further assist in securing the political will for integrating disaster risk management into development programming.[170]

Apart from political will and commitment, another condition and/or 'risk' for the implementation of the research outcomes is the lack of accountability and responsibility at operational and policy levels of aid organisations and national and municipal authorities. This refers mainly to accountability and responsibility for disaster-related losses and increasing risk, as well as to the organisations' own vulnerability, both of which can undermine the success of development programming. As regards international donors, responsibilities appear to be ever-

167 In line with the general portfolio of policy instruments, these include 'command-and-control instruments' (e.g. licenses, codes or performance requirements), 'economic instruments' (e.g. credits, subsidies and financial [tax] incentives), and 'informative instruments' (e.g. awareness-raising campaigns, information centres and certification) (Bemelmans-Videc et al. 1998).

168 During workshops held in El Salvador, the 'risks' identified to the realisation of the model as such were of a financial, institutional, and political nature. In addition, solutions such as the one described in this section were presented and discussed. As regards financial and institutional aspects, see Papers IV and VI, as well as the enclosed 'Operational Analysis and Integration Framework'.

169 Twigg and Steiner (2002) state that while work pressures clearly leave NGO staff very little time for reading and thinking, these professionals draw on a variety of information sources, selecting those that best meet the practical needs of their job and that are not only accessible in English.

170 Within the framework of this research, related presentations and advisory services regarding the research outcomes were initiated for different international organisations, such as Sida.

more blurred as external assistance is increasingly provided in the form of budget support (cf. section 2.2.2). Thus, individual measures (such as social housing and/or infrastructure) can no longer be linked to specific donors. As regards national and municipal governments, inadequate enforcement of building and planning codes are typical examples of the lack of accountability and responsibility.

*

To sum up, the cross-case and multi-level findings and analysis presented in sections 4.1 and 4.2 reflect the overall research design and provide the answers to the three research questions. As described in section 4.3, in a final step related outcomes were analysed, combined, and 'translated' into a comprehensive and grounded theory on integrating disaster risk management into (settlement) development programming, entitled the 'Analysis and Adaptation Model'. In chapter 5, conclusions are drawn from the different findings and outcomes. In fact, those aspects that demonstrate the main contribution of the research to the current body of knowledge are 'filtered out' in order both to highlight them and elaborate them further.

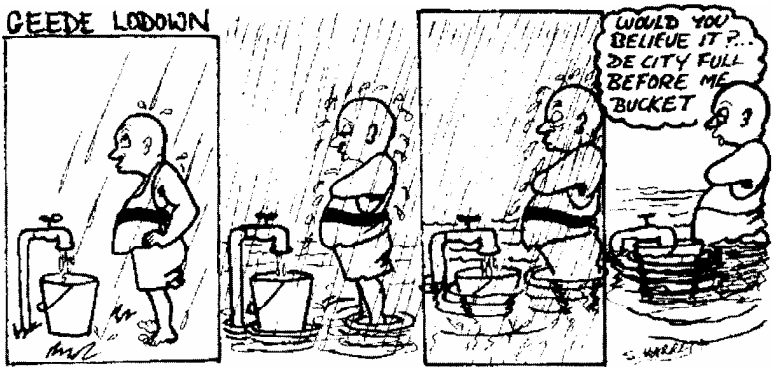

Figure 15: *Illustration of how deficient urban settlement development can affect the urban poor, for instance, through inadequate sewerage systems and lack of access to drinking water, which can directly and indirectly increase their level of disaster risk. The illustration is reproduced from Social Nature: Theory, Practice and Politics (Castree and Brown 2001) by permission from Blackwell Publishing Oxford. Source: Pelling (2003a).*

CHAPTER

FIVE

5 Conclusions and final remarks

Based on the findings and analysis presented in chapter 4, this chapter highlights the fundamental contributions of the research to the current body of knowledge. In general, the empirical and theoretical knowledge developed is of an intra-, trans- and interdisciplinary/intersectoral nature. In fact, the research contributes to advancements in: (a) disaster risk management and settlement development planning; (b) the current connection between the two sectors; (c) ways of interfacing them; (d) related disciplinary aspects of architecture, urban planning, development and disaster studies; and (e) research methodology appropriate for addressing similar intersectoral and interdisciplinary investigations (see *Figure 16*). Within the different areas just mentioned, the main contribution is the identification and systematisation of the nexus between disasters and urban settlement development and – on this basis – the advancement of conceptual and strategic approaches to integrating disaster risk management into development programming. As the research paradigm of this study lies within the tradition of so-called 'Mode 2' knowledge production (Gibbons et al. 1994; Dunin-Woyseth and Nielsen 2004), section 5.1 presents related conclusions that are intended to be directly useful or applicable for the research target group. These are mainly policymakers, programme managers and operational staff of both governmental and non-governmental organisations working in settlement development planning. In contrast, section 5.2 highlights more theoretical conclusions of the research that directly build on its conceptual framework and the methodology used. Finally, section 5.3 presents the implications of this study for future research.

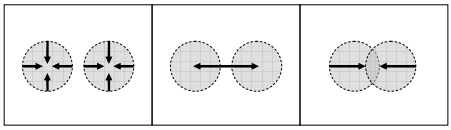

Figure 16: *Illustration of intra-, trans- and interdisciplinary/intersectoral knowledge production of this research.*

5.1 Fundamental contributions to settlement development programming

Sections 5.1.1–5.1.3 elaborate on the research's main conclusions regarding the role and potential of planners and other urban development actors to more effectively contribute to disaster risk management. In short, it is concluded that urban settlement development and related programming can reinforce both disaster risk and poverty, while at the same time providing a potentially powerful platform to

counteract them. Current conceptual and strategic approaches are, however, inadequate in terms of exploiting this potential. On this basis, implications are drawn as to how urban development actors could confront this situation by integrating disaster risk management in a holistic way into their everyday work.

5.1.1 Settlement development and the vicious poverty-disaster circle

Inadequate urban settlement development strongly fosters the vicious circle created by poverty, risk and disaster – by negatively influencing both risk and poverty (see *Figure 17*).[171] In line with this, the research revealed that urban development actors are often unconscious, but significant, contributors to the increase in risk. This is because their building and planning practices can actually not only increase vulnerabilities; they can also foster existing hazard(s) and reduce the capacities of households, communities and institutions to cope with risk and disasters.

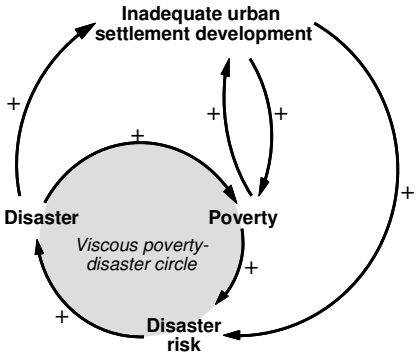

Figure 17: *Simplified causal loop diagram to illustrate the interlinkages between disasters and inadequate urban settlement development, as well as its interconnection with the 'vicious poverty-disaster circle'. This vicious circle develops as follows: increase in poverty increases people's disaster risk (as poverty can result in, for instance, people being marginalised and not having access to information, such as early warning). The increase in disaster risk directly leads, in turn, to an increased number of disasters. Finally, the occurrence of disasters increases poverty (e.g. by destroying people's belongings, assets, and/or livelihoods).*[172]

171 Three additional vicious circles are developed that foster the vicious poverty-disaster circle as illustrated in *Figure 17*: first, inadequate urban settlement development negatively influences disaster risk (i.e. hazard[s], vulnerability and coping capacities). This creates a new vicious circle as, in turn, the occurrence of disasters provokes further inadequate urban settlement development practices (e.g. by diverting related national development funds towards relief and reconstruction, or by forced evictions and relocations after a disaster occurs). Second, inadequate urban settlement development practices can also negatively influence poverty that can, in turn, lead to increased risk, disaster, and again inadequate settlement development. Finally, a third vicious circle is created as inadequate urban settlement development practices negatively influence poverty, while poverty, in turn, fosters inadequate urban settlement development practices (e.g. creating disregard for norms and standards, preventing knowledge of these being disseminated, or by creating corruption in the construction sector) (cf. section 4.2.1). (See also World Bank [2005] regarding the link between poverty and disaster risk.)

172 The loop diagram illustrates a key conclusion that can be drawn from this research. It demonstrates in a simplified way the two-way and multifaceted relationship between disasters and urban settlement development analysed at the different research levels. Note that the diagram has its limitations as it does not include additional influencing factors. This affects the reverse relations of the variables as follows: while an increase in poverty can lead to an

An important underlying reason for this unfortunate situation is the limited recognition and understanding of the nexus between disasters and urban settlement development. This can even result in denial on the part of urban development actors that they have any important role, influence and responsibility in preventing disasters or in reducing their impacts. In fact, while this research demonstrates that disasters are generated by complex and non-linear development processes in which building and planning practices play a major role, urban development actors commonly view the relationship between disasters and urban settlement development as a simple one-way, cause-and-effect relationship (see *Figure 18*). The limited perception that disasters are the uncontrollable cause and that the destruction of the built environment is the effect, is widespread amongst those professionals. Consequently, they have a tendency to focus mainly on physical/structural matters in the aftermath of disasters. This also correlates with their view of the very restricted potential of building and planning practices for disaster risk management, as urban development actors usually do not acknowledge informal settlements, small-scale everyday disasters, and non-physical/non-structural measures as being part of their sphere of activity (see *Figure 19*). The few preventive solutions that they offer, such as building codes or land-use zoning for formally built areas, are thus of little importance, and can even have negative consequences, for those urban poor whose lives are most at risk.

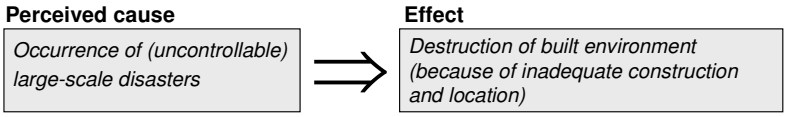

Figure 18: *Common, 'erroneous' view of the interlinkages between disasters and urban settlement development as being a simple one-way, cause-and-effect relationship.*

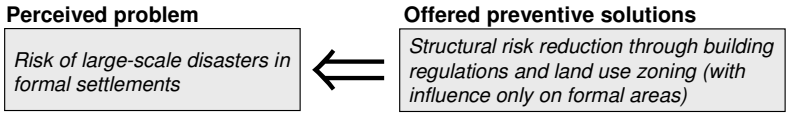

Figure 19: *Common, 'erroneous' view of the potential of building and planning practices for disaster risk management as being a simple one-way problem-and-solution tool with limited effectiveness and area of influence.*

5.1.2 Powerful – but not exploited – platform to tackle disaster risk

Whilst the research reveals the negative influence of urban settlement development and related programming in terms of increasing risk, it also concludes positively that such programming offers a potentially powerful platform for disaster

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increase in inadequate urban settlement development and in risk, poverty reduction does not always and automatically lead to more adequate urban settlement development or reduced risk, if these two aspects are not specifically targeted (cf. Papers V–VII). For a general explanation of loop diagrams, see section 3.4.3.

risk management. As can be observed in *Figure 12*, programmes that promote adequate building and planning practices (i.e. that incorporate disaster risk management) would, in fact, have the potential not only to substantially contribute to reducing risk and disasters, but also to achieve more sustainable poverty reduction. Furthermore, this potential was revealed within the organisational structures and mechanisms for social housing provision and financing that are at the disposal of urban development actors, for instance, housing microcredits, subsidies, family savings, and mutual or self-help.

Whilst urban development actors could thus make a substantial contribution to disaster risk management, many of the conceptual and strategic approaches that they currently use fail to tap into this potential. This can result in programme measures that not only have a direct negative impact on existing risk, but also create barriers for households, communities and organisations in terms of coping with future risk and disasters. Short-sightedness about the potential that exists also hampers the efforts of donor and implementing organisations to mainstream disaster risk management. While those efforts are, in fact, increasing, they have often been neither successful nor sustainable.[173] This is partly due to a lack of coordination among the different stakeholders and mainly because 'mainstreaming' is often conceived of as being synonymous with civil engineering improvements or with simply carrying out a few dedicated risk reduction measures.

5.1.3 Breaking the vicious poverty-disaster circle

To achieve or improve integration of disaster risk management into their everyday work, urban development actors would need, first, to recognise their role and influence in terms of increasing risk and, second, to acquire the knowledge and skills that would allow them to assume their responsibility for disaster risk management. However, while understanding the two-way and multifaceted relationship between disasters and urban settlement development, and also knowing how to carry out related analyses on a local basis, is an important requirement for appropriate action, it is not enough.

In fact, the research concludes that urban development actors are often unable to 'break' the vicious circle of poverty and disaster because they lack the tools necessary to adequately integrate disaster risk management into their work. Tools for merely developing and implementing hazard-proof constructions do not fill this gap. A structural adaptation of this kind actually needs to be combined with and backed by a holistic 'take-up system' that combines and integrates structural and non-structural measures at different levels. The grounded theory developed and presented in form of the 'Analysis and Adaptation Model' (together with related frameworks) offers such a 'take-up system'.

173 'Unsustainable' refers to institutional and financial sustainability at both the local household level and within donor and implementing organisations.

At the core of the 'Analysis and Adaptation Model' are seven complementary strategies elaborated for the integration of disaster risk management into development programming. In practice, urban development actors commonly consider only two out of the seven strategies identified. The model thus provides a comprehensive understanding of the meaning and scope of disaster risk management integration that assists in both analysing development organisations' work and taking action to improve programme implementation. This is crucial if both risk and poverty are to be addressed more effectively. The model and the related frameworks are therefore not just an academic exercise; they are of direct relevance to the target group of the research and its bottom-line beneficiaries, the urban poor. Within the framework of this research, their applicability was, to some extent, already tested and validated through their practical use for the planning and implementation of current development programmes in Central America and the Philippines.

In the following, those key aspects and conclusions of the model's conceptual strategies that are of especial relevance for urban development actors are highlighted (for a thorough description of the model, see section 4.3 and *Table 1*):

First, although the integration of disaster risk management into development work can include the integration of disaster risk management programming, it should, predominantly, include the mainstreaming of disaster risk management. These two approaches should not be confused.[174] The former is the 'adding-on' of dedicated disaster risk management programmes or programme components that are not related to the organisation's core work. The latter is the adaptation of the organisation's core work so that disaster risk can be tackled through the organisation's sector-specific programme measures. Both approaches are included in the model's seven strategies.

Second, to achieve sustainable integration of disaster risk management (both programming and/or mainstreaming), related changes are needed not only at the local household level, but also at the institutional levels of the implementing, funding and cooperating organisations. The model's strategies address both levels (i.e. the local household and institutional levels).

Third, within each of the seven conceptual strategies for disaster risk management integration five complementary measures to tackle risk have to be considered. They thus apply to both the local household and the institutional levels. These measures can be embraced under the heading 'ex ante measures for disaster risk management' and are called (1) prevention, (2) mitigation, (3) preparedness, (4) risk 'financing', and (5) stand-by for recovery (for a thorough descrip-

174 See annexed glossary for definitions of disaster risk management integration, mainstreaming and programming. Disaster risk management programming (included under *Strategies I and II* of the 'Analysis and Integration Model') are commonly confused with mainstreaming, which can result in competition among and the duplication of efforts of organisations that specialise in different humanitarian and development sectors. This was also the case in El Salvador after the 2001 earthquakes and it thus led to an unfruitful overlapping of disaster risk management and settlement development planning (cf. section 4.2.2 and Paper III).

tion of the measures see section 4.3.3 and annexed glossary). At present, urban development actors commonly adopt only some aspects of (1) and (2).

Fourth, the 'keeping separate' of the five complementary measures from each other during planning and implementation of development programmes helps ensure integral disaster risk management. In fact, the identification and development of these measures was carried out in this research in order to provide a frame of reference that allows urban development actors to systematically search for and analyse potential programme measures.

Fifth, to sustainably tackle disaster risk at local household level, the five measures just mentioned should, where appropriate, be built on local patterns of social behaviour and existing coping strategies. From the research it can be concluded that where local coping strategies are denied, unsustainable programmes often result. This refers to both programmes for disaster risk management and settlement development planning. However, the five measures were developed on the basis of the integral local approach of people to cope with risk and disasters (cf. *Figure 13*). Hence, delineating these measures also assists in the search for programme activities that match local needs, local capacities and local dimensions of risk. Within each type of coping strategy (i.e. strategies for risk reduction, self-insurance and recovery), the urban poor have a number of innovative, but also somewhat weak, practices that development actors could take on, support and/or improve. It is thus essential to consider, on the one hand, encouraging and scaling up sustainable practices and, on the other hand, scaling down unsustainable practices and offering better alternatives, where needed.[175] Moreover, the creation of barriers to coping by settlement development programming needs to be avoided.[176] The identification and analysis of people's local efforts are thus crucial – efforts that in El Salvador were reflected in more than 100 coping strategies being identified. In other words, the common practice of implementing physical/structural measures to reduce vulnerability that are not related to local efforts (and continue unchanged after the programme has ended) is not sufficient to sustainably reduce risk.

Sixth, for the five measures (i.e. prevention, mitigation, preparedness, risk 'financing', and stand-by for recovery), the aspects listed below were ascertained to be particularly relevant for settlement development programming at the local household level.

- *Prevention* relates to the avoidance or the reduction of the potential intensity and frequency of hazards that are understood as being partially manageable in

175 Only local efforts to cope with risk and disaster that, in effect, sustainably tackle the key variables, and their causal relations, underlying the complex system of risk and disaster occurrence in slum areas should be supported by aid organisations. Obviously, careful attention needs to be given here to the cost-effectiveness and sustainability of settlement development programmes.

176 An example would be giving permission to use assisted programme housing as collateral when applying for future credits for risk reduction and/or recovery.

terms of the human activity that can lead to their creation. In the case of landslides, human-induced processes, such as environmental degradation related to urban settlement development, could be counteracted through programme measures.

- The achievement of sustainable implementation of *mitigation* (to reduce vulnerabilities) and *preparedness* (to establish effective disaster response mechanisms and structures) often strongly depends on the existing relations between the local communities and national and municipal authorities.[177] Improving these relationships to overcome, for instance, the loss of trust in community solidarity and in the hierarchical structures of planning and emergency authorities at municipal and national level can thus be important. Examples of related programme measures are the improvement of local urban governance that addresses community rights and obligations, as well as better pre- and post-disaster communication and decision-making in which the urban poor have a stake.
- *Risk 'financing'* and *stand-by for recovery* aim to establish mechanisms and systems that can help slum dwellers recover quickly from hazard or disaster impacts. These measures should especially be considered for the adaptation of housing financing mechanisms. Examples are the integration of insurance mechanisms or special recovery funds. Housing microcredits, subsidies and family savings can thus become integral ex ante tools for disaster risk management. Moreover, the scope of social housing financing mechanisms could be extended to support the financing of risk reduction measures.

In conclusion, put into practice, the proposed conceptual and strategic 'take-up system' can assist in the sustainable reduction of both risk and poverty, and thus also to achieve the MDGs. Indeed, this system can help urban development actors to 'break' the vicious poverty-disaster circle described in *Figure 17* by:

- Enabling them to take on the role of developing secure and sustainable communities;
- Overcoming the constraints that they currently face to get disaster risk management 'translated' into their building and planning practices; and thus
- Not only improving the living status and security of the urban poor, but also enhancing poverty reduction, and decreasing post-disaster destruction and the forced evictions and relocations associated with this.

Concerning ways of 'translating' the complementary strategies and measures of the 'Analysis and Adaptation Model' into practice, various frameworks were developed under this research. One important contribution is the 'Operational Analysis and Integration Framework' that further details and operationalises the

177 Note that this often also applies to the other three measures (i.e. prevention, risk 'financing' and stand-by for recovery).

model's strategies. Its indicator system can assist in gradually initiating and pursuing the process of integrating disaster risk management into development organisations' work (see enclosed CD). This indicator system includes:

- Input and process indicators to get the integration process started;
- Input and process indicators in the form of benchmarks;
- Output indicators; and
- Sector-specific reference activities.

Other complementary analytical, conceptual and strategic frameworks were developed for, amongst other aspects, (a) viewing the interlinkages between disasters and urban settlement development; (b) viewing local disaster risk (i.e. its key variables and causal relations); and (c) analysing and supporting urban coping strategies (cf. Papers V–VII).

Importantly, most outcomes, including both the 'Analysis and Adaptation Model' and the 'Operational Analysis and Integration Framework', are applicable within a variety of cultural and geographic contexts, as well as to all types of 'natural' hazards and disasters. They can further be applied not only by different development sectors, but also in the context of relief, rehabilitation and reconstruction (i.e. in both the pre- and post-disaster context).

5.2 Fundamental contributions to the existing body of knowledge

Apart from the fundamental inputs, described in the preceding section, that are of direct use for the research target group, more theoretical conclusions can also be drawn. These build directly on the research's conceptual framework and the methodology used, which were presented in chapters 2 and 3. On this basis, section 5.2.1 elaborates on key conclusions that advance the conceptual framework of disaster risk management and its integration. Section 5.2.2 relates the research's main contribution to the current discourses on settlement development planning. Finally, section 5.2.3 highlights aspects of the innovative research methodology used, which offers a template for similar intersectoral and interdisciplinary investigations.

5.2.1 Conceptual framework of disaster risk management – integration

Since the 1970s, the discourses within the broader disaster risk management community have undergone a gradual paradigm shift from response, to improved response and preparedness, to hazard mitigation, to vulnerability reduction, to integrated disaster risk management, and finally to factoring disaster risk management into development programming (cf. section 2.1). The conclusions presented next advance the current discourses, and related concepts, and assist in overcoming the shortcomings and incomplete approaches to disaster risk management and its integration that were identified by this research.

Advanced understanding of risk and, thus, of risk reduction. Conclusions can be drawn from this research that enhance the current understanding of risk. This enhanced understanding can also have a bearing on the type of measures used to tackle risk and how they are prioritised. This is because the way in which risk is defined by different actors and research communities generally influences how disaster risk management is addressed (i.e. investigated, promoted and implemented). The following aspects led to an extension of the definition of risk:

- Identification and development of risk 'financing'[178] and stand-by for recovery as important (ex ante) measures for disaster risk management at both the local household and institutional levels. This was based, amongst other things, on the analysis and categorisation of local coping strategies that, to date, had been little systematised within an urban context. In fact, the identification and analysis of coping strategies for self-insurance and recovery revealed that these strategies are crucial in terms of helping slum dwellers to recover, not only from disasters, but also from localised small-scale hazards (cf. *Figure* 13). Such hazards were shown not only to have immediate and short-lived impacts, but also delayed and/or long-lasting effects that cannot always be sufficiently counteracted by the use of prevention, mitigation and preparedness measures. It is thus argued that risk 'financing' and stand-by for recovery, which aim to increase people's capacity to recover from hazards (and disasters), are an important complement to measures to support the urban poor so that they can better cope with disaster risk.
- Extension of the definition of risk to include the lack of capacity to recover from disasters (LC_{Rec}) (see *Figure 20*). This extension results from the inclusion, as described, of risk 'financing' and stand-by for recovery as measures for tackling disaster risk in a pre-disaster context. If, and only if, this change to the definition of risk is made, can the usual term 'disaster risk reduction' (as opposed to 'disaster risk management') be used as an umbrella term for all potential measures to tackle disaster risk within a pre-disaster context. These measures would thus include all types of activity that aim to minimise existing hazards (H), vulnerability factors (V), and a lack of both response *and* recovery capacities of households, communities and organisations (LC_{Res}; LC_{Rec}). These complementary measures would thus have the potential to match up with, and support, the coping strategies identified for risk reduction, self-insurance and recovery (as shown in *Figure 13*).
- Demonstration that all the risk components identified (i.e. H; V; LC_{Res}; LC_{Rec}), are directly linked to settlement development planning, which can thus generate different levels of risk (see *Figure 20*).

178 Note that the term risk 'financing' has an extended connotation compared to its conventional meaning. This is indicated by writing the term 'financing' in quotation marks. See definition included in glossary.

- Systematisation of prevention, mitigation, preparedness, risk 'financing', and stand-by-for-recovery measures to allow them to be 'kept separate' from each other (see section 4.3.3 and glossary for definitions of these). Doing this helps in relating each of the five measures to a specific risk component, and thus in providing a frame of reference that enables a systematic search for and analysis of measures to reduce risk (see *Figure 20*).
- Systematisation of the key variables, and their causal relations, of local disaster risk in slum communities (see *Figure 20*). These were identified as not only being closely linked to settlement development planning but also as reinforcing one other (see *Figure 12*).
- Identification of reasons for weak coping in slums (if compared to more rural environments). Although more evidence is needed, such coping also appeared to be less conscious and more individualistic (as opposed to communitarian) than in rural contexts, with stronger focus on housing construction and land issues and less emphasis on people's income sources. This outcome contributes to the improved differentiation between urban vulnerability and risk in general (see *Figure 20* and footnote 155).[179]

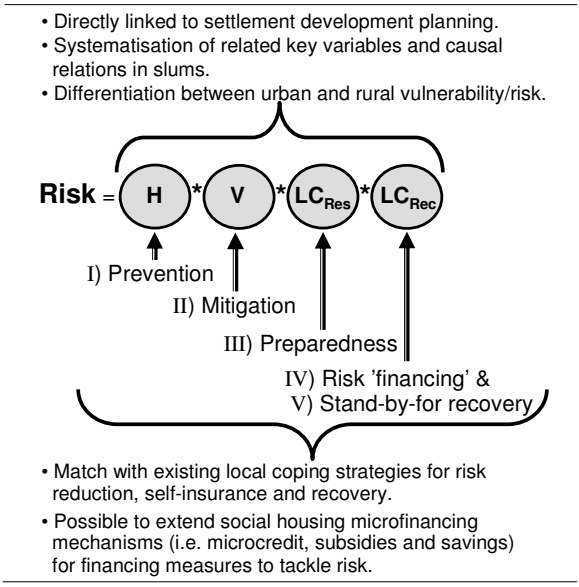

Figure 20: *Illustration of the extended definition of risk, its components, and the related five measures to reduce each risk component.*

179 This complements former studies, such as Moser et al. (1996) who identify three aspects of urban life and livelihoods that differentiate rural and urban experiences of vulnerability: commoditisation (integration into a cash economy); environmental hazard (poor housing and infrastructure and industrial pollution); and social fragmentation (loss of supportive social networks, greater social problems) (cf. footnote 43).

The aspects described led to an enhanced understanding of risk and, thus, an extension of the definition of risk. This extension could also be expressed through the following extended equation 5.1, with all risk factors being defined as ≥1 (cf. section 2.1.5):

$$R = H * V * LC_{Res} * LC_{Rec} \qquad (5.1)$$ [180]

The equation shows that even a small rise in one of the four risk component has a multiplicative effect on the others and thus can result in a major increase in risk. Assuming that this equation expresses the initial risk situation of a specific slum area at a given point in time, the following equation 5.2 illustrates how this risk can be minimised through the implementation of risk reduction measures:

$$R = H(1/P_{Rev}) * V(1/M) * LC_{Res}(1/P_{Rep}) * LC_{Rec}(1/R_F+S_R) \qquad (5.2)$$

where P_{Rev} stands for prevention, M for mitigation, P_{Rep} for preparedness, R_F for risk 'financing' and S_R for stand-by for recovery, with all denominators being defined as ≥1 (e.g. if no preventive measures are carried out, the respective denominator equals 1). Alternatively, equation 5.2 can also be expressed slightly differently:

$$R = \frac{H}{P_{Rev}} * \frac{V}{M} * \frac{LC_{Res}}{P_{Rep}} * \frac{LC_{Rec}}{R_F+S_R} \qquad (5.3)$$

The extension of the risk definition, as described and represented by these equations, is a potentially powerful tool for researchers and practitioners. It can actually help these professionals to systematise and gain a better understanding of existing risk components and the strategies required to reduce each of them. Its objective is *not* to actually calculate risk, but to help tackle risk more effectively. It allows the complementary risk reduction measures to be differentiated one from the other, which, subsequently, assists in properly designing and combining them. The extended definition of risk is thus meant to be mainly an analysis and planning tool for identifying and developing measures for holistic disaster risk management (integration) during the preparation and planning phase of programmes.[181]

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180 It is acknowledged that the term/variable 'lack of capacity' (*LC*) in this equation might not be the most appropriate term because the 'vulnerability' variable could, for instance, also be expressed as a 'lack of capacity to reduce vulnerabilities'. However, in order to stay as close to the commonly known risk equation 2.4 (i.e. $R=H*V/C$; which is mathematically identical to equation 2.5 [i.e. $R=H*V*LC$]), the variables LC_{Res} and LC_{Rec} were not replaced by the terms 'lack of structures and mechanisms for response' and 'lack of structures and mechanisms for recovery', respectively.

181 While the systematisation described can also be used for evaluating the disaster risk management approaches of organisations, its purpose is not the classification of already existing programme measures after implementation. In fact, such classification is sometimes not easy as (a) one and the same measures can serve different purposes; and (b) depending on the understanding of vulnerability, measures can be classified differently (e.g. can fall under mitigation or rather preparedness).

It is important to note that the research outcomes described, which advance the understanding of risk, could also be acknowledged by adapting the conventional risk definition. As described in section 2.1.2, this definition is based on the prevalent variables hazard (*H*) and vulnerability (*V*), that is, *R=H*V* (equation 2.5). This definition could continue be to be used if the lack of capacity to respond and the lack of capacity to recover are explicitly included as part of vulnerability (as has already been done by a few researchers such as Benson and Twigg [2007] and Wisner et al. [2004]).[182] It would then furthermore be necessary to adapt the current definitions of the respective measures to tackle each component, as these definitions, as yet, do not serve the purpose of identifying and developing respective actions. Another, more precise solution would be to adapt equation 2.2 (*R=H*V*LC*) used for this research and to explicitly define that *LC* includes the capacity to both respond *and* recover. *Figure 21* figuratively illustrates this definition of risk, and *Figure 22* the corresponding measures to tackle the respective risk components. Note that the advances presented are also reflected in the new and extended definitions included in the annexed glossary.

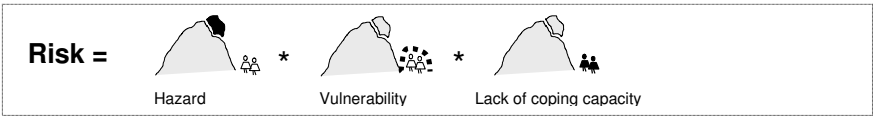

Figure 21: *Initial risk situation and components of a specific area (or organisation), being composed of: (a) hazard/s, (b) vulnerability, and (c) lack of coping capacity both to respond to and to recover from disasters.*

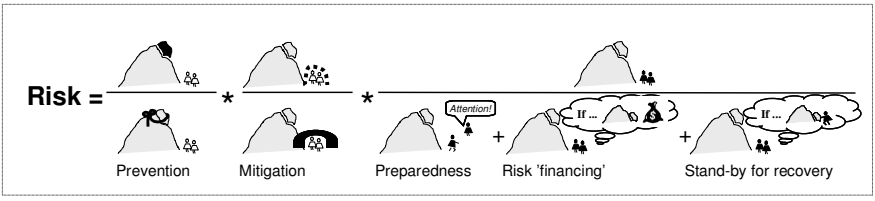

Figure 22: *Changed risk situation through the implementation of disaster risk reduction measures, namely, (a) prevention, (b) mitigation, (c) preparedness, (d) risk 'financing', and (e) stand-by for recovery (see denominator). The denominator thus illustrates the measure/capacity that is impl*emented/increased to reduce the three respective risk components (see numerator).

As concluded above, the advances described regarding the understanding of risk can influence the disaster risk management measures that are investigated, promoted and implemented. One concrete example of this would be the further development of (housing) microfinancing mechanisms (i.e. microcredits, subsidies and savings) to (a) support risk 'financing' and stand-by for recovery; and (b)

182 The capacity to respond and to recover would thus be part of social or institutional and organisational vulnerability (see glossary).

finance risk reduction measures. (Housing) microfinancing mechanisms would thus become an integral ex ante tool for disaster risk management (see *Figure 20*).

Advanced concept of disaster risk management integration. In addition to the aspects described above, further conclusions can be drawn that advance the concept of disaster risk management integration.[183] In fact, the analysis and integration frameworks elaborated, and especially the 'Analysis and Adaptation Model', provide a comprehensive continuation and advancement of related concepts by systematising and developing the following aspects:

- The concept of disaster risk management integration being divided into disaster risk management programming and disaster risk management mainstreaming;
- The concept of mainstreaming being differentiated into programmatic, organisational, internal and educational mainstreaming;[184]
- On this basis, seven complementary strategies being identified to integrate disaster risk management into development programming that address the local household and institutional levels;
- Related key stakeholders and their respective roles in disaster risk management integration at the global, national, municipal and local household level, namely, (a) implementing organisations, (b) donor organisations, (c) other implementing organisations, and (d) universities and other training institutions; and
- The five potential measures being identified to tackle risk that need to be considered by all the different stakeholders and within each of the seven integration strategies.

Sustainable disaster risk management integration. The research further provides conclusions regarding the aspects that are vital if sustainable integration of disaster risk management into programme implementation is to be achieved. These are:

- The perceptions, needs and capacities of urban slum dwellers, thus taking into account: (a) local coping strategies for risk reduction, self-insurance and recovery (cf. *Figure 13* and annexed glossary); and (b) local heterogeneity of social behaviour, compounded by individualistic, communitarian, hierarchical and fatalistic coping.[185]

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183 While the focus of this research was on the pre-disaster context, the related conceptual outcomes can also be widely applied to post-disaster programming, that is, the integration of disaster risk management into relief, rehabilitation and reconstruction programmes (cf. discussions on linkages between relief and development [e.g. Anderson and Woodrow 1998]).

184 Note that not only the mainstreaming of disaster risk management, but also the integration of disaster risk management programming at local household level, needs to be backed up and complemented by organisational, internal and educational mainstreaming to become sustainable (cf. *Table 1*).

185 The offer of only community-based measures in communities where individualistic coping strategies prevail can, for instance, negatively influence the sustainability of programmes.

- The perceptions, needs and capacities of organisations servicing slum communities, thus taking into account their institutional settings, capacities and core work.
- The combined financial support provided by international, national and municipal organisations for strategies and related measures at both local household and institutional levels.

Extended academic and policy discussions. Apart from advancing discourses on risk and sustainable disaster risk management integration, the following research outcomes also contribute to the existing body of knowledge and open up new discussions:

- Thorough description and systematisation of the ways in which urban lives and livelihoods are affected by disasters,[186] as well as of the efforts[187] and personal financial resources invested by poor urban households in coping with risk and disasters.
- Identification and analysis of the separation of disaster risk management and settlement development programming, which can lead to an increase in the risk faced by the urban poor. This separation was recognised as being only identical in parts to the generic challenges to mainstreaming disaster risk management within development work. Additional reasons encountered relate to sector-specific barriers regarding social housing and urban planning.
- Demonstration that disasters and resultant distress can push forward the integration process of disaster risk management and settlement development planning. However, it was revealed that this integration process is not sustainable if it is, as is currently the case, not properly supported by international aid, governmental and public organisations.
- Illustration of the multiple scale of disaster risk management, where the different stakeholders working at local household, municipal, national, and global level interact and interfere in each other's efforts, thus constructing risk between local and global forces.

5.2.2 Discourses on settlement development planning

Since the 1940s the discourses within the field of settlement development planning and programming have undergone a gradual paradigm shift. Changes related to this shift have developed from a top-down physical design view (marked by public housing provided on a mass scale and the eradication of informal settlements) to a broad management approach, which goes beyond the sectoral issues of housing and urban planning (as elaborated in sections 2.2.1 and 2.2.2). It is

186 This outcome contributes to 'filling' a knowledge gap described, for instance, by Pelling (2003b) who states that little is known of the ways in which urban livelihoods are affected by disasters. In fact, related aspects had, as yet, mainly been studied in rural areas, especially in relation to droughts.

187 The analysis and systematisation of people's efforts to cope with risk and disasters complements and expands former studies, such as Wisner et al. (2004).

concluded that the frameworks/model developed are compatible with, and partly advance, the actual discourses and related practices of international donor and aid agencies in the sense that they:

- Provide new inputs for improved poverty reduction efforts that: (a) have over the last years, been increasingly strengthened and coordinated at the international level; and (b) now commonly include the reduction of vulnerability to disasters as an integral component.
- Substantiate the current tendency, promoted by Sector-Wide Approaches (SWAps), to link different sectors and actors and illustrate how such an approach might look in practice.
- Do not lose validity as a result of the shift towards budget support, as they can be: (a) used as a basis for defining related output and outcome indicators and stakeholders, and (b) be implemented independently of this shift in the sense that governmental and non-governmental organisations at the national and municipal level could directly apply the frameworks/model developed and/or take the lead in promoting them.
- Can assist in the improvement and scaling up of slum upgrading programmes that are promoted by international organisations.
- Complement trends towards the support of housing microfinancing for low-income households by providing input on how housing microcredits (and related subsidies and savings) could be developed to become an integral ex ante tool for disaster risk management.
- Substantiate the tendency to increase support for institutional capacity building and expand this conception by including capacity building within the donor organisations themselves.
- Are flexible enough to match the role of contemporary planning, being less about 'plan-making' as an activity fixed in time or strict regulatory control, but rather a form of action planning that can respond to change and is open to negotiation.

Apart from the aspects listed, current discourses can be expanded by the proposed conceptual shift away from conventional and traditional urban planning towards a planning framework based on the concepts of *urban environmental planning, defensible city, responsible architecture* and *urban disaster governance* (cf. section 4.3.2). This shift is important in encouraging planners to develop a sense of 'ownership' of disaster risk management. As with past paradigm shifts, this would also imply a change in the kinds of knowledge, skills and techniques that are required from these professionals.

5.2.3 Research methodology

Further conclusions can be drawn that contribute to knowledge development at the level of research methodology. In fact, the methodology used is an innovative combination of case studies, grounded theory and systems analysis, which could be used as a template for similar intersectoral and interdisciplinary investigations. Such a 'case studies–grounded theory–systems analysis approach' permits a grounded theory to be built from case study data, which is viewed and analysed as part of a system that includes causal factors and feedbacks. This is an important advancement of the linear paradigm model commonly used for axial coding, which is one of the data analysis tools of grounded theory (cf. section 3.4.2). Moreover, this approach allows theory to be built not only on any specific situation/system, but also on how this situation/system could be improved (i.e. be positively influenced).

The approach used allows investigations that cross the traditional boundaries between disciplines and sectors as regards: (a) the methods applied; (b) the research focus; (c) the heterogeneous set of practitioners and experts involved; and (d) the outcomes that are relevant to more than one discipline and/or sector (cf. section 3.1). In this context, the combined use of interviews, group discussions, walk-through analyses, observations, text reviews, questionnaires, and, importantly, research workshops and 'hands-on' practice proved to be an effective means of attaining this (cf. section 3.3).

*

Finally, it is worth mentioning that this research is already contributing to and influencing the existing body of knowledge at the global, national, municipal and local levels, as evidenced by the various references to its outcomes – in relation both to settlement development planning and disaster risk management. Those references can be identified, inter alia, in related literature reference lists,[188] sector-specific Web pages,[189] and the publications of cutting-edge stakeholders and theoreticians.[190] In addition, the influence of the research on the ground can be

188 For instance, several publications elaborated during this research can be found on the course literature lists of different universities, as well as within the lists of key professional literature (e.g. 'Seminar on Building Disaster-Resilient Communities' at Muthesius University Kiel, Germany at www.martinvoss.de/muthesius/?Informations plattform:Linksammlung or of the Fraunhofer Information Centre for Environment and Construction at www.baufach information.de/publikationen.jsp?s=Entwicklungsland&pg=11&wo=z).

189 One important example is the Web page of the ProVention Consortium, which includes several links to outcomes of this research. The ProVention Consortium is supported by the World Bank and bilateral donors and hosted by the International Federation of the Red Cross and Red Crescent Societies. It is a think tank for disaster risk reduction and works closely with United Nations organisations.

190 Examples are Benson and Twigg (2007); World Watch (2007); UN-HABITAT (2007); ProVention Consortium (2007); Satterthwaite et al. (2007); as well as recent professional research articles:

- Benson and Twigg (2007:61) state that 'Christine Wamsler's Operational Framework for Integrating Risk Reduction is a detailed, comprehensive model that covers both operational and institutional dimensions, with indicators and guidance on implementation. Although written primarily for agencies working in human settlement development, it can easily be modified for use by a wider range of development organisations.' They further include Paper III on the list of key literature on interfacing disaster risk management and aspects related to construction design, building standards and site selection.

demonstrated by its actual use in practice by several international and national organisations (for details see sections 3.3.6 and 5.1.3). This ensures that its impact will not only be at a theoretical level but will also be 'translated', so that it reaches the bottom-line beneficiaries of this study, the urban poor. Moreover, the contribution of this research is reflected in the fact that some organisations have already used its outcomes as a basis for developing organisation-specific, operational tools, adapting and thus transferring them to their specific institutional settings and objectives.[191] In conclusion, the actual consideration of the research outcomes by multiple stakeholders and related initiatives can be taken as an indication of its relevance and validity.

5.3 Further research

New knowledge always leaves some uncertainties and opens up new questions, and thus has implications for subsequent research. Some potential fields of further research are now described.

The first field relates to empirical data that could be gained from the implementation of research outcomes. As different organisations are currently applying parts of the frameworks and model developed within the 'real-life' context, subsequent research could investigate in detail their experiences on the ground so that the frameworks/model can be refined. In fact, while the outcomes of this study present an important step forwards, there is a need to further develop and subsequently operationalise them. Questions that could be asked are: how can the seven conceptual strategies proposed be taken further? How can they, for in-

- Chafe (2007) refers to the content of Papers I, V and VI, and states regarding the 'Operational Analysis and Integration Framework' that it '(…) guides aid agencies on how to best incorporate disaster risk reduction into housing and settlement development projects. It recommends ways to build safe housing, generate income through local risk reduction, make housing affordable to the most vulnerable families, and develop financial tools to sustain the aid agency itself' (World Watch 2007:129).
- Mark Pelling of the Hazards, Vulnerability and Risk Research Unit, King's College London, author in chief of chapters 7, 8 and 12 of the UN-HABITAT Global Report on Human Settlements 2007 entitled 'Enhancing Urban Safety and Security', draws on the outcomes of this research, mainly Paper II and III (e.g. box 12.4 of chapter 12 on 'Integrating disaster risk reduction, urban planning and housing in El Salvador').
- Within the section on 'community and civil society perspectives, local knowledge and coping strategies' the ProVention Consortium (2007:15–16) refers to Papers V and VI, stating, for instance, that 'too often local initiative and capacities continue to be overlooked during external interventions', as well as highlighting that 'the wealth of local risk solutions was well demonstrated by an example from San Salvador which identified more than a hundred coping strategies used by the people in a local urban community that was at risk of several hazards, including landslides. Households spent an average of 9 percent of their income on reducing risk and being prepared for recovery from hazard impacts.'
- Satterthwaite et al. (2007:47–48) include a summary of paper VI in their analysis of 'vulnerabilities of cities and the urban poor to climate variables and change'.
- Examples of recent professional research papers are Bosher et al. (2007) and Balamir (2007). The research outcomes influenced not only the studies mentioned, but were further supported by them. In fact, Bosher et al. (2007:174) state that their paper's 'discussion reinforces the results of research conducted by Wamsler (2004), which identified a lack of integration between the working fields of risk reduction and urban planning and illustrated how urban planning and the occurrence of disasters interact.'

191 An example of this is the conceptual strategy for disaster risk management of the international organisation German Agro-Action (*Deutsche Welthungerhilfe*), which was developed based on some of the outcomes of this research (Amend et al. 2006:60–66).

stance, be best 'translated' to a specific context and programme? Or how could each of the seven conceptual strategies be best implemented? How can, for instance, the curricula of a specific academic institution best be adapted to push forward the educational mainstreaming strategy (i.e. *Strategy VII*)?

The follow-up of on the ground experiences could furthermore provide the basis for research to establish, from the bottom up: (a) complementary frameworks for specific types of settlement development programming, for instance, programmes for social housing, slum upgrading, new settlement development and/or local urban governance; (b) guiding principles and/or standards for disaster risk management programming and mainstreaming;[192] (c) monitoring tools, allowing the assessment of progress in, and the effectiveness of, disaster risk management integration; and (d) appraisal methodologies to select which disaster risk management measures and strategies present the best options in terms of yielding the most significant development benefits.

Finally, this research provides partial answers to questions that could be more thoroughly investigated. These relate to broader aspects that are crucial if urban risk is to be managed effectively, such as:

- Why are urban households' coping strategies 'weaker' than those of rural households?
- How does climate change influence households' coping strategies?
- How could the private sector (be offered incentives to) get engaged in and develop housing microfinance and related disaster insurance systems so that these become an effective integral ex ante tool for disaster risk management?
- How could the research outcomes in the form of the frameworks and model presented be expanded to include other types of urban risk (i.e. others than disaster risk, such as, further climate change impacts and HIV/AIDS)? Or, how can the frameworks and model presented best be linked to existing theories and concepts on climate change adaptation and HIV/AIDS mainstreaming?

192 The outcome could be a tool comparable to 'The Sphere Project' (2004), which sets guiding principles and standards for disaster response.

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Note that the references included in the attached research papers are not listed here.

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Appendix A

A1. Glossary

The definitions listed in this glossary refer to the foregoing chapters and sections. These definitions do not apply across the board in all the different papers included in the appendices. This is because: (a) different terms were developed and improved throughout the thesis work; and (b) the different papers had to be adjusted to the perspectives of the journals in which they were published, as well as to current trends and international agendas.

The following definitions are drawn partly from Benson and Twigg (2004, 2007); Davis and Izadkhah (2006); Holloway (2003); UN-IATF/DR (2006); UNISDR (n.d.[a], 2004); UNDP (2004a); UN-HABITAT (2003b); Wisner et al. (2004); World Bank (2003); and World Watch (2007). However, most were expanded and adapted to reflect the research outcomes. In addition, some definitions had to be newly elaborated and are based purely on the research outcomes. Expanded or further detailed definitions are marked: [*]; newly elaborated ones are marked: [**]. Note that the glossary was elaborated to meet the needs of professionals working in disaster risk management integration and climate change adaptation, particularly where settlement development planning is involved.

Adaptation	(Continuous) modification of a system with the aim of increasing its ability to respond and adjust to the actual or potential impacts of changing climatic conditions and thus reduce harm and exploit opportunities.
Aid organisation	Organisations that support or directly implement programmes in developing countries that aim to alleviate poverty and/or reduce related harm. They can include both governmental and non-governmental development and relief organisations which, in turn, can be specialised in different sectors, such as health or social housing. Note that in this study the terms 'organisation' and 'institution' are used as synonyms.
(Coping) capacity *	The means by which households, communities or organisations use available resources and abilities to tackle adverse effects that could lead to (and are caused by) a disaster. While the term usually refers only to the (coping) capacity to respond to disasters and hence to related preparedness measures, it also includes the (coping) capacity to recover from hazards/disasters, and hence is related to measures of self-insurance and recovery that they take. Note that in contrast to response, recovery includes more long-term activities related to reconstruction and rehabilitation. (Coping) capacity can further refer to: - (Coping) capacity to resist disasters, which is related to vulnerability of households, communities or institutions, and hence to the mitigation measures that they take; and - (Coping) capacity to reduce or avoid hazards, and hence is related to measures of prevention.
Coping strategies (of people living at risk) *	Constantly changing and adapting cognitive and behavioural efforts to manage disaster risk or disaster impacts on the part of households and communities at risk. These efforts influence the key variables, and their causal relations, underlying the complex system of risk and disaster occurrence in specific (slum) areas, and can be carried out deliberately or automatically/instinctively.

Coping strategies for recovery *	Measures taken by households/communities at risk to (have the capacity to) recover quickly after hazards/disasters through effective recovery mechanisms and structures. These actions are taken to recover as fast as possible from the immediate, short-term, long-term and/or delayed impacts caused, that is, to regain their former standard of living/status quo, or an even higher one. Coping strategies for recovery are directly interlinked with those for self-insurance (see below). However, not all recovery strategies are initiated in a pre-disaster context; in fact, they are mainly implemented ad hoc after hazard/disaster occurrence. Examples are the establishment of mechanisms and structures (for accessing assistance) to reconstruct and/or replace damaged, destroyed or lost belongings, assets and systems. Only some risk reduction aspects are usually considered in this context. Note that slum dwellers also use some of the economic coping strategies for recovery-for financing risk reduction measures.
Coping strategies for risk reduction **	Measures of prevention, mitigation and preparedness taken by households and communities to reduce their risk. (Slum) dwellers use these measures mainly for risk reduction during 'normal' times, that is, in a pre-disaster context, so as to be less affected by future small-scale or exceptionally large-scale disasters. However, they are partly also used during reconstruction and rehabilitation. In an ideal case, they lead to an absence of disasters, as hazard impacts will be minimal, especially if combined with coping strategies for self-insurance and recovery.
Coping strategies for self-insurance **	Measures taken by households and communities at risk that aim to build adequate capacity to recover quickly after disasters by putting in place a formal or informal security system (safeguards) for use in the event of a hazard/disaster. In other words, it is the creation or maintenance of security systems that help them access as fast as possible sources of financing or mutual social help in the event of a hazard/disaster. Examples of financing sources are (illegally accessed) compensation from formal insurance, or the selling price of assets. Mutual help can include offering refuge, temporary custody of children, fostering a child, and assistance for washing and cleaning. In other words, to insure themselves, (slum) dwellers take pre-disaster action in the hope of obtaining direct or indirect compensation if a hazard/disaster leads to death, injury or loss of property or income. They thus ensure that they can 'bounce back' faster than if they do not have self-insurance to regain their former standard of living/status quo, or an even higher one.
Development programmes/ programming	Development programmes are initiatives in developing countries supported and/or implemented by so-called development organisations with the aim of alleviating poverty and achieving sustainable development through different sector support. Development programming is the act of supporting and implementing such sector-specific programmes (or programme components). Their focus is, as such, on the developmental context (i.e. not relief, rehabilitation or reconstruction). Note that in this study the terms 'programme' and 'project' are used as synonyms.
Disaster ('natural')	Serious disruption triggered, amongst other things, by a natural hazard causing substantial damage, disruption and possible casualties, and leaving the affected communities unable to function normally without outside assistance. It includes everyday and large-scale disasters. A disaster occurs when hazards strike in vulnerable areas where inhabitants have little coping capacity. Disaster management literature commonly distinguishes rapid-onset disasters, such as water surges or earthquakes, which cause immediate loss and disruption, and slow-onset events, notably drought.
Disaster Risk Management (DRM) *	Range of activities/programmes to minimise the likelihood, intensity or frequency of a disastrous occurrence, preferably carried out before potential

	disasters take place. Disaster risk management is thus the generic term for measures of: (1) prevention, (2) mitigation, (3) preparedness, (4) risk 'financing' and (5) stand-by for recovery. Risk assessment is not listed separately as it is understood as an inherent part of all five measures that is needed for identifying and planning related activities. Disaster risk management can be implemented and is essential before, during and after disasters. However, within the framework of this study, the term mainly pertains to the development (i.e. pre-disaster) context. The term thus does not refer to post-disaster actions such as relief (i.e. immediate emergency assistance to save lives and minimise disruptions), rehabilitation (i.e. restoring 'normal' activities within around two years after disaster); and reconstruction (i.e. longer-term work to restore and further improve infrastructure and services). Note that if risk is defined as listed in this glossary, the terms 'disaster risk management' and 'disaster risk reduction' can be understood as being synonymous.
Disaster risk management (DRM) programmes/ programming	Programme or programme components that aim to improve existing disaster risk management. Disaster risk management programming is hence the act of supporting and implementing such dedicated sector-specific programmes (or programme components). The integration of disaster risk management programming into sector-specific programmes includes 'direct stand-alone DRM' and 'direct integrated DRM', which to become sustainable should be complemented by organisational, internal and educational mainstreaming, as well as synergy creation for DRM (see *Table 1*). Note that in this study the terms 'programme' and 'project' are used as synonyms.
Discipline	Refers mainly to academic fields of studies/specialisations, such as architecture, urban planning, philosophy, theology, law, disaster studies, development studies, sociology, psychology, and economics. In comparison, disaster risk management and settlement development planning are understood to be working fields or sectors that are related to different disciplines. Note that in this context disaster risk management is also understood to be a cross-cutting topic to be integrated into different disciplines and sectors.
Hazard (natural)	A natural hazard may cause a 'natural' disaster (of both small or large scale). It is a geological, atmospheric, or hydrological event (e.g. earthquake, landslide, volcanic eruption, windstorm, wild fire, drought, flood, and water surge) that has the potential to cause harm or loss (e.g. death or injury, property damage, social and economic disruption, environmental degradation). Natural hazards are not necessarily caused by purely natural forces. In fact, human activity can also contribute to their creation. A landslide caused by environmental degradation is one example of such a 'human-induced hazard'.
Household	Group of people, consisting of the members of a family who live together along with non-relatives, occupying one living space. The latter refers to the constructions, composed of a single dwelling or conjoined houses that are built on one plot.
Integrating/integration of disaster risk management (DRM) **	Integration of disaster risk management aspects into the work of aid organisations, here, with a focus on development organisations. This includes disaster risk management mainstreaming as well as disaster risk management programming (see *Table 1*).
Mainstreaming of disaster risk management (DRM) *	Generally, the term 'mainstreaming' signifies the modification of a specific type of core work of an aid organisation (e.g. modification of the social housing activities of a specialised development organisations) in order to take into account a new aspect (e.g. disaster risk management) and to act indirectly upon it. Thus, 'mainstreaming' does not mean to completely change an organisation's core functions and responsibilities, but instead to

	view them from a different perspective and to make any necessary modifications/amendments, as appropriate. Thus, the integration of completely new sector-strange programmes or programme components is not part of mainstreaming (cf. DRM programming). There are different complementary strategies for mainstreaming: programmatic, organisational, internal and educational mainstreaming, as well as synergy creation for DRM (see *Table 1*).
Mitigation *	Measures to (increase the capacity to) minimise the vulnerability of households, communities and/or institutions, thus reducing existing disaster risk. These measures can support and be built on local coping strategies for risk reduction. Mitigation is part of disaster risk management (see above).
Planner	Umbrella term for professional groups of architects, urban planners, engineers and other settlement developers. They are among the stakeholders that are engaged in urban development (i.e. urban development actors).
Preparedness *	Measures to (increase the capacity to) establish effective response mechanisms and structures of households, communities and/or institutions so that they can react effectively during and in the immediate aftermath of potential hazards/disasters, thus reducing existing disaster risk. These measures can support and be built on local coping strategies for risk reduction. Preparedness is part of disaster risk management (see above).
Prevention *	Measures to (increase the capacity to) avoid hazards or reduce the potential intensity and frequency of human-induced hazards that threaten households, communities and/or institutions, thus reducing existing disaster risk. The potential intensity can refer to both time span and magnitude of hazards. These measures can support and be built on local coping strategies for risk reduction. Prevention is part of disaster risk management (see above).
Resilience	Capacity of a community, system, or society to withstand/resist hazards and/or disasters, and thus maintain an acceptable functional and structural standard – even in the case of a hazardous/disastrous occurrence – by 'bouncing back' rapidly, as well as adapting so as to be able to deal adequately with future threats. To put it simply, resilience is the opposite/antithesis of vulnerability. More precisely, it reflects a functioning disaster risk management system that works before, during and after disasters. The idea of resilience suggests a proactive stance towards risk. It has its origin partly within ecological theory and also partly in systems analysis and disaster studies.
Risk *	The probability of harmful consequences or losses (e.g. deaths, injuries, property damages, social and economic disruption, environmental degradation) resulting from interactions between natural and human-induced hazards (H), vulnerable conditions (V), and the lack of capacity of households/communities/institutions to respond to (LC_{Res}) and recover from (LC_{Rec}) disasters. Thus, risk is expressed by $R=H*V*LC_{Res}*LC_{Rec}$. Alternatively, the risk definition provided can also be expressed through the conventionally used equations $R=H*V$, $R=H*V/C$ or $R=H*V*LC$, but only if the definitions of variables V, C and LC are adapted, respectively, to take into account the capacity to both respond and recover from hazards and disasters. Note that in this study the terms 'risk' and 'disaster risk' are used as synonyms.
Risk financing (risk transfer/sharing)	Financial instruments of disaster risk management which aim to assure readily available post-disaster funds (e.g. through formal insurance systems). These instruments are conventionally called 'risk transfer' or 'risk sharing' as risk of individuals or organisations is partly 'transferred to' or 'shared with' other parties.
Risk 'financing' **	Measures to (increase the capacity to) transfer or share risk so as to establish a 'security system' (safeguard) for households, communities and/or

	institutions that comes into force after potential hazard/disaster impacts and helps them to obtain 'readily available' compensation. The aim is to recover from hazard or disaster impacts, that is, to 'bounce back' quickly and to a reasonable level. These measures can support and be built on local coping strategies for self-insurance. In contrast to the conventionally used term 'risk financing' (see above), this measure includes formal *and* informal, and monetary *and* non-monetary mechanisms. Examples are formal and informal disaster insurance systems. Risk 'financing' measures are part of disaster risk management (see above).
Risk management	Here, used mainly as a synonym for disaster risk management.
(Disaster) risk reduction *	Popular term used to bring together all measures that aim to minimise disaster risk throughout a society. As with disaster risk management, risk reduction can be implemented and is essential before, during and after disasters. However, within the framework of this study, the term pertains mainly to the development, pre-disaster context. If risk is defined as described in this glossary (see above), disaster risk management and disaster risk reduction can be understood as being synonymous, and thus to include prevention, mitigation, preparedness, risk 'financing', and stand-by for recovery. If, however, the conventional risk definition $R=H*V$ is applied, in contrast with disaster risk management, risk reduction would not include risk 'financing' and stand-by for recovery.
Settlement development planning	In the context of the research focus, settlement development planning mainly refers to bottom-up planning exercised within the framework of development programming, through social housing, slum upgrading, settlement planning and/or local urban governance programmes. However, in this study related analyses also include other, more top-down and broader, approaches. Note that some of the annexed papers use alternative, more far-reaching terms, such as 'urban planning', 'human settlement development', and/or 'urban development planning'. Note also that, in this context, Paper I provides a wider definition of the term urban planning: 'the term (urban) planning includes the provision of housing, infrastructure and basic services. Planning is the "public forethought and conscious involvement preceding the pursuit of community-determined action, achieving social goals for the common good in both the public and private domain" (Riddell 2004:XV). It "includes the way places work and matters such as community safety, as well as how they look. It concerns the connections between people and places, movement and urban form, nature and the built fabric, and the processes for ensuring successful villages, towns and cities" (DETR 2000:8).'
Settlement development programmes/ programming	Programmes focused on supporting or directly providing social housing, slum upgrading, settlement planning and/or local urban governance. Settlement development programming is thus the act of supporting and implementing such sector-specific development programmes. Note that in this study the term 'programme' and 'project' are used as synonyms.
Slum	The term is used for poor-quality settlements and shelters. Typically, this would be locations with substandard housing and without access to adequate drinking water, sanitation, and security of land tenure, electricity and sewerage. The term also embraces shelters that are serviced but located in a dangerous place. Note that the terms 'slum' and 'low-income settlement' in this study are used synonymously, as are 'shelter' and 'social housing'.
Social housing/ planning organisation	Organisations that work in settlement development planning and whose core work is related to social housing and/or settlement planning, and which are thus a specialised subgroup of urban development actors (see below). They include both governmental and non-governmental organisations. Note that in this study the terms 'organisation' and 'institution' are used as synonyms.

Stand-by for recovery **	Measures to (increase the capacity to) establish appropriate recovery mechanisms and structures for households, communities and institutions that are accessible after a potential hazard/disaster. The aim is to recover from hazard or disaster impacts, that is, to 'bounce back' quickly and to a reasonable level through appropriate recovery mechanisms and structures. These mechanisms and structures relate to the rehabilitation and reconstruction of damaged, destroyed or lost belongings, assets, structures and systems. They can support and be built on local coping strategies for recovery. Stand-by-for-recovery measures are part of disaster risk management (see above).
Urban development actors	Umbrella term for stakeholders/organisations that work at the international, national, municipal and local household level in the field of settlement development planning and/or programming (without necessarily specialising in this sector). Social housing/planning organisations are a more specific subgroup (see above). Note that in this study the terms 'organisation' and 'institution' are used as synonyms.
Urban governance	Exercise of economic, political and administrative authority to manage a country's affairs at all levels – here, especially in relation to social housing, upgrading, and (local) settlement planning and development. It comprises related mechanisms, processes and institutions, through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and take action to mediate their differences. Good governance is, among other things, participatory, transparent and accountable. It is also effective and equitable and promotes the rule of law. Good governance ensures that political, social and economic priorities are based on a broad consensus in society and that the voices of the poorest and the most vulnerable are heard in decision-making, for instance, in decision-making over the allocation of resources for settlement development planning and disaster risk management.
Urban planning	See above under 'settlement development planning'.
Vulnerability *	Degree to which systems (i.e. households, communities and/or organisations) are susceptible to loss, damage, suffering and death in the event of a 'natural' hazard/disaster. It thus describes the existing condition and setting of an area exposed to hazards, where a vulnerable area is understood to being incapable of resisting their impacts. Both vulnerability and its opposite/antithesis, resilience, are determined by physical, social, economic, environmental, organisational and institutional factors that are the result of human conduct. An example of physical vulnerability is the susceptibility to hazards of the built environment (including technical and social infrastructure). Examples of social vulnerability are influenced by the levels of literacy and education, compliance with laws, systems of good governance, access to basic human rights, existence of peace and security, and the existing traditional values and ideological beliefs. Economic vulnerability characterises, for instance, a local economy with high levels of corruption and lacking a diverse productive base, as well as less privileged people who suffer proportionally larger losses. 'Less privileged' relates to class or caste, ethnic minorities, the very young and old, the disadvantaged, and are often women who are primarily responsible for providing essential shelter and basic needs for their families. Environmental vulnerability refers to the extent of natural resource degradation (e.g. contaminated air, water and soil caused by inadequate sanitation). Examples of organisational and institutional vulnerability are the lack of institutions, related organisational structures, laws and regulations for disaster risk management or secure social housing provision, as well as the lack of inter-institutional cooperation and learning.

Working field/sector	Area of activity that is not (necessarily) an academic discipline. Examples are disaster risk management and settlement development planning. Settlement development planning can further be understood as being part of the development sector 'urban development' (sometimes also called 'urban settlement development' or 'urban development planning'). Note that in this context disaster risk management is understood to be a cross-cutting topic to be integrated into different disciplines and sectors. Further note that in this study the terms 'working field' and 'field of activity' are used as synonyms.

A2. Research matrix

Title	Managing urban disaster risk
Subtitle	Analysis and adaptation frameworks for integrated settlement development programming for the urban poor.
Purpose	To provide a better understanding of the challenges of increasing disaster risk and its impact on the living conditions of the urban poor, as well as to develop new conceptual and strategic approaches to face those challenges.
Overall research objective	To enhance and develop new knowledge and innovative ways in which urban development actors can contribute more effectively to disaster risk management, thus demonstrating their role and potential within this field of activity.
Expected outcome	Provision of knowledge, concepts and strategies to increase the potential of settlement development programming for disaster risk management, in order to assist in decreasing urban risk – and thus post-disaster destructions, forced evictions and relocations – and poverty.
Overall research question	How can disaster risk management be properly integrated into settlement development programming?

Main research questions	**Subresearch questions**	**Information/data needed**
What is the relationship between the working fields of disaster risk management and settlement development planning?	**A. Focus of investigation: understanding the particular setting and search for causal explanations**	
	1.1 How is the existing situation? (=descriptive, that is, the description of current situation)	**1.1.1** Existing dedicated disaster risk management programmes/programming **1.1.2** Existing dedicated settlement development programmes/programming **1.1.3** Existing integrated programmes/programming **1.1.4** Interrelation of related institutional and organisational structures and legislation (e.g. organisations, policies and codes for settlement development planning and/or disaster risk management and related programmes) **1.1.5** Perceptions of the existing intersection and interrelationship of the staff involved (both sectors) (e.g. separated or integral, positive or negative, interest in cooperation or not)
	1.2 Why is the current situation like this? And what influences or influenced the degree of integration/separation positively or negatively? (=explanatory, that is, explanation of current situation)	**1.2.1** Interinstitutional, intersectoral and interdisciplinary barriers (cf. 1.1.3 – 1.1.5) **1.2.2** Knowledge of stakeholders of disaster risk management and settlement development planning as regards the respective other working field, as well as of the interlinkages between disasters and urban settlement development (cf. questions 1.1.1, 1.1.2 and 3) **1.2.3** Historical development of the working fields and the related programmes **1.2.4** Problems, needs and capacities of organisations working in settlement development planning to further include disaster risk management within their spheres of activity. **1.2.5** Related challenges at and among the global, national, municipal and household level.

What is the potential to improve risk reduction and risk financing through settlement development programming?	**2.1** What kind of approaches to reduce risk or finance risk are existent in relation to settlement development planning (i.e. are already implemented)? (=descriptive, that is, the description of existent intersection)	**2.1.1** Existing measures elaborated within both programmes for settlement development planning and disaster risk management (= overlapping measures) **2.1.2** Related objectives, strategies, concepts and terminology used within programmes for settlement development planning and programmes for disaster risk management (= overlapping institutional/organisational approaches) **2.1.3** Related tools and methods used within programmes for settlement development planning and programmes for disaster risk management (= overlapping programmatic approaches)
	B. Focus of investigation: identifying the unanticipated phenomena	
	2.2 What other disaster risk management measures in the field of settlement development are further possible? (=exploratory, that is, the description of potential intersection)	**2.2.1** Match of approaches (see 2.1) with existing problems, needs and capacities at local level, that is, problems, needs and capacities of people/communities living at risk to cope with disaster risk and disaster occurrence (cf. answers to question 3) **2.2.2** Match of approaches (see 2.1) with existing problems, needs and capacities at institutional level (i.e. of organisations working at global, national, municipal and/or household level) (cf. answers to question 1.2). **2.2.3** Lessons learned from existing (successful) approaches/programmes located in other regional areas **2.2.4** Post-disaster disaster risk management measures (applied within the context of reconstruction, rehabilitation, and/or recovery programmes)
	2.3 How can the identified measures (cf. 2.1 and 2.2) be successfully combined or integrated? (=explanatory and exploratory)	**2.3.1** The 'ideal' programme type: conceptual strategy for combining disaster risk management and settlement development planning measures within settlement development programming, thus overcoming challenges and gaps identified (theoretical, ideal intersection) **2.3.2** Why is this 'ideal' programme type (cf. 2.3.1) not 'reality?' (comparison with outcomes from questions 1 and 2)
What are the interlinkages between disasters and urban settlement development?	**3.1** How does the occurrence of disasters affect low-income settlements – as well as related building and planning practices? (=explanatory)	**3.1.1** Direct correlation perceived and analysed at the different research levels (compare with 2.2) **3.1.2** Indirect correlation perceived and analysed at the different research levels (compare with 2.2)
	3.2 How do low-income settlements – as well as related building and planning practices – affect disaster occurrence? (=explanatory)	**3.2.1** Direct correlation perceived and analysed at the different research levels (compare with 2.2) **3.2.2** Indirect correlation perceived and analysed at the different research levels (compare with 2.2)

A3. Interview protocols

In the following, the different interview protocols used at the global, national/municipal and local household level are presented. Note that not all the listed questions were always used as the protocols were generally adapted to the respective interviewee/organisation.

A3–1) Basic interview protocol for the global research level

1) Could you give some short background information about yourself, your professional background/career and your position within your organisation?

2) Could you give some background information about the department you work in?

- Number of employees (office/field) ⇔ total number of staff.
- Professional background of employees.
- Historical developments of and changes in department: since when, name, structure, etc.
- Historical developments of and changes in working field.
- Role and function within the organisation ⇔ organisational policy and priorities, internal co-operation, responsibility-share, part of relief or development, allocation of money, budget.
- Basic working concepts.

3) Could you describe your activities/projects in the field?

- Number of activities; de- or increasing.
- Planning steps: selection, initiation, counterparts, duration, etc.
- General vision, goal/aim, objectives.
- Focus: 'natural'/man-made disasters, pre/post, small/big ⇔ organisational focus
- Regional focus (LA) ⇔ focus of resources.
- Priorities: working level, target groups, working area: urban, rural, high-risk area
- Content: main sectors, most frequent/important measures.
- Changes.
- Methodology.
- Role of culture/country.

4) Could you describe the experience with your activities/projects in the field?

- Main results
- Positive experience: success stories/success factors.
- Negative experience: problems/failure factors.
- Effectiveness, efficiency and sustainability – correspond to existing problems, fast, reach poorest.
- Main constraints. Future challenges and trends.
- Improvement

5) Could you describe the linkages between your activities (and your department) with other activities (and other departments) in the field of disaster risk management/settlement development planning?

- Cooperation with other departments.
- Cooperation with other organisations.
- Similarities/differences in departments: priority within organisation, objectives, approaches, concepts, working procedures, employees, number and content of activities, roles within co-operation activity.
- Similarities/differences in activities.
- Unplanned correlation between activities in the field ⇒ increased vulnerability?
- Unplanned correlation between disasters, low-income settlements, urbanisation, urban settlement planning, housing.

- Existing research.

6) Could you explain the reasons behind the existing situation (cf. Nr.5)? What would cause your organisation to combine/separate disaster risk management and settlement development planning to a greater extent?

- Existing efforts.
- Combination (not) feasible/(not) useful/(not) beneficial.
- Why and how.
- Barriers: institutional, financial, inter-organisational.
- Other efforts of combination/integration: e.g. relief.

7) How do you see/how would you describe the correlation between the occurrence of 'natural' disasters and low-income settlements?

A3–2) Detailed interview protocol (global level)

- Presentation of research
- Ask for time frame of meeting
- Recording OK?
- Anonymity of person/quotations.
- Definition of activities/activities in the field

I. Personal background questions

1) Could you give me some background information about yourself and your position?
- Name, profession.
- Current department and position.
- Time working in the current position.
- Previous career within this or another organisation and/or working field.
- Academic background.
- Current tasks and responsibilities.

II. Departmental background information (disaster risk management or settlement development planning department respectively)

2) How many employees work within the department? Professional background?
- Office. Organisation.
- In the field.
- Professional background

3) Could you describe the development of the department and its working field within the organisation?
- Since when.
- Renamed.
- Departmental changes
- Same activities within another department.

4) Could you describe the role and situation of the department within the organisation?
- Policy or mandate.
- Organigram of organisation.
- Money allocation.
- Responsibility for activities.

5) What are the basic working concepts of the department?
- Visions, goals and objectives.
- Technical terms/concepts
- Basis
- Internal working papers.

6) Could you describe the general organisation and the planning steps of the activities that you elaborate?
- General organisation of the activities. Organisational chart.

- Counterparts.
- Working levels. Linkages.
- Are there linkages between the different levels? What linkages?
- Creation of new projects. Organisation and assessments.
- Lengths.

III. Concrete information about activities in the field (settlement development planning or disaster risk management activities respectively)

7) How many activities are elaborated, and where?
- Increasing/decreasing.
- Geographical focus.
- Latin America. El Salvador.

8) Could you describe me the general focus as well as the main target group of your activities?
- 'Natural' or man-made disasters.
- Pre or post-disaster
- 'Natural' disasters or general environmental risks, accidents, diseases.
- Large or small-scale disasters.
- Poverty reduction
- Change of focus.
- Most at risk/vulnerable.
- Cities or countryside.
- Low- or middle income.

9) What concrete activities do you carry out? How (methodology)?
- Most frequent activities.
- Most important/typical.
- Concrete measures. Changes.
- Coping mechanisms.
- Livelihood approach.
- General approach? Community-based.
- GIS.
- High-risk areas.
- Laws and codes.
- Disaster risk management: more mitigation, prevention or preparedness.
- Settlement development plannning: new houses or improvement.
- Urban or rural areas.
- Countries.

IV. Evaluation of activities (settlement development planning or disaster risk management activities, respectively): success and failure factors, general problems

10) How do you evaluate the activities?
- Correspond to the existing problems. Reach the poorest. Fast.
- Main results.
- Good, bad, improvement.
- Quantifiable benefits.
- Further measures needed.
- Sustainability.
- Best activity.

11) Based on your experience, what are the success or failure factors?
- Indicators.
- Biggest success story.
- New ideas/approaches.
- Main constraints.

V. Other type of activities (settlement development planning or disaster risk management activities respectively): linkages and comparison

12) Do you cooperate actively with other departments? (with their respective other working field)
- Why.
- How.

- Efficient cooperation work. Yes/no. Why (different roles, etc.).

13) What type of activities do 'the others' (i.e. other working field) perform? Are these similar regarding objectives, approaches, concepts, working procedures, employees, etc.? Why?
- Activities.
- More or fewer activities. Why.

14) How do you see the relationship between disaster risk management and settlement development planning activities/departments? Is there an interest in changing it/need to change it?
- Good/positive or bad/negative.
- Change needed/initiated.

15) Do you believe that it theoretically possible and/or useful to combine (more) disaster risk management and settlement development planning activities? What would be the barriers?
- Feasible/beneficial. How.
- Institutional or administrative barriers.
- Public demand.
- How to increase interest.

VI. General linkages between settlement development planning and disaster risk management? (research/opinion)

16) Could you describe the (unplanned) correlation between the activities in settlement development planning and activities in disaster risk management?
- Disaster risk management activities that influence living in settlements.
- Settlement development planning activities that influence disasters.
- Policies and institutional mandates.

17) What is the mutual influence of low-income settlements, urban settlement planning and disasters?
- Disasters.
- Low-income settlements.
- Urban planning.
- Living in low-income settlements.
- Urbanisation.
- Housing sector.
- Existing research.
- Available information.

A3–3) Interview protocol for key informants (global level)

1) What is the general relationship between development assistance in the settlement development planning and disaster risk management?
- Actors.
- Cooperation between specialised institutions or departments.
- Roles.
- Objectives.
- Budget.
- Staff.
- Working concepts.
- Number of activities.
- Changes over time.
- Trends.

2) What factors positively or negatively impact this relationship?
- Institutional, financial or technical barriers, etc

3) What risk reduction activities exist in the field of settlement development planning? (Intersection)
- Own organisation and others
- Main sectors
- Success and failure factors

4) What are further potential risk reduction activities in the field of settlement development planning? (potential intersection)

5) ⇔ What is the detailed existing correlation between 'natural' disasters and low-income settlements (urban settlement planning, urbanisation, the housing sector)?

6) Is there an unplanned correlation between the activities in the field of disaster risk management and settlement development planning, resulting in increasing vulnerability of the poor?

7) What 'real' and potential linkages exist between the international, city and neighbourhood level (flow of knowledge)

8) Would a (stronger) combination of pre-disaster activities in the field of disaster risk management and settlement development planning improve the existing activities/situation? If yes – how?

A3–4) First detailed interview protocol for national and municipal level

I. Información de base

1. Información personal

- ¿Cuál es su nombre, profesión y posición?

2. Información institucional

- ¿Me podría dar información general sobre su organización? (¿desde cuando existe? ¿cuál es el mandato/misión y los objetivos principales?)
- ¿Qué documentos legales forman la base de las iniciativas desarrolladas?
- ¿En qué ámbitos de trabajo su organización se enfoca? (¿en ayuda de desarrollo, ayuda humanitaria, rehabilitación y reconstrucción, o gestión de riesgo?
- ¿Se considera gestión de riesgo como un área de trabajo independiente o parte de ayuda humanitaria, ayuda de desarrollo o rehabilitación y reconstrucción?

II. Importancia de planificación/desarrollo de assentamientos (PDA) y/o de la gestión de riesgo (GR) en la organización

3. Información sobre el departamento (PDA/GR)

- ¿Tiene su organización departamentos especializados en PDA o GR? (¿Organigrama?)
- ¿Me podría describir el desarrollo de éste departamento? (¿desde cuando existe?, ¿hubo cambios de objetivos o de contenidos de los proyectos?)
- ¿El establecimiento de éste departamento y/o sus actividades se basan en un documento legal? ¿Cuál?
- ¿Me podría describir el rol de éste departamento dentro de su organización (¿número de empleados?, ¿financiamiento?)?

4. Información sobre iniciativas en el ámbito de PDA/GR

- ¿Cuantos proyectos implementa su organización actualmente en PDA/GR?
- ¿Cuál es el grupo meta de éstas iniciativas?
- ¿De dónde proviene el financiamiento? ¿Existe cooperación con otras organizaciones?
- ¿Estos proyectos se encuentran en áreas de riesgo? ¿Qué tipo de riesgo (terremotos, inundaciones, huracanes, deslizamientos, erupciones volcánicas, fuegos, otros?)
- Los proyectos, ¿se desarrollan en asentamientos precarios ilegales (área urbana, rural, semi-urbana?)? ¿Cómo se llaman las áreas?
- ¿Cuál es la influencia/el impacto de las iniciativas a nivel municipal/nacional/regional?
- ¿Qué tipo de actividades se implementan? (¿sector de salud, agricultura, vivienda? ¿actividades de educación, técnicas, etc.?)

III. Integración de PDA ⇔GR en las iniciativas existentes

5. Evaluación de los proyectos PDA/GR

- ¿Dentro de sus actividades de PDA/GR se integran actividades en el ámbito de GR/PDA? ¿Cuáles? ¿Por qué no/si?
- ¿Cómo describiría las experiencias positivas/negativas de las iniciativas?
- ¿Qué tipo de problemas existen?

- ¿Cuáles son los factores críticos de éxito/factores de fracaso?

IV. Factores que influyen la integración PDA ⇔ GR en las iniciativas

6. Diferencias y conocimiento

- ¿Qué similitudes existen o pueden ser identificadas entre proyectos/instituciones de GR/PDA?
- ¿Qué diferencias existen o pueden ser identificadas entre proyectos/instituciones de GR/PDA que hacen una cooperación/integración difícil (¿conceptos de trabajo, procedimientos de planificación que utilizan para la elaboración de las iniciativas?)?
- En el mandato de su organización, ¿se menciona también GR/PDA?

7. Experiencias

- ¿Conoce usted otras organizaciones en su país que trabajen en vivienda y planificación urbana (proyectos de desarrollo)/área de gestión de riesgo? ¿Y en América Central?
- ¿Existen muchas/pocas iniciativas integrales? ¿Por qué? (¿falta de compromisos políticos o falta de interés y acción de los actores de GR/PDA?)
- ¿Conoce proyectos que aumentaron vulnerabilidades por no haber integrado GR/PDA?

8. Percepciones

- ¿Cuál es la correlación entre la ocurrencia de desastres 'naturales', planificación urbana, y asentamientos precarios?
- ¿Sería posible/necesario de integrar más la GR/PDA en el ámbito de PDA/GR?
- ¿Cómo se podrían integrar más las áreas de trabajo de PDA/GR? ¿Cuáles son los factores claves?
- ¿Cuál es la relación entre desastres cotidianos y desastres de alta magnitud?

V. La institucionalización y legalisación de PDA/GR

9. Estructura institucional a nivel nacional y municipal

- ¿Cuáles organizaciones estatales son los responsables para la planificación urbana y de vivienda/para la gestión de riesgo? ¿Quien tiene el mandato para GR/PDA?
- ¿Cuáles son los procesos de decisión en el ámbito de planificación urbana y de vivienda/de gestión de riesgo?
- ¿Cuál es la importancia/interés de GR/PDA en el gobierno? (¿financiamiento?)
- ¿Hubo cambios del rol o de la importancia dentro de los últimos años? (¿Cuál fue el desarrollo histórico de planificación urbana y la gestión de riesgo?)
- ¿Cuál es el rol de los municipios en PDA/GR?
- ¿Cuál es el rol de la población en PDA/GR? ¿Puede la población participar en la planificación de los asentamientos? ¿Cómo?

10. Documentos legales a nivel nacional y municipal

- ¿Cuáles documentos legales presentan la base para PDA/GR en El Salvador (normas para la construcción de nuevas construcciones, la intervención en asentamientos existentes, la industria de seguros, la prevención de riesgos, el desarrollo, el uso de suelo, el medio ambiente, etc.)?
- ¿Quién desarrolló éstas normas? ¿En qué año y sobre que base de información? (¿normas importadas? ¿experiencias con desastres? ¿mapas de riesgo? ¿clasificación de edificios?)
- ¿Estas normas están obligatorias? ¿Para quién?
- ¿Cuál es el nivel de fiscalización? ¿Cuáles son los problemas de fiscalización? ¿Capacidad de las personas encargadas de la fiscalización? ¿Rol de seguros? ¿Suficiente personal para la fiscalización? ¿Posibilidad de transferir el control de las normas al sector privado? ¿Existencia de un registro de nuevas construcciones y de arquitectos, etc.? ¿Corrupción en la fiscalización? ¿Control de calidad de materiales? ¿Capacidad de arquitectos, constructoras etc. para cumplir con las normas?
- ¿Cuáles son los procedimientos de fiscalización?
- ¿Quién tiene la responsabilidad de implementar/controlar la fiscalización (instituciones y profesionales)? ¿Esta responsabilidad está definida en una norma? ¿Cual?
- ¿Son las normas adecuadas? ¿Qué tipo de desastres están considerados? ¿Cómo es la complejidad de las normas? ¿Hay una falta de normas?
- ¿Según usted, leyes y normativas tienen el potencial de mejorar la situación de asentamientos precarios en riesgo reduciendo las vulnerabilidades existentes? ¿Cómo? ¿También en asenta-

mientos ilegales? ¿Existen experiencias positivas con normas teniendo una influencia positiva sobre la vulnerabilidad existente de asentamientos precarios?
- ¿Cual es el grado de la sensibilización de los habitantes respecto al cumplimiento con las normas?
- ¿Existen seguros que promueven gestión de riesgo? ¿Cuál es su cobertura? ¿Cuál es el número de empresas de seguro? ¿Son seguros privados o estatales? ¿Tienen seguros para comunidades o individuales? ¿Se aplican ha asentamientos precarios?

11. Rol de profesionales

- ¿Pueden arquitectos, urbanizadores y planificadores influir en la gestión de riesgo de asentamientos precarios? ¿Por qué? ¿Cómo?

VI. Integración de PDA ⇔GR en la legislación e institucionalización

12. Similitudes y diferencias de normas de GR y PDA

- ¿Están interconectadas las diferentes normas/instituciones de GR y de PDA?

VII. La situación a nivel local

13. Asentamientos precarios en áreas de riesgo

- ¿Qué tipo de desastres 'naturales' ocurre con mayor frecuencia? ¿Por qué?
- ¿Cuáles son los factores que influyen el nivel de riesgo en asentamientos precarios?
- ¿Cuál es el proceso de acumulación de riesgos?
- ¿Qué estrategias locales de adaptación se implementan/desarrollan?
- ¿Los habitantes consideran su asentamiento/casa seguro o inseguro? ¿Por qué?
- ¿Cuánto tiempo dedican los habitantes a mejoramientos y mantenimiento de su asentamiento/casa?
- ¿Qué se debería hacer para aumentar la seguridad de las casas/los asentamientos?
- ¿Hay un lugar en el que los habitantes se sienten particularmente inseguros/seguros? ¿Por qué?
- ¿En cuáles meses existe más/menos seguridad/inseguridad? ¿Por qué?
- ¿Qué tipos de iniciativas existen en el ámbito de GR/PDA?
- ¿Cuál fue el rol de medidas de PDA para la reducción de riesgos?
- ¿Cuáles fueron los resultados de éstas iniciativas?
- ¿Tiene algunas sugerencias para actividades futuras?

A3–5) Second interview protocol for national and municipal level, for organisations working in settlement development planning

(PREGUNTA OPCIONAL) Como parte de sus proyectos de gestión de riesgo y/o de vivienda social/planificación urbana, ¿usted ha desarrollado análisis de riesgos locales? Si/No. (Posibilidad de obtener el estudio) Desde la perspectiva local, ¿cuáles fueron los resultados respecto a ...

- la percepción local de los riesgos/desastres existentes (priorización)?;
- las causas de los riesgos/desastres existentes?;
- la relación de los riesgos/desastres existentes con vivienda y planificación urbana?
- la importancia/el rol de la vivienda y planificación urbana?

I. Seguimiento de A3–4

1) ¿Estuvo su organización afectada por los últimos desastres? Ej. Pérdidas financieras, personal afectado, oficinas dañadas, etc. Por favor describa brevemente.

2) En éste momento, ¿su organización tiene proyectos enfocados en el tema de la gestión de riesgo?

3) Por favor describa brevemente qué tipo de actividades de gestión de riesgo desarrolla su organización en tales proyectos de gestión de riesgo.

4) ¿Su organización tiene proyectos enfocados en vivienda social/planificación urbana?

5) ¿Éstos también incluyen componentes de gestión de riesgo?

6) Por favor describa brevemente qué tipo de actividades de gestión de riesgo desarrolla su organización en sus proyectos de vivienda social/planificación urbana.

7) Además de tales actividades para reducir riesgos, ¿también tiene actividades que reducen riesgos de una forma más indirecta?

8) Además, ¿qué actividades de gestión de riesgo potenciales (no aplicadas) se podrían incluir en sus proyectos de vivienda social/planificación urbana?

9) ¿Por qué no las implementan? ¿Cuáles serían las barreras más importantes para su implementación?

10) Según usted, ¿cuáles serían las actividades más importantes? ¿Por qué?

11) ¿Usted trabaja en sus proyectos para reducir vulnerabilidades económicas?

12) Por parte de otros actores que trabajan en el tema de vivienda social, ¿qué más se podría hacer para que futuros desastres tengan un impacto menor (medidas técnicas)? (ya en implementación y/o en teoría) Por favor describa ¿qué más se podría hacer por parte de ...

- la comunidad?;
- del gobierno local/nacional?; y/o
- de otras organizaciones?
- ¿Y qué se podría hacer por parte de las familias viviendo en áreas de riesgo?

13) En general, ¿quién debería tener la principal responsabilidad de implementar actividades de gestión de riesgo?

14) ¿Cuál sería la actividad más importante? ¿Por qué?

15) ¿Cómo se deberían financiar tales actividades?

16) ¿Tiene su organización el objetivo de introducir más el tema de gestión de riesgo en su trabajo?

17) ¿Qué planes tienen para cumplir tal objetivo? ¿Por qué?

18) ¿Usted tendría financiamiento y personal suficiente para poder introducir más el tema de gestión de riesgo?

II. Instrumentos desarrollados para incluir la gestión de riesgo

1) ¿Conoce y/o utiliza instrumentos para incluir gestión de riesgo (u otro tema) en el trabajo de desarrollo? Por favor describa.

2) ¿De qué año, contenido, estructura, (de-)limitantes, éxito, etc.?

3) ¡Presentación del instrumento operacional! ¿Cree que tal instrumento podría ser útil para su organización?

4) ¿Contenido, estructura, lógica, (de-)limitantes, interés, etc.?

5) ¿Cuáles serían las barreras más importantes para su aplicación/implementación? (barreras políticas, sociales, financieras, etc.)

6) ¿Cómo se podrían sobrepasar tales barreras?

7) ¿Sería un problema para usted de financiar la implementación de tal instrumento? ¿Por qué?

8) ¿Qué ideas tendría para poder financiar su implementación por su organización/otros actores?

III. Financiamiento de proyectos

1) ¿Cómo financia sus proyectos/actividades en gestión de riesgo?

- ¿Con micro créditos?;
- ¿Con seguros?;
- ¿Con fondos especiales?;
- ¿Con subsidios?;
- ¿Con ayuda internacional, nacional, municipal, local?

2) ¿Qué otras formas de financiamiento aplican otras organizaciones para financiar proyectos/actividades en gestión de riesgo?

3) ¿Cómo financia sus proyectos en vivienda social y planificación urbana?

- ¿Con micro créditos?;
- ¿Con seguros?;
- ¿Con fondos especiales?;
- ¿Con subsidios?;
- ¿Con ayuda internacional, nacional, municipal, local?

4) ¿Qué otras maneras de financiamiento aplican otras organizaciones para financiar proyectos en vivienda social y planificación urbana?

- ¿Organizaciones internacionales?;
- ¿Gobiernos locales/nacionales?;
- ¿Familias?

5) ¿Por qué el mecanismo de financiamiento de actividades de gestión de riesgo es diferente de los mecanismos de financiamiento de vivienda social?

IV. Otros aspectos financieros

1) ¿Tiene su organización algún tipo de mecanismo para financiar pérdidas de desastres o compartir riesgos? Por favor describa.

- ¿Seguros?
- ¿Fondos especiales?
- ¿Subsidios?

2) ¿Piensa que algo (más) se podría hacer para que las pérdidas financieras de futuros desastres sean mejor distribuidas y/o los riesgos mejor compartidos? (ya en implementación y/o en teoría) ¿Qué podrían hacer....

- su/las organizaciones? ¿Cómo?
- familias afectadas? ¿Cómo?;
- las comunidades? ¿Cómo?;
- el gobierno local/nacional? ¿Cómo?; y/o

3) Piensa usted, que ¿sería posible de extender el mecanismo de financiamiento para viviendas (utilizado por su organización) de manera que se puedan al mismo tiempo financiar tal medidas/actividades de gestión de riesgo?

4) ¿Tiene su organización algún tipo de seguro? (automóvil, de bienes raíces, etc.)

5) ¿Conoce seguros de desastres? (funcionamiento, organizaciones que los ofrecen)

6) ¿Piensa que seguros de desastres podrían ser útil? ¿Cómo deberían funcionar para que los seguros sean útiles para:

- los beneficiarios de proyectos?
- su organización?

7) Según usted, ¿existen posibilidades para combinar mecanismos de financiamiento para viviendas con sistemas de seguro de desastres?

- ¿Micro créditos?
- ¿Fondos especiales?
- ¿Subsidios?

A3–6) Interview protocol for local household level

1) ¿Me podría describir qué tipo de riesgos afectaron su familia durante los últimos 5 años?

2) ¿Qué otros tipos de riesgos existen en su comunidad/asentamiento?

3) ¿Cómo priorizaría la importancia de los diferentes riesgos/desastres?

4) ¿Cuántas veces ocurren desastres en su comunidad/asentamiento?

5) ¿Por qué piensa que usted/su comunidad/su asentamiento está afectado por tales desastres?

6) ¿Respecto a los riesgos/desastres mencionados, cuál es el rol de su vivienda y el diseño de su asentamiento? ¿Éstos los afectan de forma negativa/positiva?

7) ¿Me podría describir más en detalle cómo vivió el último desastre y cómo lo afectó?

8) ¿Qué pérdidas tuvo? ¿Tuvo problemas para cubrir sus necesidades básicas?

9) ¿Cómo usted pudo recuperarse del desastre?

- ¿Con esfuerzos propios para recuperar?;
- ¿Con ayuda de familiares/la comunidad?;
- ¿Con ayuda del gobierno local/nacional?; y/o
- ¿Con ayuda de organizaciones?;
- ¿Con ayuda de un préstamo (de familiares, bancos, organizaciones)?;
- ¿Con el uso de ahorros y/o venta de propiedades?;
- ¿Con el recibo de compensaciones de sus pérdidas? ¿De quién?
- ¿Con remesas de familiares que trabajan en el extranjero? ¿De quién?

10) ¿Qué otro tipo de soporte técnico recibió para recuperar del desastre? ¿De quién recibió tal ayuda?

11) ¿Qué otro tipo de soporte financiero recibió para recuperar del desastre? ¿De quién recibió tal ayuda?

12) ¿Qué tipo de ayuda fue la más importante/faltó? (financiero y técnico)

13) ¿Le podría preguntar qué tipo de ingreso tiene? ¿De qué vive? (parte de II/III)

- ¿Recursos?;
- ¿Profesión – negocios – salario?;
- ¿Propiedades?

14) ¿Qué ha hecho en el pasado para protegerse de potenciales desastres? ¿Cómo? Por favor describa sus acciones. (Acciones técnicas: medidas de prevención/mitigación/preparación; acciones financieras: medidas para compartir riesgos y/o perdidas potenciales)

15) ¿Con ayuda de quién pudo realizar tales acciones para protegerse? (técnica y/o financiera)

- ¿Con su esfuerzo propio?;
- ¿Ayuda de familiares/la comunidad?;
- ¿Ayuda del gobierno local/nacional?; y/o
- ¿De organizaciones?

16) ¿Qué tipo de acción/medida usted considera fue la más importante? (de lo contrario el impacto del último desastre hubiese sido mayor)

17) ¿Qué medida importante faltó por implementarse?

18) ¿Piensa que algo (más) se podría hacer para que futuros desastres tengan un impacto menor (medidas técnicas)? (ya en implementación y/o en teoría) ¿Qué tipo de medidas? Por favor describa. ¿Cuál sería la iniciativa/medida/acción más importante?

19) ¿Cómo se deberían financiar tal iniciativas/medidas/acciones?

20) En general, ¿quién debería tener la principal responsabilidad de tomar acciones/medidas de gestión de riesgo?

- ¿Usted juntos con su familia/la comunidad?;
- ¿El gobierno local/nacional?; y/u
- ¿organizaciones?

21) ¿Cómo el gobierno y/u organizaciones de asistencia podrían motivar familias, negocios, comunidades para tomar medidas para reducir riesgos?

22) ¿Cómo se podrían incentivar a las familias para no vivir en áreas de riesgo?

Aspectos financieros

1) ¿Qué cree usted que se podría hacer para que las pérdidas de futuros desastres sean mejor distribuidas en términos financieros? (ya en implementación y/o en teoría)

2) ¿Quién debe o debería implementar éstas medidas?

3) Además, para financiar pérdidas económicas de futuros desastres, ¿qué podrían hacer....

- las familias/comunidades afectadas? ¿Cómo?;
- el gobierno local/nacional? ¿Cómo?; y/o
- las organizaciones? ¿Cómo?

4) ¿Usted tiene un tipo de seguro? (automóvil, de vida, de bienes raíces, etc.)

5) ¿Conoce seguros de desastres? (funcionamiento, organizaciones que los ofrecen)

6) ¿Piensa que seguros de desastres podrían ser útil? ¿Cómo deberían funcionar para que éstos sean útiles para usted?

A4. Questionnaires

In the following, the four different questionnaires used for the elaboration of this research are presented, focusing on a) the selection of the research focus country; b) basic background studies; c) the evaluation, validation and refinement of the 'Operational Analysis and Integration Framework'; and d) financial mechanisms regarding settlement development planning and disaster risk management.

A4–1) Questionnaire for the selection of the research focus country

Objetivo: El propósito de este cuestionario es obtener información preliminar acerca de las iniciativas dirigidas a asentamientos precarios que se desarrollan en su país, en el campo de vivienda y planificación y/o gestión local de riesgo. La información obtenida a través de este cuestionario será utilizada para asistir mí Doctorado, dirigida a la reducción de riesgos de desastres 'naturales' en asentamientos precarios. ¡**Muchas Gracias por su cooperación!**

1. Nombre: _____
2. Nombre de la organización que representa:_____
3. País:_____
4. La organización que representa desarrolla proyectos de:

	Sí, mucho	Sí, poco	No
a. Ayuda de desarrollo			
b. Ayuda Humanitaria			
c. Prevención, Preparación o Mitigación de desastres 'naturales'			
d. Rehabilitación o Reconstrucción			

5. Éstos proyectos se encuentran en áreas de riesgo de:

	Sí	No
a. Terremoto		
b. Inundaciones		
c. Huracanes		
d. Deslizamientos		
e. Erupciones volcánicas		
f. Fuegos		
g. Otros?		

6. Podría describir brevemente, de acuerdo a usted, el significado de:
   Gestión local de riesgo:_____
   Prevención:_____
   Preparación:_____
   Mitigación:_____
   Asentamientos precarios _____

7. La organización que usted representa desarrolla proyectos en asentamientos precarios:

	Sí, mucho	Sí, poco	No
a. Urbanos			
b. Rurales			

Detalles: _____

8. ¿Su organización implementa medidas de prevención, preparación y/o mitigación?
   Sí. Por favor describa_____
   _____
   No:_____
9. ¿Podría describir brevemente un proyecto típico de desarrollo de su organización que trabaja en asentamientos precarios?
   _____

_____

10. ¿Conoce usted otra(s) organización(es) en su país que trabajen en vivienda y planificación urbana (proyectos de desarrollo)?
    a. Si: _____
       Número total (aproximadamente):_____
       Nombre(s):_____
    b. No:_____

11. ¿Conoce usted otra(s) organización(es) en su país que trabajen específicamente en el área de gestión local de riesgo?
    a. Si :_____
       Número total (aproximadamente):_____
       Nombre(s):_____
    b. No:_____

12. ¿Cree usted que en su país existe interés por la gestión local de riesgo? Favor argumente su respuesta
    a. Si :_____
    b. No:_____
    c. Razón(es):_____

13. ¿Qué tipo de desastres 'naturales' ocurre con mayor frecuencia en su país? ¿Por qué?

_____

14. ¿Podría nombrar otra(s) persona(s) y/u organización(es) que trabaje en América Latina en el área de gestión local de riesgo?

_____

15. Qué otro país me recomendaría para la investigación planificada?

_____

16. Finalmente, considerando la presentación sobre mí investigación de Doctorado el lunes pasado, ¿usted y/o su organización estarían dispuestos a cooperar con el desarrollo de mí investigación si ésta se lleva cabo en su país?
    a. Si :_____
       ¿En qué podría constituir tal cooperación?:_____
    b. No:_____

Otros comentarios: _____

Nuevamente, ¡muchísimas gracias por su colaboración!

A4–2) Questionnaire for basic background studies

My country of origin: _____

Please explain the following words:

'Natural' Disaster	
Disaster Risk	
Prevention	
Mitigation	
Preparedness	
Vulnerability	
Disaster Risk Management	

A4–3) Questionnaire: operational framework for sustainable risk reduction integration into the work of aid organisations

Whilst the need to integrate disaster risk management with development aid in order to achieve sustainable poverty reduction is acknowledged amongst donors, experts and practitioners, little work has been undertaken to identify how this could be achieved. In order to meet this need, Christine Wamsler from Lund University recently elaborated an operational framework for development aid organisations. It provides general guidance for organisations working in human settlements to integrate risk reduction within their 'normal' work. From your answers to this questionnaire, it is hoped to obtain important information for the further development of the tool mentioned as regards its content, format, limits and implementation. Your contribution is of high relevance for us and all people living in risk areas around the world. Thank you very much for your kind cooperation, Christine Wamsler (christine.wamsler@hdm.lth.se)

1) For what type of organisation do you work? (Choose three alternatives)

☐ Development organisation	☐ Non-governmental organisation	☐ Local/municipal organisation
☐ Emergency organisation	☐ Governmental organisation	☐ National organisation
☐ Social housing organisation		☐ International organisation

2) Does your organisation work in the field of disaster risk management? (Choose one alternative)

☐ Yes, a lot ☐ Yes, a little ☐ No (Continue with question 4)

3) Within what type of projects does your organisation carry out activities in the field of disaster risk management?
(Choose one or more alternatives)

☐ within the framework of the organisations' specialised projects on disaster risk management
☐ within the framework of the organisations' development projects
☐ within the framework of the organisations' social housing projects
☐ within the framework of other types of projects. Describe: _____

4) Do you know operational tools – apart from the one elaborated by Christine Wamsler – that have the objective of providing guidance for development organisations working in human settlements to integrate risk reduction within their 'normal' work? (Choose one alternative)

☐ No ☐ Yes. Describe (name, organisation, etc.):_____
_____

5) ¿Does your organisation use operational tools which have the objective to provide guidance for development organisations working in human settlements to integrate risk reduction within their 'normal' work? (Choose one alternative)

☐ Yes ☐ No ☐ I don't know (continue with question 7)

6) Why do they use/not use such a tool? Describe:_____
_____

7) Do you consider the operational tool elaborated by Christine Wamsler useful for your organisation? (Choose one alternative)

☐ Yes, a lot ☐ Yes, a little ☐ Indifferent ☐ No ☐ Not at all

8) Why? (Please explain your statement given under question 7)
_____

9) Are there any disaster risk management measures/strategies that should be included in the tool?

☐ No ☐ I don't know ☐ Yes. Describe:_____
_____

10) Do you see any important constraints as regards the tool's content? ☐ No ☐ Yes. Describe: _____

11) Do you see any important constraints as regards the tool's format? ☐ No ☐ Yes. Describe: _____

12) How could the tool's content/format be improved to overcome the described constraints/limits? _____

13) Do you see any important constraints as regards the tool's implementation? ☐ No ☐ Yes. Describe:_____ _____

14) How could constraints/limits as regards the implementation of the tool be overcome? Describe: _____

15) How could your organisation finance the implementation of the strategies/measures proposed by the tool? Describe:_____ _____

16) Do you think that disaster insurance could be included in housing finance mechanisms?
☐ No. Why? ☐ Yes. Describe, how: _____ _____

17) Do you think that social housing financing mechanisms could be extended so as to be used for funding measures in disaster risk reduction?
☐ No. Why? ☐ Yes. Describe, how: _____ _____

Would you allow me to contact you if I have more questions? ☐ No ☐ Yes. Please note contact name, e-mail and telephone: _____

A4–4) Questionnaire: financial mechanisms for social housing and disaster risk management

1) For what type of organisation do you work? (Choose three alternatives)

☐ Development organisation	☐ Non-governmental organisation	☐ Local/municipal organisation
☐ Emergency organisation	☐ Governmental organisation	☐ National organisation
☐ Social housing organisation		☐ International organisation
☐ Financing organisation		

2) Does your organisation work in the field of disaster risk management? (Choose one alternative)
☐ Yes, a lot ☐ Yes, a little ☐ No (Continue with question 4)

3) Does your organisation work in the field of social housing/settlement planning? (Choose one alternative)
☐ Yes, a lot ☐ Yes, a little ☐ No (Continue with question 4)

4) Do you think that it would be possible to extend mechanisms for financing social housing/infrastructure in such a way that it can be used at the same time for financing activities/measures in the field of disaster risk management?
☐ No ☐ Yes. Please describe:_____
_____

5) Does you organisation have a mechanism for financing losses caused by disasters? (financial losses due to the disaster impacts on the organisation itself or its projects)
☐ No ☐ Yes. Describe: _____
_____

7) ¿Does your organisation have a mechanism for financing activities/measures in the field of disaster risk reduction implemented as part of their development work? ☐ No ☐ Yes. Describe:
_____

8) ¿Does your organisation have any type of insurance? ☐ No ☐Yes. What type?_____
_____

9) Do you think that disaster insurance could be a useful mechanism for your organization and its projects? ☐ No ☐ Yes. How would such an insurance need to look in order to be useful for your organisation/the beneficiaries of your projects? Please describe:_____
_____

10) Would it be possible to combine financing mechanisms for social housing with disaster insurance systems? ☐ No. Why? ☐ Yes. How could this be best done? _____
_____

Could I contact you if I would have more questions? ☐ No ☐ Yes. E-mail, telephone and other contact details: _____

Appendix B: selected papers

The following articles, book chapter and working paper are included in this thesis:

Paper I: Wamsler (2004) 'Managing urban risk: perceptions of housing and planning as a tool for reducing disaster risk', *Global Built Environment* (GBER) 4(2):11–28.

Paper II: Wamsler (2006) 'Mainstreaming risk reduction in urban planning and housing: a challenge for international aid organisations', *Disasters* (Journal of Disaster Studies, Policy and Management) 30(2):151–77.

Paper III: Wamsler (2006) 'Integrating risk reduction, urban planning and housing: lessons from El Salvador', *Open House International* (OHI) 31(1):71–83, special issue on 'Managing urban disasters'.

Paper IV: Wamsler (2006) 'Tackling urban vulnerability: an operational framework for aid organisations', *Humanitarian Exchange* (HE) 35:24–26, special issue on 'Humanitarian action in urban contexts'.

Paper V: Wamsler (2006) 'Understanding disasters from a local perspective: insights into improving assistance for social housing and settlement development', *TRIALOG* (Journal for Planning and Building in the Third World) 91(4):4–8, special issue on 'Building on disasters'.

Paper VI: Wamsler (2007) 'Bridging the gaps: stakeholder-based strategies for risk reduction and financing for the urban poor', *Environment and Urbanization* 19(1):115–142, special issue on 'Reducing risks to cities from climate change and disasters'.

Paper VII: Wamsler (2008) 'Planning ahead – before disasters strike', book chapter 16 in: *Hazards and the built environment: attaining built-in resilience*, Lee Bosher (ed.), Taylor and Francis Publications (forthcoming).

CD: Wamsler (2006) *Operational framework for integrating risk reduction for aid organisations working in human settlement development*, Disaster Studies Working Paper No. 14 (first version published in February 2006, revised version from December 2007), Benfield Hazard Research Centre (BHRC), London.

I

Paper I	
Title: Managing urban risk: perceptions of housing and planning as a tool for reducing disaster risk	
Author(s)	Christine Wamsler
Published	Yes
Review Process	Peer Review
Public presentation (conference/workshop)	International conference of ENHR (European Network of Housing Research) on Housing Growth and Regeneration, July 2–6, 2004, Cambridge, UK
Publication type	Journal: *Global Built Environment* (GBER)
Directly related publication(s)	No

Managing Urban Risk: Perceptions of Housing and Planning as a Tool for Reducing Disaster Risk

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Abstract

This paper examines current perceptions within international aid agencies regarding the existing and potential roles of housing and urban development planning as a tool for reducing urban disaster risk in developing countries. It is mainly based on interviews with more than 50 professionals from international agencies and a review of documents on planning and risk reduction.

The paper analyses the correlation between planning and the occurrence of naturally triggered disasters, and argues that this correlation is inadequately considered by international stakeholders elaborating pre-disaster initiatives. It shows that the identified gap between the working fields of planning and risk reduction increases the vulnerability of the urban poor in two ways: 1) actively, through existing initiatives, which only focus on planning ***or*** *risk reduction; and, 2) passively, through the lack of developing initiatives that integrate both fields.*

I. Introduction and Outline

The damage caused by the worldwide rise in disasters (see *figure 1*) is felt most acutely by the almost one billion people living in inhuman and dangerous conditions (UN-HABITAT, 2003).[1] When disasters strike in cities, the effects can be worse than in other environments, and it is the communities of the poor and the marginalized in the developing world, that face the greatest risks (e.g. Blaikie et al, 1994; IDNDR, 1990). With growing urbanisation (see *figure 2*) and more and more small and large-scale disasters occurring in urban areas, years of development effort and labour are continually being destroyed and eroded (Sanderson, 2000). As Maskrey (UNDP-BCPR)[2] stated: "The trend is for the risk to become urban".[3] Thus, public policies and disaster response measures are increasingly being tested beyond their capacities, with tragic consequences (Mitchell, 1999). In response to this development, it is essential to determine what kind of pre-disaster initiatives can help to mitigate disaster risk, especially in urban, low-income and informal settlements.

"Urbanisation affects disasters just as profoundly as disasters can affect urbanisation" (Pelling, 2003, p7). However, urban growth, whether planned or unplanned, is seldom carried out with a view to reduce disaster risk. This gap between planning and risk reduction will be demonstrated by the literature, planning history, discourses, and existing international initiatives. Since provisions such as microzonation, land-use zoning, building code changes, and rescue operations at present may not affect the most socially vulnerable people (Velasquez et al, 1999), urban planning and mitigation has to be re-evaluated again in the light of the last 20 years' challenges.

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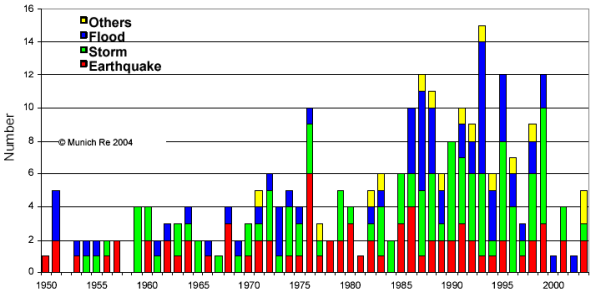
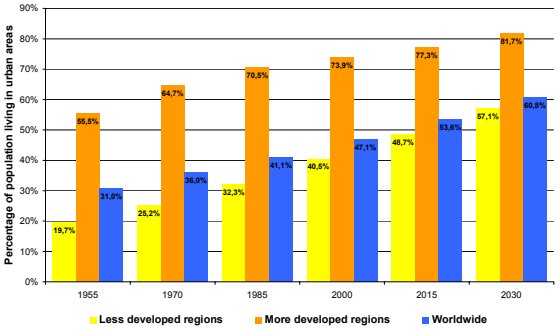
Figure 1: Worldwide increase in the frequency of large-scale disasters. Disasters are classed as large-scale if the ability of the region to help itself is overtaxed



Source: Munich Re, 2004, www.iabm.org/Conference_PDFs/Berzgraph.pdf, retrieved 01.07.2004.

Figure 2: Worldwide urbanisation: Percentage of population living in urban areas



Source: United Nations World Urbanization Prospects, 2003, www.un.org/esa/population/publications/wup2003/2003WUPHighlights.pdf, retrieved 09.07.2004.

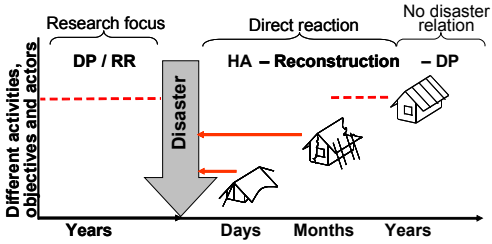
In the following sections, the paper analyses the current linkages, strengths and weaknesses in terms of how literature, planning history, discourses, as well as international aid agencies address, or do not address, the interconnection between risk reduction and planning. Sections III and IV address the issues around the gap and the interplay between planning and the occurrence of disasters, section V and VI deal with the disregard of this interplay, which results in increased urban vulnerability, section VII presents and describes existing integrated risk reduction initiatives.

II. Methodology and Limitations

This qualitative study is mainly based on semi-structured interviews with more than 50 programme managers, operational or academic staff of international governmental and non-governmental organisations (NGOs), as well as reviews of research and project documentation on planning and risk reduction.[4] Chain and purposeful sampling was used to select interviewees in a balanced way, who were working either in the disaster, development or planning fields.[5]

While risk reduction can be implemented and is essential before, during and after disasters, the term risk reduction in this paper refers to measures of prevention, mitigation and preparedness in a developmental (pre-disaster) context. This was necessary in order to limit the scope of the research, and to focus on the most neglected context (see *figure 3*).

Figure 3: Research focus: Initiatives in the field of Developmental Planning (DP) and Risk Reduction (RR)



Source: Wamsler 2002. HA= Humanitarian Assistance.

III. The Gap between Planning and Disasters

General View in Literature

The literature confirms the separation of the two fields of risk reduction and planning, and the fact that in general the: "linkages between urbanisation and disaster are weakly theorized" (Pelling, 2003, p44).

The limited disaster-related literature from an architectural and engineering perspective, focuses mainly on structural issues related to the post-disaster scenario of exceptionally large-scale disasters, looking at general safety issues for reconstruction programmes or large-scale engineering solutions. Literature which offers a wider view includes Aysan et al (1995), GTZ (2003), Sultan Barakat (2003), as well as a series entitled 'Guidelines for disaster prevention', which looks at the most basic problems in the field of risk reduction related to physical planning, building and the management of human settlements (UNDRO, 1976). Furthermore, research on urban disaster risk has mainly focussed on mega-cities. Important reference examples are Mitchell (1999), Velasquez et al (1999) and Wisner (2002).

More general literature on cities and development often has a limited focus, treating cities primarily as engines for economic growth (see for example World Bank, 2000, pp125-138). This approach has been challenged by the more ecological and health-centred perspective of authors such as Hardoy, McGranahan, Mitlin, Satterthwaite, and Girardet (e.g. McGranahan et al, 2001; Hardoy et al, 2001). These authors, and some compilations on urban sustainability (e.g. Zetter et al, 2002), include, but do not specifically focus on, disaster-related risk reduction measures.

General disaster studies tend to focus, not on the actual vulnerability, but on the hazards, themselves, addressing scientific aspects and related technical solutions, such as expensive high-tech prediction systems, whilst socially-oriented disaster studies look mainly at the social causes of vulnerability and poverty. The latter often neglects planning (including housing) as being vitally important risk reduction measures, since it is perceived as purely physical tool.[6]

Literature on climate change focuses more on the reduction of greenhouse gas emissions and less on searching for possible mitigation in developing countries, although human settlements are given an important role in respect of reducing disasters. In fact, the Intergovernmental Panel on Climate Change (IPCC, 2001, p383) states: "Human settlements are expected to be among the sectors that could be most easily adapted to climate change, given appropriate planning and foresight and appropriate technical, institutional, and political capacity". Nevertheless, in respect of specific planning measures, in the main it is general 'sustainable cities activities' and Local Agenda 21, which are named (IPCC, 2001).

Few examples such as Bull-Kamanga et al (2003), Pelling (2003), Sanderson (2000), El-Masri et al (2002), GTZ (2001) and compilations such as Aysan et al (1992), IDNDR (1990) and the World Bank (2003) integrate social and technical concerns, thus linking the work that arises from disaster risk reduction, livelihoods and sustainable urban planning. In addition, there is a range of related 'grey' literature in the form of case studies and project reports from national organisations such as, for example, SEEDS[7] and DMI[8] in India, as well as La Red[9] in Latin America, and PeriPeri in Africa. However, little attention is given to the analysis of the gaps and linkages between planning and the occurrence of disasters, to their potential for risk reduction, or, indeed, to the professional perspective of planners.

General View of Interviewees

It is becoming more common to integrate an understanding of risk from disasters with risk from other hazards (Hardoy et al, 2001). However, the interviewees confirmed that planners show little attention to small-scale disasters, which result in an increasing number of victims each year, in comparison to that of large-scale disasters.[10] On the other hand, disaster people perceive urban planning only as an issue of land use zoning and of building regulations, without any relation to the concept of risk reducing measures; planning was further seen as an unhelpful tool in terms of tackling problems in low-income and informal settlements. Nevertheless, planners are beginning to recognize that urban scale vulnerabilities encompass much more than the sum of individual buildings and some elements of infrastructure (Bahrainy, 1998).

The interviewees stated directly and indirectly that many of the people working in risk reduction or planning issues are not fully aware of the interconnection between planning and the occurrence of natural disasters. This results in few initiatives being developed, which would integrate both fields (see section VI). Maskrey (UNDP-BCPR) explained that this situation has arisen as the result of little systematic research having been carried out on the issue as well as the general complexity of cities. In fact, the correlation between planning and disasters was principally only seen in the vulnerability of the urban poor, expressed in their current location and the quality of their housing. Haghebaert (ProVention Consortium) summarized: "In the end, whether you are vulnerable to disasters or not depends mainly on where you live, and in what type of house you live. These are key factors if you are a victim or not." Several interviewees saw this basic interconnection primarily in relation to earthquakes, and interpreted it as a one-way cause and effect relationship during the period of destruction, with the natural event being the cause, and the destruction of the urban environment being the effect. Davis (DMC) explained this limited perception by the fact that: "98% of people killed in earthquakes die in buildings – while this does not apply to any other hazard".

IV. The Interplay between Planning and Disasters

In order to study the interplay between planning and disasters, information gathered from the interviews and literature was systematised. In the first instance, the historical development of how the working field of planning interrelates with disasters is examined. Then, the factors that interconnect planning and the occurrence of disasters are analysed. *Figure 5* at the end of this section, summarizes the key aspects.

Historical Development

Although it was shown that planning is not commonly seen as related to disasters, Milbert (IUED) stated that: "looking at the history of cities, the correlation between urban planning and natural disasters is obvious".

Colonialism

Although the nature and character of urban settlements vary to a large extent throughout the different countries of the developing world, many share a history of colonialism, which has exerted a profound effect on the process of urbanisation. Several colonial settlements constitute a case of risk by origin, being exposed to storms, volcanic eruptions or earthquakes (Pelling, 2003; UNDP-BCPR, 2004). Primarily, economic factors were considered for site selection. In contrast to these planned settlements, more naturally grown cities seem to have developed in safer areas (e.g. Milbert, IUED). However, because of the manner in which settlements tend to grow and develop, they create their own hazards, which, in turn, can generate large-scale disasters. Currently, the problem in developing countries is that the planning and building codes are colonial legacies, or mostly imported standards, without much attention being given to local factors, and standards, which are based on quality instead of performance (e.g. Gavidia, UN-HABITAT).

Protective City Planning and Defensible Space

Historically one of the main functions of the city was to provide defence, not against disasters but against human threats from the outside (Kopomaa, 1999). Meurman (1947) coined the term 'protective city planning' for fire and air protection, suggesting the decentralisation and isolation of vulnerable facilities from the rest of the city. While for example Mumford (1938) offered a pessimistic perspective of urbanism, referring to the development of cities racked by war, famine and disease, the architectural Modern Movement saw itself as capable of improving the human conditions (Kopomaa, 1999). Since then, more inner-city, man-made threats have been considered, with a trend towards the increased protection of cities through physical means and electronic surveillance. In this context, the term 'defensible space' was created in the 1970s by Newman (1972). In parallel, 'nature ecology studies' and 'urban ecology' considered planning, which ensured the compatibility between urban planning and the natural environment (Moudon, 1992). However, the focus is mostly on the conservation of the environment and climatic design features.

Preventive Disaster Planning

There are also some exceptional examples of integrated, preventive, urban planning, based on the consideration of naturally triggered disasters. Milbert (IUED) stated that: "looking at the Western world, such as Scandinavia and Japan, the possibilities of urban planning, having created prevention for disasters, become obvious". In fact, in many developed countries improvements in methods of risk reduction, coupled with good planning, have greatly reduced the vulnerability and risk of the population (Velasquez et al, 1999). One case in hand is that of Ruoholahti, a district in Helsinki in Finland, which was planned so that the potential rise of the sea level caused by climate change was taken into account by, for example,

building on higher ground (Kopomaa, 1999). In Tokyo, 'disaster-proof urban planning' is promoted and regulations prescribe regular implementation of 'area vulnerability assessments' (Velasquez et al, 1999). An example from the developing world is Cuba, where national land-use planning and management are integrated into risk reduction considerations (UN-ISDR, 2002). In the case of a disaster, informal settlements are the first to be evacuated (Quevedo, 2002). However, Ruskulis (2002, p8) states that generally: "city-wide disaster mitigation planning rarely includes poor communities".

Influencing Factors of the Interplay

There has been a tendency to exclude nature from analysis (Allen et al, 1999). Consequently: "In urban areas, society is popularly perceived as being in control of a benign physical environment where temperature can be moderate, disease controlled, floodwaters channelled away and food easily accessed" (Pelling, 2003, p14). However, studies increasingly recognize disasters as one of the realities of city life (e.g. Green 1990 in Blaikie et al, 1994, p125). Some recent publications fully recognize urban disasters, pointing out that existing risk is magnified by urbanisation and the failure of adequate planning (e.g. UNDP-BCPR, 2004). Based on the reviews of interviews and documents, the aspects influencing the interplay between urban disasters and planning were analysed and are presented as follows:

Social Aspects: Segregation, Peoples' Priorities, and Health Problems
Due to the functioning of land and property markets in cities, and the inability of formal housing and planning sectors to cater for the priorities of the population (e.g. access to work opportunities), vulnerability expresses itself in the growth and development of illegal settlements in marginal high risk areas. In addition, segregation exists within settlements, with, for example, the poor living on the ground floors of houses, which are particularly vulnerable to flooding. In fact, housing and settlements are the physical expression of the socio-political and economic community processes (e.g. inequality, lack of opportunities and development) (Clarke, IDB).

In cities, a range of factors influence people's priorities resulting in low investment in planning security features, and, consequently, substantially increasing vulnerability. The importance of status results in the construction of modern looking houses in risk areas without technical safety features, or without the necessary resources and knowledge of traditional/rural coping strategies. Another factor is land pressure and tenure; if people fear that their house could be bulldozed by the authorities, they will not invest in security measures. Also landlords, developers and property holders seldom invest in security features. A good example is Santa Tecla in El Salvador, where the supreme court overrode a municipal order, and a developer was allowed to build a new settlement in a risk area that was later severely affected by landslides in 2001 (Rhyner, 2002).

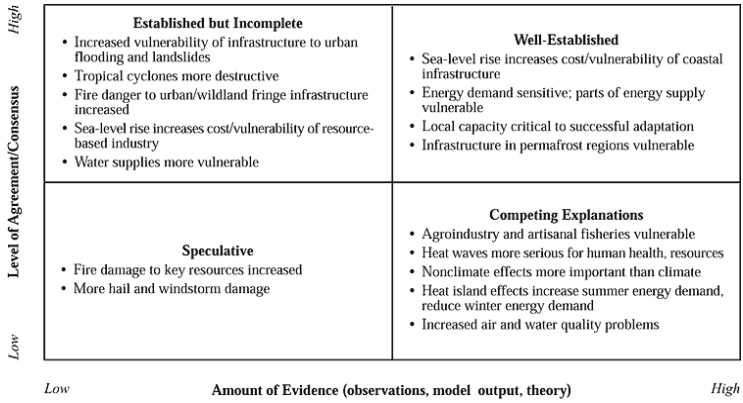
The interrelation between planning and disasters is especially evident in health-related issues and aspects. A study in Accra, Ghana, on environmental problems at household level for different types of residential areas, clearly demonstrates the correlation between poverty and ill-health, which, in turn, is caused by deficient housing and unsanitary neighbourhood environments (Sida, 2002), making people more vulnerable to disaster.

Environmental Aspects: Deterioration and Climate Change
General processes of urban expansion contribute towards increasing risk through environmental degradation, such as the transformation of the physical environment and the overexploitation of natural assets in formal and informal areas (e.g. Hardoy et al, 2001; UNDP-BCPR, 2004). Deforestation and the colonisation of garbage landfills occur frequently. The degradation and deterioration process is fostered by the inadequate use of

infrastructure in low-income settlements, such as inadequate waste disposal, in part from wealthy neighbourhoods, the blocking of drainage systems, causing flooding, illegal electrical connections provoking fire, and inadequate water disposal causing construction instabilities (e.g. Chardon, 2002).

Climate change cannot only increase the frequency and severity of natural hazards resulting in the urban poor being more exposed to risks, but it can also increase the number of immigrants from rural areas, who might be affected by decreased agricultural productivity, rural disasters, etc. The major effects of climate change on human settlements are shown in *figure 4*. These are related to flooding, landslide, and fire, driven by increased rainfall intensity, a rise in sea-level and heat waves (IPCC, 2001).

Figure 4: Impacts of climate change on human settlements, categorized by state of scientific knowledge



Source: IPCC (2001, p383).

Demographic Aspects: Population Growth and Migration

Growing urbanisation creates new challenges for planning as the population is living increasingly closer to hazards, and urban areas generate increasingly higher concentrations (e.g. of people, social networks, buildings and infrastructure), including the central state government and the financial centres of economic life. This concentration generates vulnerabilities as its disruption easily creates disasters. Rural-urban migration is created by the perception that in urban areas people have better opportunities for social and economic development (e.g. Gavidia, UN-HABITAT). In this context, vulnerability is exacerbated by structural forces related to the globalisation of economies. The way multinational corporations operate, and the ease with which capital moves and relocates, creates a competition and, what could be described as a global bidding process between cities, to attract investment. However, such competition is characterised by being a down-bidding process; a down-bidding process, in terms of which cities can lower, or totally turn a blind eye to the environmental regulations, which provide higher tax incentives or tax holidays, more profit repatriation, and, most of all, do not insist on the stringent insurance of worker and assets, etc. (e.g. Hamza, IC).

Economic Aspects: Informal Sector and Economic Growth

With urbanisation, people become increasingly dependent on infrastructure. Economic activities are incrementally related to housing of the poor, which provides space for income

generation through labour opportunities and room rental. Housing ownership is by far the most important productive asset of the urban poor (Moser, 1998). In 2001, in the most earthquake affected area in El Salvador, one fifth of all houses accommodated a small business (Lazarte, ILO). However, Moser (1998) notes that compared to rural areas, the importance of the house and its plot, as productive assets for the urban poor, have received far less attention.

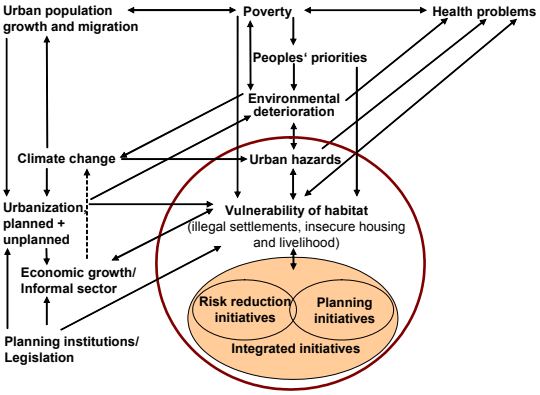
This situation is not a one-way correlation with the destruction of houses destroying many low-income jobs. Economic activities, by themselves, along with related constructive changes, can increase disaster risk. One of the most serious damages in Algeria happened when a ten-floor building collapsed totally in the earthquake, because a bakery on the first floor had created public access by removing a supporting wall; 400 people died (Lazarte, ILO). The local production of dangerous artefacts such as fireworks or dangerous production processes (e.g. use of open fire) are other examples, which can increase vulnerability and risk.

Another link between planning, economic activities and disasters is the fact that in the poor urban areas of developing countries, construction is mainly an activity of the informal sector, which has major economic importance (Sida, 2002). The construction industry focuses on higher profit sectors and offers a limited social responsibility (e.g. Gavidia, UN-HABITAT). Furthermore, on the one hand, corruption within the building industry, together with non-compliance to building codes, can create vulnerabilities throughout the whole construction process (e.g. Molin Valdes, UN-ISDR). On the other hand, the construction sector constitutes a good potential for decreasing vulnerabilities at the local level. This is due to the fact that: "construction and its related trades usually have a low content of imported goods and employ a lot of semi-skilled or unskilled people" (Sida, 2002, p44).

Institutional Aspects: Planning Institutions and Legislation

Centralized and separate disaster and planning institutions and inadequate enforcement schemes can create vulnerabilities. Inappropriate planning legislation can exacerbate the vulnerability of the urban poor through the enforcement of inadequate standards or the general disregard of informal and low-income settlements (Ruskulis, 2002). An example of increasing vulnerability as a result of legislation can be demonstrated by a study of disaster risk in Zambia (Charvériat, 2000). Since widows are denied any claim on household possessions following the death of their spouse, female-headed households become much more vulnerable.

Figure 5: The complex interplay between planning and the occurrence of disasters showing the potential of integrated risk reduction and planning initiatives



Note: The research focus is highlighted.

In summary, the urban poor are caught in a complexity of factors that aggravates their poverty, with the occurrence of disasters rather intensifying, than equalising, the differences of status and the patterns of social inequality.

V. Increasing Vulnerability through Developmental Planning Initiatives

Section IV demonstrated that there is a really interesting mixture of factors completely intermingled with buildings and planning, and yet: "it is no-one's problem to do the intermingling, and no-one is responsible" (Davis, DMC). The disregard of the correlation between planning and the occurrence of disasters on the part of international and also national stakeholders, together with: "the erroneous assumption that pro-poor development automatically reduces risk" (Tearfund, 2003, p6), can result in actually increasing risks. Development, in itself, is a cause of disasters (Wijkman et al, 1984), whilst disasters in their turn, place development at risk.

The livelihoods approach adopted by many development specialists and generally favoured by aid agencies and donors alike is insufficient as: "some key mitigation requirements are not usually related to livelihood protection. For example, making dwellings safe against hazard impact may not have a direct impact on livelihoods, but this does not negate the strategic life-preserving importance of such action" (Tearfund, 2003, p20).

Examples of how vulnerability can be increased through developmental planning initiatives are presented as follows:

Reconstruction and Resettlement

Increasing risk can be simply demonstrated by post-disaster initiatives that reconstruct or repair houses, settlements, services, and infrastructure in hazard-prone areas. The reason behind this is the fact that there is an inherent problem in recovery programmes; most initiatives aim at returning communities to 'normality' as quickly as possible. This ignores the fact that such 'normality' could be the condition of vulnerability that allows a hazard to become a major disaster in the first place (e.g. Hamza, IC). Reconstruction of buildings or infrastructure in the same vulnerable location reproduces not only the problem and risk, but it can also create increased and additional risks (e.g. Rhyner, 2002). This is the case when, for example, light structures on flood plains are replaced by permanent structures, thus producing more damage in communities, whereas seasonal evacuation may have been a better solution. Additional risks are also created when initiatives ignore the changes in the physical landscape following a disaster, reconstructing a 'better' house that is adapted to the former landscape (e.g. ignoring a change of the course of a river, or changed soil conditions).

An example of the consequence of the disregard of the interconnection between the sectors of planning and construction, in respect of social and economic aspects, is the reconstruction in Mozambique after the floods in 2000. A large sum of money was approved by donors to contract companies from South Africa, who arrived in Mozambique bringing equipment, technicians and even, in some cases, unskilled workers. Four hundred million dollars were invested and the whole economic benefit was exported to South Africa (Lazarte, ILO).

Vulnerability can also be increased by resettlement initiatives (Blaikie et al, 1994). Several interviewees stated that whenever programmes tried to reduce vulnerability by re-locating people to theoretically safer locations, they ended up destroying their livelihoods.

New Urban Developments and Structural Adjustment

Not only post-disaster, but also pre-disaster initiatives, can increase the vulnerability of the urban poor. Inadequate developmental planning initiatives can actually cause disaster risk, as structures such as bridges or schools, destroyed by disasters, were in part the result of development initiatives (e.g. Maskrey, UNDP-BCPR).

Most international agencies accept local building standards for the majority of structures, but find it often difficult to promote codes, as this would create additional costs, thereby rendering human settlement planning and improvement initiatives unreachable for the urban poor (Stein, Sida). In addition, within developmental initiatives, environmental impact assessment (EIA) and hazard impact analysis are seldom carried out in respect of urban developments (e.g. Manock, IC). In countries where EIA is legally binding, problems with non-compliance, especially with the housing and infrastructure ministries, are common (e.g. Egypt (El-sheikh, Urban Training and Studies Institute)). Rowell (CARE) mentioned an example from Delhi, where the disregard for environmental analyses resulted in the construction of a road through the final remaining watershed outlet for the monsoon rains, leading to the destruction of a whole community during the rainy season.

Income and employment generating planning initiatives can also increase the vulnerability of the urban poor. Examples are industrial development in high risk areas increasing the vulnerability of the surrounding residential areas, as well as large-scale infrastructure works, forcing tens of thousands of people to move to risk areas where they can hardly make a living (e.g. Haghebaert, ProVention Consortium). Another example within the informal sector, is the idea of trying to ‘deal’ with this sector by 'formalising' it, thus imposing regulations that make it impossible for its inhabitants to make a living, since formalisation deprives them of their comparative advantage (e.g. Hamdi, CENDEP).

Further, Hamza et al (1998) argues that structural adjustment processes that were introduced by the World Bank and the IMF[11] in the 1980s and 1990s increased vulnerability. With structural adjustment, investment in urban planning ceased and the size of planning ministries or units were reduced, or they disappeared completely. As decentralization in the developing world took place many times without resource-decentralization, planning functions were decentralized to municipalities, without having technical or financial resources (e.g. Molin Valdes, UN-ISDR). The net result has been an erosion of living standards in urban areas (Hamza et al, 1998). An example of this is Jamaica after hurricane Gilbert 1988, where the planning and housing sectors were blamed for the losses, partly because of structural adjustment policies that resulted in the poor maintenance of rental property and non-compliance with building regulations (Ford 1987 in Blaikie et al, 1994).

VI. Lack of Integrated Risk Reduction Initiatives

The lack of integrated risk reduction initiatives can be summarized with the words of Hamza (IC): “There is a huge gap between what is actually happening today and what should happen”. Reasons for this lack are, for example, the competing and decreasing interests of international stakeholders in combining risk reduction and planning, as well as a lack of knowledge regarding the possibilities of integration. This results in the development of initiatives that adopt a deficient approach, with only partial integration.

Competing Interests

Whilst the interviews revealed a strong interest from international stakeholders in the post-crisis and post-disaster scenario, in putting more effort into developing closer linkages between emergency and reconstruction programming, relatively little concern and minimal concrete action could be identified regarding the pre-disaster scenario and the integration of risk reduction into developmental initiatives. However, the old view of disasters as 'one-of' events was replaced by an awareness that development processes can influence the impact of disasters (Twigg et al, 2002), resulting in the creation of a range of disaster management units and the expansion of aid agency capacity to deal with risk reduction (e.g. Twigg, Benfield Hazard Centre).

Within the identified initiatives, the interviewees confirmed that the focus is mainly on the rural context. Within the few risk reduction initiatives, the housing and planning sectors generally inspired little interest and were repeatedly described as a 'nightmare' and a 'bad experience'.

Decreasing Interests

With few exceptions, the interviewees agreed that the interest in integrating planning aspects and risk reduction is not only very limited, but has also decreased during the last decade. During the 1970s and 1980s, earthquakes were the most prominent disasters, with planners focussing on related physical issues (Aysan, UNDP-BCPR). Since then, the definition of the term 'disaster' has significantly broadened. Instead of including additional factors to develop new and more integrated measures, several interviewees stated that physical planning measures have lost relevance and disappeared from the risk reduction agenda. Currently, Asia seems to be the most active area, and there is a decrease of interest in Latin America. The latter is probably because there have been less urban disasters in the region than during the 1970s and 80s. The other possible factor could be the cessation of international funding in several countries which returned to democracy, where many people working for NGOs have moved into government organisations (Satterthwaite, IIED).

Deficient Approach

The few existing risk reduction initiatives that are related to planning were criticised by many interviewees, since they often have a deficient approach (e.g. lack of community-participation; missing vertical links between the community, the municipal and the national level; missing links between large and small-scale measures, as well as between physical/structural, socio-political and environmental measures). The focus is on refining specific issues that, because of the afore-mentioned criticism, often does not get translated into long-term improvements.

Existing internationally promoted initiatives can be put into three groups: Firstly, cutting across all types of organisations, there are the 'stand-alone' structural measures, which aim to increase the safety of public buildings and services, such as schools and hospitals, within the formal sector. Secondly, there are those initiatives that work on large-scale disasters, mostly together with national agencies, by using technological measures, such as early warning systems and geographical information system databases and maps. Thirdly, there are the community-focused initiatives that partly include small-scale planning measures, targeting everyday hazards, by connecting health and socio-environmental issues.

VII. Integrated Risk Reduction Initiatives

Those interviewed had limited knowledge about integrated initiatives and stakeholders which indicates a lack of such initiatives, and could also point to weak networking within the community working with disaster, development and planning.[12]

Integrated Initiatives

Interviewees stated repeatedly that existing integrated initiatives of international stakeholders are often only implemented because of the personal interests of programme managers or the informal relations between people working in planning and disaster units, not because of institutional legislation or mandates. This supports Twigg et al (2002, p473) who point out that: "well-placed individuals can push significant [risk reduction] innovations through".

Only three initiatives were named frequently by the interviewees as having a more integral approach regarding planning and risk reduction: 1) Manizales in Colombia, 2) the CARE project 'Mainstreaming mitigation to reduce urban poverty', and 3) the United Nations Risk Assessment Tools for Diagnosis of Urban Areas Against Seismic Disasters (RADIUS).

In a recent publication, Manizales, an initiative that is among others supported by IDB, was called: 'the world leader in disaster prevention and planning' (Quesada, 2004). One of its main strengths is its community-based approach and the strong coalition between the municipality, universities (including the faculty of architecture and engineering), and the private sector. This helped to set up a municipal disaster prevention system based on municipal development and land use plans, incorporating disaster prevention as a strategic and political cornerstone (Quesada, 2004; Velásquez, 1998).

The CARE project started in the year 2000 and was completed at the end of 2003.[13] It promoted activities for the reduction of risks in three urban locations in Nepal and India. Its approach is also inter-institutional (including CENDEP at the Oxford Brookes School of Architecture) and community-based, focusing on urban improvement on a very small scale (Hamdi, CENDEP), as well as general urban governance processes (Rowell, CARE).

RADIUS was initiated in 1996, linking different stakeholders, and working in nine cities to develop earthquake risk assessment methods. Post-project evaluations provided action plans for urban development, land use planning and the updating of official disaster management structures.[14] Despite repeated positive naming of this initiative, critical comments were that it has too strong a structural focus, and a lack of broader linkages.

International Stakeholders

Besides the three initiatives mentioned above, some interviewees pointed out agencies, which partly work with both risk reduction and planning. Those most frequently mentioned were analysed in order to filter out the few existing activities, which integrate to some extent planning and risk reduction.

IFRC/RC was generally seen as the main stakeholder within the field of preparedness. However, it does not have a systematic approach towards planning in general (Oelreich, IFRC/RC). Its community-planning activities include the establishment of risk maps, the construction of emergency housing and small-scale risk reduction measures, such as raised embankments, etc.

Almost all interviewees mentioned UNDP, although it does not particularly focus on planning (Maskrey, UNDP-BCPR). Currently, UNDP-BCPR, together with IIED and the ProVention Consortium, have implemented an initiative named 'Urbanisation, Environment and Disaster

Risk Management in Africa'. It aims to integrate risk reduction into urban development planning through supporting the activities of the established African Urban Risk Analysis Network (AURAN) (ProVention Consortium 2004).

UN-HABITAT was acknowledged to be the mandated organisation for urban issues, including urban risk reduction. In 2002, together with UN-ISDR and MINURVI[15], a regional consultation in the Caribbean was carried out, leading to the formulation of a programme named 'Strengthening Capacities in Local Risk Management for Urban Development in the Spanish-speaking Caribbean Basin'. Activities will probably commence towards the end of 2004 (Gavidia, UN-HABITAT). Apart from the aforementioned programme, UN-HABITAT was criticised on account of its limited initiatives on the subject.

UN-ISDR was mentioned as an important advocate, influencing agencies working in disaster related areas. Their publication 'Living with risk' has a special section on land use planning (UN-ISDR, 2002, p221). Within the edition from 2004, another section deals with safe building constructions (UN-ISDR, 2004, p323).

The World Bank was named as having linkages with both planning and disaster management. The World Bank's Hazard Management Unit (HMU), in the 'Transport and Urban Development Department', was established in 1998. In 2002, the Bank organised a meeting together with the ProVention Consortium on: 'The future of Disaster Risk: Building Safer Cities' (World Bank, 2003). Cities Alliance, established in 1999 with initial support from the World Bank, UN-HABITAT and others, has, so far, only supported one initiative (out of 107) in Mozambique, with a primary focus on risk reduction (Milroy, Cities Alliance).

IDB has been engaged in Central America since the early 2000s. Based on its action plan (IDB, 2000), risk reduction components are integrated with planning initiatives. In addition to this, IDB recently elaborated a risk assessment checklist as a tool for integrating risk reduction into its development work. For this purpose, ten developmental sectors were selected, including one for housing, and one for water and sanitation (Keipi, IDB).[16]

Sida was mentioned as a bilateral agency that is especially engaged in urban planning issues. The agency supports municipalities in the process of learning how to carry out planning with communities, thereby introducing some aspects of risk reduction (Stein, Sida). Some interviewees referred to ITDG and its engagement in risk reduction in Peru.

National and Regional Stakeholders

Finally, some interviewees named national and regional organisations such as DMI and SEEDS (together with UNCRD[17]) and its urban projects in Nepal, as well as ADPC[18]. The AUDMP-programme[19] of ADPC is designed to respond to the need for safer cities in Asia, and is aimed at reducing the disaster vulnerability of urban areas, including the infrastructure, critical facilities, and shelter. La RED was mentioned as one of the most important regional networks.

VIII. Conclusions

This paper has focussed on looking at the interface between the built and the related socio-economic and environmental components. It has demonstrated how urban planning and the occurrence of disasters interact. In fact, the outcomes of decisions about planning, low-income housing and related socio-economic activities are not only affected by disasters, but can also have a direct influence on creating new ones. With growing urbanisation and climate change, this interplay is becoming increasingly important.

The analysis demonstrates the need, as well as the potential, to address the interplay between planning and disasters by combining risk reduction and planning initiatives, in order to reduce disaster risk in hazard-prone areas (see *figure 5*). Nevertheless, the analysis revealed that, firstly, internationally promoted initiatives in the field of risk reduction do not seem to actively integrate issues related to planning. Secondly, development agencies, whose focus is planning, seem to mostly overlook the occurrence of disasters in their initiatives. This omission can not only cause the further deterioration of the living conditions of the urban poor, but such neglect can also increase their vulnerability.

International planning initiatives should include an explicit component, which aims to reduce vulnerability. In fact, risk reduction has to be actively integrated and a constant, ongoing commitment to active collaboration between communities and stakeholders working in disaster-related issues and planning has to be achieved. This does not mean to overstate the role of planning, but to emphasise its current, somewhat marginal role, and the need to change current practices and concepts in order to improve its out-moded performance, as well as to promote its risk reduction potential, especially in terms of addressing the issues of informal settlements. Based on this outcome, ways how risk reduction can be mainstreamed within the fields of urban planning and governance have to be discussed.[20]

IX. Acknowledgements

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Notes

[1] Important definitions used in this paper:
The term *disaster* is used as a generic term for large and small-scale disasters as well as everyday hazards that have a natural trigger. *Disaster risk* is composed of three factors: hazard, vulnerability and response capacity. The impact of hazards is profoundly influenced by the extent of people's vulnerability.
Risk reduction involves measures designed to avoid (prevention) or limit (mitigation and preparedness) the impacts of disasters.
The term (*urban) planning* includes the provision of housing, infrastructure and basic services. Planning is the "public forethought and conscious involvement preceding the pursuit of community-determined action, achieving social goals for the common good in both the public and private domain" (Riddell, 2004, pXV). It "includes the way places work and matters such as community safety, as well as how they look. It concerns the connections between people and places, movement and urban form, nature and the built fabric, and the processes for ensuring successful villages, towns and cities" (DETR, 2000, p8).

2 Citations and comments that are based on interviews are indicated with the name of the interviewee and their organisational affiliation.

3 In cities disasters can cause the greatest damage (Velasquez et al, 1999), and the majority of the most destructive disasters since 1990 have occurred in or near urbanized areas (Ruskulis, 2002).

4 The interviewees were independent international consultants (IC) and representatives of: Benfield Hazard Research Centre (UK), CARE International (UK), Centre for Development

& Emergency Practice (CENDEP, Oxford School of Architecture, UK), Cities Alliance (USA), Cranfield Disaster Management Centre (DMC, UK), Department for International Development (DFID, UK), Development Planning Unit (DPU, University College London, UK), German Association for Technical Cooperation (GTZ, Germany), Graduate Institute of Development Studies (IUED, Switzerland), Inter-American Development Bank (IDB, USA), Intermediate Technology Development Group (ITDG, UK), International Federation of the Red Cross/ Red Crescent (IFRC/RC, Switzerland), International Institute for Disaster Risk Management (IDRM, Philippines), International Institute for Environment and Development (IIED, UK), International Labour Organisation (ILO, Switzerland), King's College (UK), Oxfam International (UK), Pan American Health Organisation (PAHO, USA), Post-war Reconstruction and Development Unit, York (PRDU, UK), ProVention Consortium (Switzerland), Swedish International Development Cooperation Agency (Sida, Sweden), Tearfund (UK), United Institute of Development Studies (IDEA, Colombia), United Nations Development Programme, Bureau for Crisis Prevention and Recovery (UNDP-BCPR, Switzerland), United Nations Human Settlements Programme (UN-HABITAT, Switzerland and Brazil), United Nations International Strategy for Disaster Reduction (UN-ISDR, Switzerland), United Nations Office for Project Services (UNOPS, Switzerland), United States Agency for International Development (USAID, USA), World Bank (USA), and WSP International Management Consulting Ltd (UK). The interviews, as well as visits of implemented initiatives were carried out between November 2003 and September 2004.

5 The study differentiates between people working in the field of development (*development people*) and in the field of disasters (*disaster people*). Urban specialists form part of the development people; in turn, planners form part of the urban specialists. The term *planner* will be used as an umbrella term for experts of physical applied science, including architects, urban planners and engineers.

6 Blaikie et al (1994) has a broader view, analysing how to address root causes, how to reduce pressures, and how to achieve safe conditions.

7 The Sustainable Environment and Ecological Development Society.

8 Disaster Mitigation Institute.

9 The social studies network of prevention of disaster.

10 Website LA RED: www.desinventar.org/ (retrieved 01.04.2004).

11 International Monetary Fund.

[12] For example, the Healthy Cities Programme of the World Health Organisation, as well as LACDE (Local Authorities Confronting Disasters and Emergencies) mentioned in Twigg (2004, p245) under: 'International initiatives in urban risk reduction', were not mentioned.

13 The project was funded by DFID and is currently in the process of systematisation in order to analyse its strengths and weaknesses (Twigg, Benfield Hazard Research Centre), www.careusa.org/careswork/projects/IND149.asp# (retrieved 01.06.2004).

14 www.geohaz.org/radius/ (retrieved the 01.05.2004).

15 Regional Assembly of Ministers and High-Level Authorities of Housing and Urbanism in Latin America and the Caribbean.

16 Up to now, only a general checklist for all sectors has been drawn up.

17 United Nations Centre for Regional Development.

18 Asian Disaster Preparedness Center.

19 Asian Urban Disaster Mitigation Programme.

20 Another paper by the author discusses this topic.

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II

Paper II	
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Mainstreaming risk reduction in urban planning and housing: a challenge for international aid organisations

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The effects of 'natural' disasters in cities can be worse than in other environments, with poor and marginalised urban communities in the developing world being most at risk. To avoid post-disaster destruction and the forced eviction of these communities, proactive and preventive urban planning, including housing, is required. This paper examines current perceptions and practices within international aid organisations regarding the existing and potential roles of urban planning as a tool for reducing disaster risk. It reveals that urban planning confronts many of the generic challenges to mainstreaming risk reduction in development planning. However, it faces additional barriers. The main reasons for the identified lack of integration of urban planning and risk reduction are, first, the marginal position of both fields within international aid organisations, and second, an incompatibility between the respective professional disciplines. To achieve better integration, a conceptual shift from conventional to non-traditional urban planning is proposed. This paper suggests related operative measures and initiatives to achieve this change.

Keywords: developing countries, disaster, housing, prevention, risk reduction, urban planning

I. Introduction

The need to work on disaster risk has tended to 'fall between the cracks' of the grander frameworks of development cooperation and emergency relief (Christoplos, Mitchell and Liljelund, 2001, p. 185). Yet, Benson and Twigg (2004) confirm that recently there has been a convergence of the previously separate discourses on development and disasters around the linked themes of vulnerability, social protection and livelihoods. While the mainstreaming of risk reduction is becoming increasingly recognised as a key challenge for development, very little work has been undertaken to date to identify *how* this could be done (Tearfund, 2005).[1]

The absence of integrated *urban* risk reduction is a subgroup of the failure to mainstream risk reduction in development cooperation. Urban risks play a significant role in Latin America and Asia where a high percentage of the population already lives in cities, as well as in Africa, the continent with the world's fastest rising urban growth rate. According to Pelling (2003b, p. vii), 'urbanisation looks set to be one of the most forceful drivers for and contexts of social change that will prefigure disaster risk in the medium and long term'. Furthermore, 'urbanization affects disasters just as profoundly as disasters can affect urbanization' (Pelling, 2003a, p. 7). In large part, this is because

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urban growth, whether planned or unplanned, seldom occurs to reduce disaster risk. In response to this fact, the Hyogo Framework for Action 2005–2015 urges that disaster risk should be addressed in urban planning, along with other technical matters, such as housing. It calls on governments to:

> *Mainstream disaster risk considerations into planning procedures for major infrastructure projects, including the criteria for design, approval and implementation of such projects and considerations based on social, economic and environmental impact assessments. (To) develop, upgrade and encourage the use of guidelines and monitoring tools for the reduction of disaster risk in the context of land-use policy and planning. […] (To) encourage the revision of existing, or the development of new building codes, standards, rehabilitation and reconstruction practices at the national or local levels […] particularly in informal and marginal human settlements […]* (Section 4, paragraph 19(iii), p. 12).[2]

However, little research has been done on *how* risk reduction can be effectively mainstreamed in the *developmental sectors of urban planning and housing*.[3] While purely structural (physical) risk reduction initiatives, such as conventional and traditional engineering or planning, which can easily create false security, are decreasingly seen as *the* solution, few alternative strategies are being developed to replace them.[4]

Against this background, this paper tackles the following question: if an appropriate, secure, urban environment is the aim, what prevents us from achieving it, and how can risk reduction be integrated in a more holistic and comprehensive way into urban planning, as well as into building capacities? The impact of past disasters and their related experiences should influence the way urban planning is being handled today, in order to promote a process that will enable decision-makers and urban poor populations—those most affected by disasters (see, for example, Wisner et al., 2004; IDNDR, 1990)—to avoid creating structures and environments that may lead to future disasters.

This paper is based on a previous study by Wamsler (2004), which illustrated how urban planning and the occurrence of disasters interact. This study further identified a lack of integration between the working fields of risk reduction and urban planning, which results in international aid organisations contributing to the increased vulnerability of the urban poor in the following two ways:

- actively, through existing projects and programmes, which focus only on urban planning or risk reduction; and
- passively, through the failure to develop projects and programmes that incorporate both fields.

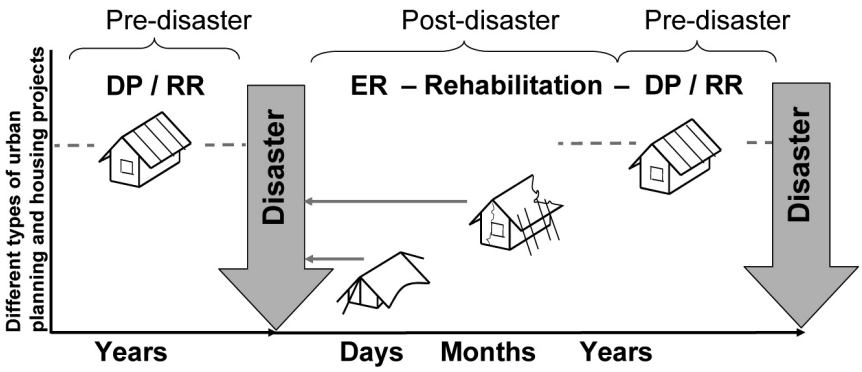
Based on these outcomes, the present paper analyses the *underlying reasons* for the lack of integration of these two fields, and presents planning measures that international aid organisations could apply to reduce urban risk. Although the focus is on the international level and the perceptions, practices and potentialities of related organisations vis-à-vis risk reduction and urban planning, national development bodies can also implement the resultant identified initiatives.

II. Methodology and outline

Risk reduction can be implemented and is essential before, during and after disasters, yet the term as used in this paper pertains only to prevention, mitigation and preparedness measures in a developmental, pre-disaster context (see Figure 1). This was necessary to limit the scope of the research, and to concentrate on the most neglected areas of advocacy, funding and knowledge of potential risk reduction measures.

The methodology of the presented research is qualitative, since it aims to understand the underlying reasons for an existing situation, to provide insight into the setting and circumstances of existing problems, and finally to generate possible ideas for solutions and recommendations that, a priori, could not be foreseen. The study was mainly carried out between November 2003 and August 2004. It is based on reviews of project documents and technical literature on urban planning and risk reduction, as well as on individual interviews with a total of 61 programme and project managers, operational or academic staff from 31 multilateral and bilateral aid agencies, governmental organisations and non-governmental organisations (NGOs), including developmental or financial institutions, consultancies and research establishments working at the international level.[5] Research trips were made to: Geneva, Switzerland; Stockholm, Sweden; Washington, DC, US; Rio de Janeiro, Brazil; and various locations in the UK.[6] The respondents were selected in a balanced way: 24 interviewees had a disasters background; 24 an urban planning background; and 13 a general developmental background. The majority of individuals with a disasters background have worked in relief organisations or the relief divisions of development organisations. The author was frequently guided towards relief specialists as appropriate risk reduction contacts, while interviewees in sector development divisions and/or those with an urban planning background were initially generally hesitant about discussing natural disaster issues.

Figure 1 Research focus: pre-disaster projects in the field of urban planning—one subset of development planning—and risk reduction



Note: DP = development planning; RR = risk reduction; and ER = emergency relief.
Source: Wamsler, 2002.

This is indicative of the primary problem identified by the research: the lack of integration of risk reduction and urban planning.

All interviews were recorded, transcribed and analysed by filtering out recurrent themes and patterns.[7] Citations and comments made in interviews and presented in the paper were selected as exemplary and representative with regard to recurrent and specific themes, and were all confirmed by the interviewees. The surname of one representative interviewee and his/her organisational affiliation accompany them in the paper.

Complementary studies were carried out in Colombia and El Salvador during 2004–05, to compare and supplement the findings at the international level with those at the national and local level. The additional data permitted verification and validation, as well as complementation of the outcomes of this study with national and local perspectives.[8]

Sections III–V of the paper are based on data obtained through interviews and literature reviews. The generic challenges of mainstreaming risk reduction in development planning are discussed, and—within this framework of development planning—additional and specific barriers to the mainstreaming process in the realm of urban planning demonstrated. Sections VI–X present a new conceptual framework for viewing and considering the mainstreaming of risk reduction in urban planning.

III. The gap between 'disaster people' and urban planners

The study differentiates between people working in the field of development ('development people') and those employed in the area of disasters ('disaster people').[9] Urban specialists form part of the group of development people, and in turn, urban planners make up part of the group of urban specialists (see Figure 2). The disaster people category includes mainly those working in the sphere of disaster emergency relief and on 'longer-term' preparedness.

The interviews revealed a lacuna or incompatibility between these different professional groups and disciplines, which in fact should share responsibility for risk reduction. Those professionals coming from very different educational backgrounds lack the appropriate knowledge and adequate institutional structures required to support most effectively their contribution to risk reduction and to coordinate their efforts. Literature confirms that 'this broad spectrum, whilst being a strength in the multi-faced push to reduce disaster risk at all levels and across all sectors, simultaneously adds to the confusion regarding whose responsibility it currently is' (Tearfund, 2003, p. 22).

The interviews exposed particularly strong discrepancies between, on the one hand, the concerns of urban planners and disaster people, and on the other, the concerns of urban planners and other development people. The underlying reasons for this are examined below.

Historical separation

Discussions about disasters have traditionally taken place in the emergency relief arena, resulting in an institutional and cultural division and even tension between

disaster and development departments. Twigg and Steiner (2002), for instance, corroborate this with regard to NGOs. Consequently, development people often do not perceive risk reduction as their sphere of activity. In addition, because specialised development units and activities in the urban planning sphere are rare, and frequently of low priority, urban planners working within international aid organisations tend to have a particularly weak sense of ownership of risk reduction.

Interviewees with a disaster background stated that urban planners usually associate disasters only with the fire brigade and the Red Cross, because the subject of risk reduction is not properly integrated into their curricula. This situation is continuing to deteriorate along with the developing trend of converting architecture and planning schools into art and design houses, which have not incorporated social content into their syllabi (Davis, DMC). Thus, risk reduction is often not well developed in urban planning practice. This state of affairs is further exacerbated by the fact that urban planners themselves have little experience of immediate post-disaster work, as compared to other professionals (Keipi, IDB). In fact, disaster response team members and relief professionals generally organise the construction of (temporary) housing and settlements following a disaster, neither of whom necessarily have an urban planning background.

In conclusion, the historical separation and related lack of education and experience on the part of urban planners in the field of risk reduction result in disaster people perceiving the planning sector as one of the most difficult development sectors with which to work, since knowledgeable and experienced experts are uncommon. In their defence, urban planners argue that, due to a series of political, institutional and financial constraints, those planners who do have specific knowledge of risk reduction are often unable to have this translated into practice (Gavidia, UN-HABITAT). These constraints are further explored later in the paper.

Working priorities, concepts, terminologies and tools

The historical separation results in the use of different working priorities, concepts and terminologies that further foster the gulf between the different professionals. Several cases in point are described below.

The interviews and literature, such as Bull-Kamanga et al. (2003), reveal that development people focus more on life, health or livelihood threatening everyday hazards, while disaster people look at life threatening situations of occasional large-scale disasters. Furthermore, disaster people use concepts and terms like 'risk', 'mitigation', 'preparedness' and 'prevention', whereas development people tend to employ terminology like 'security' and 'security measures'.

Although the concept of sustainable livelihoods has the potential to bring together disaster and development people (Christoplos, Mitchell and Liljelund, 2001), the interviews revealed that, in general, disaster people do not apply this concept. In contrast, development people coming from a social science background have a propensity to 'overlook' the built environment as a livelihood asset. Actually, interviewees repeatedly stated that compared to 'livelihood aspects', urban planning and housing are not important.

This ignores the fact that, for instance, housing is an important physical, social and financial asset (Hamdi, CENDEP). Surprisingly, even though urban planners are an inherent part of the body of development people, the interviews indicated that they are, ordinarily, much less familiar with the livelihood concept. This also relates to the fact that urban planners often do not perceive non-structural activities, as well as small-scale risk reduction measures (for instance, the tying down of roofs with ropes), as part of their work, thus impeding the development of mutual understanding with other development people (see Figure 2).

Compared to development people, furthermore, urban planners conceded that they are usually less familiar with environmental aspects and, consequently, with the Environmental Impact Assessment (EIA), a tool for predicting and evaluating the environmental ramifications of planned activities, generally demanded by donors for any planned improvement or new development. In reality, urban planners are still far from carrying out and understanding an EIA or even working with the people who conduct this type of assessment (Hamza, IC).

The distinctiveness of humanitarian priorities—to protect life and reduce excessive human suffering—together with the concepts of 'neutrality' and 'impartiality' followed by disaster people create further conflict, as this group of professionals considers development projects to be of a more political nature (Schaar, Sida).[10] Additionally, while there is a diverse range of working approaches within each sector, disaster people (apart from those working for NGOs) and urban planners are criticised for their tendency to adopt a more centralised and top-down approach, which adheres to pre-defined institutional structures and practices. Conversely, development people (excluding urban planners) are inclined to think more from the bottom-up, with a vision of decentralisation, depending on the possibilities provided by institutional and regulatory frameworks.

The different counterparts and networks used by urban planners to implement projects, together with related working approaches, also create conflicts between them and disaster and development people (Doyle, IDB). Development people in particular, who tend to work more directly with the beneficiaries, view sceptically cooperation between urban planners and the private sector established to provide housing, infrastructure and services.

Competition

The interviews revealed that the partly existing interest of urban planners in a more holistic working approach clashes with the one of other stakeholders involved in risk reduction who have varying political, economic and social backgrounds (Pelling, EDRG, King's College London). In fact, competition for funds and influence was mentioned repeatedly during the course of the research. Interviewees tended to be territorial and sectoral within every working field and discipline, attempting to claim the whole sphere as their own. Interest in developing more integrated, interdisciplinary risk reduction projects is further limited by donors' separate budget lines for development and emergency relief, with these structures actually reinforcing the gap between the professional disciplines.

Competition regularly took the form of scepticism about the tools and capacities of other fields. The urban planners' developmental approach is frequently perceived as a proven failure: disaster and development people criticised urban planning as being a purely structural and formal tool, often related to expensive large-scale engineering measures, that does not have any relevance to sustainable risk reduction. Moreover, urban planners are perceived as particularly concerned with design or profit-oriented issues, thereby ignoring risk reduction aspects (for instance, being preoccupied with the ratio of the circulation area to the area served, leading to the use of space-saving staircases, while ignoring its basic function of risk reduction: to provide core strength). Scepticism regarding planners is also based on negative experiences of cooperation, during which urban planners—following the old/traditional principles of planning—were viewed as a problem and not as a solution (Satterthwaite, IIED). In contrast, urban planners criticise the very limited impact of 'soft' risk reduction measures (such as awareness raising and training) implemented by the other professionals. Disaster people themselves partly support this criticism (Bastable, Oxfam).

Legal/institutional structures

The lacunae between professionals with an urban planning, development and disaster background can be demonstrated and are further reinforced by the following five institutional aspects:

- First, the internal and inter-institutional structure of international organisations often does not favour a multidimensional and holistic approach, impeding cooperation and the creation of integrated risk reduction projects (Schaar, Sida).[11]
- Second, the internal organisational structure of international agencies, with independent, regional or national centres, can hinder the integration or mainstreaming of risk reduction, with headquarters struggling to include risk reduction in regional and national agendas (Bastable, Oxfam).
- Third, the time frame of international projects often precludes those processes necessary for integrated urban planning and related implementing processes, also resulting in time constraints for more participatory approaches (Gavidia, UN-HABITAT).
- Fourth, because of the reduced number of implemented urban planning projects since the mid-1980s, and thus the lack of related organisational structures, the partial interest of disaster people in inter-departmental and inter-institutional connections that could be conductive to more integrated urban planning/risk reduction often can not be established (Bastable, Oxfam).
- Fifth, institutional and legal structures for risk reduction and urban planning at the national level are frequently separate, absent or lack national–municipal collaboration, thus reducing the possibility of promoting more integrated planning projects (including risk reduction) through international organisations. The lack of national–municipal collaboration is illustrated by the case of New Delhi, India, where a settlement created by the national Ministry of Housing was bulldozed the following day by the municipal division for infrastructure development (Rowell, CARE).

IV. Risk reduction: a marginalised working field

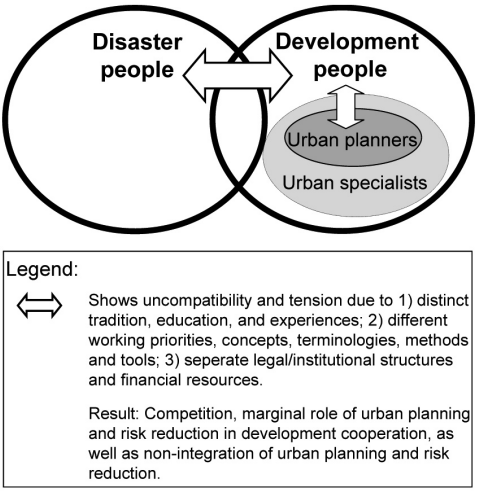
The marginal role of risk reduction is generally recognised. There is a possibility that risk reduction becomes another label swirling around with others in the gap that exists between disaster emergency relief and development (Christoplos, Mitchell and Liljelund, 2001). The interviews revealed that the marginalisation of risk reduction in the agendas of international organisations is mainly based on three opposing foci:

- risk reduction versus emergency relief;
- natural disasters versus man-made crises; and
- risk reduction versus development.

Risk reduction versus emergency relief, and natural disasters versus man-made crises

According to Maskrey (UNDP–BCPR), 'somehow we still have not got this idea that it is better to reduce risks than to have disasters, and it is still not on the political agenda in any big way'. Literature and interviewees confirmed that risk reduction is not perceived as 'politically sexy' (that is, invisible, only having long-term impacts, et cetera) and, therefore, is of low priority for international organisations. Lack of interest at the national level is partly because national authorities hope to receive international financial resources following a disaster, as well as because of fast changing governments, which do not have any interest in long-term investments (Keipi, IDB). This also presents a barrier to the promotion of risk reduction at the international level, where the money invested in this field and the number of people involved are negligible, when compared to the budget and staff engaged in emergency relief in general, especially in relation to man-made crises like wars and internal unrest. Apart from enormous disasters, such as the December 2004 tsunami in Asia, interviewees agreed that man-made crises, as in the case of Iraq, generally attract more international attention and hence funding.

Figure 2 The gap between disaster people, development people and urban planners



Risk reduction versus development

In the developmental context, risk reduction competes with poverty alleviation, because aid organisations have not clearly identified the link between risk reduction and

poverty (Milbert, IUED). One exception seems to be the World Bank's handbook on the preparation of Poverty Reduction Strategy Papers (PRSPs), which identifies the low level of security, including 'exposure to risk and income shocks that may arise at the national, local, household, or individual levels', as one of the four basic dimensions of poverty (Klugman, 2002, p. 3).

During the past three decades, policy statements related to all major developmental and environmental agendas have included the reduction of disaster risk as a precondition and an integral part of sustainable development (UN-ISDR, 2002).[12] However, when it comes to practical implementation, very little has been done, even when money has been available. After Hurricane Mitch in 1998, the Swedish International Development Cooperation Agency (Sida) implemented projects that were supposed to have an integrated risk reduction element. Nevertheless, an evaluation concluded that little money was spent on this issue (Frühling, 2002).

V. Urban planning: a marginalised working field

The marginal role of urban planning on the agendas of international organisations was identified as being due to two opposing foci:

- urban versus rural; and
- urban planning versus development.

Urban versus rural

The World Bank estimates that there is almost one billion poor in the world, of which more than 750 million live in urban areas.[13] The interviews showed, though, that international organisations accord very low priority to urban issues. This is related to a number of 'urban myths', such as the perception that 'urban poverty is not as bad as rural poverty' (Sanderson, 2002, p. 2). Reasons for the rural bias, given by the interviewees, include:

- the history of development organisations, whose roots are to be found in village development;
- the belief that urban areas are the responsibility of national and municipal governments;
- the notion that project work is easier in rural areas due to institutional and demographic structures; and
- the lack of knowledge of the long-term impacts of projects in urban contexts combined with limited financial resources.

In the past decade, only a few organisations have started to put more emphasis on urban issues, while several bilateral agencies have demonstrated diminishing interest. The UK Department for International Development (DFID) and the Swiss Agency for Development and Cooperation (SDC) are examples of organisations that have actually decreased their number of projects related to, and staff working on, urban

development. Sida is an exception: it still has an urban division. Actions such as the establishment of the Cities Alliance in 1999[14] and the specification of Millennium Development Goal (MDG) 7, Target 11 (UN-HABITAT, 2003),[15] indicate an existing, but still marginal, interest in urban issues.

The rural bias at the international level does not necessarily reflect priorities at the national level. Interviewees mentioned several examples, where, due to national authorities' demands, the rural focus of international projects was broadened to permit the funding of activities in urban areas (Hall, WSP). With the current tendency among multilateral and bilateral donors to provide budgetary support for national-level programmes instead of funds for individual projects, PRSPs, country assistance strategies and the like are central to identifying the foci of interventions (Stein, Sida). However, research shows that urban poverty, human settlements and water and sanitation matters have been underrepresented and poorly understood in PRSPs.[16]

Urban planning versus development

Most of the interviewees confirmed that, due to negative experiences, as well as a shift in priorities and the constant emergence of new topics, international organisations are currently only implementing a few urban planning projects.

The historical development of international schemes/projects promoting urban planning influenced its present marginalisation, as well as the creation of barriers to the integration of risk reduction into urban planning: in the 1970s, governments received financial support for the building of housing for the poor on a mass scale. As these efforts were not very successful, donors started to back site and service programmes. From 1972, they assisted squatter upgrading, and in the early 1980s, the institutional development of housing financing institutions (World Bank, 1993). Running parallel to this, urban community development workers championed participatory methodologies in the 1960s and beyond. In addition, due to the failure of conventional and traditional urban planning and the lack of adequate responsiveness by urban planners to the fast changing needs of cities, Otto Koenisgberger developed participatory approaches, such as community action planning (Hamdi and Goethert, 1997). Despite these positive developments, and in view of the shift from 'delivering' to 'enabling' housing and settlements, it became even more difficult to promote and implement risk reduction measures. In fact, the 'enabling' approach can be viewed as an obstacle to integrated risk reduction and urban planning.

Some interviewees stated that, for a long time, urban planning was dismissed within their organisations, since it was associated with centralised, social planning (Chavez, World Bank). Besides, the structural adjustment programmes that the World Bank and the International Monetary Fund (IMF) introduced in the 1980s and 1990s not only increased vulnerability (Hamza und Zetter, 1998), but also marginalised the working arena of urban planning by decreasing the influence and political role of national planning units and urban planners (Molin Valdes, UN-ISDR).

Based on the MDGs and the outcomes of the World Summit on Sustainable Development, held in Johannesburg, South Africa, from 26 August–4 September 2002,

international donors now promote the private sector as a leading provider of urban infrastructure and services, including drinking water and sanitation. Unfortunately, this means that projects with a focus on urban planning again have a tendency to lean towards the more structural aspects, thus hampering the conception of more holistic planning, which should include risk reduction (Pelling, EDRG, King's College London).

Recently, different themes related to urban planning have been emerging from donors, such as 'strengthening local governments' (Sanderson, 2002). With the push towards decentralisation and dealing with municipalities, urban planning has attracted again the interest of international organisations (Chavez, World Bank). Furthermore, the Rome Declaration on Harmonization of 25 February 2003, designed to enhance coordination and synergy between donors and partner countries, combined with related discussions about PRSPs and Sector-Wide Approaches (SWAPs), has rendered the issue of sectoral planning, including urban planning aspects, relevant once more (Stein, Sida).[17]

VI. Mainstreaming risk reduction in urban planning

The interviewees acknowledged that, generally, risk reduction has to be integrated into existing systems and fields to be successful. At the international level, some agencies, which have specialised disaster units, have initiated the process of mainstreaming risk reduction by incorporating the topic step-by-step in their regional and thematic developmental departments. Consequently, the specialised disaster units have become smaller support services (Lazarte, ILO). Additionally, some organisations, such as the German Agency for Technical Cooperation (GTZ), the Inter-American Development Bank (IDB) and Tearfund, have been developing performance targets or guidelines in order to mainstream risk reduction in development policy and practice (see, for example, Tearfund, 2005). However, no organisation specifically targets the urban planning sector.

Some interviewees suggested that the easiest way to integrate risk reduction and urban planning is 'to wait for the next earthquake, let the city fall down and start again' (Maskrey, UNDP–BCPR). This paper proposes a more proactive approach that can help urban centres to identify and act on problems driven or led by what citizens themselves see as priorities. In this context, it is crucial to emphasise that 'if planners know about the process of ultimately getting buildings built, to inject into that the knowledge of how to make them safer, is just one out of 100 other components that one needs to think about' (Aysan, UNDP–BCPR).

To develop a more proactive approach, the proposed step is to encourage the development of a conceptual shift away from conventional and traditional urban planning towards a planning framework based on the proposed concepts of *urban environmental planning*, *defensible city*, *responsible architecture* and *urban disaster governance,* as discussed below. This shift is important in encouraging urban planners to develop a sense of 'ownership' of risk reduction, to enhance communication between them and other professionals, and hence to encourage more work on risk reduction, which links the

structural/physical with environmental, socio-economic, institutional and political aspects.

The proposed conceptual framework relates directly to the problems identified and demonstrated in the previous sections. The ideas presented in the framework have been partially discussed with some of the interviewees, and were further examined with national organisations in Colombia and El Salvador during 2004–05, in order to compare and supplement the findings derived at the international level.

VII. Concept 1: urban environmental planning

The concept of *urban environmental planning* expresses the necessary inter-connection between urban planning and broader environmental development aspects, thereby linking large-scale disasters with everyday small-scale disasters.

Assessment

EIAs (environmental impact assessments) have to become part of an integral urban planning discipline. Within *urban environmental planning* it is crucial that EIAs are not only based on experts' evaluations, but also on participative local livelihoods and risk assessments, including hazard, vulnerability and capacity analyses (see also Twigg, 2004, pp. 31–54). In this context, the whole range of risks from large- to everyday small-scale disasters has to be considered. For example, widening a road could create better access and enable the more efficient evacuation of marginalised settlements. However, such action could also increase traffic-related hazards, cause landslides if the perpendicular cut for the road in the hillside is not well selected, and increase the mobility of people, which, under particular conditions, can foster the spread of diseases. In addition, the EIA should not only consider the ramifications of certain developmental projects for the environment, but also the impacts that are created by the environment and which affect the actual planned project.

Selection of measures

When it comes to the selection or design of appropriate structural/physical risk reduction measures, the active integration of local people is important for the development of adequate performance indicators that link urban planning with environmental aspects. Such indicators, which are normally defined only in terms of the frequency of the occurrence of environmental hazards, should, especially in low-income areas, take into consideration the type of impact on the lives of potential victims (see also Kolsky and Butler, 2004). For instance, ultimately, it is not simply the frequency of flooding that is the critical factor for low-income residents. Depending on the type of existing housing and infrastructure, the critical factors could be aspects like the time lapse between the prediction and the actual occurrence, the duration of the flooding and the profundity of the water.

Legal planning framework

The majority of the interviewees agreed that legal frameworks related to urban planning have the potential to mitigate risks. To establish a framework that promotes *urban environmental planning,* existing legal documents have to be revised, not only by experts, but also with the help of community-based assessments. Such legal documents are international planning and cooperation papers, as well as national and local norms, codes and contracts regarding environmental protection, development, emergency relief, risk reduction and urban planning (including land use, infrastructure design, construction techniques, maintenance, and ownership aspects). These documents have to be linked, streamlined and adapted at all levels, including, explicitly, the respective bodies responsible for implementation and financing. Concrete examples of action are: the promotion of the integration of environmental policies (including risk reduction) into the municipal development plan; cross-checking of the rules and regulations for infrastructure and housing with those for environmental protection; the fusion of laws for emergency relief and development, thus coordinating responsibilities and resources for urban planning; and the adaptation of nationwide urban planning codes to different environmental and climatic regions within the country. Furthermore, it is especially important to link international agendas set out within environmental and human settlement frameworks. Examples are the Local Agenda 21 (and the Rio Declaration on Environment and Development) adopted at the United Nations Conference on Environment and Development (UNCED), also referred to as the Earth or the Rio Summit, in Rio de Janeiro, Brazil, on 3–14 June 1992, and the HABITAT agenda that came out of the second United Nations Conference on Human Settlements (Habitat II) held in Istanbul, Turkey, on 3–14 June 1996.

The revised legal documents should include more flexible rules for urban low-income or illegal settlements. Developing an urban planning framework for these areas becomes a question of moral and human rights, since it is not considered justifiable to put up barriers to prevent people from settling in an area of environmental risk if this exposes them to greater economic insecurity. In this context, the aim of urban planning should not be to transform the informal housing sector into a formal structure, to plan where people should or should not live, but rather to deal with people in situ, encouraging practices and structures that reduce risks without depriving the urban poor of their assets. Such an alternative approach could be combined with the 'de-professionalisation' of urban planning (being part of *Concept 3: responsible architecture,* see under IX), by, for example, implementing in situ measures through the work of 'barefoot planners' offering door-to-door advice on the upgrading of housing.

Risk maps, which form part of the basis of legal planning frameworks (for instance, for land use, the conservation and employment of natural resources), should be combined and connected to databases, providing not only information on existing hazards, but also on settlement development, local capacities and existing vulnerabilities (including housing and infrastructure), as well as their causes and effects. Additionally, existing maps and databases of different levels and organisations should be linked or merged and made compatible. For this purpose, terms and concepts have to be standardised.

Enforcement

Governments and municipal authorities need to be made aware of the benefits of sustainable urban planning, including risk reduction. They need to ensure that the legislation they have introduced is adequate and that the commitments they have entered into are implemented. Accountability is crucial. This became obvious following the Izmit earthquake in Turkey, on 17 August 1999. The construction company owners, who were imprisoned with a view to determining their accountability in respect of this disaster, in terms of loss of life and damage, were prematurely released, because of the inadequacy of the legislation (Aysan, UNDP–BCPR).

To improve and ensure the enforcement of urban planning frameworks and to decrease corruption,[18] those responsible for implementation need to receive a better education and ample salaries. It is clear that a different approach is required to tackle the issue of illegal settlements. This could be achieved through innovative and accessible low-income insurance schemes, vigilance and giving advice via 'barefoot planners' or local groups, and ensuring the participation of community-based organisations in the implementation of urban planning initiatives. In Manizales, Colombia, the use of urban environment observatories in combination with environmental quality traffic lights helped to create awareness and a bottom-up movement that subsequently influenced city planning (see also Velásquez, 1998). Also in Manizales, housewives are working for the municipality, maintaining and controlling the colonisation of dangerous, non-habitable hill sites (García, OMPAD). Furthermore, the transformation of high-risk zones in eco-parks can help to enforce established limits in respect of the expansion of built-up areas, by combining environmental conservation, urban planning and risk reduction.

Common understanding based on local context

To promote a common understanding among those dealing with disasters, environmental development aspects and urban planning, based on a local context and designed to encourage local action on both large- and everyday small-scale disasters, the following three strategies are proposed (see also Bull-Kamanga et al., 2003, pp. 201–202):

- First, local research has to be undertaken to understand urban risk-accumulation processes, identifying the key stakeholders and the causal processes particular to each area, including analyses of their inter-correlation with environmental aspects and urban planning, and the active integration of urban planning and construction agencies.
- Second, to create a locally owned process of risk reduction, those community processes that identify, prioritise and focus on urban disaster risk must be supported. The instigation of discussion at the community level is crucial in order to initiate a bottom-up process, with the population demanding their right to a safe urban environment, thus bringing their voices into policymaking, and, consequently, improving themselves and the settlement in which they live (see also under *Concept 3: responsible architecture*).

- Third, empirical studies involving urban planning and construction stakeholders need to be carried out to demonstrate the main differences in the scale and nature of existing urban risks, and to supply data that will serve to support the mobilisation of any action required and permit the further refinement of policies.

VIII. Concept 2: defensible city

Defendable space is a term that emergency organisations currently use to depict bushfire protection measures, while *defensible space,* coined by Oscar Newman in 1972, describes crime prevention actions (Newman, 1972). It is suggested here to include partially and extend these terms under the heading of *defensible city,* to express the need to integrate the concept of community protection against natural disasters as one key aspect of integrated urban planning, thereby achieving the incorporation of risk reduction in urban planners' spheres of activity.

Structural/physical protection

In practical terms, structural-oriented measures involve, inter alia, the construction of: firebreaks; flood defences (for instance, bunds around villages and dams combined with the extraction of water); access and evacuation roads to and from specifically vulnerable areas; escape routes to emergency shelters, protected rooms in basements (for hurricanes) or top floors (for tsunamis); subterranean electric wires; inclined roofs, preventing overload in the case of ash rain near volcanoes; and disaster-resistant social and technical infrastructure (such as retrofitting of critical amenities). In the case of bushfires, detachable roofs could be introduced, which can be removed to prevent the spread of fire.

Furthermore, the arrangement of houses and infrastructure is crucial (for instance, so as not to block water or lava flows; in respect of fault lines, the long axis of existing buildings can be placed parallel to the fault, so that the buildings present less of a vulnerable cross-section (Sieh, 2000)). With regard to specific arrangements, the following aspects are crucial for risk reduction: densities; building heights; street widths; and plot sizes. Also vital are the consideration of wind tunnels and the location of certain installations, such as pit latrines and handpumps in areas with a high water table that face the risk of landslide or flooding. Awareness raising and training must ensure that formal and informal builders and planners recognise and apply such measures.

Protective planning and preparedness

Although there is general knowledge about structural/physical protection measures, non-structural ones need to be invented. In sectors like agriculture, there is substantial documentation on the non-physical characteristics of risk reduction (including diversification of crops and planting on disjoint land parcels), while such development is still required within the actual field of urban planning. Examples are: back-up facilities (for example, transportation systems), when structural/physical measures such as

those listed above fail; the planting of trees and other vegetation to decrease the amount of damage caused by landslides, tsunamis and cyclones; evacuation plans; the creation of incentives to build in a safe manner; land pooling and readjustment; and the establishment of eco-parks and inventive early-warning systems. These are partly outlined below.

The creation of incentives to build in a safe manner depends on the respective national context and demands an imaginative approach. Cases in point are tax inducements and exchanging rights schemes. The latter is a tool that aims to reduce population densities in high-risk areas by transferring people to zones of lower risk. If, for instance, a five-storey building was constructed in a high-risk area, with the current law only allowing three levels, the building rights for the two additional levels could be transferred to a more secure part of the city. Other existing incentives are insurance schemes, which demand compliance with specific constructive precautions, and that encompass the destruction of houses following disasters. Insurance could cover people living in low-income areas, with only middle- and high-income inhabitants paying the fee.[19]

Slum improvement instruments are other measures that can be utilised to support protective urban planning. These tools are land development techniques, such as land pooling and readjustment, where a group of separate land parcels are assembled for unified planning, servicing and subdivision as a single area, with some of the new building plots sold to recover the costs and the other plots redistributed to the landowners. In fact, re-plotting/relocation can be used to design a low-income settlement that offers better protection to its inhabitants. And, as mentioned before, the establishment of eco-parks can help to limit the expansion of the built environment to high-risk areas.

Regarding the use of early-warning systems as a means to protect urban communities at risk, local urban indicators must supplement natural disaster databases, which in turn can serve as a type of urban early-warning system. These indicators have to be developed in such a way that they can link large- and everyday small-scale disasters. In a particular area, for example, the number of existing pit latrines (perforating hill sites), or a certain recurrence of rainfall triggering small-scale floods and erosion, could be indicators of the increased risk of large-scale landslides. In another area, greater use of particular cooking facilities could point up an enhanced risk of health impacts or conflagration. Additionally, in an area where direct links between poverty, mobility and the spread of the human immunodeficiency virus (HIV) could be identified, and given that the highly mobile construction worker's sector is believed to be a key HIV vector, related data on the location of big construction projects could perhaps form the basis of an HIV early-warning system.

IX. Concept 3: responsible architecture

Responsible architecture encapsulates the need for urban planners to work not only on large-scale structural improvements of the formally built environment, but also to target

specifically informal settlements and to combine large-scale structural improvements with structural and non-structural small-scale measures. The active use of small-scale measures could forge a better link with other development people as well as with disaster preparedness experts, which might generate further positive outcomes. The *responsible architecture* concept also attempts to express the need to integrate actively the local population into all urban planning projects. A range of publications, such as Maskrey (1989), the experiences of The Sustainable Environment and Ecological Development Society (SEEDS), and reports emerging from meetings like the first International Conference on Community-Based Disaster Management, held in Manila, Philippines, on 12–15 November 2003, reveal the importance of grass-roots action—also with regard to urban planning.[20]

Small-scale structures

To improve present structures and technologies before importing new ones, it is important that urban planners become more aware of local knowledge, assets and the coping strategies of people at risk. These assets have to be systematised, further developed, distributed, and eventually transferred to other areas. This is crucial, as: first, people living in urban areas have often become detached from their coping mechanisms; second, existing local planning and risk reduction practices are not well recorded (Oelreich, IFRC); and third, important architectural and structural engineering work elaborated in the 1960s and 1970s, linking urban planning and risk reduction, was not well disseminated (Gavidia, UN-HABITAT).

Small-scale security and protection measures pertaining to housing and settlements can be especially critical shortly before and during disasters, since they not only have the potential to reduce risk, but also to support the efficacy of large-scale measures. In the case of flooding, for instance, small-scale structural/physical measures could be: appliances to lift objects; buried waterproof containers designed to hold drinking water or valuables; and higher platforms for emergency refuge and rescue endeavours. A further example in respect of landslides is the covering of slopes with plastic sheets to allow the rain to run off rather than be absorbed. However, this can also increase the run-off pressure and lead to an increased risk of flooding and landslides in settlements further down the slope. The simple use of bigger bolts or tied strings to attach roofs to walls in a safer way is another vital step that can be taken, as is building supporting walls using old tyres. In this context, the above-mentioned work of 'barefoot planners' offering door-to-door advice on integrated risk reduction is crucial.

Small-scale participatory planning

In addition, small-scale non-structural measures can be very efficient for the increased secureness and sustainable functioning of buildings and settlements. These include:

- The exchange of dwellings so that less mobile people can be placed in the most secure sites—for instance, the elderly, the disabled and children can be moved to higher ground within a flood area or closer to access roads.

- Awareness raising and instruction vis-à-vis the possibilities for small-scale risk reduction measures (for schoolchildren, general population, informal builders, et cetera) as part of capacity building efforts. Hereby, the different groups also have to be made aware of the risks they create (such as the use of open fire or removing sheer walls—a frequent practice to gain space, which can easily result in disasters).
- Exchange between communities living at risk: 'it is residents talking to residents, technicians talking to technicians, and the local authority talking to the local authority that seem to work best' (Schilderman, ITDG).
- Use of the already cited urban environment observatories along with environmental quality traffic lights, which indicate the actual environmental quality level within each community (including the existence of disaster risk). This tool is a participatory instrument, as well as an intermediary information source, linking the community and the municipal administration.
- Introduction of the concept of joint and collective public responsibility for environmental necessities, such as the maintenance of open sewage channels, to achieve long-term engagement of communities in risk reduction. In places where no community structure exists, individual work is needed.
- Technical training of local informal builders. The manufacture of model houses is a teaching mechanism and strategy successfully employed by organisations like SEEDS in India.
- Creation of micro enterprises, for instance centres for the production of local construction materials, which can be fashioned through community contracting arrangements and thus employed to provide sustainable settlements, employment and livelihoods.

Besides the measures mentioned, changes are also required to project implementation processes to reduce vulnerabilities. Such modifications include the endorsement of equal treatment of female- and male-headed households through, inter alia, the promotion of appropriate deeds of ownership. Furthermore, the selection criteria established by urban development bidding processes should be revised to promote positive economic impacts, not only at the national level, but also at the local level. For example, the rules and criteria for approval could include a quota of non-skilled labour to be contracted locally, and a 'job–capital' ratio, favouring labour intensive activities that do not affect overall economic efficiency. This could encourage enterprises to subcontract micro enterprises situated in low-income areas, hence also promoting the utilisation of local materials.

The livelihood approach and strategic action planning (a progression of community action planning) are tools that can help to reform the outmoded instruments and techniques of urban planning, replacing master plans with participative measures that integrate structural, non-structural, large- and small-scale initiatives, as well as illegal and low-income settlements, and allow urban planners to engage in a complex process that is organic and dynamic. The livelihood approach could be further used in combination with risk assessment, and as a multiplier to influence people to improve their building work and safety.

X. Concept 4: urban disaster governance

The proposed concept of *urban disaster governance* contains the idea of the combined domain, wherein knowledge about disaster and urban planning, and their management, is coordinated, mediated and altered through joint governance practices. The domain of *urban disaster governance* is the realm in which the interrelationship between disasters, urban planning and society becomes apparent. Therefore, adequate organisational structures and cooperation are required.

Institutional/organisational framework

To enable urban planners to become more active in governance processes, Hamza (IC) stated that 'it needs the kind of political support to review the authority that urban planning departments have, for instance within the municipalities, because it is not a question of less or more, it is a question of inappropriate authority'. Thus, the creation of new institutional and organisational structures at all levels, which favour integrated risk reduction/urban planning, should be supported. For example, risk reduction cells could be integrated into urban planning ministries, and with regard to the internal structure of international aid organisations, focal points for integrated risk reduction within urban planning units are vital.

Cooperation

Additional legislation is needed to facilitate the institutional/organisational 'bringing together' of development people, disaster people and urban planners. This could be achieved, for instance, through changes to inter-agency or collaborative agreements, institutional mandates and working descriptions. Incentives should be provided to the private urban planning sector to engage in good business practices to reduce risks, while civil society organisations should be motivated to facilitate continuous communication between the private sector and the population, thus helping to support the control of the use of international resources. It has to be noted that private sector engagement and public–private partnerships are complex, and related practical challenges are often overlooked, as relatively little analysis has been conducted on this issue.[21] From the standpoint of this paper, it is crucial however to find ways to demonstrate possible business benefits of risk reduction measures to urban planning and constructing firms.

Horizontal and vertical partnerships for risk reduction have to be established at all levels, including those of stakeholders working in urban planning. Partnerships have to be built to connect urban planners with other professionals, as well as with community groups, business associations, universities and authorities, thereby breaking down sectoral barriers in terms of professional disciplines and public–private–civil society forms of collaboration. Given that urban planning processes are an integral part of urban governance, related projects should actively target and integrate stakeholders working in urban planning.

Funding

Problems concerning the financing of integrated risk reduction/urban planning projects range from non-existent or insufficient financial support, to earmarked funding for specific non-integrated risk reduction or planning measures. The marginalisation of risk reduction and urban planning is partly responsible for this situation. In addition, urban planning projects are often perceived as too costly, while financing risk reduction does not offer the quick returns that donors and governments frequently demand.

As funding is a precondition for the implementation of the aforementioned concepts and related initiatives, national agencies require assistance to build up awareness of the connections among risk reduction, poverty alleviation and the key issues of urban planning, such as housing, land tenure, and the provision of infrastructure and basic services. The topic of risk reduction has to be built into proposals for urban planning projects, but in such a way that it fits with the current language of policymakers.[22]

At the international level, first donors need to include risk reduction requirements in their financing processes and cooperation frameworks. Second, a special and transparent mechanism for apportioning resources for integrated risk reduction should be developed (for example, improved access to development budget lines). In this context, the process should guarantee that the voices of the poor are integrated into resource allocation, and the partial shift of post-disaster funding to developmental risk reduction should be facilitated (that is, for instance, the allotment of a certain percentage of the budget). Third, international funds for the specific financing of mitigation in developing countries, including measures in the field of urban planning, are also needed. The Adaptation Fund, established by the 1992 United Nations Framework Convention on Climate Change (UNFCCC), finances only those activities related to the avoidance of deforestation and combating land degradation and desertification.[23]

At the national level, the decentralisation of urban planning and risk reduction structures—and related resources—should be promoted, while at the local level, co-participative funds, credit and saving arrangements could be established to support integrated risk reduction/urban planning.

XI. Conclusion

This paper reveals that mainstreaming risk reduction in urban planning confronts many of the generic challenges to incorporating risk reduction in development planning. Yet, it further faces additional barriers. The lack of integration of urban planning and risk reduction is often the consequence of the gap or even tension between disaster people, development people and urban planners, which is based on an incompatibility between their related disciplines (see Figure 2).[24] This incompatibility impedes the establishment of more integrated projects needed to reduce urban risks. In fact, while urban planners generally do not perceive risk reduction as part of their sphere of

activity, only a few development and disaster people have worked to identify and act on the processes and factors that lead to the accumulation of disaster risk in urban areas.

The underlying reasons for the incompatibility and consequent lack of integration lie in the historical and educational backgrounds of the distinct professional groups, resulting in different working priorities, concepts, terminologies, tools and experiences, as well as related competition and a critical perception of the working approaches and methods of other groups. Non-integration is expressed, aggravated and reinforced by the separate institutional structures and financial resources available for emergency relief and development. In addition, risk reduction and urban planning are two marginal activities within international aid organisations, thus hindering interest in a more integrated approach.

Urban planning as a tool for risk reduction

Based on the outcomes of the study, the proposed conceptual framework presents a new vision for mainstreaming risk reduction in urban planning. It is a necessary step towards reducing urban vulnerabilities, hence increasing the living standards of urban communities at risk and reducing post-disaster destruction and forced evictions. The measures and initiatives of the four concepts presented, namely *urban environmental planning, defensible city, responsible architecture* and *urban disaster governance*, can help to initiate the necessary shift in the philosophy that drives urban planning. This will assist in bringing urban planners, disaster people and development people together by moving towards an understanding of the risk that urban dwellers face, which incorporates large- and everyday small-scale disasters. In fact, urban planners require a different knowledge base and radically different skills. Diminishing risk has to become a basic principle of all urban planning projects, with special attention paid to illegal, low-income settlements and their inhabitants, who are, by dint of circumstance, involuntary 'risk takers'.

Table 1 presents a summary of proposed measures and initiatives that international aid organisations can promote, given the existing barriers and weaknesses discussed within this paper.

Broadened developmental concepts, such as 'poverty' and 'livelihoods', have shown that changed definitions can substantially influence the work of international and national organisations. Yet, the development of the presented conceptual framework is unlikely to be sufficient to stimulate greater consideration of risk reduction in urban planning. Other critical issues have to be addressed, including raising awareness of the existing situation and underlying reasons, enhancing understanding of the potential of proactive and preventive urban planning, and increasing knowledge of related measures and their application among international aid organisations to develop their capacity to utilise them.

Based on the outcomes of this study, the need for an operational framework with performance targets for integrating risk reduction into urban planning, as a tool to provide guidance for different stakeholders involved in human settlement development, became obvious and was developed in 2005–2006 (Wamsler, 2006b).

Table 1
Concepts and measures that enable urban planning to become a tool for risk reduction

	Objective	Measures and initiatives
Urban environmental planning	To inter-connect urban planning and broader environmental development aspects, thereby linking large-scale disasters with everyday small-scale disasters	• Use of participative, integrated and broadened EIA. • Use of participative and broadened performance indicators for selecting and designing integrated planning measures. • Linking legal frameworks and agendas related to urban planning and environment protection. • Adaptation of planning regulations based on climatic area-specific characteristics. • Improved enforcement of integrated legal planning frameworks through: better education and payment of building control officers; vigilance by local groups; innovative low-income insurance systems; advice offered by 'barefoot planners'; creation of eco-parks; and integration of community organisations into city planning (for example, through environment observatories and environmental quality traffic lights). • Establishment of risk maps combined with databases related to urban settlement development. • Support for local studies, providing data on the inter-connection between local risk-accumulation processes and urban planning at the city, settlement, community, and housing level. • Support for bottom-up processes focusing on urban disaster risk and the promotion of safe urban environments.
Defensible city	To integrate the concept of community protection against natural disasters as a key aspect of urban planning	• Innovation and use of structural/physical protection, including engineering and architectural measures, for instance: the construction of disaster-resistant housing, infrastructure and services; mitigation works; and the modification of street widths, plot sizes, building arrangements, densities, and heights to reduce vulnerabilities. • Innovation and use of protective non-structural planning measures, such as: planting; evacuation plans; incentives to build safely (for example, tax inducements, exchanging rights and insurance schemes); land pooling and readjustments; and urban early-warning systems that include urban risk indicators for disaster forecasting.
Responsible architecture	To target specifically informal settlements and to combine large-scale structural improvements with participatory small-scale measures	• Systematisation, further development and dissemination of local coping strategies. • Small-scale structural/physical measures for increased security, for instance: buried containers for water and valuables and appliances to lift objects in the case of flooding. • 'De-professionalisation' of urban planning: work of 'barefoot planners' offering door-to-door advice on the secure upgrading of housing. • Small-scale non-structural measures for the more secure functioning of buildings and settlements. Examples are: the exchange of dwellings between low- and high-risk groups; awareness raising and teaching on the design/use of buildings; technical training of builders; joint and collective public risk reduction work; and the creation of local construction centres. • Changed project implementation processes to reduce vulnerabilities, including through appropriate bidding processes and the use of adequate deeds of ownership. • Use of tools such as the livelihood approach and strategic action planning to ensure participatory and integrated risk reduction.

Urban disaster governance	To combine knowledge and management of disasters and urban planning to create joint governance practices	• Support for more integrated institutional and organisational structures, for instance the establishment of integral cells and focal points for risk reduction within planning units. • Adaptation of inter-agency or collaborative agreements, institutional mandates and working descriptions etc. to facilitate institutional/organisational integration. • Promotion of good business practices for risk reduction within the urban planning sector. • Establishment of horizontal and vertical partnerships for integrated risk reduction at all levels. • Inclusion of urban planning stakeholders in urban governance projects. • Creation of a body of knowledge on how to incorporate risk reduction in developmental planning issues and related project proposals. • Inclusion of risk reduction analysis in requirements pertaining to financing processes and cooperation frameworks. • Improved international, national and local resource allocation for integrated risk reduction, for example through: the partial shift of post-disaster funding to pre-disaster risk reduction; the establishment of specialised funds for integrated risk reduction; decentralisation; and co-participative savings and credit arrangements.

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Endnotes

[1] *Natural disaster* and *disaster* serve as synonyms and as generic terms for large- and small-scale disasters as well as everyday disasters with a natural trigger. *Disaster risk* comprises three factors: hazard; vulnerability; and response capacity. The extent of people's vulnerability and response capacity influences the impact of hazards. *Risk reduction* involves measures designed to avoid (prevention) or limit (mitigation

and preparedness) the ramifications of disasters. *Urban planning* 'includes the way places work and matters such as community safety, as well as how they look. It concerns the connections between people and places, movement and urban form, nature and the built fabric, and the processes for ensuring successful villages, towns and cities' (DETR, 2000, p. 8).

[2] According to the Hyogo Framework for Action 2005–2015 (see http://www.unisdr.org/eng/hfa/docs/Hyogo-framework-for-action-english.pdf), governments are further requested to incorporate disaster risk assessments in urban planning and the management of disaster-prone human settlements, in particular highly populated areas and fast urbanising settlements. The issues of informal or non-permanent housing and the location of housing in high-risk areas should be addressed as priorities, including within the framework of urban poverty reduction and slum upgrading programmes. Governments are also urged to ensure that all new hospitals are built with a level of resilience that strengthens their capacity to remain functional in disaster situations, to implement mitigation measures to reinforce existing health facilities, and to protect and fortify critical public facilities and the physical infrastructure, especially that of schools, clinics, hospitals, water and power plants, communications and transport lifelines, disaster warning and management centres, and culturally important lands and structures through the use of proper design, retrofitting and rebuilding.

[3] From this point on, *urban planning* will serve as an umbrella term for the developmental sectors of urban planning and housing. The term *urban planners* will serve as an umbrella term for experts of physical applied science, including architects, city and regional planners and engineers.

[4] The UK Department for International Development (DFID) (2004, p. 30) states: 'Infrastructural developments may create a false security. People are attracted to sites where hazard mitigation is in place but may be at extreme risk if these infrastructures fail—this is most commonly the case with river and coastal flood defences. High losses to flooding are frequently a result of informal and planned settlement adjacent to "safe" flood defences'.

[5] The interviewees were independent international consultants (IC) and representatives of: Benfield Hazard Research Centre (BHRC) (UK); CARE International (UK); Centre for Development and Emergency Practice (CENDEP), Oxford School of Architecture (UK); Cities Alliance (US); Cranfield Disaster Management Centre (DMC), Cranfield University (UK); Department for International Development (DFID) (UK); Development Planning Unit (DPU), University College London (UK); Environment and Development Research Group (EDRG), King's College London (UK); Geoffrey Payne and Associates (GPA) (UK); German Agency for Technical Cooperation (GTZ) (Germany); Graduate Institute of Development Studies (IUED), University of Geneva (Switzerland); Inter-American Development Bank (IDB) (US); Intermediate Technology Development Group (ITDG) (UK); International Federation of Red Cross and Red Crescent Societies (IFRC) (Switzerland); International Institute for Disaster Risk Management (IDRM) (Philippines); International Institute for Environment and Development (IIED) (UK); International Labour Organization (ILO) (Switzerland); Oxfam International (UK); Pan American Health Organization (PAHO) (US); Post-war Reconstruction and Development Unit (PRDU), University of York (UK); ProVention Consortium (Switzerland); Swedish International Development Cooperation Agency (Sida) (Sweden); Tearfund (UK); United Institute of Development Studies (IDEA) (Colombia); United Nations Development Programme, Bureau for Crisis Prevention and Recovery (UNDP–BCPR) (Switzerland); United Nations Human Settlements Programme (UN-HABITAT) (Brazil and Switzerland); United Nations International Strategy for Disaster Reduction (UN-ISDR) (Switzerland); United Nations Office for Project Services (UNOPS) (Switzerland); United States Agency for International Development (USAID) (US); World Bank (US); and WSP International Management Consulting, Ltd (UK).

[6] The interviewees were selected by snowball and purposeful sampling, based on key literature and information obtained from research cooperation partners.

[7] No further interviews were carried out when the same issues began to reappear, and interviewees provided no new and relevant information (theoretical saturation). Key persons' beliefs and stated reasons were accepted as true unless discrepant evidence was encountered (triangulation).

[8] The detailed outcomes of the Salvadorian case study are presented in a separate paper (Wamsler, 2006a), which together with the outcomes of the present paper further led to the development of an operational framework for integrating risk reduction (Wamsler, 2006b). In El Salvador, representatives of 33 national and international aid organisations were interviewed. In Colombia, IDEA and the municipal emergency and prevention organisation (Oficina Municipal de Prevención y Atención de Desastres, OMPAD) were the main points of contact.

[9] The categorisation into 'disaster people' and 'development people' is simplistic; however, the interviewees acknowledged this categorisation as such.

[10] All cited statements by Mr. Johan Schaar relate to a presentation during the 'Supporting Natural Disaster Risk Reduction' conference in London on 5 November 2003, organised by Tearfund.

[11] While five of the 24 interviewees with an urban planning background were located in the disaster divisions of international organisations, urban planning as such was not part of their field of activity. The legal and institutional structures were, among other things, said to impede cross-disciplinary and cross-sectoral work.

[12] These include agendas set out during (in chronological order) the United Nations Conference on Environment and Development (UNCED) (also called the Earth Summit or the Rio Summit) in 1992, the United Nations Conference on Human Settlements (Habitat II) in 1996, the International Decade for Natural Disaster Reduction (IDNDR) from 1989–99, the United Nations International Strategy for Disaster Reduction since 2000, the World Summit on Sustainable Development (WSSD) in 2002, the Monterrey Conference on Financing for Development in 2002, and the World Conference on Disaster Reduction of 2005, as well as in documents like Agenda 21 (1992) and the Millennium Development Goals (MDGs) established during the Millennium Summit of 2000 (UN-ISDR, 2002; 2003).

[13] See http://www.worldbank.org/urban/facts.html (accessed 8 September 2004). The World Bank identifies 'the poor' as people who live on less than one US dollar per day.

[14] The World Bank and UN-HABITAT launched the Cities Alliance in 1999. It was created to foster new tools, practical approaches and knowledge sharing to promote local economic development and a direct attack on urban poverty. Its activities support the implementation of the Habitat Agenda. For more information, see http://www.citiesalliance.org/citiesalliancehomepage.nsf (accessed 5 August 2004).

[15] MDG 7, Target 11, also known as the 'Cities Without Slums' target, is one of the three targets of Goal 7 to 'Ensure Environmental Sustainability'. The objective of Target 11 is as follows: 'By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers'.

[16] See 'CSD-13: issue briefing on human settlements', produced by Homeless International and the Intermediate Technology Development Group (ITDG), http://www.homeless-international.org/doc_docs/CSDNGOBriefing_HumanSettlements__FinalWithLogos__15Feb0525695.pdf (accessed 5 August 2004). Mitlin (2004) confirms that PRSPs fail to address issues related to the urban poor due to the way in which poverty is measured.

[17] See http://www1.worldbank.org/harmonization/romehlf/Documents/RomeDeclaration.pdf (accessed 5 August 2004). According to the Rome Declaration on Harmonization, representatives of over 20 multilateral and bilateral development organisations and 50 countries decided to improve the effectiveness of their efforts to fight poverty, by working more closely together. The main message is that donor aid, however well intentioned, implies a high recipient toll in terms of transaction costs. Donors can alleviate this problem by doing more to coordinate their initiatives, harmonise (and thus reduce) their multiple requirements, and assist partner countries in taking charge of their own development process.

[18] Transparency International's *Global Corruption Report 2005* focuses on corruption in construction and post-conflict reconstruction. See http://www.globalcorruptionreport.org/ (accessed 10 October 2005).

[19] Together with the IDB, the municipality of Manizales, Colombia, is trying to implement an insurance system that covers low-income and illegal settlements, without their inhabitants paying fees. Those can be covered by the fees paid by the middle- and high-income population, once a coverage of 30 per cent of these social strata is achieved (García, OMPAD).

[20] The conference was organised by the Philippine National Red Cross and based on experiences of its project on 'Preparing for disasters: A community-based approach' (PNRC, 2002). Conference documentation was disseminated on a CD-ROM. For more information on SEEDS and its work on urban planning and security, see http://www.seedsindia.org/Archive/arch.htm (accessed 10 August 2004).

[21] See also http://www.unisdr.org/WCDR-dialogue/t3-summary.htm (accessed 10 September 2004).

[22] Depending on the specific organisation and ongoing international discussions, integrated urban planning and risk reduction can be built into project proposals in the fields of 'climate change', 'urban violence and insecurity' or other late-breaking buzzword areas in order to receive funding.

[23] For more information, see http://www.gm-unccd.org/FIELD/Multi/GEF/FR_Ad.htm, http://unfccc.int/cooperation_and_support/funding/adaptation_fund/items/2600.php and http://www.cevreorman.gov.tr/iklimkonferansi/pdf/1_2_Vladimir_Litvak.pdf (slide 23) (accessed 9 November 2004).

[24] Surprisingly, the research indicates that the thinking of disaster people and urban planners appears to be closer together compared to that of development people and urban planners where a strong discrepancy could be identified. This impedes the mainstreaming of risk reduction in urban planning in a post-disaster, developmental context.

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III

Paper III	
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INTEGRATING RISK REDUCTION, URBAN PLANNING AND HOUSING: LESSONS FROM EL SALVADOR

Christine Wamsler

Abstract

Increasingly, attention has been given to the need to mainstream risk reduction in development work in order to reduce the vulnerability of the urban poor. Using El Salvador as a case study, the paper analyses the mainstreaming process in the developmental disciplines of urban planning and housing. The overall aim is to identify how the existing separation between risk reduction, urban planning and housing can be overcome and integration achieved.

Since Hurricane Mitch in 1998, and especially after the 2001 earthquakes, not only relief and development organisations, but also social housing organisations have initiated a shift to include risk reduction in their fields of action in order to address the underlying causes of urban vulnerability. The factors that triggered the process were: 1) the negative experiences of organisations with non-integral projects, 2) the organisations' increased emphasis on working with municipal development, 3) political changes at national level, and more importantly, 4) the introduction and promotion of the concept of risk reduction by international and regional aid organisations. However, required additional knowledge and institutional capacities were mainly built up independently and internally by each organisation, and not through the creation of co-operative partnerships, thus duplicating efforts and increasing ineffective competition.

Whilst positive experience has been gained through the implementation of more integral projects, the creation of adequate operational, organisational, institutional and legal frameworks is still in its initial stage. Unfortunately, four years after the 2001 earthquakes, emergency relief funding for post-disaster risk reduction is coming to an end without the allocation of resources for following up and consolidating the initial process. Based on the findings, an integral model is proposed which shows how mainstreaming risk reduction in urban planning and housing could be dealt with in such a way that it becomes more integrated, inclusive and sustainable within a developmental context.

Keywords: *Disasters, Risk Reduction, Urban Planning, Housing, El Salvador*

1. INTRODUCTION

El Salvador is the most densely populated country in Central America, which is one of the most disaster-prone regions in the world (e.g. LAVELL, 1994:49). The metropolitan area of San Salvador has been seriously damaged 14 times over the past three centuries (BOMMER, 1996:2). Two earthquakes struck El Salvador in 2001 damaging nearly 20 per cent of the nation's housing stock, resulting in more than 1,100 fatalities (UNDP/FUSAI, 2003:22). In 1998, Hurricane Mitch devastated the country leaving over 30,000 people homeless. During the same year, a severe drought destroyed 80 per cent of the country's crops, which resulted in a famine. In early October 2005 - within only one week - El Salvador was hit tragically by hurricane Stan, flooding, mudslides, an earthquake and the Ilamatepec volcano eruption.[1]

The relatively high level of disaster risk marked its beginning in 1526 with the historic foundation of San Salvador in a seismic zone. The level of the country's disaster risk cannot be purely attributed to its geographical characteristics, its location, and the frequency and intensity of occurring natural hazards. It has its roots in a long history of political and socio-economic marginalisation of the majority of Salvadorans with an elite control of both urban and rural land (WISNER, 2002:8). In the 1970s, severe social inequalities, poor economic growth, and a repressive dictatorship led to a civil war that resulted in an estimated 75,000 fatalities. Since then, uncontrolled and accelerated urbanisation combined with the improper management of natural resources has increased the risk and occurrence of landslides, flooding and droughts.[2]

[1] See, for instance, http://news.bbc.co.uk/2/hi/americas/4322442.stm, accessed 8 October 2005, and http://www.iht.com/articles/2005/10/08/america/web.flood.php, accessed 9 October 2005.

[2] See, for instance, http://socsci.colorado.edu/~parisr/PARIS_centamerica_Aug2002.pdf or http://www.mongabay.com/reference/country_studies/el-salvador/all.html, accessed 10 June 2005.

The combination of political and economic crises, human-induced vulnerabilities, and natural hazards, leading to the internal displacement of hundreds of thousands of Salvadorans, has increased the disaster risk levels of the country. Manifestations of this situation can be found in the national housing deficit of more than half a million (UNDP/FUSAI, 2003:22), and the fact that more than 1.3 million people were living in slums in 2001 (UNITED NATIONS, 2005).

Risk reduction in urban planning and housing

During recent years, attention has been increasingly given to the need to mainstream risk reduction in development work in order to reduce the vulnerabilities of the poor communities (e.g. UNDP, 2004; UNISDR, 2004).[3] The Millennium Declaration points towards this need by aiming to achieve a significant improvement in the quality of the lives of slum dwellers (MDG7, target 11); and the "Hyogo Framework for Action 2005-2015" urges governments to address the issue of disaster risk in their sector development planning and programmes (Section 4, paragraph 19).[4] Nevertheless, little research has been carried out in respect of how risk reduction can be mainstreamed in the developmental sectors of urban planning and housing.

The objective of this paper is to analyse the mainstreaming (or divergence) process in El Salvador, especially since Hurricane Mitch, with the aim of identifying how the existing separation between risk reduction, urban planning and housing can be overcome and integration achieved. Lessons learned and information gained from this analysis will support the identification of ways to sustain and promote mainstreaming within a developmental context.

Methodology and outline

The research was conducted between August 2004 and April 2005 including a field study in El Salvador. 11 social housing organisations, three relief organisations, and 19 development organisations were analysed.[5] Their names and acronyms are listed in the footnotes.[6] A total of 50 project managers was interviewed, and technical literature, project documents, and policies were reviewed. Furthermore, eight key projects were identified and visited. In this way single and group interviews were conducted with around 40 beneficiaries and operational project staff.[7]

The analysis of the mainstreaming process is addressed by filtering out developments and patterns of change within the four identified levels/spheres presented in sections 2 to 5: implemented projects, operational instruments, institutional and organisational structures, as well as national and municipal legislation. In section 6, the underlying drivers, the strengths and weaknesses of the process are discussed, and the potential for integrating risk reduction, urban planning and housing is identified. Finally, a model for comprehensive integration is proposed.

[3] See also Wamsler (2004; 2006).

[4] Hyogo Framework for Action 2005-2015, see http://www.unisdr.org/wcdr/intergover/official-doc/L-docs/Hyogo-framework-for-action-english.pdf; Millennium Declaration and Millennium Development Goal (MDG) 7, target 11, see http://www.undp.org/fssd/sustdevmdg.htm.

[5] The categorisation of the three types of organisations is based on the products and services they offer, as well as their main objectives (i.e. construction of social housing, development in general or emergency relief). Whilst social housing organisations can also be seen as development organisation, for the purpose of the paper, it was necessary to categorise them separately. Relief organisations are commonly also called humanitarian aid organisations or emergency organisations. The term "aid organisations" is used as an umbrella term for all three types of organisations.

[6] The financing and implementing organisations interviewed are (in alphabetical order): AMUVASAN (oficina de planificación de la Asociación de Municipios del Valle de San Andrés), CARE, CEPRODE (Centro de Protección para Desastres), CHF (Cooperative Housing Foundation International), COEN (Comité de Emergencia Nacional), COMURES (Cooperación de Municipalidades de El Salvador), FISDL (Fondo de Inversión Social para el desarrollo local), Fundación Habitat, Fundación Techo para un Hermano, FUNDASAL (Fundacion Salvadorena de Desarrollo y Vivienda Minima), FUNDE (La Fundación Nacional para el Desarrollo), FUSAI (Fundación Salvadoreña de Apoyo Integral), GTZ (German Association for Technical Cooperation), HFDI (Habitat for Humanity International), IDB (Inter-American Development Bank), MARN (Ministerio de Medio Ambiente y de Recursos Naturales), OFDA (Office of US Foreign Disaster Assistance), OPAMSS (Oficina de Planeación del Área Metropolitana de San Salvador), PAHO/WHO (Pan American Health Organization, regional office of the World Health Organization), PRISMA (Programa Salvadoreño de Investigación sobre desarrollo y medio ambiente), Red Cross, RTI (Research Triangle Institute), SNET (Servicio Nacional de Estudios Territoriales), the municipalities of Sacacoyo, Talnique, Santa Tecla, and San Salvador, UCA (University José Simeón Cañas; department of engineering and department of architecture), UNDP (United Nations Development Programme), VIVIDU (Viceministerio de Vivienda y desarrollo urbano), World Geologists, and World Vision. These are the key organisations in the focus areas for the research (i.e. risk reduction, urban planning and housing), selected through snowball and purposeful sampling.

[7] The term "project" is used for all types of initiatives and programmes carried out by the analysed organisations. Four of the visited projects were implemented by social housing organisations (FUSAI and FUNDASAL); three projects by the development organisation CEPRODE, and one by the relief organisation Red Cross. These projects were selected for their information richness (i.e. the existence of a certain level of integration of risk reduction, urban planning and housing). The existence of such more integrated projects was also one of the criteria for selecting El Salvador as the study area.

2. IMPLEMENTED PROJECTS

Since Mitch, and especially after the 2001 earthquakes, nearly all the analysed organisations reconsidered the contents of their projects and partially adjusted them, thus opening up their disciplinary boundaries.[8] Whilst the adjustments have certainly varied between the organisations, specific patterns can be identified for social housing, relief and development organisations respectively.

Projects of social housing organisations

After Mitch, most of the social housing organisations were involved only in short-term disaster recovery activities, returning to their normal work after the relief phase was over. However, following the 2001 earthquakes, a profound change was initiated within the implemented projects. The identified patterns of change were:

a. Improvements of constructive and structural aspects
b. Inclusion of institutional capacity building components for risk reduction[9]
c. Inclusion of socio-economic development components for risk reduction
d. Implementation of land use planning projects
e. Creation of pilot projects for risk reduction

With the aim of reducing physical vulnerabilities, most of the social housing organisations re-evaluated and changed the construction and design used for their project houses, and started to give more importance to their environment (e.g. basic services and infrastructure). As many of the affected municipalities were not prepared for receiving and efficiently using financial assistance obtained for housing, institutional capacity building was further included as a component of new projects. Several social housing organisations such as CHF, FUNDASAL, and FUSAI have also started to combine employment generating activities within their housing projects in order to reduce the socio-economic vulnerabilities of the affected communities. Micro credits were partly offered, not only for housing, but also for micro enterprises, and educational activities were no longer exclusively focused on the construction processes. Furthermore, due to the demand from municipalities, academic institutions were, for the first time, engaged in designing and implementing land use planning projects.[10]

CHF and FUSAI designed and implemented pilot projects for risk reduction. These were not linked to their housing projects, and focused on the establishment of emergency committees, capacity-building for risk reduction, the elaboration of local risk maps and the implementation of minor mitigation works.

After the relief phase, some social housing organisations started a process of mainstreaming risk reduction within their general pre-disaster housing projects. In order to do so, the definition of risk was broadened including themes such as urban violence and insecurity, traffic accidents, environmental contamination, drug abuse, and HIV/AIDS. FUSAI has initiated the process of integrating risk reduction and housing in a more systematic way by creating a pilot project based on a newly developed comprehensive planning matrix.

Projects of relief organisations

Following hurricane Mitch, most of the relief organisations initiated a gradual change in their projects. The identified patterns of change were:

a. Creation of pilot projects for risk reduction (focus: preparedness)
b. Inclusion of land use planning components
c. Implementation of permanent housing projects

A growing awareness that it was unsustainable to work only in short-term recovery led to the development of specialised projects for risk reduction. Project activities included the establishment of emergency committees, early warning systems, the elaboration of local risk maps and relief plans. Mitigation plans were established including land use maps and the identification and prioritisation of essential infrastructure work.

After the earthquakes, relief organisations started to work towards the implementation of permanent housing in order to reduce and address phys-

[8] The term "discipline" is used to describe specific branches/sectors of knowledge (i.e. risk reduction, urban planning and housing) that find their expression in different fields of action.
[9] For the paper, the Spanish term "gestión de riesgo" was translated as "risk reduction".
[10] For example, the department of engineering and the department of architecture at the University José Simeón Cañas executed land use planning projects for Nejapa and Jiboa.

ical vulnerability both during and after disasters, whilst temporary housing was given less financial support. Even after the relief phase was over, the Red Cross continued to work in housing, initiating a pilot housing project in Morazán to promote the use of improved, traditional building materials for self-help housing and upgrading.

Projects of development organisations

With the growing awareness that risk reduction was not only to be included in the aftermath of disasters, development organisations re-oriented their projects. Here, identified patterns of changes were:

a. Creation of pilot projects for risk reduction
b. Inclusion of land use planning components
c. Creation of specialised georeferencing projects
d. Implementation of housing projects for risk reduction

Pilot projects for risk reduction were implemented. With the increasing experiences in the elaboration of hazard maps, and the awareness of their use for broader risk analyses, World Vision, for instance, started to implement georeferencing projects with the idea of combining hazard maps with others related to food security, sanitation, infrastructure and adolescent criminality.

The interest of international organisations (IOs) and municipalities in land use planning increased significantly: Already by the 1990s, development organisations started to support municipalities in elaborating participative land use development plans. With the recent disasters, the integration of urban planning components was included as a continuation and enhancement of the ongoing work of the organisations involved in risk reduction (e.g. the establishment of land use plans, local decision-making groups for participative planning, municipal enactments for land use and register, and the design of access and emergency routes) (CEPRODE, 2003).

After the earthquakes, many development organisations worked increasingly and more specifically in housing because of the great need to reduce physical vulnerability. However, only few organisations subsequently fully integrated the concept of risk reduction. REVIVES, a project by GTZ, combined reconstruction with the establishment of local committees for risk reduction. And PAHO/WHO developed a new comprehensive house prototype for reconstruction called VIVISAL.[11] An interesting case is CEPRODE which started to include housing within their projects for risk reduction, thereby using the construction of project houses - which was organised by established emergency committees - to further promote risk reduction (e.g. through mutual help).

3. OPERATIONAL INSTRUMENTS

In parallel to the changes of the projects' content, organisations partly adapted operational instruments for the proper implementation of the broadened and new projects.

Working approaches

In respect of methodological and organisational working approaches, three patterns of change were identified:

a. Increased work at municipal level
b. Increased focus on participation
c. Changed provision of housing financing (subsidies)

In the 1990s, development organisations started to work at the municipal level. This was as a result of the adoption of the municipal code in 1986 and the peace agreements in 1992, which promoted decentralisation and thereby created the demand for an increased role of local governments. In the following, as a result of the occurrence of the recent disasters, social housing and relief organisations have undergone three shifts or changes. The first one was to focus on the municipal level. The second was to associate themselves directly with local governments. The third was to change from delivering services to encouraging and promoting more participatory and community-based work. This resulted, for instance, in improved municipal-national communication systems for disaster response, through the creation of better defined, participatory structures and use of adequate technical equipment (i.e. radios).

[11] See http://www.paho.org/Spanish/DD/PIN/Numero16_articulo4_4.htm, accessed 15 March 2005.

Another trigger for the adoption of a new operational approach was the substantial drawbacks social housing organisations faced as a result of the free provision of housing constructed by relief and development organisations. Free provision generated a passive attitude among beneficiaries, who were no longer willing to contribute financially to the construction of their houses. Social housing organisations such as Fundación Habitat, HFDI, and FUSAI adopted a new approach that included the exclusive provision of housing through subsidies, as opposed to a system of combined credits and subsidies.

Tools

New tools, which promote an increased integration of risk reduction, urban planning and/or housing were developed for the implementation of wider or new projects:

Risk check-lists for improved housing quality control: After the 2001 earthquakes, some social housing organisations, such as HFDI, developed specific check-lists for the evaluation of disaster risks in potential project areas. The lack of related laws, regulations and enforcement mechanisms, as well as increased requirements by IOs forced them to establish such check-lists.

Risk maps/assessments: As far back as 1992, WHO together with COEN and the Ministry of Health developed guidelines for the elaboration and application of local risk maps. However, most aid organisations and municipalities only started after the recent disasters to develop their own guidelines, and to use participative local hazard (and vulnerability) maps within their projects. These maps were, at first, merely a by-product of activities in local awareness-raising for risk reduction. However, by gaining increased experience in the process of their elaboration, together with the local interest in land use planning, hazard maps were improved, digitalised and used as an information basis for land use plans. Currently, organisations are searching for criteria and tools, with which to elaborate adequate vulnerability maps. In contrast, social housing organisations do not generally use local risk maps or land use plans within their housing projects. As a result of the Ministry of Environment's increasing control over construction permit applications after the 2001 earthquakes, technical hazard assessments were only improved and extended geographically.

Strategic framework for integral housing and risk reduction: In 2004, the social housing organisation FUSAI developed a strategic framework for the elaboration of more integral projects. Housing is no longer viewed as the final or ultimate aim, but rather as a catalyst that, together with other activities, can achieve sustainable development goals. The framework includes progressive performance targets vis-à-vis the different components (e.g., land use planning, risk reduction and housing).

Guidelines for integral land use planning and risk reduction: In 2002/03, GTZ, together with VIVIDU, developed methodological guidelines for the development of municipal and land use development plans (GTZ, 2003a). This is the initial effort of aid organisations to combine land use planning and risk reduction, and to standardise related plans and maps.

Establishment of risk indicators: With the aim of creating a more quantitative instrument for policy decision-making, IDB is working together with SNET on the formulation of indicators for risk reduction. The integration of risk reduction, urban planning and housing is partly promoted by established indicators (e.g., indicator RR1: The integration of risks in land use and urban planning; RR4: Housing improvement and relocation of disaster-prone settlements) (IDB, 2004:17).

4. INSTITUTIONAL AND ORGANISATIONAL STRUCTURES

With the aim of effectively implementing the broadened new projects and institutionalising the integration of risk reduction, urban planning and/or housing, some organisations have adapted their internal organisational structures, and developed new, institutional and co-operative channels. Furthermore, new organisations were created.

Internal structures and new organisations

By looking at the institutional structures of the analysed organisations, the following patterns of change were identified:

a. Broadening of departments' activities (mandates)

b. Integration of risk reduction in the strategic plans of organisations
c. New departments for construction quality control
d. New organisations, departments and commissions for risk reduction
e. Creation of focal points for risk reduction
f. Increased inter-departmental co-ordination

In most analysed organisations, the integration of risk reduction, urban planning and housing was only made possible through the broadening of the field of activities of existing departments in respect of the issues of relief, development or social housing. Only a few departments have changed their mandate. However, for the first time several organisations included risk reduction in their strategic plans, action plans and co-operative frameworks. This precedent also permitted them to continue their support of risk reduction within a pre-disaster context. For the same reason, the relief organisation OFDA also created a new programme for technical assistance.

Following the 2001 earthquakes, organisations, such as HFDI and FISDL, established new departments for construction quality control in order to systematically revise structural designs and normative aspects of their construction work. New departments and/or commissions for the promotion of risk reduction were created within relief and development organisations such as the Red Cross, Care, FISDL, COMURES and some municipalities.[12] In 2001, UNDP supported the establishment of SNET, a department for territorial studies and risk reduction, within the Ministry of Environment (MARN). It includes a specialised unit for risk reduction with the focus on the enhancement of hazard knowledge. Other organisations created focal points for risk reduction, being composed of specialised staffs, who have the task of transforming risk reduction in a cross-cutting topic.

The elaboration of more integrated projects caused the different departments to move closer together and even merge. Within FUSAI, the department for local development, established in 1998, recently merged with the department for habitat to become the single "department for local development and housing".

Not only were changes within organisations made, but new organisations were also established. The creation of two new organisations, which was financially supported by some IOs, was critical for the promotion of risk reduction: At regional level, the Co-ordination Centre for Natural Disaster Prevention in Central America (CEPREDENAC) was established in 1995, and at national level, MARN was created in 1997. The creation of MARN was important because it became the host organisation of SNET in 2001. Whilst new structures for risk reduction were established, the importance of organisations in the field of urban planning and housing has decreased since the 1980s due to structural adjustment supported by international financing institutions. However, to a certain extent, the recent disasters again highlighted their importance.

Institutional cooperation

Another set of patterns of change was identified in relation to the co-operation between different organisations:

a. Inter-institutional capacity building
b. Creation of new networks for risk reduction
c. New project alliances and counterparts

Since 1992, the regional network "La Red" has been one of the cornerstones for the promotion of risk reduction in Central America.[13] In El Salvador, only in respect of the 2001 earthquakes "La Red" together with international and national organisations started to actively organise a range of related forums and seminars as well as consultancies at national and municipal level. IOs further established two networks for risk reduction.[14] However, only a few organisations co-operated temporarily in the implementation of joint projects[15], and a poor exchange of information (e.g. data and maps) was identified.

[12] At a municipal level, a range of different committees was established (e.g. for emergency relief, mitigation, environment, or risk reduction) which, in 2004, were mostly inactive. After the 2001 earthquakes, only a few municipalities, such as that of Santa Tecla, created departments to promote operational and technical risk reduction.
[13] "La Red de Estudios Sociales en Prevención de Desastres en América Latina". Please see http://www.desenredando.org/. In respect of El Salvador, an important publication from 1996 is called "De terremotos, derrumbes e inundados".
[14] One network was promoted by OFDA, the other one by Oxfam ("Red de Iniciativa para la Gestión de Riesgo" and "Mesa Nacional permanente en Gestión de Riesgo") (GTZ 2002:14-15).
[15] An exception is an ongoing further education course for risk reduction, which was created in co-operation between the social housing organisation FUSAI and the development organisations FUNDE.

Required knowledge of relief and development organisations regarding housing construction was mainly built up by hiring architects or engineers as part of the staff team, as well as learning-by-doing from other professionals. In fact, PAHO/WHO developed the above-mentioned house prototype VIVISAL without co-operating with or consulting social housing organisations.

5. NATIONAL AND MUNICIPAL LEGISLATION

Important policy developments can be identified since the 2001 earthquakes. Legislation related to urban planning and housing has altered as follows:

a. Updating of laws and regulations for construction and urban planning
b. Integration of risk reduction in the national housing policy
c. Integration of risk reduction in the draft policy for land use planning
d. Change of governmental housing finance
e. Integration of risk reduction in municipal land use plans and related enactments

Legislation for urban planning and housing was enacted before the first disaster-related laws and policies came into effect. In 1956, the first law for urban planning and construction was adopted which was updated after the 2001 earthquakes. The 1986 earthquake had provoked the establishment of a seismic code, which currently requires revision. After Mitch, the national policy for housing adopted in 1999 addressed, for the first time, the management of environmental risks.[16] Between 2001 and 2004, the first draft policy for land use planning was developed in co-ordination between VIVIDU and MARN/SNET. Risk reduction is included as one out of the six sub-programmes of its national territorial/land use plan. The criticism of the draft policy is based, amongst others, on the policy's centralised character, non-participative elaboration, restricted focus on natural hazards, and its disputed proposal of establishing an additional legal and institutional system for risk reduction (GTZ, 2003b:38).

As a consequence of the 2001 earthquakes, governmental housing subsidies were opened up to population groups earning up to four (formerly two) minimum salaries; and in 2003, national subsidies were completely cut for around two years, thus decreasing the available funds for the poorest people. At municipal level, enactments, which partly included risk reduction, were adopted.

The developments of legislation related to disaster management and risk reduction, in particular, were:

a. New draft laws for risk reduction
b. Proposals of policies for risk reduction

Disaster-related legislation dates back to 1976, when the Law for Civil Defence came into effect. After Mitch, COEN presented a new bill for relief and civil protection against natural disasters. A number of NGOs heavily criticised this bill as being based on a military and centralised vision. In response, UNES presented an alternative bill which was based on decentralisation (GTZ, 2003b:17). In a joint effort, COEN and UNES presented, in 2002, a third bill for prevention and mitigation. Criticism came this time from MARN/SNET which demanded its technical and juridical revision, arguing that the bill was focused solely on emergency management, but should, in fact, be elaborated as an integral part of the land use planning policy (GTZ, 2002:6-9; GTZ, 2003b:33). Since 2001, different organisations developed guidelines for policies for risk reduction, but without clearly determining the roles and responsibilities of national and municipal stakeholders.

6. LESSONS AND CONCLUSIONS

The foregoing analysis shows that since the 2001 earthquakes, a range of remarkable changes in aspects related to risk reduction, urban planning and housing have taken place in El Salvador. The underlying drivers, strengths and weaknesses of the described developments, as well as the potentialities for integration, are presented in the following sections.

[16] The policy is not recognised by national NGOs as its elaboration was carried out without their active involvement/participation.

Need for integration

The occurrence of the recent disasters has triggered an increased awareness in organisations regarding the correlation between risk reduction, urban planning and housing, as well as the need for their integration for sustainable urban poverty reduction. Beneficiaries of more integral projects which have been implemented since Mitch considered them as more successful than former ones, which, as they stated, resulted in increased vulnerabilities (e.g. resettlement projects leaving them economically more vulnerable; construction of dry compost latrines together with the use of wood ash, resulting in increased occurrence of landslides and contamination due to excessive soil perforation, deforestation and the premature deposit of excrement on the slopes). The success of more integral projects was substantiated by Providencia, a community in San Salvador, where human and material losses after the 2001 earthquakes, were comparatively small.[17]

Missing links for integration

The study shows that the mainstreaming process was not only a one-way one in respect of the issue of integration of risk reduction in the work of social housing organisations. Unexpectedly, a mutual integration of the three disciplines risk reduction, urban planning and housing was identified within the work of social housing, relief and development organisations. This provoked increased competition (see figure 1).

The progressive overlapping of disciplines led, on the one hand, to more integral projects with different entry points, but, on the other hand, to partly similar activities and final outcomes. Different alternatives for the step by step integration of the three disciplines in question could be determined (see table 1). Thereby, the concept of risk reduction has been identified as steering towards and promoting urban planning and housing activities. For instance, with the implementation of risk reduction activities, communities had the opportunity to legalise their land, and the elaboration of risk maps led to the work in land use planning and enactments for housing constructions. On the other hand, housing, itself, proved to have the potential to further promote risk reduction. Mutual help for the construction of houses in the urban community Providencia resulted in the reconciliation of hostile groups (i.e. youth gangs), thus improving activities in respect of risk reduction and reducing violence. Unfortunately, organisations focusing on housing did not generally connect their housing activities with land use planning, thus the projects' full risk reduction potential was not fulfilled.

Competition instead of cooperation

The mutual and progressive integration (as shown in figure 1 and table 1) was not achieved by increased inter-institutional co-operation. Since the 2001 earthquakes, competition between organisations deepened, resulting in the duplication of small-scale efforts and higher investment costs. Established alliances were mostly of a temporary nature, and additional knowledge and capacities, which were needed by the organisations to initiate a shift towards integrating risk reduction, urban planning and housing, were mainly built up independently and internally (e.g. through the use of short-term consultants). Only a few projects were implemented jointly, and organisations were seen as being reluctant to exchange relevant information. National-municipal competition was felt by municipalities such as Santa Tecla, one of the areas most severely affected by the 2001 earthquakes, which had difficulties in obtaining required data from national organisations. At the municipal level, competition resulted in a vast number of non-compatible or duplicated plans and maps for relief, reconstruction, mitigation, development, and land use planning.

Competition was partly provoked by IOs through the promotion of different concepts of risk reduction. Two separate networks for risk reduction were established, splitting the organisations working in El Salvador into two competing groups. Competition further relates to the inherent differences between social housing, relief and development organisations (e.g. different objectives, target groups, working principles and concepts).[18] Compared to others, social housing organisations

[17] The project in Providencia was implemented by CEPRODE. The statement is based on interviews conducted with the beneficiaries of the project.

[18] Interviewees working in risk reduction including housing and infrastructure criticised, for instance, those NGOs focused on housing and infrastructure as not being able to reach the poorest groups as a result of their working approach.

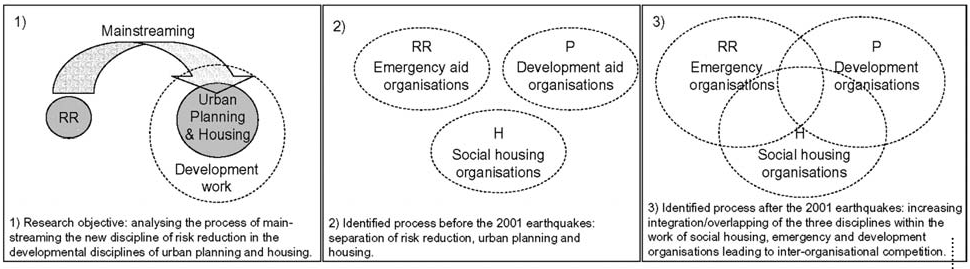

Fig 1. Process of mainstreaming risk reduction in El Salvador. RR = Risk reduction, H = Housing, P = Urban Planning.

seem to have built up more lasting alliances aided by the fact that these alliances provided them with further access to financial resources.

Unsustainable and unilateral finance

The influence of financial support from IOs in promoting risk reduction started in the early 1990s when regional organisations and networks for risk reduction were established in Central America. After the 2001 earthquakes, IOs promoted and financially supported risk reduction as a new and autonomous field of work to be integrated mainly in project implementation. This resulted in the creation of new projects or components for risk reduction which were added temporarily, but were not adequately linked to the organisations' general work. Thus, more inclusive integration was not pushed forward by IOs, and a divergence process can already be identified.

Apart from the changes at project level, alterations of internal organisational structures were often identified as adding on risk reduction as a new and separate structure, without being adequately integrated and/or consolidated.[19] Today - compared to the relief phase after the 2001 earthquakes - departments or focal points for risk reduction are of little importance and have only a few staff remaining in them.

When it comes to national and municipal legislation, international organisations partly financed the revision and adaptation of existing legal frameworks. National draft laws and policies including risk reduction were proposed but have not been adopted. In addition, there is obsolescence, non-compliance, and non-enforcement of existing housing and urban planning regulations. The lack of adequate legal frameworks and their application in the local context - particularly in informal settlements - is a key barrier to promoting further integration. This situation can be attributed to the competition and power games of different governmental organisations, the lack of participative and consensus-based approaches in the development, enforcement and monitoring of laws and policies,

Table 1. Identified entry points and steps followed by different stakeholders to integrate risk reduction, urban planning and housing

STAKEHOLDERS	STEP 1 (= ENTRY POINT)	STEP 2	STEP 3	STEP 4
Mainly relief, but also social housing and development organisations	Risk Reduction (mainly Preparedness)	a) Infrastructure b) Land use planning	a) Land use planning b) Infrastructure	Housing
Mainly development, but also academic social housing organisations	Land use planning	Risk reduction	Infrastructure	Housing
Mainly social housing, but also relief and development organisations	Housing	a) Risk reduction b) Infrastructure	a) Infrastructure / b) Risk Reduction	—
Social housing organisations	Upgrading (housing and infrastructure)	Risk reduction	—	—

[19] For example, the new departments for risk reduction were not connected to the departments for urban planning or housing. In Santa Tecla, within an established GIS unit in 2001, the three sections of risk reduction, land register, and urban planning were designed to work completely separately.

as well as the shortage of the necessary financial resources.

Four years after the earthquakes in El Salvador, international relief funding for post-disaster risk reduction is now coming to an end. This leaves the recently initiated process halfway and far from achieving and completing an inclusive and consolidated integration of risk reduction, urban planning and housing. In this sense, the concept of "risk reduction" in El Salvador resembles other buzz words ("gender" in the early 1990s, and "environment" in the mid-1990s) or the current top priority theme of: "urban violence and insecurity", which is currently pushed by the IOs. However, whilst the concepts of gender, environment, urban violence and insecurity were introduced through development co-operation resources, risk reduction was, to a large extent, promoted by international disaster relief funds which have a short term perspective.[20]

Despite the mentioned pitfalls, in the case of social housing organisations, a potential for a more lasting change towards integral projects together with participative work at municipal level is identifiable. The initiated changes were not only based on the occurrence of the recent disasters and the (financial) push of international and regional organisations for risk reduction. Two financial factors at national level influenced the opening-up of their disciplinary boundaries. Firstly, most of the social housing organisations had to respond to damages caused to some of their former housing projects. To avoid a loss of market credibility, social housing organisations faced financial losses because of the necessary repairs that they had to carry out. This led to an increased awareness about the shortcomings of a purely physical/constructive approach and the need for more integral and participatory approaches closely connected to local development. Secondly, due to the changed governmental housing subsidies after the 2001 earthquakes, social housing organisations were suddenly deprived of their main financial source. The scope of their projects was broadened in order to tap into municipal budgets, national funds provided by FISDL, as well as international resources.

Risk maps: lost link for integration

Postulating that the starting point for reducing disaster risk lies in the knowledge of existing hazards and related vulnerabilities, the Hyogo Framework for Action calls for the development, updating and dissemination of risk maps and related information in an appropriate format (Section 2, i (a)).

In El Salvador, for many organisations, the crosslink between risk reduction, urban planning and housing - as shown in table 1 - did not become apparent until the continuous development of risk maps took place. To use the elaboration of risk maps as an effective platform to further sustain integration, several barriers will require to be overcome. Almost every organisation uses different methods and approaches to elaborate risk maps, thus hampering their compatibility and use for land use planning. Differences exist regarding empirical survey methods, scales, technical tools (GPS, aerial photographs, soil analyses, etc.), and content (natural and anthropogenic hazards, etc.). In addition, digitalised maps have, in the main, been prepared by external consultants over a very short period of time. Thus, they lack regular updating, dissemination, participation and even basic knowledge, which is available at local, municipal or national level.[21] Furthermore, despite the fact that local hand-made maps are considered to be more updated than the digitalised ones, the former have been, for the most part, excluded from land use planning. In fact, the correlation between maps for land use planning (seen, for instance, as a technical analysis to stop or attract investors) and municipal risk maps (based on peoples' daily lives) is hardly recognised by operational project staff. Furthermore, social housing organisations do not generally link local risk maps or land use planning with their work in housing.

Land use planning policies: lost potential for integration

Despite the pitfalls of the existing legal frameworks for relief, urban planning and housing, the draft policy for land use planning could be an important advancement for integrating urban planning, hous-

[20] Consequently, while gender and environment analyses are, nowadays, often required by bilateral and international organisations to be included in project applications, little effort is made to include disaster/risk reduction analyses.

[21] Within a Red Cross project, hazard maps for landslides were developed which provided less details and information than an already existing map from 1974 which was elaborated by the investigation centre for geological technology and in collaboration with the German Co-operation. The information is based on an interview with Carlos Umaña Cerna.

ing and risk reduction, if the obstacles in the path of its enactment can be overcome. The acceptance of such policies as tools for better integration can be increased if they are participatory, include all types of hazards as well as related vulnerabilities, and provide more flexibility. Improved effectiveness can be achieved if risk reduction is not an add-on programme, and national and municipal budgets for risk reduction are included explicitly in the policy's investment plan. In this context, it is crucial to define clearly the responsible implementation organisations and legal frameworks at all levels, thereby complementing already existing legal and institutional structures.

In contrast to the draft policy for land use planning, some of the municipal land use plans include risk reduction in a more cross-cutting way. Here, political and financial restrictions have to be overcome in order to effect its adequate implementation.

7. RECOMMENDATIONS

On the basis of the research conducted, and the subsequent lessons and conclusions drawn, the question that poses itself is how mainstreaming risk reduction in urban planning and housing could be made more inclusive and sustained within a developmental context. Whilst a series of important changes has been carried out in the work of social housing organisations since the 2001 earthquakes, there are many uncertainties as regards how the gained experiences can be included within the organisations' usual work. Two main recommendations to overcome the shortcomings highlighted in the preceding discussion are presented as follows:

Firstly, a comprehensive and organisational model is proposed, which shows how risk reduction, urban planning and housing can be integrated in a co-ordinated, complementary and compatible way (see table 2). Integration should be based on the idea of creating synergy between different

Table 2. Proposed organisational model for integrating risk reduction, urban planning and housing

OPERATIONAL INSTRUMENTS/ IMPLEMENTED ACTIVITIES Creation of synergies instead of competition through unification and differentiation respectively		**EMERGENCY RELIEF/ RISK REDUCTION**	**DEVELOPMENT**	
			URBAN PLANNING	**HOUSING**
1) Implementing structure	Establishment of and work through a unified structure	Municipal committees for local development planning as well as its sub-committees for risk reduction Political and operational focal points for project implementation		
	Establishment of and work through complementary and cooperative sub-committees	Municipal and local committee for emergency management	Municipal and local committee for project implementation	Municipal committee for reconstruction and local commissions for project implementation
2) Maps	Unified maps	Unified and specified methods, scales and contents for the same type of maps (based on standardisation of the concept of risks reduction between different organisations)		
	Compatible and complementary maps through consideration of existing maps and establishment of new project-related maps (different scales and contents)	Municipal, regional and national digitalised hazard maps, as well as risk maps for disaster response	Municipal, regional and national digitalised vulnerability analyses and risk maps for mitigation and prevention as well as territorial land use maps	Local maps/analyses of hazards, vulnerabilities and risks of the project areas as well as maps/strategies for land use of the respective area.
3) Plans and legal frame-works	Establishment of and work in accordance with a unified municipal plan	Municipal development plan which unifies different sub-plans (based on standardisation of the concept of risks reduction between different organisations, unified and specified methods and contents). Development and enactment of related municipal legal frameworks		
	Compatible and complementary plans and legal frameworks	Municipal and inter-municipal emergency plans, laws and policies	Municipal and inter-municipal land use plans, laws and policies	Local land use plans, municipal reconstruction plans, laws and policies
4) Project components	Inclusion of more comprehensive project activities for risk reduction	Project-related educational and socio-economic components for institutional and community capacity building as well as socio-economic development for risk reduction		
	Different additional and complementary project activities	Early warning Establishment of communication structures for emergencies Capacity building for emergency response and preparedness Etc.	Infrastructure and basic services Capacity building and building-up of "infrastructure" for planning and land register (cadastral register) Etc.	Housing Local infrastructure and basic services Capacity building for secure housing and project management Etc.

organisations instead of duplicating efforts. In a post-disaster context, the described model has the potential to harmonise the transition from relief to development. Co-ordination between the work of social housing, relief and development organisations can be achieved by: 1) working with unified implementation structures (e.g. municipal committees for local development along with political and operational focal points for project implementation), 2) the standardisation and unification of methods, scales and contents for the development of specific maps and plans, 3) the standardisation and adjustment of the concept of risk reduction in the different organisations, and 4) the co-ordinated inclusion of activities for capacity building and socio-economic development for risk reduction. Complementation and compatibility can be achieved by: 1) working through different municipal/local commissions (e.g. for relief, risk reduction, project implementation), 2) the development of compatible products and services, such as maps and plans with different contents and scales, and 3) the implementation of additional sector-specific activities. Furthermore, if risk reduction should become an inclusive and integral part of housing projects, the link with risk mapping and land use planning is crucial (see also figure 2).

On the basis of the presented model, it is recommended that the integration of risk reduction is promoted in specified key aspects of urban planning and housing through the development of specific tools (e.g. the establishment of criteria of how to include risk reduction in land use planning policies). The described model can - once established - help to use resources more efficiently. However, its establishment would probably require co-operation resources.

Secondly, in this context it is suggested that it is not only emergency relief, but primarily development resources, which need to be allocated in order to push forward the integration of risk reduction into urban planning and housing. It is, therefore, not only important to use financial incentives to promote integration in project implementation. It is equally crucial to promote integration in national and municipal legislation, as well as operational instruments and institutional/organisational structures of social housing organisations (see figure 2). This includes municipal and national agencies and also implementing aid organisations. Financing requires the channelling of resources to encourage changes in integral structures, without the addition of separate ones.

The next stage of this research will focus on developing an operational framework with performance targets to be utilised as a tool for providing guidance for integrating risk reduction in social housing organisations' work.

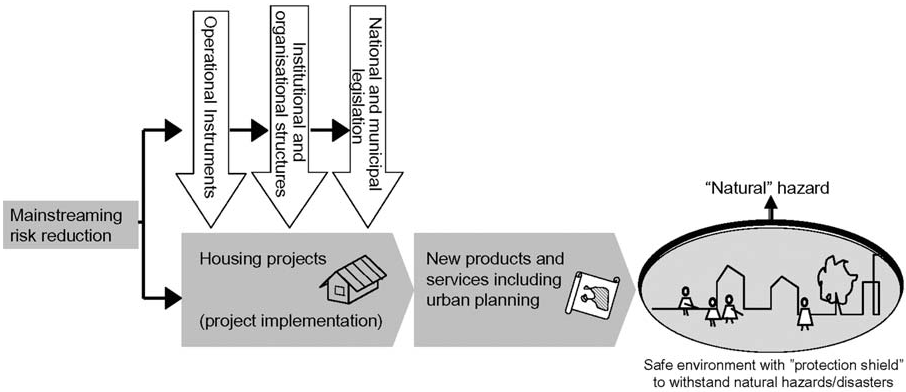

Fig 2. Suggested change from a unilateral to a more multilateral process of mainstreaming risk reduction at national and municipal/local levels, as well as in the work of social housing organisations (at four identified levels/spheres), leading to the inclusion of urban planning.

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IV

Paper IV	
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Publication	Journal: *Humanitarian Exchange* (HE)
Directly related publication(s)	Papers I–III Wamsler (2006) *Operational framework for integrating risk reduction for aid organisations working in human settlement development*, Disaster Studies Working Paper No. 14, Benfield Hazard Research Centre (BHRC), London (English and Spanish version)

Tackling urban vulnerability: an operational framework for aid organisations

Christine Wamsler, Lund University

With increasing urbanisation, cities in the developing world are growing both in population and area. At least a billion people worldwide live in slums.[1] They are forced to accept dangerous and inhuman living conditions, in which any natural event is likely to become a disaster. Poor access to land, overcrowding and low-quality housing – related to a complex system of socio-political, institutional and economic processes – lie at the heart of urban disaster risk. Nevertheless, international aid organisations accord low priority to both urban issues and disaster risk reduction (RR). While the need to integrate RR within the work of aid organisations is generally acknowledged, little has been done to identify how this could be achieved. Related operational tools are urgently required.

In February 2006, an operational framework for integrating RR into the work of aid organisations was published as a joint paper by the Benfield Hazard Research Centre in the UK and the Department of Housing Development and Management at Lund University in Sweden. Based on three years of research, the framework aims to support aid organisations with concrete tools and guidelines to:

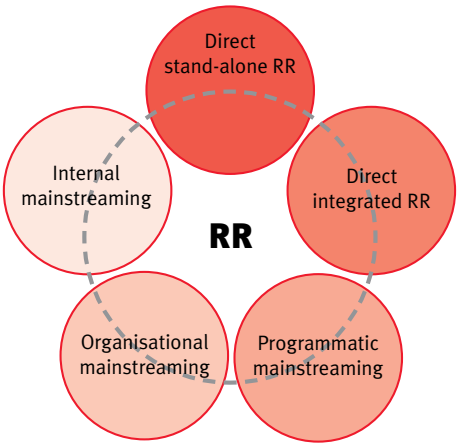
- evaluate the relevance of integrating RR within their organisation;
- identify and prioritise the different options for integrating RR;
- formulate activities for the selected option(s);
- evaluate possibilities for financing these activities; and
- define an implementation strategy.

Although the operational framework was developed for development aid organisations, its underlying ideas and concepts also apply to organisations working in relief. The framework can be used within a variety of cultural and geographic contexts, and it is relevant to all types of natural hazard and disaster. In addition, it offers more detailed guidance for aid organisations engaging in social housing and settlement development planning by providing sector-specific reference activities.

To validate the framework, questionnaires were distributed to operational staff and programme managers in different aid organisations, and three workshops were held (in Costa Rica, El Salvador and Sweden). The workshop participants, who were drawn from aid organisations in Africa, Asia and Latin America, carried out practical exercises to apply the operational framework. They were then asked to evaluate whether the tool was comprehensible, comprehensive/complete, relevant and applicable/useful. On average, the rating for all four aspects ranged between four and five (on a scale of one to five, five being the best). Finally, ways to surmount potential financial, political and institutional barriers to the implementation of the tool were discussed.

1 UN-HABITAT, *The Challenge of Slums* (London: Earthscan, 2003).

Figure 1: Strategies for implementing risk reduction



> at least a billion people worldwide live in slums

The framework is currently being tested in practice in Central America by FUSAI (Salvadoran Integral Assistance Foundation) and UN-HABITAT-ROLAC (UN Human Settlement Programme, Regional Office for Latin America and the Caribbean), and in El Salvador and the Philippines by PLAN INTERNATIONAL.

Five complementary strategies for integrating risk reduction

The operational framework provides five complementary strategies for integrating RR within aid organisations (see Figure 1). The five strategies are:

a) *Direct stand-alone RR:* This is the implementation of specific RR projects that are explicitly and directly aimed at reducing disaster risk through prevention, mitigation and/or preparedness. These stand-alone interventions are distinct, and they are implemented separately from other existing project work carried out by implementing organisations. The objective is explicitly to reduce disaster risk, for

instance through establishing early-warning systems or institutional structures for risk reduction (e.g. special-ised RR committees) and physical disaster mitigation (e.g. embankments to reduce flooding).

b) Direct integrated RR: This is the implementation of specific RR activities alongside, and as part of, other project work. The focus is still on direct and explicit RR through prevention, mitigation and/or preparedness, but with the difference that the work is carried out in conjunction with, and linked to, other project components. An example of this strategy would be the establishment of a local RR committee within the framework of a self-help housing project carried out by a social housing organisation.

c) *Programmatic mainstreaming:*[2] This is the modification of sector-specific project work in such a way as to reduce the likelihood of increasing vulnerability, and to maximise the project's potential to reduce risks. The focus is on the aid organisation's 'normal' project work, but in a way that takes into account the changing context created by the increasing frequency and severity of natural disasters. In other words, the objective of programmatic mainstreaming is to ensure that ongoing work is relevant to the challenges presented by natural disasters. However, in contrast to the two strategies described above, the project's objectives do not focus on RR as such. An example of such a strategy could be a settlement upgrading project which adjusted its loan/credit system to the needs of vulnerable households living in a disaster-prone area.

d) *Organisational mainstreaming:* This is the modification of organisational management, policy and working structures for project implementation in order to back up and sustain project work in RR (direct and/or indirect), and to further institutionalise RR. If integrating RR in project work is to become a standard part of what an organisation does, then organisational systems and procedures need to be adjusted. The objective is to ensure that the implementing organisation is organised, managed and structured to guarantee the sustainable integration of RR within project work.

e) *Internal mainstreaming:* This is the modification of an aid organisation's functioning and internal policies in order to reduce its own vulnerability to impacts created by disasters. The focus is on the occurrence of disasters and their effect on organisations themselves, including staff and head and field offices. The objective is to ensure that the organisation can continue to operate effectively in the event of a disaster. In practice, internal mainstreaming has two elements: i) direct RR activities for staff and the physical aspects of the organisation's offices, including setting up emergency plans and retrofitting; and ii) modifying how the organisation is managed internally, for example in terms of personnel planning and budgeting.

What follows is a hypothetical example of how an aid organisation – a Mexican social housing organisation called UNAGI – might be triggered to apply these five strategies to its work: In response to the increased funding for RR being offered by international donors, UNAGI employs a new staff member with expertise in RR, and designs and implements a pilot RR project. The project aims to raise community awareness about disaster risk through the distribution of leaflets and the establishment of local RR committees. Thus, UNAGI becomes engaged in the *stand-alone direct RR strategy.*

With the experience gained from the pilot project, UNAGI then starts to include RR activities in its ongoing housing projects. For instance, it begins to raise risk awareness alongside its community training for self-help housing. Thus, it becomes involved in the *direct integrated RR strategy.*

One year later, UNAGI's managers decide that all projects should take greater account of disasters, and should seek to maximise their positive effects on reducing risks. Accordingly, UNAGI carries out research analysing the links between its social housing activities and disaster risk. In one project area, it finds that basing housing credits on income capacity makes it impossible for the people most vulnerable to disasters to qualify for UNAGI projects. Without doing any direct RR work, UNAGI responds to this finding by offering partial housing subsidies and smaller credits for physical mitigation measures in existing houses. In another area, community research provides evidence that beneficiaries are vulnerable to disasters due to their dependency on informal vegetable trading, and that past housing projects had increased their socio-economic vulnerabilities by resettling them far from their income activities. It is also discovered that these housing projects used roof tiles that were not durable, and were very expensive. Acting on these findings, UNAGI sets up a local material production workshop for concrete roofing tiles, to provide a more disaster-resistant and cheaper construction material. At the same time, the workshop allows some households to diversify away from vegetable trading. In both project areas, advice on disaster-resistant construction techniques is also provided. In this way, UNAGI becomes involved in the *programmatic mainstreaming of RR*.

Over time, UNAGI realises that its various efforts in RR are not sustainable in the long term because they are not institutionalised and/or anchored within the organisation's general management and project planning cycle. It thus starts to engage in the *organisational mainstreaming of RR*. As an initial step, the organisation revises its policy to formalise its commitment to integrating RR, and develops a financial strategy to sustain this integration. In addition, risk, hazard and vulnerability assessments become routine tasks in the planning phase of all social housing projects.

Several months later, there is an earthquake in Mexico. Unexpectedly, UNAGI is affected: its head office is damaged, four staff members are severely injured and there are problems communicating with field offices. This forces the organisation to engage in the final strategy: *internal mainstreaming of RR*. A team is formed to predict

2 Generally, 'mainstreaming' signifies the modification of a specific type of work (e.g. development or relief work) in order to take a new aspect/topic into account and to act indirectly upon it. Thus, mainstreaming does not mean completely changing an organisation's core functions and responsibilities; rather, it means viewing them from a different perspective, and carrying out necessary alterations as appropriate.

the likely impacts of disasters on the organisation's finances and human resources, analysing potential direct and indirect losses (e.g. costs related to damaged buildings or vehicles, reduced reputation, staff absence and sick leave). Based on this work, UNAGI acquires an organisational insurance policy and improves its working structure, installing an enhanced communications system, introducing better processes for information sharing and revising its workplace policy. In addition, the head office is retrofitted to become more disaster-resistant.

How to use the operational framework

Apart from the comprehensive explanation of the five strategies for RR integration, the operational framework provides two rapid assessment checklists which an aid organisation can use to evaluate the relevance of integrating RR into its work, and the importance of each strategy. Once the appropriate strategies are selected and prioritised, the framework provides tables for the formulation of related project activities. These include:

a) input and process indicators to get the RR integration process started;
b) input and process indicators in the form of benchmarks, i.e. the operational state which an organisation should seek to achieve;
c) output indicators; and
d) reference activities and recommendations.

In addition, guidelines are offered on how international aid organisations can support and encourage the implementation of the framework through their local partner organisations, and how national implementing organisations can sustain this work financially.

Donor support for integrating risk reduction

International donor organisations can pursue essentially three approaches in support of integrating RR. Within each of these approaches, there are three alternatives, giving a total of nine options.

Approach 1: Offering partner organisations training, technical support, links to specialists and funding for:
a) direct RR;
b) mainstreaming RR; or
c) comprehensive RR integration (i.e. a) and b) combined), but leave the partner organisations to decide whether, how and to what extent to engage in RR.

Approach 2: Imposing funding conditions to enforce the implementation of:
a) direct RR;
b) mainstreaming RR; or
c) the comprehensive integration of RR (i.e. a) and b) combined).

Approach 3: Offering programmes for which interested NGOs can apply, which include technical assistance and seed grants, for the purpose of guiding and accompanying the process of:
a) integrating direct RR;
b) mainstreaming RR; or
c) the comprehensive integration of RR (i.e. a) and b) combined).

To date, the first choice of international organisations seems to be 1a). This leads to unsustainable risk reduction activities: once donor funding ceases, RR activities end. International funding organisations urgently need to recognise the importance of mainstreaming, and must be willing to support it financially.

Conclusion

If aid organisations continue to accord low priority to urban issues and are reluctant to look beyond the relief and reconstruction stages after a natural disaster occurs, the urban poor – the ones most severely hit – will remain caught in a vicious cycle of repeated disasters, relief and reconstruction. The operational framework presented here provides a basis for the sustainable integration of RR within aid organisations' work. It is a significant step towards reducing the vulnerability of the urban poor, providing a comprehensive extension of existing RR frameworks and concepts. It includes and integrates direct RR and the mainstreaming of RR, differentiates between three levels of mainstreaming and tackles physical, socio-economic, environmental and institutional aspects at both project and organisational level.

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V

Paper V	
Title: Understanding disasters from a local perspective: insights into improving assistance for social housing and settlement development	
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Understanding Disasters from a Local Perspective

Insights into Improving Assistance for Social Housing and Settlement Development

Christine Wamsler

Die Schäden der weltweit ansteigenden Naturkatastrophen sind erschütternd. Marginale Armensiedlungen in Entwicklungsländern sind gegenüber diesen Naturkatastrophen am anfälligsten und somit am stärksten betroffen. Der vorliegende Artikel untersucht im Detail die dem Katastrophenrisiko und –vorkommen in Slums zugrundeliegenden Hauptvariablen und deren kausale Beziehungen, zu deren Analyse sogenannte „causal loop diagrams" herangezogen werden. Die Sicht und das Wissen von Slumsiedlern in El Salvador stehen im Fokus dieser Untersuchung. Ein besseres Verstehen dessen, wie betroffene Familien Katastrophenrisiko und -vorkommen wahrnehmen und erfahren, gibt wichtige Einblicke, welche für die Verbesserung von Entwicklungshilfe — einschließlich sozialen Wohnungsbaus und Stadtplanung — von entscheidender Bedeutung sind.

The damage caused by the worldwide increase in natural disasters is staggering, with the poor and marginalised slum communities being the most vulnerable. This paper analyses the key variables and their causal relations underlying the complex system of risk and disaster occurrence in slum areas in El Salvador. Slum dwellers' views and knowledge are the focus of this inquiry. A better understanding of what households perceive, experience, and hence need in order to deal with risk and disasters can yield important insights into how to improve reconstruction and development aid, including assistance for social housing and settlement development. Causal loop diagrams, one of the main tools of systems analysis, is presented as an instrument that can help aid organisations in this process.

Background

Over the past decades, the frequency of so-called natural disasters has increased worldwide, resulting in growing human and economic losses. In 2005 alone, over 360 disasters were reported, with around 92,000 people being killed, another 160 million suffering adverse impacts, and direct material losses of about US $ 160 billion (UNISDR, 2006). Developing countries bear the highest losses in terms of human lives and gross domestic product (GDP), and El Salvador is no exception to this. On the contrary, being located in one of the most disaster-prone regions in the world, the country is strongly affected by natural disasters (Lavell, 1994).

Slum dwellers are particularly vulnerable to natural disasters. Low-income human settlements are often located on marginal land near rivers or on steep slopes; housing and infrastructure are substandard and thus less disaster-resistant. Among other problems are leaking sewage pipes from better-off settlements passing through slum areas to discharge into nearby rivers, a lack of water and waste management services, limited access to information, and overcrowding. Currently, more than one billion people worldwide live in slums and are forced to accept inhuman and dangerous living conditions. It is estimated that their numbers will double over the next 24 years (UN-HABITAT, 2003).

During recent years, increasing attention has been given to the need to reduce disaster risk[1] within the context of development work. The stated aim of the Millennium Declaration, namely, to achieve a significant improvement in the lives of at least 100 million slum dwellers by 2020, alludes to this need;[2] and the Hyogo Framework for Action 2005–2015 urges governments to address the issue of disaster risk in their sector development planning and programmes (UNISDR, 2005). However, aid organisations working in human settlement development in the field still struggle to sustainably reduce existing disaster risk in their everyday work.

A better understanding of the underlying drivers of risk and disaster occurrence in slums is a first urgent step towards improving the situation described.

Objectives and Methodology

This paper is based on case studies carried out at the household level in El Salvador in 2005/2006.[3] Its objective is to investigate, from a local perspective, the existing disaster risk, the related causes and impacts, and the resulting local needs. The main focus is on analysing the key variables — and their

1
Risk is defined as: "The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions. Conventionally, risk is expressed by Risk = Hazards x Vulnerability." See http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm. Risk reduction has become a popular term used to bring together those measures to minimise disaster risk throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards within the broad context of sustainable development. It is also a component of successful reconstruction.

2
www.unmillenniuproject.org

3
The case studies were carried out within the framework of a broader research study on managing urban disasters which was initiated by the author in 2003. The outcomes so far are summarised in several publications (Wamsler 2007; 2006a,b,c; 2004).

causal relations — that underlie the complex system of risk and disaster occurrence in slum areas. Slum dwellers' views and their extensive knowledge as to what makes them vulnerable or resilient to natural disasters are presented. The outcomes provide an understanding of what households perceive, experience, and hence need in order to deal with disaster risk and disaster impacts. This yields important insights into how social housing assistance could be improved.

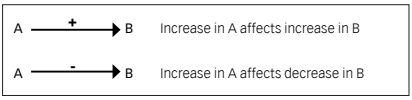
The research included observation, walk-through-analyses and interviews with 62 households, comprising a total of 331 persons, living in 15 disaster-prone slum communities.[4] For the data analysis, a combination of grounded theory (Glaser and Strauss, 1967) and systems analysis (Haraldsson, 2004) was applied.

In the following, analyses of the current situation in El Salvador will be presented, providing a "snapshot" from the household level of the selected slum communities. Discussed are, firstly, the significance of disaster occurrence, secondly, its underlying drivers, and thirdly, its impacts on slum dwellers. Finally, general conclusions are drawn regarding the needs and possible conditions that could assist in improving aid organisations' social housing assistance to effectively and sustainably manage risk and disasters.

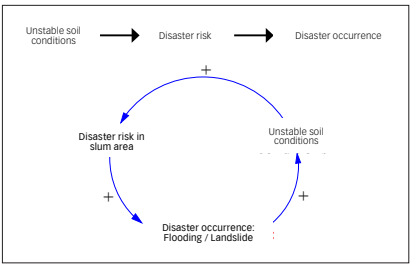
Understanding Risk and Disaster Occurrence in Slums

In the slums analysed, flooding and landslides affect many slum dwellers, not only sporadically but annually, usually during the winter period. These were generally seen as the main risk to lives and livelihoods. Earthquakes and windstorms were next in importance. The lack of job opportunities and water provision, and the insecurity due to violent juvenile gangs (*maras*) were also seen as substantial "risks".[5]

Causal loop diagrams, one of the main tools of systems analysis, were used to develop illustrative models of the key variables and their causal relations that influence risk and disaster occurrence in slums.[6] A causal relation between two variables is portrayed by an arrow with a plus (+) or minus (-). As shown in *Figure 1*, a plus (+) or minus (-) indicates the type of change that occurs if variable **A**, at the beginning of the arrow, increases: A positive symbol (+) shows that the increase in variable **A** affects the increase in **B**. However, a negative symbol (-) means that the increase in **A** results in a decrease in **B**.



▲
fig 1: Illustration of positive or negative causal relations between two variables

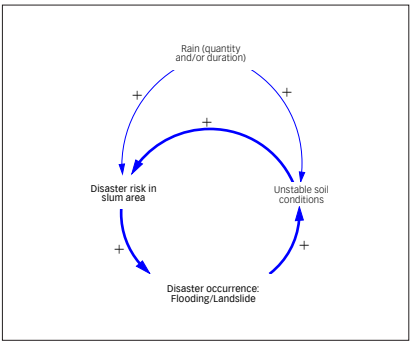


◀
fig 2: Flow diagram and corresponding causal loop diagram

The inclusion of non-linear relationships is one of the most important advantages of causal loop diagrams compared to conventional models, such as flow charts. Causal loop diagrams usually have at least one closed loop, representing feedback. *Reinforcing feedback loops* are circular relations between various variables, which are all connected with arrows going in the same direction (see *fig 2*). These loops could create a vicious circle and can be highlighted through the use of bold arrows.

When slum dwellers were asked about the underlying drivers of risk and disaster occurrence, the primary response of most referred to natural drivers (i.e., weather [rain] and soil conditions). *Figure 3* illustrates how the identified key variables "rain" and "unstable soil conditions" relate to risk and disaster occurrence. As can be seen, an increase in the amount of rain or in its duration could increase disaster risk and hence the occurrence of flooding and landslides.[7] In turn, flooding and landslides can make unstable soil conditions worse, resulting in a further exacerbation of disaster risk. In addition, more rainfall further destabilises unstable soil conditions, which again influences the occurrence of risk and disaster (see *fig 3*).

Upon probing, the majority of the interviewees knew of at least some other factors that increase their vulnerability. In fact, apart from natural drivers, it was possible to identify space-related, infrastructure-related, socioeconomic, organisational and institutional drivers.[8]



◀
fig 3: Natural key variables underlying risk and disaster occurrence

4
The communities analysed are: La Chacra; Llanos de la Charcra; Quiñones Privado; Quiñones Municipal; San Martín Privado; San Martín Municipal; Casitas del Coro, Coro Nuevo; San Luis Portales, Bolívar, Granjero II and Nueva Esperanza (making up the slum area called "Los Manantiales, situated in San Salvador), José Cecilio del Valle and Divina Providencia (also situated in San Salvador); and Refugio (situated in and made up of people from the slums of the Bálsamo region).

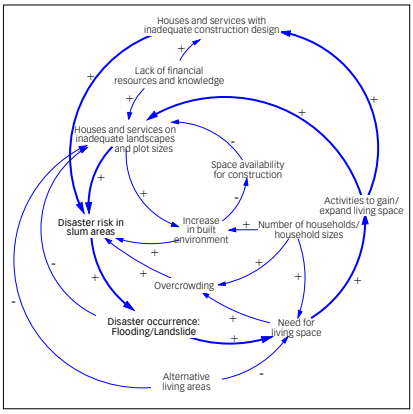
5
For more information on juvenile gangs in El Salvador see Kotowski (2005).

6
The computer programme Vensim© was used to support the creation of the diagrams/models. These models can be used as a basis for computer simulations. See www.vensim.com.

7
Note that the relation between disaster risk and disaster occurrence is definitional. However, it is important to illustrate the variables separately in order to show causal loops as affected by disaster occurrence (i.e., not by disaster risk).

8
Note that there is a range of variables that are inherent of different sub-diagrams and interconnect the different thematic loops. Those interconnecting variables are only partially included in the following figures.

fig 4. Space-related key variables underlying risk and disaster occurrence

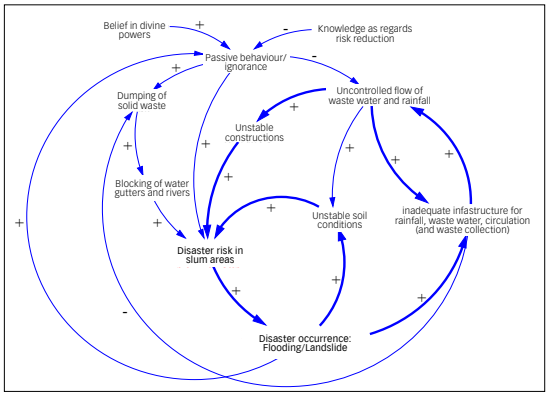


9
Note that in all thematic causal loop diagrams presented, some influencing variables from other thematic groups are also included. For instance, in *Figure 4*, "number of households/ household sizes" is a socioeconomic factor. However, as it has an important influence on space-related aspects, it was included in this diagram.

10
In addition, disasters could increase the differences in the levels of residents' financial resources.

Space-related drivers. Interviewees reported on residents' different strategies to gain and expand their living space to cope not only with the growing number and size of slum households but also with the lack of alternative living areas. Strategies included neighbours downhill felling trees or excavating the slopes below their houses; neighbours uphill building latrines close to the declivity; and other residents claiming land from nearby rivers. As illustrated in *Figure 4*, a vicious circle could develop, with the increasing need for living space encouraging people to expand their living areas. Under slum conditions, this could result in unsuitable buildings and services being constructed in inadequate locations and on too-small plots. This is related to a lack of financial resources, knowledge, and available space for mitigation works. The outcome can be increased disaster risk and hence floods and landslides, which in turn affects the need for living space (due to loss of housing and land). Moreover, an increasing built environment (in terms of space and density) and overcrowding foster disaster risk. *Figure 4* portrays the related key variables.

fig 5: Infrastructure-related key variables underlying risk and disaster occurrence



Infrastructure-related drivers.[9] Lack of adequate infrastructure (for waste collection, pedestrian and vehicle circulation, rain and waste water) was another key variable identified. Slum dwellers reported on neighbours uphill allowing waste and storm water to flow on to their land, and people from inside and outside the settlement tipping solid waste down their hills or into the nearby rivers. Insufficient knowledge about how to reduce existing risk and the conventional belief that disasters are purely "divinely driven" may — together with a range of other needs — foster such behaviour. Blockage of water gutters and river flows, as well as unstable constructions, such as pathways and housing, are the outcome. *Figure 5* illustrates related key variables and causal relations.

Socioeconomic (and organisational) drivers. The lack of financial resources due, among other things, to unemployment and low income levels, was mentioned frequently as one of the underlying causes of risk and disaster occurrence. The research indicated that a lack of financial resources, apart from its more obvious influence on the quality of housing and infrastructure and on people's ability to absorb disaster impacts, further influences individuals' community engagement (see *fig 6)*. In fact, as people need to work at several jobs and take care of family members (e.g., children and the elderly), they have little time available for community efforts to reduce risk. Furthermore, better-off household members opt out of community involvement, which can have a negative effect not only on social cohesion but on the disaster resilience of the entire community. A general mistrust of community cohesion and the local community organisation was also identified. This was related, among other things, to corruption, co-optation, and political factionalism.

Figure 6 highlights a vicious circle that could develop: Disaster affects people's already poor financial situation through, for instance, reduced income and additional expenses for reconstruction. Hence, increased disaster occurrence can result in an increased lack of financial resources.[10] This, in turn, increases people's disaster risk, and hence flooding and landslides are more likely to occur.

Institutional drivers. Lack of or inadequate outside help was further mentioned by slum dwellers. In fact, national and municipal governments were often seen as unhelpful, and even a hindrance, to slum dwellers' efforts to improve their situation. The actions taken by planning authorities and the information obtained by them with respect to the development and legalisation of planned settlements were often viewed as contradictory and unreliable. Further outside help was seen as crucial for, among other things, easing people away from passive behaviour.

The incremental improvement of housing and infrastructure in slums, which reduces disaster risk, is generally supported by governmental and non-governmental organisations, religious institutions

and political parties. Unequal distribution of such support was identified as being related to the level of community organisation, levels of corruption, and slum dwellers' individual relationships with the organisations mentioned. *Figure 7*, which summarises the institutional key variables, further shows that insecure tenure as well as promises of outside help being unfulfilled, can result in passive behaviour on the part of slum dwellers; that is, a general unwillingness to invest in reducing risk.

In the slum communities analysed, there was not only little sense of the mutual rights and obligations related to the settlements' maintenance and development (e.g., forbidding excavation of the slopes below houses or the construction of latrines close to declivities), but also a lack of information on risk reduction. Thus, the asymmetric disaster risk that the inhabitants incur is strong and rising, increasing tension among neighbours.

Understanding Disaster Impacts

Within the slums analysed, the key variables and causal loops identified result in the regular and presumably increasing occurrence of natural disasters. As shown in *Figures 3–7*, disasters subsequently have a negative impact on some of the key variables. Disaster impacts often have long-lasting negative effects on slum dwellers' livelihoods as well as on the development of their settlements. The information obtained by slum dwellers suggests that disaster impacts can be classified as immediate and delayed, as well as short- and long-lived:

a. *Immediate and short-lived:* Examples are electricity failures; temporary evacuations or resettlements; blocked accesses to houses or settlements; community distress; and psychological shocks.
b. *Immediate and long-lasting:* Examples are destruction of or damage to housing, infrastructure, household and vegetation; loss of land and personal belongings; modification of the landscape; deaths; and traumas.
c. *Delayed and short-lived*: Examples are secondary hazards, such as landslides during "normal" rain or through waste water flows due to soil instability and erosion caused by disasters; burglaries due to damaged houses; and reduced incomes.
d. *Delayed and long-lasting:* Examples are illnesses caused, for instance, by waste water entering houses; accidents due to insecure pathways; family disruptions due to a permanent move of children to other family members; contamination of the environment as a result of the plastic sheets used for protecting slopes from rain being blown away; and reduced support (e.g., legalisation of land) by planning authorities due to increased and unacceptable risk levels.

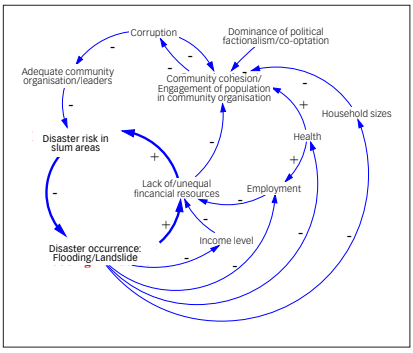


fig 6: Socioeconomic (and organisational) key variables underlying risk and disaster occurrence

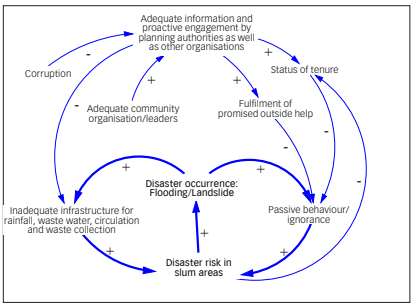
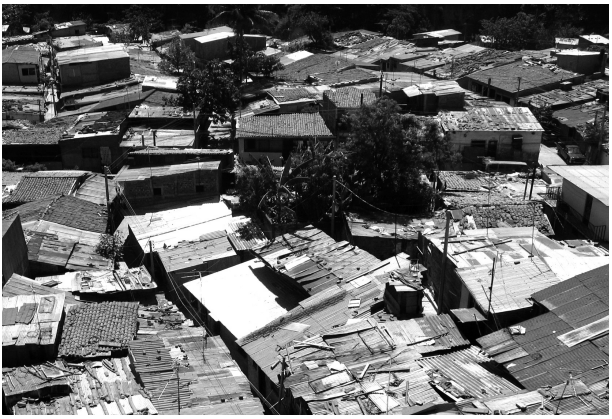


fig 7: Institutional key variables underlying risk and disaster occurrence

As with the key variables underlying risk and disaster occurrence, the impacts can also be classified as:

- Natural (environmental),
- Space- and infrastructure-related (physical),
- Socioeconomic and organisational,
- Institutional.

fig 8: Location of a slum community on marginal land and steep slopes



▲
fig 9: Slum community in San Salvador

11
The slum dwellers' coping strategies were analysed in detail and are presented in Wamsler (2007).

Acknowledgements

The author is particularly grateful to Joanne Linnerooth-Bayer of the International Institute for Applied Systems Analysis (IIASA) and Alfredo Stein of HDM, Lund University for commenting on draft versions of this article. Special thanks to all who agreed to be interviewed. The Swedish International Development Cooperation Agency (Sida) and the German Advisory Council on Global Change (WBGU) provided financial support for this research.

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Conclusions

The paper discusses — from a local perspective — key variables and causal loops underlying the complex system of risk and disaster occurrence in selected communities in El Salvador. It provides a comprehensive "snapshot" of what drives risk and disaster occurrence in slums. This new "vision" may provide fresh input into ongoing discussions which currently deal with the issue only in terms of location and construction quality — aspects that are seemingly "solved" simply through post-disaster resettlement. The paper shows that disasters are the outcome of a non-linear development process, with the key variables and disaster occurrence reinforcing each other. Disasters make the already precarious conditions of slum dwellers worse, creating vicious circles of increasing risk. "Poverty traps" can be the outcome. Assistance provided for social housing and settlement development could counteract such developments.

Causal loop diagrams, a tool of systems analysis, can help to provide an understanding of local contexts, perspectives and needs, and also assist in analysing the effectiveness of people's interrelated efforts to cope with risk and disaster occurrence.[11] This knowledge, which contributes to a better understanding of the conditions and conditionality for effective and sustainable project implementation, is crucial for development aid organisations that service slum communities, as they often do not have such information at their disposal and seldom carry out related analyses.

The research outcomes, illustrated in causal loop diagrams, confirm the respondents' views that improved housing and infrastructure in situ are crucial if physical/structural vulnerabilities are to be reduced. However, because of the complex system of risk and disaster occurrence, such improvements are not enough to achieve the sustainable security of slum dwellers' habitat, lives and livelihoods. The analysis supports the accepted view that an integrated perspective regarding disaster risk management is necessary to achieve sustainable risk reduction. Hence, integrating disaster risk management into social housing assistance has to combine purely physical/structural improvements with environmental, socioeconomic , organisational and institutional risk reduction. The use of causal loop diagrams can help to develop and validate concrete and slum-specific project measures. For instance, only local efforts to cope with risk and disaster occurrence that, in effect, tackle the key variables and causal loops identified in a sustainable way should be supported by aid organisations. In addition, the study indicates that, to be sustainable, projects need to consider the improvement of social relations within slum communities, as well as the trust of these communities in national, municipal and local authorities. This could be achieved, for example, through improved communication structures, the creation of community rights and obligations, the offer of *communitarian and individual* project measures for risk reduction, professional education in disaster-resistant construction, and training both in risk awareness and in the repair and maintenance of community infrastructure.

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VI

Paper VI	
Title: Bridging the gaps: stakeholder-based strategies for risk reduction and financing for the urban poor	
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Bridging the gaps: stakeholder-based strategies for risk reduction and financing for the urban poor

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ABSTRACT This paper explores the options that can be used by aid organizations working in human settlement development to more effectively address disaster risk management. Qualitative research was carried out in El Salvador at both the household and institutional levels – to analyze the needs, capacities and perspectives of slum dwellers and aid organizations. A clearer understanding of the gaps between what households need and undertake to deal with disasters and risk, and how organizations support them, yields important insights for the restructuring of development aid. At the household level, the research reveals a huge variety of crucial but somewhat weak coping strategies. At the institutional level, organizational structures and mechanisms for social housing provision and financing offer a potentially powerful platform for tackling disaster risk. However, current project measures are insufficient. Support for and scaling up of selected household coping strategies, combined with the expansion of social housing funding mechanisms for risk reduction and financing, are some of the options proposed for targeting aid.

KEYWORDS development assistance / disaster risk management / El Salvador / insurance / risk financing / risk reduction / settlement development / slum / social housing

I. INTRODUCTION

a. Background

Over the past decades, the frequency of so-called natural disasters has increased worldwide, resulting in growing human and economic losses. In 2005 alone, more than 360 disasters were reported, with around 92,000 people killed and another 160 million suffering adverse impacts. Direct material losses were about US$ 160 billion. Low- and middle-income nations bear the highest burden in terms of the human lives and proportion of gross domestic product (GDP) lost as a result of disaster.[1]

Slum dwellers are particularly vulnerable to natural disasters. Low-income human settlements are often located on marginal land near rivers or on steep slopes; housing and infrastructure are sub-standard. Among other problems are leaking sewage pipes from better-off settlements that pass through slum areas to discharge into nearby rivers, a lack of water and waste management services, limited access to information, and overcrowding. Disasters make the already precarious economic, social and environmental conditions of slum dwellers worse, creating a vicious circle.

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Currently, more than one billion people worldwide live in slums and are forced to accept inhuman and dangerous living conditions. It is estimated that their number will double over the next 24 years.[2]

In recent years, increasing attention has been given to the need to reduce disaster risk within the context of development work. The stated aim of the Millennium Declaration to achieve a significant improvement in the lives of at least 100 million slum dwellers by 2020 alludes to this need;[3] and the Hyogo Framework for Action 2005–2015 urges governments to address the issue of disaster risk in their sector development planning and programmes.[4] Nevertheless, aid organizations working in human settlement development still struggle to sustainably reduce existing disaster risk in their everyday work.

This paper reports on case studies carried out in El Salvador, which is located in one of the most disaster-prone regions in the world.[5] Its objective is to explore and develop stakeholder-based options for aid organizations to more effectively integrate disaster risk management (i.e. risk reduction and financing) into their core project work. The focus is on non-government aid organizations working, inter alia, in the field of settlement development planning for the urban poor. The term "social housing organizations" will be used to describe this type of organization.

b. Methodology and outline

Case studies were carried out at the household and institutional levels in El Salvador in 2005/6 to determine the existing perceptions, needs and capacities of both the urban poor and the national organizations servicing slum communities.

The research at the household level included semi-structured interviews with people living in 15 disaster-prone slum communities,[6] as well as walk-through analyses, observation and a literature review. Sixty-two households, comprising 331 persons, in high-risk areas were interviewed. The emphasis was on analyzing:

- existing disaster risk, its causes and the resulting local needs;
- local capacities for risk reduction and their financial implications for residents' livelihoods; and
- local capacities for risk financing, including formal and informal insurance mechanisms.

At the institutional level the research included a text review, workshops, group discussions and semi-structured interviews with a total of 22 representatives of social housing organizations and other non-government organizations (NGOs), housing finance institutions or departments, government housing bodies and insurance companies.[7] The focus was on analyzing the provision of social housing projects and the related mechanisms for risk reduction and financing. A range of different projects was reviewed, and in-depth evaluations were also carried out of four of the projects that were implemented in the above-mentioned 15 slum communities.

The challenges and gaps identified among the perspectives, needs and capacities at the household and institutional level were used as the basis for exploring, together with the stakeholders, options for assisting in targeting aid. A literature review was carried out to complement and

organizations FUSAI and UN–HABITAT–ROLAC (Regional Office for Latin America and the Caribbean). The Swedish International Development Cooperation Agency (Sida) and the German Advisory Council on Global Change (WBGU) provided financial support for this research.

1. UNISDR (2006), "Disaster statistics 1991–2005", accessed at www.unisdr.org/disaster-statistics/introduction.htm, 7 June 2006.

2. UN-HABITAT (2003), *The Challenge of Slums*, Global Report on human settlements, Earthscan, London.

3. See www.unmillenniumproject.org.

4. UNISDR (2005), "Hyogo framework for action 2005–2015: building the resilience of nations and communities to disasters", accessed at www.unisdr.org/wcdr/intergover/official-doc/L-docs/Hyogo-framework-for-action-english.pdf, 5 June 2006.

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6. The communities analyzed during research in 2005 and 2006 were: La Chacra, Llanos de la Charcra, Quiñones Privado, Quiñones Municipal, San Martín Privado, San Martín Municipal, Casitas del Coro, Coro Nuevo, San Luis Portales, Bolívar, Granjero II and Nueva Esperanza (forming the slum area called Los Manantiales, situated in San Salvador); José Cecilio del Valle and Divina Providencia (also situated in San Salvador); and Refugio (situated in and made up of people from the slums of the Bálsamo region).

7. The organizations interviewed were: ACSA (Asociación Salvadoreña de Empresas de Seguros);

validate different options. For the data analysis, a combination of grounded theory,[8] systems analysis[9] and cultural theory[10] was applied.

Analyses of the current situation in El Salvador are now presented, providing two "snapshots", one from the household level and one from the institutional level. The gaps, challenges and potential solutions are discussed on this basis, and the main outcomes are summarized.

II. FIRST "SNAPSHOT": HOUSEHOLD-LEVEL CASE STUDIES

a. Existing needs: understanding disasters

In the slums analyzed, flooding and landslides, which affect many slum dwellers annually, and usually during the winter, were generally seen as the main risk to lives and livelihoods. Earthquakes and windstorms ranked next in importance. The lack of job opportunities and water provision, as well as insecurity due to violent juvenile gangs (*maras*) were also seen as substantial "risks".[11]

To analyze the existing local problems and the measures needed to address them, slum dwellers were asked for their views on the underlying drivers of disasters and disaster risk in slums. Interviewees reported on:

- neighbours downhill felling trees or excavating the slopes below their houses;
- neighbours uphill building latrines close to the declivity and allowing waste and storm water to flow onto their land;
- people from outside the settlement tipping solid waste down their hills or into the nearby rivers; and
- other residents not knowing how to improve their situation.

As there is not only little sense of mutual rights and obligations in slum communities, but also a lack and unequal distribution of information on risk reduction, the asymmetric disaster risk that inhabitants incur is growing,[12] creating increased tension among neighbours. Other key aspects (driving disasters and disaster risk) mentioned in the interviews were:

- insecure tenure resulting in slum dwellers being unwilling to invest in reducing risk;
- increases in the area of the built environment and overcrowding caused by growing households;
- inadequate housing construction and technical infrastructure;
- space restrictions;
- a shortage of financial resources due to unemployment; and
- little outside help.

Furthermore, national and municipal governments were often seen by slum dwellers as unhelpful, and even a hindrance, to their efforts. In fact, the actions taken by planning authorities, and the information obtained by them with respect to the development and legalization of planned settlements, were viewed as contradictory and often unreliable. In some communities, local community cohesion and organization was affected by mistrust, mainly related to corruption and political factionalism. In Wamsler,[13] the key variables and causal loops underlying the complex system of risk and disaster occurrence in slum areas are described more in detail and illustrated in so-called causal loop diagrams, a systems analysis tool (Figure 1).[14]

CEPRODE (Centro de Protección para Desastres); CHF (Cooperative Housing Foundation International); Sistema Cooperativo Financiero FEDECACES; FEDECREDITO (Federación de Cajas de Crédito); FONAVIPO (Fondo Nacional de Vivienda Popular); Fundación Habitat; FUNDASAL (Fundacion Salvadorena de Desarrollo y Vivienda Minima); FUSAI (Fundación Salvadoreña de Apoyo Integral); HFH (Habitat for Humanity); IDB (Inter-American Development Bank); INTEGRAL; national Red Cross; Seguros Futuros; UCA (University José Simeón Cañas, Department of Architecture); SISA (Seguros e Inversiones SA); VMVDU (Vice-Ministerio de Vivienda y Desarrollo Urbano); and different municipalities. All organizations were selected through snowball and purposeful sampling. CEPRODE, FUNDASAL and FUSAI were operating in the 15 slum communities analyzed.

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9. Haraldsson, Hördur V (2004), *"Introduction to system thinking and causal loop diagrams"*, Reports on Ecology and Environmental Engineering 2004, Vol 1, Institute of Chemical Engineering, Lund University; also Sterman, John D (2000), *Business Dynamics: Systems Thinking and Modelling for a Complex World*, Irwin/McGraw-Hill, New York.

10. Thompson, Michael, Richard Ellis and Aaron Wildavsky (1990), *Cultural Theory*, Westview Press Inc, Oxford.

11. The word "risk" is in quotation marks as, in this paper, the term generally refers to risk associated with natural disasters and/or hazards and not to socioeconomic hazards. However, as slum dwellers mentioned such hazards as part of the risk they face, some of the main related aspects have been mentioned here. Note, however, that – in keeping with the focus

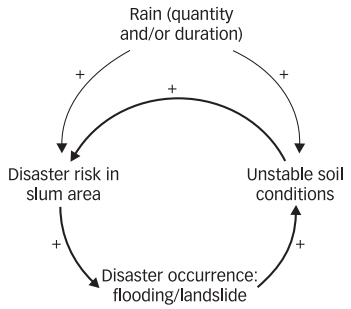


FIGURE 1
Example of a basic causal loop diagram showing some natural key variables underlying risk and disaster occurrence as regards flooding and landslides

b. Existing capacities: coping with disasters

"*We are always trying to improve, little by little, step by step, in order to become more secure*." This statement by a slum dweller living in San Salvador illustrates the constant efforts that are put into coping with disasters and disaster risk. Key literature on disaster risk management commonly makes use of the term "coping strategy"[15] – usually, however, without defining it. Based on household-level research, the following definition of coping strategy is proposed: "constantly changing and adapting cognitive and behavioural efforts to manage disaster risk or disaster impacts". These efforts influence the key variables and causal loops underlying the complex system of risk and disaster occurrence in specific slum areas.

The research reveals three types of coping strategies employed by slum dwellers living at risk. These are:

- strategies to reduce existing risk;
- strategies to insure themselves informally or formally against possible disasters; and
- strategies to recover from disaster impacts.

Within each strategy – risk reduction, self-insurance and recovery – different thematic foci and underlying social patterns were identified. The thematic foci are physical/technological, environmental, economic, social/cultural, organizational and institutional.[16] The social patterns, which have been established by "cultural theory",[17] are individualistic, communitarian, hierarchical and fatalist. Within this research context, individualistic behaviour is characterized by the use of self-help to fix things without help from people outside one's own household. Communitarian behaviour is based on the belief that everybody sinks or swims together; it is hence characterized by community efforts. Hierarchical patterns relate to the belief in authority structures for assistance, control and organization, including strong prescriptions. Fatalist behaviour is a non-strategy

of this research – these were of secondary consideration to slum dwellers compared with the risk caused by natural hazards.

12. Asymmetric disaster risk is the unequal distribution of the level of disaster risk experienced by people living close to and within a specific area. Hence, the asymmetric disaster risk of slum inhabitants refers to the fact that the level of disaster risk within a given slum is not constant across the entire community.

13. Wamsler, Christine (2006), "Understanding disasters from a local perspective: insights into improving assistance for social housing and settlement development", *TRIALOG* (Journal for Planning and Building in the Third World) No 91, December, special issue on "Building on disasters".

14. Causal loop diagrams portray a causal relation between two variables (e.g. *A* and *B*) by an arrow with a plus (+) or minus (–). A plus (+) or minus (-) indicates the type of change that occurs if variable *A*, at the beginning of the arrow, increases: A positive symbol (+) shows that the increase in variable *A* affects the increase in *B*. However, a negative symbol (–) means that the increase in *A* results in a decrease in *B*. The inclusion of non-linear relationships is one of the most important advantages of causal loop diagrams compared to conventional models such as flow charts. Causal loop diagrams usually have at least one closed loop, representing feedback. Figure 1 illustrates how the identified key variables "rain" and "unstable soil conditions" relate to risk and disaster occurrence. As can be seen, an increase in the amount of rain or in its duration could increase disaster risk and hence the occurrence of flooding and landslides. In turn, flooding and landslides can make unstable soil conditions worse, resulting in a further exacerbation of disaster risk. In addition, more rainfall further destabilizes unstable soil conditions, which again

influences the occurrence of risk and disaster.

for survival based on the idea that taking action or not taking action has the same (negative) result.

c. Coping strategies for risk reduction

Risk reduction includes prevention (to minimize or avoid hazards), mitigation (to reduce vulnerabilities) and preparedness (to improve people's capacities to ensure effective response as soon as disaster strikes). Slum dwellers use risk reduction mainly during "normal" times (i.e. pre-disaster) so as to be less affected by future small-scale or exceptionally large-scale disasters. In an ideal case, risk reduction leads to an absence of disasters (as hazard impact will be minimal).

Household strategies to reduce risk are diverse, and include physical/technological, environmental, economic, social/cultural, organizational and institutional measures (Tables 1–4). El Salvadoran slum dwellers, for instance, build retaining walls or embankments with old car tyres, stones, bricks or nylon bags filled with soil and cement; they plant palm trees; remove blockages from rivers and open water channels; take jobs outside their own settlement so as to be unaffected by local disasters; temporarily move their families to the highest rooms in their dwellings if floods are forecast; and create information structures. They may also adopt more emotionally oriented strategies, such as relying on their faith or simply accepting their high risk. Answers such as "*I just sit with my Bible and pray*" were common. However, unbearable needs push most of the dwellers to actively adopt individualistic behaviour for survival. In fact, this research supports Twigg,[18] who states that expressions of belief in divine power are not incompatible with taking actions to reduce risk.

Physical or technological risk reduction was identified as including structural and non-structural improvements of dwellings and their surroundings, mostly carried out on an individual basis (Table 1). Environmental risk reduction includes the use and removal of natural resources as well as the "clean-up" of the natural environment (Table 2). These measures are carried out individually, and to some extent in cooperation with neighbours, the whole community and the local or national government. Economic and social/cultural risk reduction strategies are predominantly individualistic and were shown to include both behavioural and cognitive measures (Table 3). Economic diversification in households is a common strategy for reducing vulnerabilities. Household members furthermore engage in low-risk activities or activities with differing risk profiles. If one family member temporarily becomes jobless because, for instance, the local *tortillería* or the corn mill is destroyed by a disaster, other income sources can absorb the losses and help bridge the income shortage. Increased household income (for vulnerability reduction) is sometimes also achieved through the migration of family members to the United States. In 2004, more than one million Salvadorans were resident in the United States, and family remittances have become a major income source for El Salvador since the 1990s.[19] Organizational and institutional risk reduction comprises the creation of organized structures to reduce risk as well as strategies to access related services/assistance offered by different institutions, thereby tapping into formal or informal structures or networks. It is often closely related to kinship networks, mutual aid and self-help, as well as to formal and hierarchical structures for disaster risk management. However, some strategies are also carried out individually (Table 4).

15. For example, UNISDR (2004), *Living with Risk: A Global Review of Disaster Reduction Initiatives*, Inter-Agency Secretariat of UNISDR, accessed at www.unisdr.org/eng/about_isdr/bd-lwr-2004-eng.htm; also Twigg, John (2004), *Disaster Risk Reduction: Mitigation and Preparedness in Development and Emergency Programming,* Good Practice Review, Number 9, March, Overseas Development Institute (ODI), London.

16. Note that many coping strategies involve elements from different categories. However, such categories are helpful for viewing and analyzing strategies, thereby ensuring that no household measures are overlooked.

17. See reference 10.

18. See reference 15, Twigg (2004), page 139.

19. SELA (Latin American Economic System) (2005), *Migrations and Remittances in Latin America and the Caribbean: Intra-Regional Flows and Macroeconomic Determinants*, XXXI Regular Meeting of the Latin American Council, 21–23 November 2005, Caracas, Venezuela.

TABLE 1
Physical/technological risk reduction

Focus/aim	Activities identified
Constructive/ structural house improvements	• Increasing inclination of roofs (for better run-off without damaging roof constructions) • Prolonging roof projections/eaves (to protect houses and pathways from damage/erosion) • Changing direction of roof inclination (so rainwater is discharged without causing damage/ landslides) • Installing provisional gutters as roof eaves (so rainwater is discharged without causing damage/landslides) • Replacing mud walls with brick walls, wooden pillars with metallic ones, and corrugated iron with more durable materials (e.g. *duralita*) (to better withstand earthquakes, rain and/or floodwater) • Improving electricity installations by covering cables and putting electric connections higher up, out of reach of expected flood levels • Regularly replacing corrugated iron, wooden pillars and beams (to better withstand rain or earthquake impacts) • Improving roof fixing (to better withstand earthquakes and windstorms) • Regularly covering walls and floors with (additional) cement (for better run-off without causing damage/erosion) • Filling of cracks with cement (for better run-off without causing damage/erosion) • Closing holes in corrugated iron sheets using special fillings or patches on top of or under sheets (to prevent water entering the house) • Changing the locations of latrines and wash places (to mitigate landslides)
Non-constructive/ non-structural house improvements	• Blocking wastewater pipes with stones and other objects when river levels rise (to avoid flooding and/or related contamination) • Putting wood or bricks on the roof (to hold it in place during windstorms) • Putting plastic sheets on the roof, on the inside walls or over the bed (to prevent water entering or damaging the house) • Building water barriers in front of the house (to prevent water entering the house) • Digging water channels in earth floors inside the house (for better run-off without causing damage/erosion) • Putting pots under roofs with holes (to catch water, preventing damage/erosion)
Constructive/ structural improvement of the surrounding living environment	• Strengthening pathways by covering them with (additional) cement and filling in cracks (to mitigate landslides and minimize damage caused by rain and earthquakes) • Filling in former latrine holes with earth, stones and/or cement (to mitigate landslides and minimize damage caused by rain and earthquakes) • Repairing public infrastructure that passes through the settlement, such as wastewater pipes (to avoid flooding and related contamination) • Building provisional water channels with corrugated iron or cement (to discharge rainwater without causing damage/landslides) • Building fences to hold back soil (mitigating landslides) and/or to prevent children from falling (fences are made of corrugated iron, mattress springs, wooden pillars and wire netting) • Compacting soil (to mitigate landslides and minimize damage caused by rain and earthquakes) • Building retaining walls or embankments from: old tyres, stones and cement; old tyres and soil; bricks and cement; stones only; nylon bags filled with soil and cement; and other materials (to mitigate landslides and minimize damage caused by earthquakes)
Non-constructive/ non-structural improvement of the surrounding living environment	• Putting plastic sheets on slopes, often during entire year (to mitigate landslides) • Digging water channels in earth outside the house (to discharge rainwater without causing damage/landslides) • Avoiding obvious flood- or landslide-prone locations for house expansion • Replacing eroded earth with new earth (to mitigate landslides and minimize damage caused by rain and earthquakes) • Cleaning water gutters (to mitigate flooding)

TABLE 2
Environmental risk reduction

Focus/aim	Activities identified
Use of natural resources to reduce risk	• Planting to prevent landslides • Planting to create windbreaks • Using the natural environment as an information source to analyze risk situations (river level, clouds)
Removal of natural resources that represent risk	• Cutting down bigger branches and trees located close to houses (to minimize the risk of them falling down and causing damage during earthquakes and landslides)
Clean-up of natural environment	• Cleaning waste from slopes (to mitigate flooding caused by blocked water gutters) • Clearing objects blocking the flow of rivers, such as tyres, plastic sheets, mattresses and branches (to mitigate flooding)

TABLE 3
Economic and social/cultural risk reduction

Focus/aim	Activities identified
Economic diversification of individuals or families to increase overall income, which reduces economic impacts after disasters and/or the dependency on the income of specific sources or family members	• Carrying out different jobs simultaneously • If possible, all family members working
Taking on income activities with differing risk profiles and/or low-risk activities (i.e. jobs unaffected by local disasters)	• Taking (additional) jobs outside own settlement
Geographic diversification of families' income	• Taking jobs located in different geographic areas within and/or outside the country
Reduction of household expenses to increase disposable income	• Cutting down firewood instead of using gas ovens
Learning from friends, neighbours and project measures	• Being involved in self-help measures • Copying construction types and/or economic risk reduction strategies from neighbours
Trust in outside help	• Relying on labour and/or income of family members (e.g. regular "income" through remittances) • Relying on a hierarchical system to supply help for risk reduction
Psychological acceptance of risk situation	• Having religious beliefs • Downplaying the existing level of risk • Deciding not to invest too heavily in housing or infrastructure, as losses can be replaced more cheaply and easily

TABLE 4
Organizational and institutional risk reduction

Focus/aim	Activities identified
Creation of structures/ mechanisms to access information on existing risk level and weather forecasts	• Going to church (priests are a source of information) • Asking neighbours • Getting information from government organizations (at local, municipal and national level) • Listening to radio and watching television • Monitoring disaster-related changes (e.g. level of river, clouds) and establishing related information structures
Creation of organizational community structures for risk reduction	• Establishing local committees for risk reduction • Including risk reduction activities in the work portfolio of the local executive committee, for example, monitoring of risk situation, distribution of plastic sheets, information on evacuation, clearing of waste from slopes, accessing help from government
Accessing help for risk reduction	• Asking for help (mostly for construction materials) from different organizations, political parties and/or the municipality
Taking organizational precautions to protect family members and reduce damage to belongings	• Preparing food in advance for the children so that, if need be, they can eat and then quickly be sent to neighbours or family members in more secure areas • Temporarily moving to the highest room, another house or tents • Regularly observing and monitoring cracks in cement surfaces (if flooding is expected) • Taking belongings to another location (within the house, for example, storing them on a bunk bed, or on a higher platform outside the house (if flooding is expected)
Organized and coordinated community work	• Guarding empty houses and evacuated people who are asleep during preventive evacuation • Transportation of people's belongings to higher-level streets (if flooding is expected) • Clearing waste and other sources of risk from slopes, rivers and streets • Cementing of streets so that children, in the case of flooding, do not sink into the mud • Moving to refuges (neighbours' private houses) in anticipation of a disaster

d. Coping strategies for risk financing: self-insurance

The term "risk financing" is mainly used at the institutional level and usually describes only formal financing measures to transfer or share risk. The broader term "self-insurance" was selected for the household level to include formal *and* informal, and monetary *and* non-monetary mechanisms. The literature on disaster risk management generally uses the terms "informal insurance", "self-insurance" or "informal self-insurance" synonymously and – as in "coping strategy" – without definition.[20] Based on the research outcomes, self-insurance is defined here as "the creation or maintenance of formal or informal security systems that help people access financing sources or mutual social help in the event of a disaster". Financing sources are, for instance, informal and formal credits, donations, additional income, the selling price of assets and monetary compensation. Mutual help can include offering refuge, temporary custody of children, fostering a child, labour work for reconstruction, or washing and cleaning. In other words, to insure themselves, slum dwellers take pre-disaster action in the hope of obtaining direct or indirect compensation if a hazard leads to death, injury or loss of property or income. They thus ensure that they can bounce back faster – than if they do not have self-insurance – to their former standard of living, or an even higher one.

20. See reference 15,

Self-insurance strategies were identified as including economic, social/cultural, organizational and institutional measures (Tables 5 and 6). An example of the former is the acquisition and maintenance of physical assets, such as construction materials, which can easily be sold if need be. To alleviate financial distress, one of the slum dwellers interviewed sold seven roofing sheets of corrugated iron, and then re-roofed his home with an old car body. Not nailing down the corrugated iron allows it to be resold at a higher price. Further examples of self-insurance reported by the slum dwellers were savings, the creation of reciprocally dependent relationships and the encouragement of reciprocal dependents to achieve improved economic status. Economic and social/cultural self-insurance is mainly applied on an individual basis (Table 5).

Organizational and institutional self-insurance strategies comprise the creation of organized structures to insure oneself, as well as related strategies to access services/assistance offered by different institutions, thereby tapping into formal or informal structures or networks. It includes, for instance, accessing community emergency funds, creating linkages with government and (mostly) non-government institutions, such as religious bodies (which offer help after disasters), and illegally accessing formal insurance mechanisms (Table 6). In fact, while slum dwellers are not generally believed to have a culture of insurance, in two cases residents had illegally obtained employment certificates enabling them to pay into the social security system, even though they were not formally employed. In addition, 26 of the 331 people interviewed had health insurance as they work in the formal market. One-third of the interviewees were interested in acquiring property disaster insurance (the other two-thirds had no opinion on the subject).

TABLE 5
Economic and social/cultural self-insurance

Focus/aim	Activities identified
Creation of extensive reciprocal and dependent relationships	• Having many children • Creating a large and good family network
Encouragement of dependents and other family members to achieve improved economic status	• Encouraging dependents to study • Encouraging dependents to migrate to the United States or other foreign countries • Supporting dependents to obtain a formal job
Increase of job capacities of individuals for different sources of income	• Being able to change job sectors from one where demand decreases after a disaster (e.g. clothes vending) to one where demand rises after a disaster (e.g. the construction sector)
Acquiring/maintaining assets that can serve as collateral for formal credits	• Taking on a formal job • Accessing legal tenure • Owning a legal and permanent dwelling
Saving for a "rainy day"	• Individually accumulating money "under the mattress" (not regularly, for instance monthly, but based on irregular income)
Acquiring/maintaining physical assets that can be easily sold if need be	• Using reusable construction materials for own shelter • Owning land • Owning a home

TABLE 6
Organizational and institutional self-insurance

Focus/aim	Activities identified
Participation in informal community insurance schemes	• Paying social fees for community emergency funds
Creation of cohesion, solidarity and/or reciprocal relationships with neighbours and/or other community members	• Knowing well and interacting with people from the neighbourhood (e.g. buying from local shops, offering labour when needed) • Employing community members for small jobs • Engaging in community matters
Creation of linkages/ relationships with institutions at different levels (government and non-government)	• Participating in the local executive committee • Becoming a member of a political party • Becoming a member of a religious group • Staying in contact with NGOs that carried out projects within the settlement • Maintaining good contact with the local government (municipality) and national government organizations (mostly through the local executive committee)
Creation of illegal access to formal insurance mechanisms	• Paying into the public social security system through deals with entrepreneurs who certify the employment of the respective person
Improved possibility of accessing post-disaster assistance (partly through intentional increase of risk)	• Renting in a high-risk area • Renting in risk areas where infrastructure projects or aid projects are planned

e. Coping strategies for recovery

Directly interlinked with self-insurance approaches are coping strategies for disaster recovery. However, not all recovery strategies are initiated in a pre-disaster context; they can also be ad hoc. Based on the household level "snapshot", recovery strategies were defined as "actions taken in a post-disaster situation to recover as fast as possible from disaster impacts, that is, to regain the former status quo or become even better-off than before".

Economic and social/cultural recovery aim at loss "financing", that is, obtaining financial or material resources for recovery. Examples are borrowing money, using credit or savings, increasing income and reducing expenses (Table 7). The strategies identified are mainly carried out individually at the household level. However, the lack of solidarity among members of some households occasionally erodes such efforts: complaints about family members with regard to financial help were more frequent than accolades. Nevertheless, the interviews and literature confirm that remittances from abroad play an important role in recovery. According to Agunias, remittances rise when an economy suffers a downturn or macroeconomic shocks due to a natural disaster.[21] Following the 2001 earthquakes, the Central Reserve Bank of El Salvador estimated that Salvadorans living abroad sent home US$ 1.9 billion in remittances.[22] As of 2004, remittances totalled US$ 2.5 billion[23] and assisted more than one-fifth of all households.[24] While organizational and institutional recovery are for the most part related to kinship networks, mutual aid and self-help, they also include assistance from NGOs and government organizations (Table 8).

21. Agunias, Dovelyn (2006), "Remittance trends in Central America", *Migration Information Source* (MFI), April 1. See www.migrationinformation.net/pdf/Migration_Information_Source-Central_America.pdf.

22. UNDP (2004), *Reducing Disaster Risk: A Challenge for Development*, UNDP, New York.

23. See reference 19.

24. UNDP (2005), *Informe Sobre Desarrollo Humano El Salvador 2005: Una Mirada al Nuevo Nosotros. El Impacto de las Migraciones, San Salvador*, UNDP, San Salvador.

TABLE 7
Economic and social/cultural recovery strategies

Focus/aim	Activities identified
Access to credits/loans	• Borrowing money from family members • Taking bank credits (directly or through family members) • Taking credits from employers (directly as the employee or indirectly through family members) • Taking credits from aid institutions (e.g. religious institutions, social housing organizations) • Borrowing money from informal lenders (of own profession, for example, market lenders for vendors)
Use of savings	• Use of money that was accumulated at home, "under the mattress" (not in saving accounts)
Trade of assets	• Selling construction materials and replacing these with other objects (e.g. corrugated iron roofing being replaced by a car body)
Reduction of expenses	• Less consumption where possible (e.g. food)
Increased income	• Taking on an extra job (e.g. in the construction sector) • Changing to a more profitable job • Working longer hours
Receipt of solidarity/help from family and/or neighbours	• Receiving remittances from family members • Obtaining food, construction materials or other support, such as taking in foster children

TABLE 8
Organizational and institutional recovery strategies

Focus/aim	Activities identified
Coordination with neighbours to recover	• Mutual employment of people in the community for reconstruction work • Mutual guarding of damaged houses and affected people who have to stay/sleep in insecure places • Cleaning up disaster impacts (washing away soil, washing clothes, cleaning streets)
Creation of access to humanitarian and development assistance (food, clothes, construction materials, recovery projects)	• Receiving humanitarian assistance from non-government institutions • Accessing help from government institutions • Moving swiftly to an even more affected area, where more help is available

f. Coping strategies and incremental urban housing

Slums are generally improved incrementally, usually by self-help and mutual help. The coping strategies identified are crucial for their continuous development, to ensure an improvement in the standard of living and security (Figure 2). Assuming that the continuous arrow shown in Figure 2 indicates the relative and average development of a slum situated in a disaster-prone area, the fine and dashed arrows show how coping strategies work together to "buffer" disaster impact and reduce recovery time.

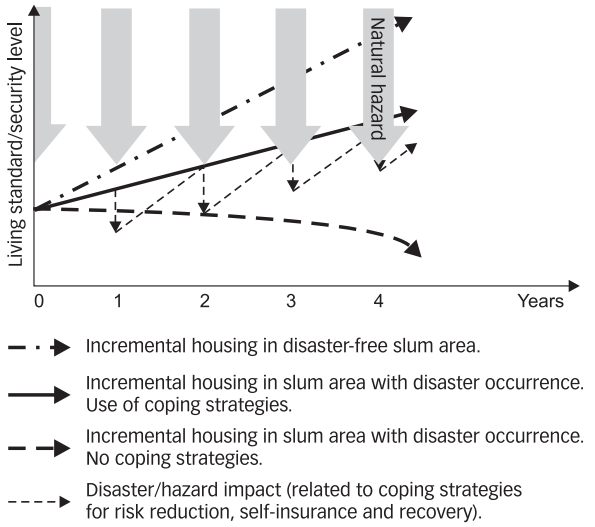


FIGURE 2
Importance of coping strategies for the development of slums

This research indicates that some of the various coping strategies identified are weak and deficient. In fact, backsliding is frequent. Slum dwellers reported that it can take them several years to recover from single events and that they are mostly dependent on outside help. If a gradual slum development process cannot keep pace with the frequency of dis-aster impacts, then increased insecurity and "poverty traps" can result. Although more evidence is needed, the coping strategies of urban – as compared to rural – slum dwellers appear not only to be weaker (i.e. less effective) but also less deliberate and more individualistic (as opposed to communitarian), with a stronger focus on housing construction and land issues, and less emphasis on productive sources of livelihood.

Weak and more individualistic coping can occur for a variety of reasons: According to Morduch, solidarity and reciprocity work best in:

- settlements where people have family members living close by;
- where there is not too great a disparity in residents' income levels;
- where family members or other dependents are not simultaneously affected by disaster impacts; and
- where disasters happen repeatedly, but not too frequently, and have mostly short-term impacts.[25]

However, within the urban slums studied, few of these conditions apply. First, the data gathered suggest that urbanization and the increasing ease of mobility related to it can enable households to "default" on their obligations to relatives and neighbours. Second, different income levels (ranging between US$ 120–750 per household and US$ 30–500 per worker)

25. Morduch, Jonathan (1999), "Between the state and the market: can informal insurance patch the safety net?", *The World Bank Research Observer* Vol 14, No 2, August, pages 187–207.

foster individualistic behaviour, with the better-off households opting out of mutual and hierarchical arrangements. In addition, slum dwellers have little to sell (e.g. no livestock or agricultural products) to help themselves or others in need. Third, slum dwellers simultaneously and persistently experience bad conditions over a period of years, with floods and landslides causing adverse environmental changes (runoff, poor soil), the effects of which continue even after the weather has returned to normal. Finally, the lost trust in both community solidarity and hierarchical structures, as well as the fear of being hoodwinked by the authorities, further promotes a dominant sense of individual responsibility and ownership at the household level, as well as a determination to "fix" things without assistance.

Incremental housing improvements – and related coping strategies – could be seen as equivalent to vulnerability reduction, with people replacing cardboard walls with brickwork or temporary retaining walls of loose tyres with cement ones. However, the research – through interviews and expert observation – revealed cases where, from a certain point onwards, increased household prosperity and the concomitant housing "improvements" did not lead to decreased disaster risk. Households, for instance, increased the height of retention walls or enlarged their houses, which in both cases led to decreased structural integrity. In other cases, wealthier household members withdrew from community involvement, again increasing their vulnerability, as social cohesion usually enhances resilience.[26] Professional specialization (as opposed to livelihood diversification) provides another example. In fact, coping capacity can be reduced by the need to compete economically, which at present rewards (productive) specialization and intensification more than diversity and sustainability.[27]

26. IFRC/RCC (International Federation of Red Cross and Red Crescent Societies) (2004), *World Disasters Report 2004*, IFCR/RCC, Geneva.

27. See reference 22.

g. Financial capacity to cope with disasters

The research revealed that, on average, households spend 9.2 per cent (ranging from 0 to 75 per cent) of their income on reducing disaster risk and preparing for the following winter, that is US$ 26 out of an average monthly household income of US$ 284. This figure is even more intriguing if one considers that it excludes construction materials that are obtained for free (such as stones and sand from riverbeds or old tyres from friends), family members' free labour, the opportunity costs of the considerable amount of time spent on risk reduction, and the negative impacts of some coping strategies (e.g. high interest paid to money lenders, or financial losses due to adjustments in assets and activities due to risk exposure[28]). There are hardly any similar studies to allow comparisons or a broader view of the expenses in question. An exception is Walker and Ryan, who state that in risk-prone areas of India, households may sacrifice as much as 25 per cent of their average income to reduce exposure to shocks.[29]

Even if risk reduction incurs a large cost, there are also substantial post-disaster expenses, amongst others, for the replacement of belongings washed away during floods and landslides; recovery efforts; temporary income losses; and the gradual loss of investments made in the incremental building of housing and community infrastructure.

28. See also Dercon, Stefan (2003), "Poverty traps and development: the equity efficiency trade-off revisited", Agence Française de Développement (AFD) and the European Development Research Network (EUDN), Paper presented at the conference on Poverty, Inequalities and Growth: What's at Stake for Development Aid?, 13–15 November 2003, Paris.

29. Walker, Thomas S and James G Ryan (1990), *Village and Household Economies in India's Semi-arid Tropics*, Johns Hopkins University Press, Baltimore.

III. SECOND "SNAPSHOT": INSTITUTIONAL-LEVEL CASE STUDIES

a. Existing capacities: dealing with slums

In terms of their capacity to deal with the needs of the poor, social housing organizations use different approaches, such as new settlement developments, in situ house improvements and settlement upgrading. Based on lessons learned during the last decades, these kinds of projects in El Salvador have been reducing their one-sided focus on construction-related work and are adopting, step-by-step, a broader approach, including non-constructive risk reduction measures (see also Section III.d).[30]

While representatives from social housing organizations report that they struggle to reach the poorest of the poor, the slum dwellers that *are* included in their projects experience a rapid improvement in living standards and security levels (Figure 3). Better housing and infrastructure, combined with other risk reduction measures, result in reduced vulnerability and hence reduced disaster impact. This is shown in Figure 3 where the lengths of the vertical thick arrows are reduced compared with those of the vertical fine and dashed ones.

However, this research reveals that projects have little impact on people's self-insurance and recovery capacities/strategies, which are usually not targeted within project implementation. This is illustrated in Figure 3 where the inclined fine and dashed arrows show no influence (i.e. they are of the same length and inclination as before). Gathered data also indicate that, in the long run, projects are not always as successful as the organizations expect them to be since:

- established hierarchical and/or community structures disappear over time (such as cooperative early-warning mechanisms and risk reduction committees);
- physical mitigation work is not maintained and is therefore not functional after the life of the project;
- slum dwellers continue to use deficient coping strategies; these were not influenced by the project measures and thus remain identical to those that existed before the project started; and
- the incremental construction process is "built on" to the help received (e.g. the height of retention walls increased, an additional floor added to the house), thus undermining the effects of aid.

Furthermore, support structures for risk financing, continuous risk reduction and incremental housing improvements are absent. The result is a slowdown in the development process, or even a decline in the security levels already achieved (Figure 3). This phenomenon is further related to transitions within the low-income bracket. In slum communities, there are the relatively well-off (the "rich poor"), a large middle segment (the "poor poor") and the relatively poor (the "destitute").[31] Through project implementation, the relatively poor (having accessed full subsidies if these are available) and the large middle segment (having obtained combined credits/subsidies) can become part of the relatively rich poor. However, these improvements refer mainly to the physical/construction conditions rather than to the economic, social, organizational and institutional aspects needed to assure a consistent improvement in people's security, such as access to credit for incremental housing and risk reduction.

30. Wamsler, Christine (2006), "Integrating risk reduction, urban planning and housing: lessons from El Salvador", *Open House International* (OHI) Vol 31, No 1, pages 71–83; also Wamsler, Christine (2007), "Integrando la gestión del riesgo, planificación urbana y vivienda social: lecciones de El Salvador", *INVI* (Revista Internacional del Instituto de la Vivienda de la Facultad de Arquitectura y Urbanismo de la Universidad de Chile), May (forthcoming).

31. Please note that Steve Rayner is the originator of the idea of varying vulnerability of the "destitute", "poor poor" and "rich poor" (information obtained orally through a discussion with Michael Thompson).

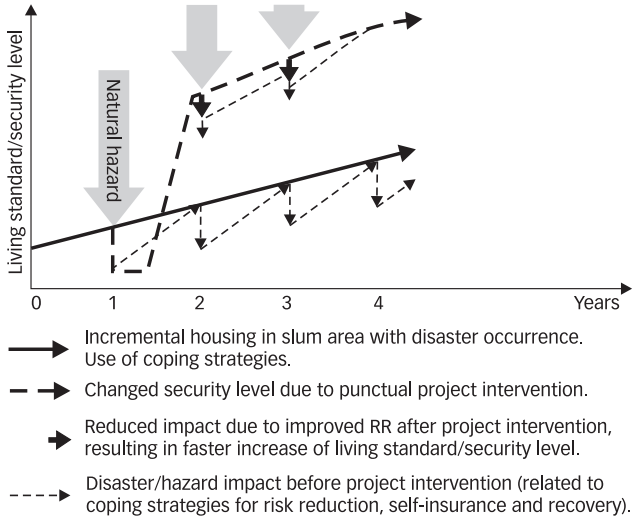


FIGURE 3
Impact of social housing project implementation on slum dwellers' security and long-term vulnerability. RR = risk reduction

b. Provision and financing of social housing

Projects carried out by social housing organizations were described as being divided into three main phases: preparation and community organization, construction through mutual and self-help, and credit repayment (at times combined with further community development). The time frame of the different phases varies considerably. Projects take 1–12 years to complete, not including the repayment phase.

Infrastructure, social housing and housing improvements are financed by a combination of government and non-government subsidies, microcredits, family savings, and mutual or self-help labour efforts (Figure 4). The percentage of resources allocated to the different mechanisms differs from organization to organization and from project to project. The average cost of a new slum dwelling is around US$ 4,000–5,000, including land and basic services.

To provide *microcredits*, social housing organizations often use seed capital from donor organizations to create so-called revolving or rotating funds; as these must maintain their original value, recovered credits are reinvested in new loans to families in the same income bracket. Interest rates range between 5–23 per cent and repayment periods between 4–10 years, during which time clients are carefully monitored. Detailed loan analyses are carried out to screen the capacity of credit beneficiaries to repay, and the clients' ability to afford credit (i.e. the amount of credit should be within 15–25 per cent of clients' secure income level) and their payment behaviour are checked regularly. Regarding the latter, potential project beneficiaries usually have to save a specific amount of money

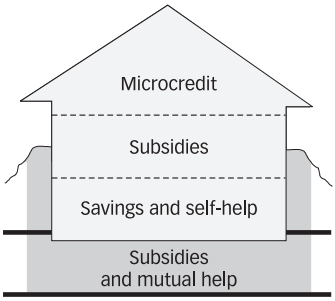


FIGURE 4
Combined financing mechanism for new settlement developments, in situ housing construction and settlement upgrading

over a period of 6–18 months, and these savings are then used as a credit down payment. Apart from housing microcredits, smaller sums of between US$ 1,500–2,000 are loaned for housing improvements, micro-enterprise development, land purchase and legalization.

A specialized finance department within the social housing organization generally manages the housing loan portfolios and subsidies, or they are coordinated with, and sold to, private microfinancing institutions (MFIs), which are then responsible for credit repayment. So far, Salvadoran social housing organizations have not worked through financing cooperatives.

Only one of the social housing organizations analyzed, FUSAI, works with *government subsidies and credits* from the National Public Housing Fund FONAVIPO (as opposed to donations and own credit funds). FUSAI uses its revolving fund as bridging finance until financial resources from the national system can be accessed.

As far as completed social housing projects are concerned, none of the organizations analyzed has a mechanism in place to offer their former project beneficiaries microcredits for future risk reduction, housing improvements or housing enlargements. Furthermore, families wishing to obtain such credits from other institutions cannot use the project houses as collateral, as assisted housing cannot become bank property in the event of default. This may have a negative impact on future developments, as project beneficiaries are unable to use their assets effectively.

Specialized financing departments within social housing organizations, and also cooperating MFIs, asserted that they are currently developing or outsourcing a wider range of financial services for the poor. Some MFIs, for instance, are developing additional savings schemes and consumer loans based on remittances paid by family members living in the United States. Neither type of scheme, however, is related to social housing projects.

c. Risk and loss financing in social housing provision

It was ascertained that credits for social housing provision generally include compulsory *life insurance* to cover the debts. The insurance fees are

included in the monthly credit repayment, and are calculated on the basis of the loan balance (around one per cent per year), or on the basis of the total credit amount (around 0.005 per cent). Hence, monthly costs are either fixed or decreasing, and generally range between US$ 0.25–0.80. Depending on the insurance policy, the credit is either completely or partly cancelled if the borrower dies. Three social housing organizations have included life insurance as part of their credits only in the last three years, after recent disasters. One of them is Habitat for Humanity, which has adopted life insurance directly in combination with disaster property insurance. This policy package costs around US$ 2.20 per month, a price negotiated based on the organization's yearly construction work in El Salvador of around 600 housing units.

None of the other social housing organizations has yet added disaster property insurance to their housing credit schemes. However, interest in risk financing is slowly growing. In fact, Hurricane Stan in 2005 led to ongoing negotiations among several social housing organizations and national insurance companies. The insurance companies that were interviewed offer *disaster property insurance* for social housing with premium rates of 0.034 per cent of the house value plus administration fees, or rates of a total of around US$ 2 per month. Damage from all types of natural disasters is covered, as is damage related to construction errors. However, representatives of insurance companies admit that the impact of such an insurance policy on promoting risk reduction is poor, as mere compliance with formal construction procedures is seen as a sufficient basis for buying insurance.

After repayment, the insurance included in the housing credit scheme is cancelled and is not replaced by any mechanism for financing future damage. This is despite the fact that some representatives of the organizations reported that around 4–5 per cent of their project houses, as well as the organizations themselves (for instance, their private access roads), have been affected by disasters.

Social housing organizations further provide *special funds for non-recoverable credits*, by including a small percentage in the housing credit (i.e. 0.5 per cent annually during the life of the debt, or a certain percentage included in the interest charges). Such funds are seldom used to ease disaster-affected slum dwellers. An exception is the case of Habitat for Humanity, which, after hurricane Stan, used its fund to amortize the outstanding credits of six project beneficiaries living in a location that was officially declared uninhabitable. None of the organizations provides a financing mechanism that could finance the relocation of affected former project beneficiaries.

Subsidies from national and international organizations are not usually conditional upon an insurance policy being bundled with accompanying credits.

With regard to *informal risk and loss financing*, local mechanisms for self-insurance and recovery are generally little supported and analyzed within the framework of the projects.

d. Provision and financing of risk reduction measures

The social housing organizations interviewed stated that resources that are earmarked for housing frequently cannot be used for risk reduction

measures. This legal constraint occasionally results in help being denied to the most vulnerable slum dwellers, as their inclusion in projects would require supplementary mitigation work. It was reported that, generally, the resources available can only be allocated to construction and design improvements that entail little or no extra cost. These costs, in turn, are included in the individual credits of the project beneficiaries. Increased costs are partly also compensated for by longer repayment periods. Existing government funds for settlement upgrading, which were accessed by the Salvadoran Vice-Ministry of Housing through the Inter-American Development Bank, allow some flexibility with regard to the integration of risk reduction, and can be obtained by participating in bidding processes. However, according to social housing organizations, projects that include risk reduction are difficult to get through such bidding procedures, as they often involve higher project costs. This situation did not seem to concern the representatives of donor and national government institutions, who reported that risk reduction is sufficiently supported and guaranteed through: market forces, existing formal construction procedures, project work through local municipalities, and the participation of project beneficiaries.

Thus, organizations willing to integrate risk reduction measures into their project design are working increasingly with municipalities and a range of other additional financial partners. "Soft" risk reduction measures, such as risk analyses, the elaboration of mitigation plans and maps, or capacity building for reducing economic, social, organizational and institutional vulnerabilities included in the project design, are generally fully paid for by international, often post-disaster, donations. Only some large-scale physical mitigation work is financed using subsidies from national and municipal governments, usually through matching funds combined with help from project beneficiaries.

Neither social housing organizations nor cooperating MFIs offer credits for risk reduction, even though some reported a demand for these from communities. Nationally, there is no established formal mechanism for financing risk reduction. Funds are available only sporadically. For instance, after Hurricane Stan in 2005, a temporary risk reduction fund was established by FONAVIPO, offering individual subsidies of up to US$ 2,200.

Coping strategies for risk reduction are not generally supported by the projects, (i.e. risk is generally reduced through alternative arrangements). Only some coping efforts are fostered, and often only temporarily, for instance through established institutional relations between the local and national authorities. Furthermore, only a few mechanisms, such as participatory work with beneficiaries, are in place to guarantee the long-term maintenance or continuation of the risk reduction measures implemented.

e. The institutional landscape: the right to secure housing versus market forces?

Widely differing organizational philosophies drive social housing projects. At one extreme are organizations, such as FUSAI, which design housing financing mechanisms that are as close as possible to market structures. Credits and revolving funds have to be financially sustainable and competitive, and housing donations are only exceptionally used for project implementation. Formal insurance, being a market instrument,

is seen as an important future and complementary mechanism. The integration of risk reduction into project design is criticized by some, as increasing implementation periods and costs ultimately endanger organizations' financial sustainability. However, risk reduction is also identified as an upcoming market, resulting in strategic engagement by these institutional actors.

At the other extreme are organizations, such as FUNDASAL, which see housing first and foremost as a human right, and who work primarily with subsidies from donor organizations and less with microcredits. Formal insurance is seen as an inadequate mechanism for the low-income sectors that would only increase costs and endanger the access to housing of the poorest people. Increasingly, integral and comprehensive projects are the aim, including risk reduction. The increased duration of projects and the expenses involved are seen not in terms of cost but, rather, of having the working focus right, that is, being dedicated to the urban poor.

While organizational philosophies differ strongly, focusing on social patterns with either an individualistic or a communitarian bias, the working approach for project implementation is not as diverse, and tends to be based on community action and the establishment of hierarchical structures. In fact, participation, mutual help and the establishment of community structures were identified as being among the most fundamental principles of project implementation.

IV. GAPS AND CHALLENGES: HOUSEHOLD-LEVEL REALITY VERSUS INSTITUTIONAL INTERVENTIONS

An understanding of the gaps between what households actually undertake to reduce and finance their disaster risk, and the endeavours supported by social housing organizations, yields important insights for reforming social housing assistance to address disaster risk more effectively. The challenges arising at the household and institutional levels, and the gaps between them, can be summarized as follows:

- People cope with disasters and risk through risk reduction, self-insurance and recovery strategies, while social housing organizations mainly look at how to reduce risk, with a focus on physical risk and, increasingly, also other types of risk. In this context, organizations rarely analyze the key variables and causal loops underlying the complex system of risk and disaster occurrence in a particular project area, or consider existing local risk reduction strategies. Hence, after project implementation, people usually continue to cope – as before – without having obtained better structures for carrying out and financing their own efforts for risk reduction, self-insurance or recovery (Sections II.a–f and III.a–e).
- While people's strategies for coping with disasters are heterogeneous, continuous and based mainly on individualistic behaviour, organizations focus more on providing uniform, short-term and community-based measures to tackle housing deficits and disaster risk, while struggling to make the projects accessible to the poorest (Sections II.b–f and III.a–e).
- Local coping strategies are diverse and crucial for the incremental development of slum areas; they influence the key variables and causal loops underlying the complex system of risk and disaster

occurrence in slum areas. Nevertheless, the strategies are insufficient to keep pace with disaster impacts (Section II.a–g).

- There is an indication that incremental slum development does not always correlate with reduced vulnerability, especially once people are in transition to being relatively well-off (becoming part of the "rich poor"). This is related to local processes and – in areas where projects have been carried out – to the nature of project interventions (Sections II.f and III.a).
- Risk and loss financing is usually not integrated into housing finance mechanisms (i.e. government and non-government subsidies, micro-credits, family savings, and mutual or self-help) (Section III.c).
- Risk reduction measures are increasingly included in project design; however, they are not financially sustainable and depend strongly on donations, which are rarely available during "normal" times (Section III.a and d).

While the list of gaps and challenges is long, there are also opportunities. Existing institutions and structures of housing provision and financing provide a promising platform for supporting disaster risk management. There is ample scope for potentially beneficial interventions that transcend purely constructive measures, leading to more sustainable housing provision.

V. BRIDGING THE GAPS

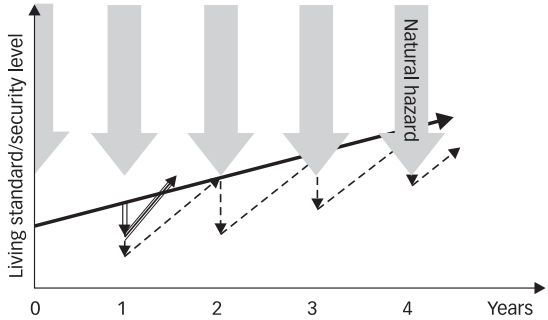
The research revealed a demand for improvements from both the household and institutional levels in current approaches to risk reduction and related practices. To address the challenges and gaps identified in El Salvador, possible stakeholder-based options for social housing organizations were developed. These reflect the analyses of the perceptions, needs and capacities of the different stakeholder groups. As far as possible, they were discussed with both the implementing organizations and the slum dwellers. A review of practical experiences from other countries was carried out to analyze, validate and complement the options identified for El Salvador. The following sections provide an overview of practical measures.

a. Framework for analyzing and supporting coping strategies

Since coping strategies were identified as crucial, although deficient, it is essential within development efforts to consider encouraging and scaling up selected strategies, as well as offering better alternative strategies where needed. As shown in Figure 5, this could help achieve reduced disaster impact through:

- improved risk reduction; and
- better "bouncing back" (in time and level) through adequate self-insurance and recovery mechanisms.

To support coping strategies, the organizations interviewed indicated that they would first need an adequate framework for viewing and analyzing them. In Section II.c–e, a framework for analyzing coping strategies was elaborated that provides a first indication as to how project measures could



Improved RR through expanded and varied RR strategies and established RR financing mechanisms (during **and after** implementation).

Improved bouncing back (time and level) after disasters through inclusion of (self-)insurance and established structures for recovery.

FIGURE 5
Improved project implementation through improved risk reduction, the integration of risk financing and the establishment of recovery mechanisms. RR = risk reduction

be designed to constructively match up with the efforts of slum dwellers. Coping strategies were, first, divided – based on their respective objectives – into risk reduction, self-insurance and recovery; and second, grouped – related to their thematic foci – into physical/technological, environmental, economic, social/cultural, organizational and institutional aspects. Then, within each of the thematic foci, they were classified into sub-groups that express the more specific aims of the different measures (see left-hand columns of Tables 1–8). Finally, based on the social patterns underlying the different coping strategies, they were categorized as individualistic, communitarian, hierarchical or fatalist.

Naturally, not all commonplace household measures can or should be supported. Careful attention should be given to the cost-effectiveness and sustainability of assistance. With regard to the latter, for operational purposes, additional typologies are needed. Based on the research outcomes, it is proposed to divide coping strategies into:

- those that can increase the capacity of slum communities to manage urban disasters and disaster risk in both the short and long terms;
- those that increase capacities in the short term but decrease them in the long term; and
- those that decrease capacities in both the short and long terms.

The focus of this division is not on individual, but on community, gains. In fact, local communities or regions may be stuck in "poverty traps" linked to individualistic social patterns and rational coping behaviour, such as overexploitation of natural and other resources (e.g. excavating slopes; cutting down trees; and removing stones from river beds to build

retention walls), or high population growth. However, such actions may harm each person individually in the long run and/or contribute to the greater impoverishment of the whole community. Identifying which coping strategies are sustainable or do not work well, and why, is a major challenge. Causal loop diagrams of different levels of detail can help in this process, providing an understanding of the local context, local needs, and people's interrelated coping efforts (Section II.a).

Examples of coping strategies that, in the slum areas analyzed, proved to be effective in the short term but might be ineffective in the long term are: borrowing from money lenders at high interest rates; selling assets off cheaply during the post-disaster period; spending money on temporary arrangements (e.g. short-lived water barriers and channels); cutting down trees to prevent them falling on nearby houses or to use as firewood to save money; covering slopes with plastic sheets that pollute the environment, blow into rivers and block them up; and the "production" of many children to provide informal social security. Parents do not always take into account child-related costs (e.g. for education) or, where overcrowding occurs, related negative externalities, such as congestion and envionmental degradation.[32]

Examples of coping strategies that might be ineffective in both the short and long terms are, for instance: passive behaviour (owing to lost trust in planning authorities or to the belief in divine forces); dysfunctional arrangements such as using corrugated iron as retention walls, or roofing houses with loose corrugated iron weighted with heavy objects that endanger neighbours during windstorms; and full dependence on family members' labour or outside help. Examples of coping strategies that might be effective in both the short and long terms are: encouraging children to study; cooperating with neighbours and the local executive committee (e.g. for savings, mutual help or early warning); learning from friends and others; accumulating assets for use as collateral or for sale in post-disaster times without making a loss; reduction of unnecessary expenses; safe and convenient saving arrangements; and accessing loans with favourable conditions.

32. See reference 25. Note that "short term" refers here to a longer period compared to the other listed examples, since even in communities where children's labour is accepted and relied on, it takes several years before the initial "investment" of time and expense eventually pays off.

b. Scaling up (and down) of coping strategies

Based on the framework presented, social housing organizations and cooperating MFIs can support or even scale up effective coping strategies through formal and informal structures. Possible examples could be the assistance for, or insurance of, local saving schemes; the establishment of linkages between formal and informal early warning systems to ensure that the clients are informed in a timely fashion about potential disasters; and professional training for slum dwellers in low-budget structural risk reduction.[33] Being able to use project housing as collateral when applying for credit would be another means of reducing barriers to coping among slum dwellers.

In addition to support for effective coping strategies, ineffective strategies could be scaled down and alternatives offered.[34] In this context, the creation of alternative formal or informal self-insurance mechanisms is of prime importance. Remittance-transfer schemes could be offered for financing new housing and housing improvements, including disaster insurance for property. A borrower living in the United States could pay an intermediary agent located in the United States who, in turn, would

33. See reference 25; also see reference 15, Twigg (2004).

34. Note that the result of new structures should be that people are better off than under the current situation. If they only replace what is there, it is not a great help. Some of the most telling evidence on crowding out comes from South Africa (1993), when the government extended basic pension benefits to black South Africans, replacing informal means of coping with aging and economic downturns. See reference 25.

transfer the money to a social housing organization or cooperating MFI in El Salvador.[35] It must be emphasized that formal insurance represents an alternative to supporting informal self-insurance and recovery mechanisms only when these are very weak or expensive. To scale down related self-insurance mechanisms, formal money-transfer systems, which may be more efficiently delivered than private transfers, could be offered,[36] as well as capacity building for family planning. Further related examples are presented in the following section.

35. In contrast to related suggestions by Woo, the responsible credit organization would have their seat in El Salvador, not in the United States. See Woo, Gordon (2001), "Risk acceptance as a charitable donation", Proceedings of the First Annual IIASA-DPRI Meeting on Integrated Disaster Risk Management: Reducing Socioeconomic Vulnerability, 1–4 August 2001, Laxenburg, Austria.

36. Cox, Donald and Emmanuel Jimenez (1997), "Coping with apartheid: inter-household transfers over the lifecycle in South Africa", Working Paper, Boston College and World Bank.

c. Extending social housing financing mechanisms for risk reduction and financing

The research indicates that the institutional and structural platform of housing provision and financing can be used to foster disaster risk management and overcome the gaps between the household and institutional levels through, first, integrating risk and loss financing into existing housing financing mechanisms (i.e. microcredit, subsidies and savings), and second, expanding those mechanisms to finance risk reduction, (self-) insurance and recovery for the urban poor (Figure 6). Such mechanisms are needed not only during, but also after, project implementation, to support incremental housing processes. Hence, it is crucial that social housing organizations provide related regulatory and institutional frameworks to improve households' access to microcredits, subsidies, safe and convenient savings opportunities, self- or micro-insurance and, where possible, employment opportunities. These will be discussed now.

With institutional structures in place, additional *microcredits* for emergencies, housing improvements and/or risk reduction could be offered during and after project implementation. These could be monetary or in the form of construction materials. Interviewees stated that adequate credit portfolios for risk reduction need to be developed by social housing organizations or their cooperating MFIs, not only for individuals but also for communities, to reduce default risk. Furthermore, if social housing

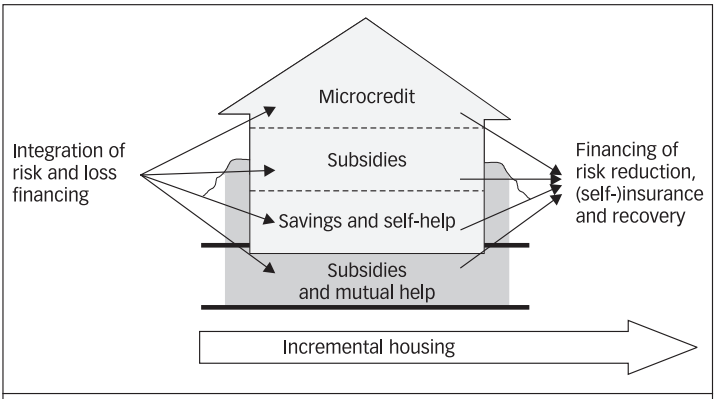


FIGURE 6
Extending social housing financing mechanisms to further support disaster risk management

organizations use revolving funds for housing credits, it was suggested that these could be used as bridging funds for risk reduction until government subsidies were accessible. Alternatively, seed funds could be provided by donor organizations to create complementary revolving funds for risk reduction and emergency loans. With regard to *subsidies*, both government and non-government donors could make access to housing subsidies conditional upon accompanying microcredits being bundled with property disaster insurance and life insurance.[37]

There is widespread positive experience with *saving arrangements* in Asia, for instance in Bangladesh, India and Indonesia.[38] However, the present research supports Morduch, who indicates that in Latin America there has also been an overhaul of savings-related programmes.[39] "Compulsory savings" are already included within the framework of social housing projects to evaluate potential borrowers' payment behaviour. Regular deposits are made to build up collateral against loans, which cannot normally be withdrawn while loan repayments are outstanding (Section III.b). These existing saving mechanisms could, interviewees confirmed, be expanded to offer independent emergency savings schemes during and after project implementation. Such schemes, combined with contingency credit facilities, could meet the immediate post-disaster needs of slum dwellers in terms of replacing or repairing lost assets. So-called crisis credits are, for instance, being used successfully by urban poor federations.[40] Furthermore, social housing organizations or their cooperating MFIs could insure the compulsory savings. Alternatively, a certain percentage of beneficiaries' savings could be put into an emergency fund, which could be made available quickly to disaster-affected borrowers in the form of emergency loans.[41] Such funds could also be created through housing microcredit instalments. At the institutional level, organizational emergency reserves could be created, eventually backed by international donors.

The institutional level "snapshot" revealed that *micro-insurance* can be included in housing microcredits, if additional costs can be accepted by project beneficiaries or be compensated by other means. The work through MFIs or financing cooperatives could allow the establishment of insurance solidarity schemes, through which policies for the poor are subsidized or fully paid from policies sold to people in higher-income groups.[42] Such schemes can even be legislated for, as in India.[43] Increasing experience and lessons learned by social housing organizations and cooperating MFIs regarding microcredits can be partly translated into micro-insurance, for instance, the selection of applicants, payment mechanisms, follow-up and reduction of transaction costs. Independent insurance policies could thus be offered after credit repayment, and eventually even to poor slum dwellers who cannot access housing credits. In general, insurance companies indicated that they cover only stochastic and unpredictable (i.e. highly uncertain) events. Hence, community insurance policies (as opposed to individual policies aimed only at slum dwellers living in high-risk areas) might be a solution.

In contrast with existing insurance arrangements in El Salvador, careful attention should be given to encouraging risk reduction rather than "moral hazard".[44] Insurance should not discourage people from taking steps to reduce physical risk, nor encourage them to take even greater risk. This can be achieved by means of:

- index-based insurance schemes where claims are independent of losses;[45]

37. Note that conditionality on of the part of international donor agencies has to be considered carefully so as not to hinder successful partnerships for poverty reduction. See DFID (2005), "Partnerships for poverty reduction: rethinking conditionality", UK Policy Paper, DFID, UK.

38. For example, Rutherford, Stuart (1999), "*The poor and their money*", Finance and Development Research Programme Working Paper Series 3/1999, University of Manchester, Institute for Development Policy and Management, Manchester.

39. See reference 25.

40. D'Cruz, Celine and David Satterthwaite (2005), "Building homes, changing official approaches: the work of urban poor organizations and their federations and their contributions to meeting the Millennium Development Goals in urban areas", Working Paper on Poverty Reduction in Urban Areas Series, Number 16, July, IIED, London. See www.iied.org/pubs/pdf/full/9547IIED.pdf.

41. See reference 15, Twigg (2004).

42. In Manizales, Colombia, the city has made an agreement with an insurance company to allow any resident to purchase insurance coverage through the municipal tax collection system. Once 30 per cent of the insurable buildings in the metropolitan area participate in the plan, the insurance coverage extends to the properties of the poorest population sectors that are exempt from property tax. See The World Bank (Marianne Fey editor) (2005), *The Urban Poor in Latin America*, Directions in Development, Washington DC. See http://siteresources.worldbank.org/INTLACREGTOPURBDEV/Home/20843636/UrbanPoorinLA.pdf.

43. Mechler, Reinhard and Joanne Bayer (2006), *Disaster Insurance for the Poor? A Review of Microinsurance*

- schemes where people who have carried out constructive mitigation work pay lower premiums than those taking no measures to reduce risk; and
- insurance policies which make access conditional on risk reduction.

With regard to the latter, in Fiji a structural engineer must certify that houses have certain cyclone-resistant features before owners can access disaster property insurance.[46] International donors could provide support regarding technical and administrative aspects of insurance schemes.[47] They could also offer community insurance policies or reinsurance in co-operation with national NGOs and national or international insurers.[48] Even if organizations decide not to include disaster property insurance in social housing credits, they could lobby governments or commercial insurance firms to cover at least schools, bridges and hospitals that serve the poor.

Based on experience in the health sector, it is clear that, in order to become successful, micro-insurance needs to be complemented by non-financial preventive measures.[49] In the housing sector, for instance, disaster property insurance could be linked to preventive construction programmes that involve training of community construction workers, or the establishment of village advisory services. Ideally, social housing organizations or housing financing MFIs would offer risk reduction measures to ensure that credits are paid back and no insurance claims become necessary.

Finally, *targeted transfers* could provide a kind of self-insurance for the poor (e.g. workfare programmes and employment guarantee schemes).[50] For instance, programmes for individuals or communities affected by disasters, offered by social housing organizations and/or governments, could provide contingent transfers to finance labour for reconstruction.

d. Matching heterogeneity

This research demonstrates that coping strategies are not homogeneous but, rather, are distinct with regard to their objectives, thematic foci, underlying patterns of social relations, sustainability and effectiveness. In Section V.b, it was argued that it is important and possible to take advantage of this heterogeneity to design projects that appeal to the various perspectives and efforts of the related stakeholders. But this is only the start. People do not just have strategies. As identified by "cultural theory",[51] under certain conditions they can move from the underlying social pattern of one strategy to another pattern.[52] Projects can help or hinder such transitions. Hence, in selecting project measures, development organizations should be sensitive to the social forms of behaviour identified in a specific slum, so that the social patterns can be matched or, where needed, channelled.

Introducing systems of mutual rights, accountability and community organization to support a shift in social patterns could be an important step in overcoming asymmetric risk (Section II.a). However, this needs to be followed up over time (i.e. after project implementation) and needs to be complemented by further strategies, such as trying to ease people away from fatalism and offering solutions for improved individual coping. Improved local coping strategies are crucial for the process of incremental housing and security, particularly after project implementation. Section V.c provided a variety of related measures for achieving this.

for Natural Disaster Risks in Developing Countries, ProVention Consortium/IIASA Study, July 2006.

44. The term "moral hazard" is generally used to describe the situation in which someone insured against disaster risk will ignore disaster risk, or even purposely engage in risky behaviour, knowing that any costs incurred will be compensated by the insurer.

45. Linnerooth-Bayer, Joanne, Reinhard Mechler and Georg Pflug (2005), "Refocusing disaster aid", Viewpoint, *Science* Vol 309, pages 1044–1046.

46. See reference 15, Twigg (2004).

47. Sinha, S (2002), *Strength in Solidarity: Insurance for Women Workers in the Informal Economy*, Self-Employed Women's Association (SEWA), Ahmedabad, India.

48. Obermayer, Bastian and Marc Baumann (2006), "Lebensversicherung für 80 cent", *GDV Position* Vol 48, May, Gesamtverband der Deutschen Versicherungswirtschaft (GDV).

49. In India, the NGO SEWA provides street vendors with umbrellas, based on its life insurance data that the sun could be increasing their risk of illness. See reference 47. See also Brown, Warren and Craig F Churchill (2000), *Insurance Provision in Low-income Communities, Part II: Initial Lessons from Micro-insurance Experiments for the Poor*, Development Alternatives, Microenterprise Best Practices Project, USA.

50. See reference 28; also see reference 25.

51. See reference 10.

52. Thompson, Michael and Aaron Wildavsky (1986), "A poverty of distinction: from economic homogeneity to cultural heterogeneity in the classification of poor people", *Policy Science* Vol 19, pages 163–199.

The philosophies, which drive the social housing organizations that service slum dwellers, differ greatly (Section III.e). However, project measures are quite uniform and uni-dimensional, with development aid generally being understood as assistance for mutual community help. A greater variety of project measures is needed to also take into account the strategizing heterogeneity of slum dwellers' efforts. Moreover, where predominantly commercial mechanisms, such as formal insurance, are inappropriate, alternative informal structures, such as those described in Section II.d, could be considered.

VI. CONCLUSIONS

The research shows how dwellers living in 15 slum communities in El Salvador cope with disasters and disaster risk, and reveals the variety of strategies, tactics and mechanisms they have elaborated to reduce risk, to insure themselves and to recover fast if disasters occur. The strategies are based on different patterns of social behaviour, with a strong focus on individualistic behaviour for survival. Coping strategies are crucial for the incremental, step-by-step development of slums, and influence the key variables and causal loops underlying the complex system of risk and disaster occurrence. However, although they entail considerable costs for the poor – on average 9.2 per cent of their income – they are not always sufficient to keep pace with the frequency of disasters.

Until recently, social housing organizations paid little attention to disasters and disaster risk. This is unfortunate as "pro-poor" housing and settlement development is not necessarily synonymous with vulnerability reduction. Greater wealth and better living standards may not themselves reduce risk. While increasing efforts are made to mainstream risk reduction in both project design and implementation, there are hardly any mechanisms for financing risk, loss, and risk reduction. The lack of such mechanisms is unfortunate as there is increasing evidence that risk and disaster shocks are a major cause of lower growth, reduce poor people's income growth, and possibly cause "poverty traps".[53]

This research indicates that social housing organizations and co-operating MFIs have the potential to provide a powerful platform to support disaster risk management. For improved project design and implementation, first, risk reduction needs to be improved to reduce disaster impact, and second, adequate (self-) insurance and recovery mechanisms need to be integrated to improve people's chances of "bouncing back" quickly and to a reasonable level after a disaster. These objectives can be achieved by:

- gaining a better understanding of what urban dwellers perceive as disasters and disaster risk as well as their underlying drivers;[54]
- encouraging and scaling up effective (i.e. sustainable) coping strategies;[55]
- crowding out of unsustainable coping strategies by offering alternative formal *or* informal mechanisms;
- reducing barriers to coping;
- integrating risk and loss financing into existing social housing financing mechanisms (i.e. microcredits, government and non-government subsidies, and family savings);

53. See reference 28; also Mechler, Reinhard (2004), *Natural Disaster Risk Management and Financing Disaster Losses in Developing Countries*, Verlag für Versicherungswissenschaft, Karlsruhe.

54. Related studies can be supported by systems analysis and its causal loop diagrams. See references 13 and 14.

55. Their identification is possible through the presented analysis framework.

- expanding existing social housing financing mechanisms to finance risk reduction, (self-) insurance and recovery for the urban poor;
- offering multi-dimensional measures to match and, where needed, channel the patterns of social behaviour that underlie people's ways of coping;
- given incremental development processes in slums, offering mechanisms that work or come into effect after project implementation; and
- improving trust and relations between national, municipal and local authorities and the slum dwellers (e.g. through improved communication structures and the creation of community rights and obligations).

In the El Salvador case studies, the emphasis was on developing a grounded theory on the existing situation, and options as to how it could be improved. The generalization of the outcomes will be validated in a subsequent study.

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VII

Paper VII	
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CHAPTER 16

‘Planning Ahead’
— Adapting Settlements Before Disasters Strike —

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1 INTRODUCTION

Civil engineers, architects, builders and urban planners[1] have the task of developing secure and sustainable settlements. However, they are unconscious—but significant—contributors to the fourfold increase in the number of disasters that has taken place during the last 30 years (UNISDR 2006). This relates to the fact that they commonly view the interlinkages between disasters and the built environment (and related planning practices) as a simple one-way, cause-and-effect relationship (figure 1). In fact, the limited perception that disasters are the (uncontrollable) cause and the destruction of the built environment is the effect, is widespread amongst those professionals, who consequently have a tendency to see disaster risk management[2] in a purely physical way. Their responses are thus very limited and mainly focused on the post-disaster context. Moreover, even preventive tools, such as building codes or land-use zoning, are currently of low relevance to the urban poor whose lives are most at risk (figure 2). With more than one billion ‘slum’ dwellers worldwide, who often have no choice but to live in precarious and life-threatening conditions (UN-HABITAT 2003), planners have to urgently re-evaluate their work to provide more adequate solutions.

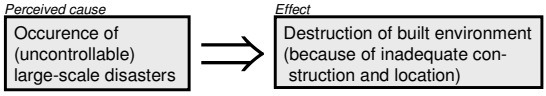

Figure 1: Common, ‘erroneous’ view of the interlinkages between disasters and the built environment (and related planning practices) as being a simple one-way, cause-and-effect relationship.

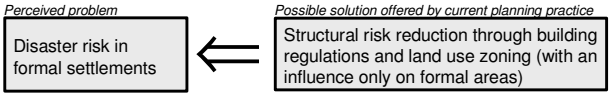

Figure 2: Common, ‘erroneous’ view of the interlinkages between the potential of planning practice for disaster risk management as being a simple one-way problem-and-solution relationship with limited efficiency and area of influence.

Responding adequately to disaster risk is inherently complex. Disasters occur when a hazardous event strikes a vulnerable human settlement, with the coping capacity of its inhabitants further influencing the extent and severity of damages received.[3] Unfortunately, at present, planners often

negatively influence *all three* risk components (i.e. hazard, vulnerability and coping capacity). Hence, the task of developing secure settlements cannot be achieved unless planners thoroughly understand the interlinkages between disasters and the built environment (and related planning practices) and—based on this—integrate disaster risk management into their everyday work. In fact, incorporating knowledge about how to make houses safer into their work is just one of many issues that they need to address. Against this background, the objective of this chapter is threefold:

1) *Preparing the ground*
   To demonstrate the complex interlinkages between disasters and the built environment (and related planning practices). It will be argued that the reality is much more complex than the one-way, cause-and-effect relationship mentioned above. It is, in effect, a reciprocal two-way and multifaceted relationship that, to date, has not been well understood and theorised. A new analytical framework for viewing this relationship is presented.
2) *Reality versus current planning practices*
   To show how the identified interlinkages between disasters and the built environment (and related planning practices) are currently addressed. This will be mainly discussed in the context of aid programming[4] in the fields of disaster risk management and human settlement development planning (including social housing, settlement upgrading, new settlement development and urban governance programming). The analysis covers related programmes and stakeholders, institutional structures, the discourses of experts and practitioners, their working priorities, concepts, terminology and tools, as well as the historical development of both fields of work. The challenges identified at the global, national, municipal and household levels are illustrated, as is the gap between reality and current practices, both of which can lead to increased disaster risk.
3) *A way forward*
   To show how disaster risk management could be better integrated into planning practices. A strategic and conceptual model is presented that provides guidance on how international, national and municipal (aid) organisations working in settlement development planning in so-called developing countries[5] could adopt a more proactive approach towards disaster risk management.

The following sections reflect the three objectives and follow an inherent logic: the two-step analysis of the interlinkages between disasters and the built environment and how it is tackled in practice is the necessary basis and input for the third step, namely, the development of the model mentioned above. Its aim is to overcome identified challenges and modify current planning practices so that they match better to reality (see figure 3).

This chapter summarises the results of research, undertaken from 2003 to 2007, that have been presented in different publications (Wamsler 2004; 2006a-g; 2007b,c). Here, their outcomes are incorporated within a new and comprehensive model that addresses how disaster risk management could be better integrated into human settlement development planning and programming. Sections 2 and 4 have been complemented by additional, more recent research results obtained during 2007.[6] Note that, in the following text, references are included only if the content is based on work other than the author's.

Figure 3: Inherent logic of research objectives presented in this chapter.

2 PREPARING THE GROUND

The following two sections show, first, the possible impacts of disasters on the built environment and related planning practices in cities and, second, the reverse interrelation (i.e. the influence of the built environment and related planning practices on risk and disasters). This two-way relationship has, to date, not been well understood and theorised. A framework for viewing it is thus presented as a first attempt to provide a comprehensive and exhaustive systematisation of the issues involved. The framework systematises the relationship by filtering out 12 key aspects. Tables 1–13 provide an in-depth analysis of each aspect.

2.1 The interlinkages: disasters ⇒ built environment

Natural hazards and/or disasters have widely varying impacts on the built environment and related planning practices. These impacts are not only physical but also socio-economic, environmental, organisational and institutional. In fact, disasters can:

- disrupt city functions;
- intensify urban hazards and create new ones;
- increase urban inequalities (producing 'poverty traps');
- create new challenges for future urban development;
- create barriers to sustainable urban development; and
- have a (negative) impact on the resources invested in the built environment.

Unfortunately, these negative effects, which are described in detail in tables 1–6,[7] are not only extensive, but can—over decades—negatively impact the urban poor, as well as municipal and national development. The effects can generally be categorised as 'immediate and short-lived', 'immediate and long-lasting', 'delayed and short-lived' and 'delayed and long-lasting'.

Table 1: Disrupted city functions caused by disasters.

Disaster impacts that can lead to the disruption of city functions
▪ Damage/destruction of housing stock.
▪ Damage, destruction or interruption of technical and social infrastructure (i.e. infrastructure for water supply, sanitation, energy, transport, communication, education and health services. Examples are electricity failure; blocked accesses to houses or settlements; damaged health care units and schools; contamination of drinking water wells; and destroyed bridges.
▪ Malfunctioning of technical and social infrastructure due to disaster impacts (e.g. accidents due to insecure pathways).
▪ Loss of architectural heritage (i.e. buildings and sites of cultural value), also undermining the collective quality of life, as well as national economies (e.g. because of fewer tourists).
▪ Destruction of whole cities (e.g. cities wiped out because of the rise in sea levels caused by climate change).

Table 2: Intensified and new urban hazards caused by disasters.

Disaster impacts that can lead to creation or intensification of hazards
▪ Damage to the integrity of ecosystems creating future hazards (e.g. destruction of vegetation leading to landslides, or damages to mangroves leading to erosion and increased wave energy).
▪ Aggravated environmental degradation triggering secondary hazards (e.g. soil instability and erosion caused by earthquakes leading to landslides during 'normal' rain or through waste water flows).
▪ Modification of the landscape of settlements, thus reshaping their hazard patterns (e.g. through the change of the course of a river).
▪ Contamination of the environment through recovery and/or preparedness measures creating new hazards (e.g. plastic sheets—used for protecting slopes or temporary shelter—being blown away, contaminating the environment and blocking river flows or water channels).

Table 3: Increased urban inequalities (creating 'poverty traps') caused by disasters. As the poor are disproportionately affected, disaster impacts can intensify differences in status and the patterns of social inequality.

Disaster impacts that can lead to increased urban inequalities which, in turn, could cause poverty traps
▪ Forced eviction of 'slum' dwellers affected by disaster.
▪ Direct and indirect post-disaster expenses, together with the disruption of local and household economies pushing already vulnerable groups further into poverty (e.g. loss of income earners through death or injury, interruption of production or access to markets, destruction of productive assets such as home-based workshops).
▪ Governance problems at different levels, resulting in aid budgets being skewed towards the recovery of one group or sector as opposed to another, resulting in increased urban inequalities.

Table 4: New challenges for future urban development caused by disasters.

Disaster impacts that can lead to additional challenges and even barriers to future urban development
▪ Increased number of urban dwellers, due to immigration, affected by disaster or by decreased agricultural productivity caused by climate change.
▪ Increased number of homeless people (due to loss of housing and land belonging to people affected by disaster) and hence a need for living space.
▪ At the household level, erosion of livelihoods, savings and physical capital, increasing the number of people and settlements that depend on outside assistance, for instance, to access adequate rental housing or house ownership, house and infrastructure maintenance, etc.
▪ Modification of the landscape of cities, affecting past and future planning (e.g. infrastructure planning).
▪ Construction of temporary housing/settlements that over time need to be transformed or replaced to offer permanent solutions for disaster victims.

Table 5: New barriers to sustainable urban development caused by disasters.[1] These barriers decelerate (positive) development processes.

Disaster impacts that can lead to decelerated urban development
▪ Increased need for resources for specific (already planned) urban developments because of, for instance, contamination of the environment as a result of disaster impacts (contaminated soil, wells, etc).
▪ Reduced capacity/functioning of housing/planning organisations that are directly or indirectly affected by disasters (e.g. national governmental and non-governmental aid organisations suffering through reduced reputation, damaged office buildings, disaster-affected programme measures and staff death, injuries, leave, etc.).
▪ Death, (temporary) disablement or migration of key persons (and workforce in general) at the national, municipal, local and household level, leading to an erosion of social capital for urban planning and governance.
▪ Aggravation of political stresses, leading to increased corruption, bureaucracy, political conflicts and rivalry at all levels, which affect developments at settlement, city or country level.
▪ Aggravation of social stresses and shocks such as disease and psychological shocks, which affect developments at settlement, city or country level (e.g. community distress; family disruptions; burglaries due to damaged houses and/or increased need, illnesses caused, for instance, by waste water entering houses; HIV/AIDS, trauma).
▪ Impacts on national fiscal and monetary performance, indebtedness, the distribution of income and scale and incidence of poverty, all negatively influencing the provision and financing of housing and infrastructure.

Table 6: Change of resources invested in the built environment caused by disasters. These effects are mostly negative in terms of achieving sustainable urban development.

Disaster impacts which can lead to changed investments in the built environment
▪ Reduced support/assistance by planning authorities to affected 'slum' communities because of increased and unacceptable risk levels (e.g. stopping land legalization processes).
▪ Disruption of national economies and related governance functions of planning authorities, for instance, due to post-disaster expenses and relocation of development investments (e.g. investments aiming to provide sustainable access to safe housing, drinking water and sanitation being disbursed on emergency issues).

[1] Note that there is a certain overlap between the aspects mentioned in tables 3,4 and 5, i.e. the aspects can—depending on different national contexts—be categorized differently.

Disaster impacts which can lead to changed investments in the built environment (cont.)
▪ Lower output from damaged or destroyed public assets and infrastructure, resulting in fewer resources that can be reinvested in the built environment.
▪ Increased temporary investment and hence activity in the (formal and informal) construction industry due to rehabilitation and reconstruction efforts.
▪ Disruption of local and household economies, affecting people's investments in improving their living conditions (e.g. incremental housing, including infrastructure), which immediately increases their vulnerabilities (vicious cycle).

2.2 The interlinkages: built environment ⇒ disasters

The reverse analysis indicates that the built environment and related planning practices constitute one of the main causes of disasters, not only in terms of generating increased vulnerabilities. In fact, they can:

- increase vulnerability;
- increase exposure to existing hazards;
- intensify/magnify urban hazards and create new ones;
- constantly change vulnerabilities and hazards (and thus make them hardly controllable);
- reduce the national and municipal coping capacities
  - because of inadequate disaster risk management systems, or
  - because of inadequate urban management/governance systems; and
- reduce the coping capacities of low-income households.

Tables 7–13[8] describe in detail how these effects, which can be classified in physical, socio-economic, environmental, organisational and institutional terms, can be generated. This detailed systematisation clearly illustrates that disasters are not one-off events caused solely by natural hazards but are generated by complex and interacting development processes in which planning practices play a major role.

Table 7: Increased vulnerability caused by the built environment and related urban planning practices. Increased vulnerability leads to reduced capacity to resist, absorb or recover from hazard impact. Hence, a condition is created where hazards easily create disasters.

Aspects or activities that can lead to increased vulnerability
▪ High number of inhabitant living in cities, expressed in high population densities and surface areas of cities.
▪ High concentration of social networks, buildings and infrastructure in cities, including state governments and financial centres.
▪ High concentration and overcrowding of people in hazard-prone areas (especially the poor living in 'slum' areas), both in inter-city and peripheral communities.
▪ High concentration of highly defenceless population groups in cities (for example, weakened by HIV/AIDS or other diseases, conflict or malnutrition). Note: such groups are mainly found within the lower income groups; in turn, the poor's inadequate and unsanitary housing results in ill-health. Furthermore, space restrictions can influence transmission of disease (e.g. through violations).
▪ High and increasing number of poor and destitute persons living in areas that are socially excluded and politically marginalised, leading to limited access to information (and hence knowledge) about, and resources for, housing, infrastructure, risk reduction, etc.

Aspects or activities that can lead to increased vulnerability (cont.)

- Poorly constructed residential and commercial buildings and infrastructure. Note that sub-standard buildings relate, amongst other things, to corruption in the construction sector, lack of control mechanisms and lack of financial resources and knowledge.
- Use of inadequate construction techniques because of lack of knowledge, together with rapidly changing environments (e.g. shelters being constructed of inflammable materials, or earthquake-resistant buildings being vulnerable to increased wind storms).
- Densely built settlements that, because of their layout (narrow paths for movement, many lanes and alleys with dead ends) can inhibit effective emergency services (e.g. evacuation).
- Densely built settlements, which allow damage to spread easily from one shelter to the next (e.g. fire spreading from one roof to the next, or a domino effect being created when earthquake affected houses fall on neighbouring buildings).
- Land used for residential, industrial and transport purposes at too close a proximity to each other.
- Closeness of shelter in risk areas to environmental hazards, intensifying the impacts of natural hazards, namely, the impact but not the hazard as such (e.g. leaking sewage pipes from better-off settlements passing through 'slum' areas to discharge into near-by rivers result, even during minor floods resulting in the immediate contamination of whole settlements).
- Construction of shelter on plots that are too small and have no space available for mitigation works (related to lack of living space, combined with inadequate financial resources and knowledge).
- Non-existence of infrastructure networks/services or inadequate capacity of existing ones (e.g. for waste collection, pedestrian and vehicle circulation, rain and waste water services). In 'slums', this results, for instance, in people living uphill allowing waste and storm water to flow down on to their neighbours' land, and people from inside and outside the settlement tipping solid waste down their neighbours' hills or into the nearby rivers.
- High dependency of people living in urban areas on infrastructure networks/services, with the result that the disruption of these can cause societies' to collapse completely (e.g. transportation and banking systems).
- Full dependency of many poor urban households on housing as a productive asset for pursuing their livelihoods. In fact, economic activities are incrementally related to the housing of the poor (i.e. labour and room rental).
- Importance of the informal construction sector, on which the poor are mainly dependent, which provides limited social responsibility.
- Local livelihood practices that are not suited/adapted to densely built areas (i.e. very limited space can result in substandard modification of the built environment to permit economic activities (e.g. removal of supporting walls or creation of land fills).
- Limited access to clean water and sanitation (i.e. access to this basic need is denied to around one-quarter of urban households, which undermines health and hence also causes vulnerability to 'natural' disasters).
- Restricted access of 'slum' dwellers to regular income, influenced by the segregation/marginalisation of people from specific geographical living areas. In turn, unemployment and low income levels influence the quality of housing and infrastructure within these areas (vicious cycle).
- 'Slum' dwellers' strategies/efforts to gain and expand their living space to cope not only with the growing number and size of 'slum' households but also with the lack of alternative living areas. Strategies include people living downhill felling trees or excavating the slopes below their neighbours' houses; people building latrines close to declivities; and/or claiming land from nearby rivers.

Aspects or activities that can lead to increased vulnerability (cont.)
▪ Few mutual rights and obligations within 'slums' related to the settlements' maintenance and development (e.g. no rules as regards excavation of the slopes below houses or the construction of latrines close to declivities).
▪ Lack of knowledge at all levels on how to construct safe buildings and settlements (due to poor education system, limited professional training, marginalization of 'slum' dwellers, etc.).
▪ Importance of status (expressed by the built environment) combined with the lack of knowledge resulting in the construction of modern-looking houses without technical safety features in risk areas.
▪ Conventional belief of 'slum' dwellers and partly also of representatives of planning authorities and aid organisations that disasters are purely "divinely driven".
▪ People's (false) perception of cities as secure places, influencing them not to invest money and effort in the built environment and related security measures.
▪ Planners' and builders' false perception that hazard-resistant design is too costly, while the implementation of hazard-proof measures in building and infrastructure design can be relatively inexpensive in terms of construction costs.
▪ Unwillingness of 'slum' dwellers to invest in security measures (related to insecure land tenure as well as to promises of outside help not being honoured).
▪ Many people living on land without having/access to secure tenure (amongst other things this also results in forced evictions after disaster occurs).
▪ Internal segregation within 'slum' areas expressed in the built environment (e.g. the poorest living on the ground floors, which are particularly vulnerable to flooding, or in inaccessible areas, which are virtually impossible to evacuate).

Table 8: Increased exposure to existing hazards caused by the built environment and related urban planning practices.

Aspects or activities that can lead to increased exposure to existing hazards
▪ Geographic positioning of cities on disaster-prone sites (e.g. 8 of the 10 most populous cities in the world sit on or near earthquake faults). The location of many cities was chosen in the pre-colonial or colonial eras when mainly economic or other strategic factors were considered for site selection (e.g. proximity to mineral resources, close to the coast, etc.).
▪ Development or expansion of illegal settlements in/into marginal high-risk areas (e.g. near rivers or on steep slopes), because of the malfunctioning of land and property markets in cities and the inability of formal housing and planning sectors to cater for the priorities of the population (e.g. access to work opportunities). The latter is also related to urban dwellers' priorities—they frequently 'choose' to live in hazardous locations if it provides access to work.
▪ Spread of housing and infrastructure towards risky open land (because of fast growing urbanisation and the lack of inner-city land).
▪ Increased proximity of housing and infrastructure to environmental hazards (shelter close to industries, heavy equipment, pipelines, effluent drains, toxic disposal sites, etc.).

Table 9: Intensified, magnified and newly created urban hazards caused by the built environment and related urban planning practices. Hazards are being intensified or reshaped and new hazards introduced, thus increasing the number and magnitude of urban disasters.[2]

Aspects or activities which can lead to intensified or even new hazards
▪ Cities, while covering only 0.4% of Earth's surface, produce the vast majority of world's carbon dioxide emissions, thus contributing to climate change. With cities growing in population and wealth, increased production and consumption is an engine for climate change. Climate change, in turn, reshapes hazard occurrence, compounding global and local insecurity.
▪ Cities' 'heat island effect' (created, for instance, by concentration of heat and pollutants from power plants, industrial processes and vehicles) can cause and exacerbate heat waves.
▪ Layout of streets (e.g. straight streets lined with tall buildings) can result in turbulence and wind gusts, hailstorms and localised rainfall.
▪ Some building features can create new hazards (e.g. antennas and electrical equipment on top of buildings that attract lightning).
▪ Transformation of cities' environment by urbanisation processes on inadequate land (e.g. developments of new urban areas on watersheds that modify hydraulic regimes and destabilise slopes, increasing the risk of floods and landslides; or colonisation of garbage landfills, which increases landslides and unplanned urbanisation of new areas.
▪ People's construction and livelihood practices, as well as urban expansion, result in overexploitation of natural assets and environmental degradation that demolishes natural protection and magnifies hazards. (Such practices include coral reef mining, sand dune grading, mangrove cutting, conversion of mangrove coasts into intensive shrimp-farming pools or development over mangrove swamps so that the natural coastal habitats can no longer protect against storm surges. As a result, erosion and wave energy are increased, and deforestation can cause a higher risk of landslides or drought).
▪ Use of livelihood practices that are inadequate for densely built areas/housing, putting neighbours or whole settlements at risk (e.g. through dangerous production processes or cooking on an open fire).
▪ Lack of trees to purify air and stabilise soil, resulting in increased storm water runoff and erosion.
▪ Lack of open space to absorb storm water (and provide wildlife habitats).
▪ Lack of infrastructure, combined with inadequate use of existing infrastructure can create new hazards (e.g. fire through illegal electrical connections).

Table 10: Constantly changing vulnerabilities and hazards caused by the built environment and related urban planning practices.

Aspects or activities that can lead to constantly changing vulnerabilities and hazards
▪ Constantly changing extension of settlements, sometimes on inadequate land, and increased closeness to hazardous areas/elements (see also following table).
▪ Constantly changing local conditions of the built environment (e.g. through change of layout, landscape and density of settlements due to urbanisation processes, combined with the impacts of disasters and climate change) (see foregoing tables).

[2] Note that there is an overlap between the aspects mentioned in table 7 and 8 (i.e. some of the aspects listed could be included in either table as depending on the respective context (see especially last three points).

Table 11: Reduced coping capacity due to non-adequate disaster (risk) management systems caused by the built environment and related urban planning practices.

Aspects or activities which can lead to reduced coping capacity due to non-adequate disaster (risk) management systems
▪ Lack of emergency infrastructure and related back-up systems (e.g. emergency fire access and evacuation roads, adequate width of highways). ▪ Out-of-date and incompatible (paper) maps, as well as lack of maps/information on informal settlement, making effective disaster response impossible. ▪ Exclusion of the urban poor and/or other vulnerable groups (e.g. women) living in marginalised settlements from decision-making processes (resulting, for instance, in those groups being unwilling to use emergency shelters). ▪ Urban growth leading to disaster management agencies not having the capacity to provide basic supplies and assistance, especially for marginal settlements. ▪ Urban growth leading to cities growing together and merging without effectively integrating their disaster agencies; this results in confusion and in inability to coordinate disaster response and disaster risk management.

Table 12: Reduced coping capacity due to inadequate urban management/governance systems caused by the built environment and related urban planning practices.[3]

Aspects or activities that can lead to reduced coping capacity because of inadequate urban management/governance systems
▪ Use of imported and/or colonial building and planning regulations that do not consider local factors (e.g. local hazards). ▪ Use of inadequate enforcement schemes resulting in non-compliance of building and planning regulations. ▪ Use of 'best local practices' for the design and construction of infrastructure which ignore relevant considerations for hazard-resistance (for instance, as a result of local traditions, lack of knowledge/existence of building and planning codes or poor enforcement schemes). ▪ Absent or poor certification and licensing of planning professionals (who would be responsible for applying, enforcing or inspecting codes) because of, for instance, disciplinary traditions and corruption. ▪ Planning authorities' lack of political power to control the construction sector (e.g. corruption leading to the use of substandard bricks or other building materials by contractors, and inability to force developers and property holders to plan in secure areas and/or invest in security features). ▪ Out-of-date and incompatible (paper) maps, as well as lack of maps/information about informal settlements, resulting in poor planning capacities. ▪ Frequent non-compliance of planning ministries with regulations prescribing the use of environmental impact assessments (EIA) for new urban developments. ▪ Insufficient capacity of urban authorities and the private sector to supply adequate housing or basic infrastructure at the same speed as urbanisation processes (especially for poor and marginal settlements). ▪ Urban growth leading to cities growing together and merging without effectively integrating their planning agencies (resulting in confusion and inability to coordinate urban planning efforts and housing provision).

[3] Note that some of the aspects listed in this table will be further described in section 3 on 'Reality versus current planning practices'.

Aspects or activities that can lead to reduced coping capacity because of inadequate urban management/governance systems (cont.)
▪ Exclusion of the poor and other vulnerable groups (e.g. women) living in marginalised settlements from decision-making processes (resulting, for instance, in those groups being unwilling to invest in improved housing and a generally apathetic civil society). Note that 'slum' dwellers often see national and municipal governments as unhelpful, and even a hindrance, to their efforts to improve their situation. In fact, the actions taken by planning authorities and the information obtained by them with respect to the development and legalisation of planned settlements are often viewed as contradictory and unreliable.
▪ Centralised planning institutions that do not generally have institutional interlinkages with disaster agencies.
▪ Decentralisation of planning functions without decentralised technical and financial resources (also due to structural adjustment processes), resulting in erosion of living standards (e.g. through poor maintenance of rental property and funds being unavailable for housing and related risk reduction).
▪ Lack of communication/cooperation between national and municipal planning authorities.
▪ Few adequate mechanisms to finance/access safe land and housing for the poor.
▪ Unequal distribution of support by housing/planning organistations for incremental housing and infrastructure in 'slums' (this is related to individual 'slum' dwellers' relationships with planning authorities, corruption, and communities' organisation level).
▪ Politicisation of building and planning processes, as, for instance, illustrated by global bidding process between cities to attract investment, resulting in planning authorities being forced to lower environmental regulations (and security of workers).
▪ Corruption at all levels, unnecessary bureaucracy and political rivalry within and between different sectors and ministries.

Table 13: Reduced coping capacity of slum dwellers caused by the built environment and related urban planning practices. In comparison with rural areas, this is related to reduced solidarity and reciprocity, as well as a lack of resources and knowledge on adequate coping.

Aspects or activities that can lead to reduced coping capacity of 'slum' dwellers to manage risk and disasters
▪ Increased ease of mobility caused by urbanisation, which creates loose socio-economic community networks that enable dwellers to 'default' on obligations to relatives and neighbours (e.g. migrants lose traditional rural networks of family and neighbours that they could rely on during and after disasters).
▪ Vulnerable habitat, combined with high risk of suffering hazards, cause 'slum' dwellers within a settlement to frequently experience simultaneous and persistent impacts on their living conditions, a situation that negatively affects solidarity and reciprocity between neighbours.
▪ Loss of trust in hierarchical structures established by housing/planning agencies (as well as disaster risk management agencies), related to corruption, co-optation and political factionalism, which negatively affects solidarity and reciprocity (e.g. unequal assistance depending on individual's relation to housing/planning authorities).
▪ Concentration of highly defenceless population groups in urban areas (for example, weakened by HIV/AIDS or other diseases, conflict or malnutrition) results in reduced community cohesion and individual coping (e.g. with HIV/AIDS, many of the able-bodied, adult workforce who would normally engage in disaster coping activities are too weak from the disease. After these people die, households are composed of the elderly and very young, who often lack labour capacity or knowledge.)

Aspects or activities that can lead to reduced coping capacity of 'slum' dwellers to manage risk and disasters (cont.)

- Urban lifestyle results in inhabitants being unwilling to get engaged in community organisation (e.g. because of (a) frequent changes in living place within the city that result in a lack of ties to the respective place; or (b) time restrictions, for instance, due to long commuting distances between home and work, or having to work at several different jobs, combined with unsocial working hours).
- 'Slum' dwellers have very few assets that can be sold to help themselves or others (e.g. because of limited income and small plot sizes that do not allow farming or the keeping of livestock).
- Rapidly changing living environments (due to urbanisation, disasters, climate change, etc.) which negatively affect people's coping knowledge and ability.
- Lack of knowledge of urban 'slum' dwellers on adequate coping due to rural–urban migration or frequent changes of dwelling within the city.

In addition, the research undertaken at household level reveals that disasters are the outcome of a non-linear development process, with the key variables underlying the complex system of risk and disaster occurrence reinforcing each other. Hence, disasters make not only the already precarious conditions of 'slum' dwellers worse, but can also create vicious circles of increasing risk. 'Poverty traps' can be the outcome.

With growing urbanisation and climate change, the described reciprocal two-way and multifaceted relationship is becoming increasingly alarming.

3 REALITY VERSUS CURRENT PLANNING PRACTICES

The interlinkages presented in the last section indicate the powerful potential of the built environment and related planning practices for reducing (or increasing) risk and hence disaster occurrence. However, the comparison between reality and current planning practices shows that these interlinkages have not been effectively confronted by planners or by disaster risk management professionals. Furthermore, it is possible to identify an unfruitful gap—and even tension—between the related working fields, which finds expression in the respective:

- literature;
- stakeholders and institutional structures;
- discourses of experts and practitioners;
- working priorities, concepts, terminology and tools; and
- sector-specific programmes.

These aspects are described briefly in the following section.

3.1 The gap between urban planning[9] and disaster risk management

Technical literature. Literature analysis shows that only a small amount of systematic research has been carried out on the linkages between disasters and the built environment (and related planning practices). As a result, on the one hand there is a large amount of literature emerging from the planning field that deals with purely construction-related issues in the post-disaster scenario of mainly large-scale disasters. Only very few publications are based on a more proactive rather than reactive attitude that also include non-structural aspects and/or consider small-scale everyday disasters. An exception to this is publications on cities and general development issues which have an ecological

and health-centred approach. However, these take account of, but do not specifically focus on, broader disaster risk reduction measures.

On the other hand, the analysis of the literature emerging from the disaster risk management field shows that general disaster studies tend to focus on the hazards themselves and hence mostly address related scientific aspects and solutions (e.g. high-tech prediction systems). However, there are also more socially oriented disaster studies that mainly look at (social) causes of vulnerability. In this respect, since the early 1990s a growing literature has emerged in Latin America and the Caribbean, Asia and Africa, born of disaster reduction research and applications carried out by developing country researchers and institutions. This literature forms the basis of many of the contemporary approaches to disaster risk management now being discussed and advocated at the international level (UNDP 2004). Nevertheless, most authors give secondary importance to the built environment and its related planning practices. In fact, more socially oriented disaster studies seem commonly to neglect planning (including social housing and infrastructure development) as a vitally important risk reduction measure, as it is perceived as a purely physical measure that only deals with the symptoms of the problem rather than the cause. Only some very recent publications fully recognize urban disasters and the importance of adequate housing and planning practices for sustainable risk reduction (e.g. UNDP 2004).

Stakeholders and institutional structures. To begin with, compared to other development sectors there are only a limited number of specialised networks, organisations and departments working on either settlement development planning or disaster risk management in developing countries. The reason for this is their marginal status at the global, national and municipal levels. Furthermore, cooperation between the few existing sector-specific stakeholders is mostly non-existent. The gap between them is expressed and further aggravated by: (a) their separate institutional and inter-institutional structures; (b) the lack of adequate channels to optimally support and coordinate their contribution to risk reduction and risk financing;[10] and (c) the separate budget lines for development and emergency relief (with the latter still being the main funding source for disaster risk management). This applies to both international donor organisations and national governmental and non-governmental implementing organisations.

In addition, at the national level in developing countries, one (by-)product of the promotion of disaster risk management on the part of donor organisations is the change to the implementing organisations' internal structures: new and separate structures for disaster risk management are often added on, without, however, being adequately integrated and/or consolidated. Increased and sustainable integration is therefore seldom achieved. Furthermore, at the household level, low-income households often perceive national and municipal planning authorities as being unhelpful, and even a hindrance, to their and other organisations' risk reduction efforts.

Discourses of experts and practitioners. The limited view of many planners as regards the correlation between disasters and the built environment was shown in figure 1. This limited perception of (large-scale) disasters being the cause and the destruction of the built environment being the effect is often combined with the erroneous assumption that pro-poor urban development automatically reduces risk. Consequently, planners do not generally perceive disaster risk management as being part of their sphere of activity.

Disaster risk management professionals, on their part, often share the perception presented in figure 1 and consequently believe that settlement development planning has no real relevance to sustainable disaster risk management. This view is also related to their understanding that urban planning is a purely structural and formal tool—related to building regulations and conventional land

use zoning—which is incapable of tackling the problems of the urban poor whose lives are most at risk (figure 2). Furthermore, the planning/construction sector is perceived as one of the most difficult development sectors with which to work, because, it is said, knowledgeable and experienced experts are rare.[11]

Working priorities, concepts, terminology and tools. The perceptions of planners and disaster risk management professionals, just described, are related to their different professional backgrounds which—due to the respective theoretical and practical training—influence the use of distinct working priorities, concepts, terminology and tools. Other approaches are met with criticism. The research indicates that together with a lack of coordination between different implementing stakeholders and the competition on the ground, this can result in the duplication of small-scale efforts (e.g. research efforts into hazard-proof construction) and higher investment costs, as well as the mutual incompatibility of their respective programme measures (e.g. risk reduction training, the plans and maps developed, and the hazard-proof construction standards promoted). As regards the latter, almost every organisation imposes different methods and approaches within their programmes (e.g. for training or the elaboration of plans and maps), thus hampering related local developments.

Sector-specific programmes. The incompatibilities between the different professional disciplines and related institutional and organisational structures impede the establishment of more integrated programmes that are needed to properly tackle urban risk. In fact, on the one hand, internationally promoted programmes in the field of disaster risk management do not seem to actively integrate planning-related issues. On the other hand, development agencies or departments, whose focus is urban settlement planning, seem mainly to overlook possible disaster occurrence in their programmes.

However, at the national, municipal and household levels, the occurrence of disasters and the resulting distress can—at least, temporarily—push forward an integration process. This was the case in El Salvador after Hurricane Mitch in 1998 and the 2001 earthquakes. Especially since 2001, relief, development and housing/planning organisations initiated a shift to include disaster risk reduction and related planning measures in their fields of action. However, because disaster risk management was promoted by most international agencies as a new and autonomous field of activity, mainly needing to be integrated into programme implementation, the actual integration within housing/planning organisations was for the most part limited to the adoption of new pilot programmes or specific programme components for disaster risk management.[12] Thus, irrespective of whether the organisations opted to ignore increasing disaster risk or to carry out direct disaster risk management work, they failed to consider the basic strategy of responding indirectly (i.e. through their core work), thus missing the opportunity to sustainably reduce risk. In addition, the following problems occurred to some extent:

- As many organisations and their staff were not well suited to undertaking such disaster risk management work, ineffective work (and even undesirable programme outcomes) resulted.
- Taking on direct disaster risk management work caused organisations' core work to suffer where they did not have sufficient human and organisational capacity to perform both tasks.
- Even if the direct work on disaster risk management was carried out effectively, there was an unproductive increase in competition with other organisations as well as duplication of effort. This was partly because most of the additional knowledge and institutional capacities required were built up independently and internally by each organisation, rather than through the creation of cooperative partnerships.

- Once the new programmes or programme components ended, the work in disaster risk management could not be continued, as it was usually not linked to the organisations' core work and not backed up by adequate operational, organisational, institutional and legal frameworks.

Research at the household level revealed further problems of partly integrated programmes being implemented by housing/planning organisations in high-risk areas. In fact, a gap was encountered between what households need and undertake to deal with disasters and risk, and how organisations support them, creating a barrier for effective disaster risk management. At the household level more than 100 coping strategies could be identified, with households spending on average 9.2 per cent of their income on reducing disaster risk and preparing for the following winter. However, while these household strategies to cope with disasters and risk include risk reduction, self-insurance and recovery mechanisms, the analysed housing/planning organisations looked mainly at how to reduce physical risk.[13] For instance, risk and loss financing is usually not integrated into housing finance mechanisms (i.e. government and non-government subsidies, microcredits and family savings, mutual or self-help). In addition, the risk reduction measures implemented were often unsustainable, as the organisations seldom analysed the key variables and causal loops underlying the complex system of risk and disaster occurrence in the programme areas, nor did they take into consideration the local risk reduction strategies that already existed.[14] Hence, after project implementation, the programme beneficiaries continued to cope—as before—without having obtained better structures for implementing and/or financing their own efforts. It has moreover emerged that some programme measures somewhat hinder future coping ability. For instance, families who wish to obtain loans for further risk reduction or general housing improvements are often not able to use their project houses as collateral, as assisted housing cannot become bank property in the event of a default in payment. Programme beneficiaries are therefore unable to use their assets effectively to reduce the risk they face. Another identified barrier for effective disaster risk management at household level is the lost trust of 'slum' dwellers in both community solidarity[15] and hierarchical structures, as well as the fear of being hoodwinked by the authorities.

Despite the described situation, the research at household level reveals that the organisational structures and mechanisms for social housing provision and financing offer a potentially powerful platform for tackling disasters and risk.

3.2 Root causes of the identified gap

The current separation between urban planning and disaster risk management, presented in the last section, does not match up with the identified reality (see section before last). The reasons can be found and are based in the roots and the subsequent historical development of the respective fields of work that is briefly described in the following.[16]

Urban planning theory and practice. Originally, one of the main functions of the city was considered to provide defence, not against natural hazards but against human threats from the 'outside', such as wars and armed conflicts. In this context, Meurman (1947) coined the term 'protective city planning' for fire and air protection, suggesting that vulnerable facilities should be 'deconcentrated' and isolated from the rest of the city.[17] Since the architectural Modern Movement, more inner-city (man-made) threats, such as assaults and accidents, have been factored into the vulnerability equation, with a move towards greater protection of cities through physical means and electronic surveillance.[18] In this regard, the term 'defensible space' was created in the 1970s by Newman (1972). In parallel, 'nature ecology' and 'urban ecology' studies gave consideration to planning that ensured compatibility between urban planning and the natural environment. However, the focus there is

mainly on the conservation of the environment and climatic design features (i.e. not on aspects relating to natural hazards). More recently, there have also been some discourses on integrated and preventive urban planning, based on consideration of climate change and related hazards. Concrete achievements, however, are still an exception.

Planning schemes promoted by international agencies. The specific history of planning theory and practice promoted by international agencies provides further important background regarding the underlying reasons of the identified gap. In the 1960s and 1970s cooperating governments in developing countries received financial support to build (conventional) housing for the poor on a mass scale. As most of these efforts were declared unsuccessful, at the beginning of the 1970s donors started to support site and service programmes. From 1972, they also assisted squatter upgrading, and in the early 1980s the development of housing-finance institutions (World Bank 1993). In parallel, urban community-development workers have championed participatory methodologies at the settlement level since the 1960s. In line with this, and because of the failure of conventional and traditional urban planning and the lack of adequate responsiveness by planners to the fast-changing needs of developing cities, Otto Koenisgberger (1964) introduced the concept of 'Action Planning' (i.e. community-based schemes supported by government agencies). This approach was subsequently further developed by Hamdi into Community Action Planning or so-called MicroPlanning (Hamdi and Goethert 1997).

During the 1970s, planners started to involve themselves in discussions on disaster management as interest was growing in the design and implementation of ways to mitigate disaster losses through physical and structural measures (for example, through building levees and flood defences, or increasing the resistance of structures) (UNDP 2004). However, with the developing concept of disaster risk management, planners' role again diminished during the 1990s (see also below). Together with the shift from 'delivering' to 'enabling' housing and settlements since the 1970s, it became even more difficult to promote and implement disaster risk management measures. Indeed, the 'enabling' approach promoted can be viewed as an obstacle to integrated risk reduction and urban settlement planning.

At the national and city level, structural adjustment programmes, which were introduced by the World Bank and the International Monetary Fund (IMF) in the 1980s and 1990s, also strongly influenced the current challenges. They not only increased vulnerability but also marginalised urban planning by decreasing the influence and political role of planners and national planning units. Based on the Millennium Development Goals and the outcomes of the World Summit on Sustainable Development, held in Johannesburg, South Africa, in 2002, international donors now promote the private sector as a leading provider of urban infrastructure and services, including drinking water and sanitation. Unfortunately, this means that programmes with a focus on settlement development planning tend again to lean towards the more structural aspects, thus obstructing more holistic planning, which would include disaster risk management. However, some recent developments have given reason to hope for better integration (e.g. trends such as the 'strengthening of local governments', 'decentralisation', and so-called Sector-Wide Approaches).

Disaster risk management. Regarding the history of disaster (risk) management, it is important to point out that this is still a relatively new area of knowledge which is developing slowly and undergoing a multifaceted process of institutionalisation. Traditionally, discussions about disasters have taken place in the emergency relief arena. Until the 1970s the dominant view was that 'natural' disasters are synonymous with natural events/hazards such as earthquakes, flooding, etc. In other words, a natural hazard was, ipso facto, seen as a disaster. The magnitude of a disaster was hence

considered to be a function of the magnitude of the hazard. Consequently, the emphasis of national governments and the international community was on pure disaster management (i.e. responding to the events and, in the best-case scenario, preparing in advance for disasters in order to improve existing response capacities). As mentioned above, from the 1970s onwards planners began to get involved in disaster discussions, focusing on the fact that the same natural hazard can have varying impacts on the built environment. A general trend evolved to associate disasters more with their physical impact than with their natural trigger, promoting conventional and traditional engineering or planning practices as an important mean of mitigating disasters. However, in many countries efforts to reduce risk by these means have been minimal (UNDP 2004).

Beginning quietly in the 1970s, but with an increased emphasis during the 1980s and 1990s, social sciences researchers triggered a shift in thinking, by pointing out that the impact of a natural hazard mostly depend on the capacity of people to cope (i.e. the ability to absorb the impact and quickly recover from loss or damage). With the advent of the term 'disaster risk management' (replacing the term disaster management), the focus of attention moved to social and economic vulnerability. This shift was further reinforced by the mounting evidence that natural hazards have widely varying impacts on different countries and different social groups within these countries (UNDP 2004). Spurred on by the International Decade for Natural Disaster Reduction (IDNDR), between 1990 and 1999, as well as by the occurrence of a number of highly destructive large-scale disasters at the end of the 1990s, many pilot programmes in the field of disaster risk management emerged in developing countries, with international agencies providing increased resources. However, the post-disaster context remained the focus of intervention. Growing experience gained within the mentioned pilot programmes, combined with ongoing development of the disaster risk management concept, meant that a common understanding gradually evolved (UNDP 2004). The causal factors of disasters are now understood to be directly linked to development processes, which generate different levels of vulnerability. The UN International Strategy for Disaster Reduction (ISDR), established in 2000, helped raise the profile of related discussions. In fact, it promoted the idea that reducing disaster risk requires a long-term engagement in development processes and, hence, an increased engagement of international organisations in this field.[19]

More recently there have been discourses to the effect that development processes are not only generating different patterns of vulnerability but also altering patterns of hazard—an argument that is causing increasing concern, especially as evidence mounts regarding the potential impact of global climate change (UNDP 2004).

Today, disaster risk management can be considered a constantly enhancing and altering paradigm that integrates the trends and perceptions mentioned above. However, while during the 1990s the—formerly promoted—purely structural planning measures were less and less seen as a solution and thus 'deleted' from the disaster risk management agenda, hardly any alternative planning strategies were developed to replace them.

4 A WAY FORWARD: HOW TO BETTER MATCH PRACTICE TO REALITY?

The two previous sections have shown (a) the interrelation between disasters and the built environment (and related planning practices); and (b) that this interrelation is not given enough attention by international and national stakeholders working in either settlement development planning or disaster risk management. This situation can contribute to increasing risk and disasters in two ways: first, through the implementation of programmes that focus only on planning *or* disaster risk management; and second, through the lack of initiatives that integrate the two fields.

While, in the meantime, implementing (and donor) organisations working in settlement development planning increasingly demand guidance on how to sustainably integrate disaster risk management within their core work, no adequate sector-specific and praxis-oriented tools are available. This is a paradox, as at a global level there is a fast-increasing number of tools for assessing progress in disaster risk management, most of them developed as a result of top-down processes created by international (and national) organisations. To make matters worse, compared to other cross-cutting issues, such as gender or HIV/AIDS, the idea of mainstreaming disaster risk management is widely underdeveloped and/or misunderstood. As a result, existing tools and ongoing discussions confuse, and hence do not differentiate between, the terms and concepts of 'mainstreaming' and 'integrating', and thus, are often very limited in their scope.[20]

To counteract the situation just described, an 'Operational Framework for Integrating Risk Reduction for Aid Organisations Working in Human Settlement Development' was developed and first published in 2006 (Wamsler 2006d).[21] The framework aims to support aid organisations with concrete tools and guidance to:

- evaluate the relevance of integrating disaster risk management within their organisation;
- identify and prioritise the different possible strategies for integrating disaster risk management;
- formulate activities to implement the selected strategies;
- evaluate possibilities for financing these activities; and
- define an implementation plan.

Based on the ongoing research, on workshops held in Central America for operational staff and programme managers, as well as on the lessons learned from organisations currently using the tool in practice, the Operational Framework was further developed during 2006–2007. The result is the conceptual and strategic integration model presented below.[22] It is based on seven complementary strategies that counter the currently incomplete approaches to integrating disaster risk management. These strategies are presented in the following sections; they are summarised in table 14 and figure 4, and are partly illustrated in box 1.

4.1 Integration strategies at the household level

The first three strategies present possible ways of integrating disaster risk management, that is, risk reduction and risk financing, into programme implementation at the household level (see figure 4, left side).

Strategy I: Direct stand-alone disaster risk management. This is the implementation of specific programmes for disaster risk management that are explicitly and directly aimed at financing or reducing disaster risk. These stand-alone programmes are distinct, and they are implemented separately from other existing work carried out by the implementing housing/planning organisation. Examples would be programmes aiming at (a) establishing early-warning systems or organisational structures for risk reduction (e.g. specialised disaster risk management committees); (b) constructing physical disaster mitigation (e.g. embankments to reduce flooding); or (c) offering independent disaster insurance (i.e. insurance policies not included in housing financing schemes being offered to the poor).

Table 14: Overview of the proposed complementary strategies for integrating disaster risk management (DRM) into the efforts of (aid) organisations working in settlement development planning and programming.

Strategies		Description	Main question to be answered by an organisation (working in settlement development planning)
N°	Name		
I	Direct stand-alone DRM	DRM programming	What dedicated programmes can be implemented separately and additionally from the organisation's core work in order to specifically address risk and disaster occurrence?
II	Direct integrated DRM	Adding DRM programming elements to core activities	What dedicated programme measures can be added to the organisation's core work in order to specifically address risk and disaster occurrence within the programme areas?
III	Programmatic mainstreaming of DRM	DRM mainstreaming (in progamme implementation)	What can be done within the core work of the organisation in order to (a) reduce risk and (b) increase the coping capacities of the programme beneficiaries? (Or at least to ensure to (a) not increase risk and (b) not reduce coping capacities).
IV	Organisational mainstreaming of DRM	Institutionalisation of DRM mainstreaming (and programming)	What can be done to sustain and back-up DRM mainstreaming (and programming)?
V	Internal mainstreaming of DRM	DRM to reduce the organisations' own risks	What measures can be taken so that the organisation, i.e. its offices and staff, become more disaster resilient?
VI	Synergy creation for DRM	Coordination and complementation for improved DRM integration	How can the DRM mainstreaming and programming activities of the organisation be coordinated and complemented with the work of other implementing (aid) organisations?
VII	Educational mainstreaming of DRM	Shift towards non-conventional settlement development planning to integrate DRM in the philosophy that drives urban planning	What has to be done so that universities and other training institutions facilitate the integration of DRM into urban actors' spheres of activity?

Strategy II: Direct integrated disaster risk management. This is the implementation of specific risk reduction and/or risk financing activities alongside, and as part of, other sector-specific programme work. The only difference from *Strategy I* is that this work is carried out in conjunction with, and linked to, other programme components. An example would be the establishment of a local disaster risk management committee or the offer of capacity building for socio-economic risk reduction within the framework of a self-help housing project. Another example could be the implementation of disaster awareness campaigns and simulations alongside a settlement upgrading project.

Strategy III: Programmatic mainstreaming. This is the modification of sector-specific programming in such a way as to reduce the likelihood of any programme measures actually increasing risk, and to maximise the programme's potential to actually reduce and/or finance risk. Hence, the objec-

tive of programmatic mainstreaming is to ensure that the ongoing core work is relevant to the challenges presented by natural hazards and disasters. In contrast to the two strategies described above, the programme's main objective is not risk reduction or risk financing as such. The modifications can be of a physical/structural, environmental, institutional and organisational nature. An example of this strategy could be a settlement upgrading programme that adjusts its loan system to the specific needs of vulnerable households at risk (e.g. offering smaller credits with different conditions and integrated risk insurance, considering beneficiaries' limited capacity for payment). Programmatic mainstreaming can also result in the elaboration of new activities within the organisation's working field that are needed to take existing risk into account. An example of this would be a social housing organisation becoming engaged in land use planning and urban governance issues for risk reduction or the offer of risk and loss financing schemes through their existing housing financing mechanisms.

4.2 Integration strategies at institutional levels of implementing organisations

Compared to *Strategies I–III*, presented in the last section, the following two strategies (i.e. *IV* and *V*) do not refer to the integration process at household level, but aim to counter the challenges identified at institutional levels (figure 4, right side, middle). This section refers to both the donors' national counterparts and their implementing partners. The latter are often governmental authorities (e.g. municipalities and decentralised ministries of education and health), together with microfinancing institutions (MFIs). *Strategy IV* has direct relevance for programme implementation at the household level; *Strategy V* is only indirectly related.

Strategy IV: Organisational mainstreaming. This means modification of the organisational management, policy, working structures and tools for programme implementation, in order to back up and sustain (direct and/or indirect) disaster risk management at project level, and to further institutionalise it. In fact, if integrating disaster risk management into programme work is to become a standard part of what an organisation does, then organisational systems and procedures need to be adjusted. The objective is to ensure that the (implementing) bodies are organised, managed and structured to guarantee that risk reduction and risk financing are sustainably integrated within their core programme work. This includes, for instance, the adaptation of institutional objectives as well as programme planning tools already used, such as logical and results-based frameworks or vulnerability and capacity analyses.[23] A summary of issues to be taken into account in the programming, identification and appraisal stages of construction projects is presented by Benson and Twigg (2007:147–9) and Rossetto (2006:9–14). In addition, organisational mainstreaming also means the adoption of new tools needed for adequately integrating disaster risk management into settlement development programming. Examples are risk mapping or causal loop diagrams for analysing the key variables—and their causal relations—underlying the complex system of risk and disaster occurrence.

In the case of governmental organisations, for instance, housing and planning ministries and municipalities, organisational mainstreaming importantly includes the following activities: (a) revision or creation of national or municipal legislation and policies; (b) the formal standardisation of methods and approaches to elaborating maps and plans for urban planning and disaster risk management; and (c) the creation of improved institutional structures between the national and municipal levels and the respective disaster risk management bodies.

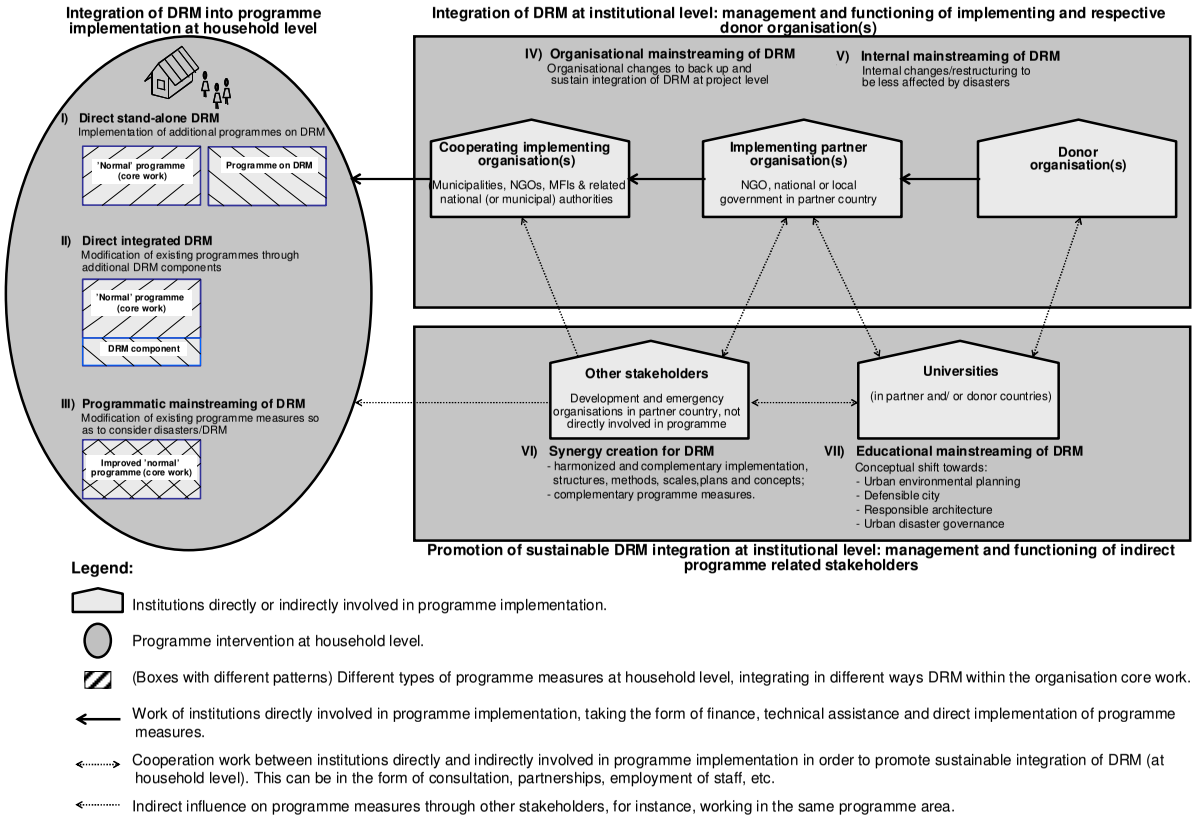

Figure 4: Strategic and conceptual model for integrating disaster risk management (DRM) into human settlement development projects, at both household and institutional levels.

Strategy V: Internal mainstreaming. This means modification of the organisation's functioning and internal policies so that it can reduce/finance its own risk to impacts created by disasters. The focus is on the occurrence of disasters and their effect on the organisation itself, including staff, head office and field offices. The objective is to ensure that the organisation can continue to operate effectively in the event of a disaster. In practice, internal mainstreaming has two elements: (a) direct risk reduction and risk financing activities both for staff and for the physical aspects of the organisation's offices, for instance, the establishment of emergency plans and retrofitting; and (b) modification of how the organisation is managed internally, for example, in terms of personnel planning and budgeting.

4.3 Integration strategies at institutional levels of donor organisations

Donor organisations that wish to promote the integration of disaster risk management through and within their partner organisations need, themselves, to be committed to disaster risk management and its integration. This is a precondition if they wish to prove effective in supporting their partners in doing the same. To that effect, not only the national partner and their cooperating implementing organisations, but also donor organisations, would have to integrate risk reduction and risk financing within their work. In sum, the *organisational* and *internal mainstreaming Strategies (IV* and *V)* also apply to international donor organisations (see figure 4, right side, top).

One important organisational change within a donor organisation, to be effected as part of the organisational mainstreaming process, would be the allocation of (primarily) development resources to push forward the integration of risk reduction and risk financing into urban planning and housing. Importantly, these resources would need to be channelled in such a way that they do not promote integration only in programme implementation at the household level. Indeed, it is equally crucial to promote integration at the institutional levels of implementing governmental and non-governmental organisations, which would affect related national and municipal legislation, operational instruments and internal structures (without separate ones necessarily being added).

To better illustrate the differences between the presented concepts *I–V* in practice, a hypothetical example is presented in box 1. It describes how a Mexican housing/planning organisation was pushed towards applying the different strategies to its work. In contrast to this hypothetical example, aid organisations could, and should, take a more proactive approach for the design of an adequate and sustainable integration strategy. In this context, the Operational Framework mentioned above can assist an organisation in 'planning ahead' before disasters strike, by guiding the selection and prioritisation of the appropriate strategies. Once the strategies are selected, the framework provides matrixes for the formulation of related programme measures. These matrixes include: (a) input and process indicators to get the integration process started; (b) input and process indicators in the form of benchmarks (i.e. the operational state that an organisation should seek to achieve); and (c) output indicators. The matrixes are organised into different subsections. Those for *Strategies I–III* include indicators related to human resources and capacity building; risk identification and community research; and physical, socio-economic, environmental, institutional and organisational programme components. The matrixes for *organisational* and *internal mainstreaming* (i.e. *Strategies IV* and *V*) include indicators regarding human resources and capacity building; risk identification and staff research; working structure and procedures, policy and strategy; financial management; and external relations.

Box 1: Hypothetical example of how an aid organisation—a Mexican housing/planning organisation called UNAGI—was triggered to apply the different strategies for integrating disaster risk management (DRM) into its work.

After a recent disaster, and in response to the increased funding for disaster risk management being offered by international donors, UNAGI employs a new staff member with expertise in risk reduction and financing and designs and implements a pilot programme on disaster risk management. The pilot programme aims to raise community awareness about disaster risk through the distribution of leaflets and the establishment of local disaster risk management committees. Thus, UNAGI becomes engaged in the **stand-alone direct DRM strategy**.

With the experience gained from the pilot programme, UNAGI then starts to include risk reduction and financing activities in its ongoing housing projects. For instance, it begins to raise risk awareness and promotes community emergency funds alongside its community training for self-help housing. Thus, it becomes involved in the **direct integrated DRM strategy**.

One year later, UNAGI's managers decide that all programmes should take greater account of disasters and seek to maximise their positive effects on reducing and financing risks. Accordingly, UNAGI carries out research analysing the links between its social housing activities and disaster risk. In one project area, it finds that basing housing credits on income capacity makes it impossible for the people most vulnerable to disasters to qualify for UNAGI programmes. Without doing any direct risk reduction work, UNAGI responds to this finding by offering them partial housing subsidies and smaller credits for physical mitigation measures in existing houses. In another area, community research provides evidence that beneficiaries are vulnerable to disasters because of their dependency on informal vegetable trading and that past housing projects had increased their socio-economic vulnerabilities by resettling them far from their income-generating activities. It is also discovered that these housing projects used very expensive roof tiles that were not durable. Acting on these findings, UNAGI sets up a local production workshop for concrete roofing tiles to provide a more disaster-resistant and cheaper construction material. At the same time, the workshop allows some households to diversify away from vegetable trading. In addition, in both project areas, advice on disaster-resistant construction techniques is provided, disaster insurance mechanisms are included in the housing credits and neighbourhood and women's associations are established which campaign for greater transparency in government and grassroots participation in urban planning decision-making. Thus they increasingly build up a stake in municipal development planning (e.g. as regards legalisation of land). In this way, UNAGI becomes involved in the **programmatic mainstreaming strategy**.

Over time, UNAGI realises that its various efforts in risk reduction and financing are not sustainable in the long term because they are not institutionalised and/or anchored within the organisation's general management and project planning cycle. It thus starts to engage in the **organisational mainstreaming strategy**. As an initial step, the organisation revises its policy to formalise its commitment to integrating risk reduction and financing, and develops a financial strategy to sustain this integration. In addition, risk assessments and capacity analyses (including the analysis of local coping strategies) become routine tasks in the planning phase of all social housing programmes.

Several months later, there is an earthquake in Mexico. Unexpectedly, UNAGI is affected: its head office is damaged, four staff members are severely injured and there are problems communicating with field offices. This forces the organisation to engage in the final strategy***: internal mainstreaming***. A team is formed to predict the likely impacts of future disasters on the organisation's finances and human resources, analysing potential direct and indirect losses (e.g. costs related to damaged buildings, vehicles, reduced reputation, staff absences and sick leave). Based on this work, UNAGI acquires an organisational insurance policy and improves its working structure by installing an enhanced communications system, introducing better processes for information sharing, and revising its workplace policy. In addition, the head office is retrofitted to become more disaster-resistant.

4.4 Key changes for integrated housing and settlement development

For each of the *Strategies I–V*, the Operational Framework offers sector-specific guidance for housing/planning organisations by providing specific reference activities and recommendations. Looking at programme implementation, while it is impossible to provide universal guidance that fits all types

of programmes, most housing/planning organisations would probably need to modify their programming and functioning to, first, improve the content and scope of their (direct and indirect) risk reduction measures so as to better reduce potential disaster impacts at the household and institutional levels and, second, integrate adequate (self-)insurance and recovery mechanisms. The latter is crucial to improving the chances of people and institutions 'bouncing back' quickly, and to a reasonable level, after disasters strike. To achieve the described changes in practice, the following four key aspects would have to be considered:

1) Implementation of additional/modified sector-specific measures for supporting disaster risk management during, and also *after,* [24] programme implementation through:
   - the integration of risk and loss financing into the organisation's housing financing mechanisms (i.e. microcredits, government and non-government subsidies and family savings); and
   - the expansion of existing housing financing mechanisms to support the financing of risk reduction, (self-)insurance and recovery measures for the urban poor.
2) Improvement of programmes' sustainability by taking careful consideration of the perceptions, capacities and needs of the beneficiaries as regards risk reduction and risk financing. It is essential within programme implementation to consider encouraging and scaling up selected coping strategies, as well as offering better alternatives, where needed. Coping strategies can be divided into: (a) those that can increase the capacity of low-income communities to manage urban disasters and disaster risk in both the short and long terms; (b) those that increase capacities in the short term but decrease them in the long term; (c) those that decrease capacities in both the short and long terms; and (d) those that decrease capacities in the short term and increase them in the long term. Naturally, those under (a) should be the main ones considered for support. In this context, careful attention should be given to the cost-effectiveness and sustainability of assistance.[25]
3) Reduction of barriers to coping. This is another important aspect related to people's coping strategies. An example would be giving permission to use project housing as collateral when applying for specific credits (e.g. for risk reduction).
4) Improvement of programmes' sustainability by ameliorating the social relations among the 'slum' dwellers, national and municipal authorities and local-level organisations, as well as within communities themselves. This is crucial because of the lack of trust and the tensions identified between and within the different levels. Measures related to this could be the improvement of communication and decision-making structures for integrated planning and the creation of related community rights and obligations. In fact, enabling the achievement of social cohesion, inclusiveness and open participation in decision making is crucial to improving communities' coping capacities and to reducing urban vulnerability.

4.5 Promotion of sustainable disaster risk management: coordination with other implementing organisations

As mentioned above, the gap between the distinct working fields and related professional groups, together with a lack of coordination with other stakeholders carrying out programmes, can result in competition, the duplication of small-scale efforts, higher investment costs and mutual incompatibility of programme measures. Unsustainable disaster risk management is the outcome. *Strategy VI* aims to counter this situation.

Strategy VI: Synergy creation for disaster risk management (integration). This is the promotion of 'harmonised' risk reduction and risk financing into the management and functioning of other

implementing organisations, including both relief and development organisations. The idea is to create synergies instead of competition through coordinating and complementing each other's work (figure 4, bottom, middle). Coordination among the work of different organisations could be achieved by: (a) working with unified implementation structures (e.g. municipal committees for local development along with political and operational focal points for programme implementation); (b) the standardisation and unification of methods, scales and contents for the development of specific maps and plans; (c) the standardisation or flexible adjustment of the concept of disaster risk management within the different organisations; and (d) the coordinated inclusion of activities for capacity building and socio-economic development for risk reduction and financing. Complementation and compatibility could be achieved by: (a) working through different municipal/local commissions (e.g. for relief, risk reduction, programme implementation); (b) the development of compatible products and services, such as maps and plans with different contents and scales; and (c) the implementation of additional sector-specific activities (that take risk indirectly into account).

4.6 Promotion of sustainable disaster risk management: cooperation with universities and other training institutions

The work on disaster risk management is a field of activity where interaction or cooperation between academia and practice can, and must, complement each other so that sustainable solutions for the urban poor can be developed. This can be by means of partnerships, by consultation, or by employing professional staff. Thus, in parallel to the integration processes described so far, a partly independent process needs to take place to generate a more proactive approach on the part of planners towards disaster risk management. This is crucial so that their work will match up with settlements' current challenges. Hence, the focus of *Strategy VII* are universities and other training institutions (figure 4, lower right side).

Strategy VII: Educational mainstreaming. This is the development of a conceptual shift in the philosophy that drives urban planning towards non-conventional settlement development planning to allow disaster risk management to be incorporated into urban planners' spheres of activity. In fact, planners require a different knowledge base and radically different skills. This will assist in bringing planners and disaster risk management professionals closer together by helping them to move towards an understanding of the risk that urban dwellers face. The four concepts presented below can help to initiate the required shift. Donor organisations could promote such a shift directly by supporting, for instance, universities or ministries of education as their counterparts. Another more bottom-up approach would be the involvement of universities and training institutions in local programme implementation.

Urban environmental planning. This concept expresses the need for the interconnection between urban planning and broader environmental development aspects, thus incorporating both large-scale and small-scale everyday hazards/disasters. Examples of concrete measures could be: (a) the use of participative and broader environmental impact assessments as well as more adequate performance indicators for selecting and designing integrated planning measures; (b) the integration of legal frameworks and agendas related to urban planning and environment protection; and (c) the adaptation of planning codes based on climatic area-specific characteristics.

Defensible city. This concept expresses the need to integrate protection (against natural hazards and disasters) as a key aspect of integrated urban planning. This strategy includes innovation and the use of structural as well as non-structural planning measures. Examples could be: (a) the construction of firebreaks, flood defences, access and evacuation roads to and from specifically vulnerable

areas, escape routes to emergency shelters, protected rooms in basements (for hurricanes) or top floors (for tsunamis); (b) the setting up of back-up facilities (such as transportation systems) when structural/physical measures fail; or (c) the creation of incentives to build in a safe manner (e.g. tax inducements, exchanging rights and insurance schemes).

Responsible architecture. This concept encapsulates the need for planners to engage not only in large-scale structural improvements of the formally built environment but also to directly target informal settlements, thereby combining large-scale structural improvements with structural and non-structural small-scale measures. Examples for the latter are (a) the exchange of dwellings between low- and high-risk groups; (b) awareness raising and door-to-door advice offered by 'barefoot planners' regarding the design and use of buildings; (c) technical training of informal builders; and (d) the creation of local construction centres. The active use of small-scale measures could enable a better link to be forged with other development professionals as well as with disaster preparedness experts, which might generate further positive outcomes.

Urban disaster governance. This concept contains the idea of the combined domain, where disaster and urban planning are coordinated, mediated and altered through joint governance practices. The domain of urban disaster governance is hence the realm in which the interrelationship between disasters, urban planning and society becomes apparent. To facilitate timely, equitable and strategically coherent decisions in resource mobilisation and supply, it is important to identify those governance tools that will be likely to simultaneously benefit disaster risk management and settlement development planning by, amongst other things:

- fostering equality in participation in decision making across genders, religious and ethnic groups, and casts and economic classes;
- engaging with the local knowledge of individuals and communities at risk;
- combining such knowledge with scientific information (for instance as regards hazards and disaster-resistant structures); and
- reforming governance practices that might inadvertently contribute to the generation of vulnerabilities. For instance, coordinating disaster risk management networks that are often in unproductive competition with one another.

5 CONCLUSIONS

Increased disaster risk is possibly one of the greatest threats to sustainable urban development that developing countries face today. Paradoxically, the built environment (and related planning practices) are not only affected by disasters; they can also constitute one of its main causes, creating:

- increased vulnerability to natural hazards;
- greater exposure to existing hazards;
- intensified and/or magnified hazards;
- newly created hazards;
- constantly changing vulnerabilities and hazards (thus making them quasi uncontrollable);
- reduced coping capacities of national and municipal institutions; and
- reduced coping capacities of urban low-income households.

Although growing urbanisation and climate change make these negative effects even more alarming, organisations working in settlement development planning have, as yet, not tapped into their full

potential to address disasters risk. Even worse, these organisations are partly contributing to increasing disaster risk.

Merely developing and implementing hazard-proof measures is not tantamount to integrating disaster risk management into planning practice. In fact, structural adaptation of this kind needs to be combined with and backed by an integral 'take-up system'—at both the household and institutional levels—that integrates structural and non-structural, large- and small-scale measures. 'Institutional level' refers to the following institutions:

- governmental and non-governmental implementing organisations;
- donor organisations;
- other stakeholders working in programme implementation; and
- related universities and other training institutions.

The Integration Model presented here offers such a 'take-up system', providing a new concept for integrating disaster risk management into the efforts of (aid) organisations working in settlement development planning and programming. If implemented into practice, it could help to (a) overcome the constraints that these organisations currently face to get disaster risk reduction translated into their working practices; and (b) enable planners to take on the role of developing secure and sustainable communities.[26] They could thus considerably contribute to the reduction of post-disaster destruction and, hence, the forced evictions of the urban poor whose lives are most at risk.

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ENDNOTES

[1] In the following the umbrella term 'planners' will be used for all the mentioned professional groups.

[2] Disaster risk management includes risk reduction and risk financing. Risk reduction has become a popular term used to bring together those measures to minimise disaster risk throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards within the broad context of sustainable development. It is also a component of successful reconstruction. In fact, risk reduction can be implemented and is essential before, during and after disasters. See http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm. However, to limit the scope of the study. the term as used in this chapter pertains mostly to prevention, mitigation and preparedness measures in a developmental, pre-disaster context. The term risk financing describes measures to transfer or share risk, such as formal and informal disaster (self-)insurance.

[3] Risk is defined by UNISDR as: 'The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions.' See http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm. Conventionally, risk is expressed by Risk = Hazards x Vulnerability x Lack of coping capacity. Note that in other existing definitions coping capacity is part of vulnerability.

[4] Note that the term 'programme' is used as an umbrella term for programmes, projects, and other type of sector support/assistance. In the following, all terms are used synonymously.

[5] Note that from now on, the umbrella term housing/planning organisations will be used for this type of organisation.

[6] The research undertaken since 2003 analysed at different levels the interlinkages between disasters and the built environment (and related planning practices) and how it is tackled in practice. In fact, step by step the global, national, municipal and—finally—the household level were the focus of the enquiry. El Salvador in Central America, which is one of the most disaster-prone regions in the world (Lavell 1994), was the focus country for the case studies at the national, municipal and household levels. At all levels, the methods included text review, group discussions, semi-structured interviews, walk-through analyses and observation. As regards the interviews, at the global level, 64 programme and project managers, operational or academic staff from 33 organisations were interviewed; at the national and municipal level around 70 project managers and operational project staff from 40 organisations; and at the household level 62 households, comprising 331 persons, living in 15 disaster-prone 'slum' communities. Research trips were made, amongst others, to Geneva, Switzerland; Stockholm, Sweden; Washington DC, USA; Rio de Janeiro, Brazil; various locations in the United Kingdom; Manizales Colombia, San Salvador, El Salvador; and Manila in the Philippines.

[7] The sources of all tables are Wamsler (2004, 2006a-g, 2007b,c), complemented with additional research outcomes gained during 2007, as well as information obtained from World Watch (2007) and UNDP (2004). Note that the different aspects listed separately in the tables are interconnected, as they are partly causes and/or effects of other aspects mentioned. In Wamsler (2006a) system analyses of different aspects, including feedback loops, were carried out for the household level in El Salvador.

[8] See footnote 7.

[9] Note that the terms 'urban planning', 'planning', 'settlement development planning' and 'settlement planning' in the text are used synonymously. They mainly refer to social housing, settlement upgrading, new settlement development and urban governance programming.

[10] Definitions of the terms risk reduction and risk financing can be found under footnote N° 2.

[11] This statement is based on Wamsler (2006g:155). In addition, Wamsler (2004:21) states that disaster risk management professionals repeatedly referred to the planning/construction sector as a 'bad experience' and/or a 'nightmare' to work with.

[12] As described in Wamsler (2006e) partial integration was to some extend also achieved as regards national and municipal legislation, as well as the organisations' operational instruments, and institutional and organisational structures.

[13] The socio-economic, environmental and institutional vulnerabilities were seldom considered.

[14] This also relates to the fact that the participatory and community-based approaches used, which also utilise capacity analysis, generally relate only to the construction process and not to disaster risk management. Hence, people's coping strategies are not looked at.

[15] 'Slum' dwellers reported, for instance, on neighbours downhill felling trees or excavating the slopes below their houses, or neighbours uphill building latrines close to the declivity and allowing waste and storm water to flow onto their land.

[16] For a more thorough description see Wamsler (2007a). Important reference literature is Tannerfeldt and Ljung (2006), Smith et al (2007), and Mumford (1961/98).

[17] Meurman was the first teacher of urban planning at Helsinki Technical University (1936) and the first professor of the discipline (1940).

[18] Note that others such as Mumford (1961) offered a more pessimistic perspective of urbanism, referring to the development of cities racked by war, famine and disease.

[19] See, for instance, www.unisdr.org/eng/about_isdr/isdr-mission-objectives-eng.htm.

[20] 'Mainstreaming' is a specific type of integration. Generally, 'mainstreaming' signifies the modification of a specific type of core work (e.g. within a specific type/sector of development assistance) in order to take a new aspect/topic into account and to act indirectly upon it. Thus, the term 'mainstreaming' does not mean to completely change an organisation's core functions and responsibilities, but instead to view them from a different perspective and carry out any necessary alterations, as appropriate. Other types of (disaster risk management) integration are described below under Strategy I and II. These integration strategies are commonly confused with mainstreaming measures, partly resulting in competition and the duplication of efforts of organisations that specialise in different humanitarian and development sectors.

[21] Compared to most tools already in existence, it was developed in close collaboration with practitioners with a focus on sector-specific, project-level implementation. Based on growing experiences in the field, it can create over time a bottom-up development that can nurture the development of proper monitoring and evaluation tools for assessing progress in disaster risk management at both the national and international levels. Note that the Operational Framework is currently under revision and a second version will be published by Benfield Hazard Research Centre at the end of 2007.

[22] From now on called 'Integration Model'.

[23] To date, housing/planning organisations have used capacity analysis; however, this is used only in respect of people's existing capacities for housing financing and construction and not for coping with risk and disaster occurrence.

[24] Offering related mechanisms that work or come into effect after programme implementation is crucial, given the incremental development processes in 'slums'.

[25] Wamsler (2006c) presents an analysis framework and methodology for viewing local disaster risk. Wamsler (2007b) includes a framework for analysing and supporting local coping strategies (assisting in the selection of adequate programme measures).

[26] Note that the development of the Integration Model and related frameworks, concepts and guidelines to stimulate the integration of disaster risk management in sector-specific development programming is not sufficient in itself. In fact, two important key factors for 'translating' technical (policy) instruments such as the Integration Model into practice are related (a) scientific input, and (b) political will/commitment. The former refers for instance to information on existing hazards, the development of past disaster impacts, as well as knowledge on how to adequately construct disaster resistant structures. As regards the latter, the political commitment of national and municipal authorities, civil society as well as international and national aid organisations for disaster risk management and its integration in settlement development planning/programming is a pre-requirement for implementing the Integration Model. However, the model itself, i.e. the proposed conceptual shift and resulting activities could assist in this regard (see also Wamsler 2007a).

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— Operational Framework for Integrating Risk Reduction —

for Organisations Working in Settlement Development Planning

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Executive summary

Over the past decades, the frequency of the occurrence of so-called 'natural' disasters has grown significantly worldwide, resulting in escalating human and economic losses. In this context, it is the developing countries that bear the greatest burden in terms of the human lives and proportion of gross domestic product lost as a result of disasters. Increasing attention has thus been given to the need to reduce disaster risk through development work, in order to bring about sustainable poverty reduction. However, aid organisations (including donor and implementing organisations), as well as national and municipal authorities still struggle to effectively tackle disaster risk in the course of their everyday work. This is, not least, due to a lack of related operational tools.

Based on more than four years of research in the field of disaster risk reduction (RR), this Operational Framework has been designed with the objective of counteracting the situation described, and thus assisting in sustainably integrating RR into the work of development organisations. It offers a comprehensive set of potential integration strategies and complementary programme measures to tackle risk (to be considered within each of the integration strategies), thus providing a comprehensive extension of existing RR models and concepts. Elaborated for both operational and management staff, it illustrates how development organisations can, step by step, initiate and pursue the integration of RR into their development programming in order to adopt a more pro-active approach towards RR. To be more specific, the framework supports organisations with concrete tools and guidance in:

- Evaluating the relevance of integrating RR within their organisation,
- Identifying and prioritising the various possible strategies for integrating RR into their work,
- Formulating activities and measures to take in the implementation of the selected strategies,
- Evaluating the possibilities of financing these, and
- Defining a step-by-step implementation plan.

In respect of the formulation of the activities and measures required for the integration of RR, the framework provides matrixes, which include:

- Input and process indicators to get the integration process started,
- Input and process indicators in the form of benchmarks (i.e. the operational state that an organisation should seek to achieve), and
- Output indicators.

Furthermore, it offers a list of sector-specific reference activities and recommendations for organisations working in settlement development planning. During the course of the research, additional analytical, conceptual and strategic frameworks were also developed, all of which complement this Operational Framework and assist in a better interfacing of RR and development planning. Related literature sources are notated in the annexes.

Importantly, the Operational Framework at hand is applicable to a variety of cultural and geographic contexts, as well as to all types of 'natural' hazards and disasters. Although originally developed for urban development actors, it can be applied within all types of development sectors, and also within the context of relief, rehabilitation and reconstruction programmes (i.e. in both the pre- and post-disaster context).

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1 Background: context and development of the framework

Over the past decades, the frequency of so-called 'natural' disasters has grown significantly worldwide. In fact, their number has quadrupled during the last 30 years, resulting in the escalation of human and economic losses. In this context, it is the developing countries that bear the greatest burden in terms of the loss of human lives and the proportion of gross domestic product lost as a result of disasters. With increasing urbanisation, cities in the developing world are augmenting both in population and size. At least a billion people worldwide live in slums. They are forced to accept dangerous and inhuman living conditions, in which any natural event, such as an earthquake, flood, landslide, windstorm, volcanic eruption, wild fires, water surge, and drought, is likely to become a disaster. Increasing attention has thus been given to the need to reduce disaster risk through development work, so as to bring about sustainable poverty reduction. However, little work has been undertaken to identify how this could be achieved in practice and, on an even more negative note, international, national and municipal organisations still accord low priority to both the concept of risk reduction (RR) and to issues related to urban development. Urban development actors in particular (including donor and implementing organisations, such as social housing organisations), still struggle to effectively tackle disaster risk through their everyday work, and this is, not least, due to the lack of related operational tools.

The Operational Framework presented here was elaborated with the objective of counteracting the situation just described. Based on research undertaken between 2003 and 2007, it provides general guidance for development organisations for the integration of RR[1] into their 'normal' everyday work[2]. In parts, the framework is also applicable in the context of relief, rehabilitation and reconstruction programmes, and thus in both the pre- and post-disaster context. It is usable within a variety of cultural and geographical contexts and it is relevant to all types of natural hazards and/or disasters. In addition, the framework offers more specific and detailed guidance for those organisations engaging in social housing and settlement development planning by providing sector-specific guidelines and reference activities.[3]

First published in 2006, the preceding version of this framework drew from research initiated in 2003, which was based on studies at international level, as well as national and municipal levels in the countries of El Salvador, the Philippines and Colombia. Amongst others, around 130 interviews were conducted with programme managers, operational officers and academic staff, and a range of research-related models and tools were critically assessed to analyse their scope, target group, structure, format, indicators and applicability. These included frameworks for: (a) assessing progress in disaster RR; (b) mainstreaming HIV/AIDS in sector development planning; (c) designing appropriate humanitarian aid or development programmes (related to settlement development planning and/or disaster risk management); and (d) adapting to the impact of climate change.

The framework was then tested and validated at the local household and related institutional levels and, on this basis, further developed during 2006–2007, resulting in the present revised version. In fact, in order to assess whether or not the framework adequately reflects and matches the needs of both the communities at risk and the professionals servicing them the following steps were undertaken: (a) case studies of programmes implemented in 15 disaster-prone slum areas were carried out, including interviews with 62 households at risk, (b)

[1] The term 'integrating' RR or 'integration' of RR is used as an umbrella term, which also includes the process of 'mainstreaming'. The different strategies of building in/integrating RR in development organisations, including mainstreaming, are presented in *Chapter 5 (see also Annex II: Terminology)*.

[2] The terms 'everyday work, 'core work, 'normal' work' and 'sector-specific work' are used as synonyyms and refer to the typical project/programme activities of an organisation in a specific sector, i.e. health, social housing or eduction.

[3] These organisations are refered to here as social housing organisations or urban development actors (see also *Annex II*: Terminology).

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questionnaires were distributed to operational staff and programme managers in a variety of aid organisations, (c) its content was compared and complemented with existing literature, and, (d) several international workshops were held in El Salvador, Costa Rica and Sweden. Throughout these workshops, the participants who were representatives from development organisations in Africa, Asia and Latin America, carried out practical exercises to apply the operational framework. The participants were then asked to evaluate whether the tool was comprehensible, comprehensive/complete, relevant and applicable/useful. On average, the rating for all four aspects ranged between four and five (on a scale of one to five, five being the best). Finally, measures to overcome potential financial, political and institutional barriers to the implementation of the tool were discussed.

Furthermore, the framework has been used in 'real-life' by different organisations in their programme implementation. Such 'hands-on' practice was carried out in Central America by the Salvadoran non-governmental organisations, viz., CEPRODE, FUNDASAL and FUSAI, as well as by UN-HABITAT, and by Plan International in the Philippines. The RR integration strategies, described in this framework are also being used by other organisations, such as CARE and the Red Cross, within their ongoing mainstreaming processes. Moreover, some organisations have already used the Operational Framework as a basis for developing organisation-specific, operational tools, adapting and then applying it to their own specific institutional settings and objectives. One example of this is the German Agro-Action organisation (Deutsche Welthungerhilfe).

Despite the described steps taken to validate and test out the framework, this second version of the Operational Framework should also be considered as a work in progress, which will require further improvement over time. The iterative progression of implementation and refinement is an ever-developing process, and, is, therefore, always, 'a work in progress'. In respect of this, a further workshop will be held in the Philippines in 2008 in co-operation with Plan International. In addition, during 2008 the matrixes included in *Annex I* will be revised and extended (as they were only in part updated for this second edition).

2 Introduction: how to use the framework

This Operational Framework is an operational tool, which is designed to support the operational and management staff of development (and relief) organisations to define and implement those changes and actions required for the integration of RR in their particular organisation. In order to ensure that the utilisation of this framework is as uncomplicated and simple as possible, *Boxes 1* and *2* provide detailed guidance on how to read and handle the framework.

Box 1 is a general guide to the chapters, and the related content, of this framework. For each chapter, the respective aim, input and tools offered are listed. This general guide is complemented with *Box 2*, a flowchart, which shows in detail the necessary steps required to go through the different chapters and related tools, with the aim of establishing and implementing a sustainable RR integration strategy. As illustrated in *Box 2*, there are three main steps:

1) Getting started (*Chapters 1–4* and related Annexes),
2) Designing a RR integration strategy (*Chapters 5–7* and related Annexes),
3) Implementing and supporting RR integration (*Chapters 8–9* and related Annexes).

As indicated in the flowchart in *Box 2*, depending on the particular knowledge and needs of the reader of this framework, only specific chapters will be relevant and only specific tools offered will be important for each individual organisation's application. Importantly, *Box 2* also indicates how the Annexes of this framework,

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especially the matrixes of *Annex I*, should be used in combination with the various chapters which cover the framework's concepts, strategies and tools.

Box 1: Guide to the chapters/the contents of this framework. RR = Risk Reduction

Chapters	Title/input and tools offered by the framework	Aim: providing answers to the following questions
Chapter 1:	**BACKGROUND** - Context of framework - Methodological development of framework	- For what, for whom, and why this framework? - How was the framework elaborated?
Chapter 2:	**INTRODUCTION** - Basic introductory information - Flow chart on how to use this framework (*Box 2*)	- How to use this framework?
Chapter 3:	**UNDERLYING GUIDING PRINCIPLES** - List of lessons learned and consequential principles which guided the development of this framework - *Figure 1*: Placement of the framework within the context of other existing tools - *Figure 2*: Overview of existing types of indicators	- On what premises is the framework based? (thus situating it within and differentiating it from other existing tools)
Chapter 4:	**RELEVANCE OF RR INTEGRATION** - Rapid Assessment Check List I (*Table 1*)	- Is RR integration relevant for your programmes/your organisation?
Chapter 5:	**STRATEGIES FOR RR INTEGRATION** - Definitions of the potential RR integration strategies - *Table 3*: Overview of the strategies' differences - *Box 3*: Illustrative description of the strategies	- What are the possible ways of integrating RR within programmes/organisations?
Chapter 6:	**STEP-BY-STEP INTEGRATION** - Rapid Assessment Check List II (*Table 4*)	- What is the most suitable step-by-step process for RR integration for your organisation (i.e. succession of selected RR integration strategies)?
Chapter 7:	**MEASURES FOR RR (INTEGRATION)** - Explanation of the matrixes included in *Annex I* providing indicators for the implementation of concrete measures required for RR integration - *Figure 2* (Chapter 2) also contains related information - Definition of the potential measures to reduce risk	- How can concrete actions and measures be designed and/or adapted to achieve RR integration within programmes/your organisation?
Chapter 8:	**SUPPORTING & FINANCING RR INTEGRATION** - List of potential financing options for donor and implementing organisations to support RR integration - *Table 3* (Chapter 5) also contains related information	- How can RR integration be financially and otherwise supported by organisations?
Chapter 9:	**FINAL REMARKS** - List of challenges and limitations for RR integration	- What kind of challenges and/or barriers are likely to be faced by your organisation by entering the process of integrating RR? - How can the framework itself help in this regard?
Annex I:	**INDICATORS AND REFERENCE ACTIVITIES** - Matrixes: Indicators and reference activities which help guiding the design of measures for RR integration (⇒ see also *Chapter 7*)	- How can concrete actions and measures be designed and/or adapted to achieve RR integration within programmes/your organisation?
Annex II:	**TERMINOLOGY** - Glossary of key terms	- What do terms such as 'risk', 'vulnerability', 'risk reduction', etc. stand for?
Annex III:	**LITERATURE AND FURTHER READING**	- What literature provides additional information and complementary tools regarding this framework?
Annex IV:	**LIST OF BOXES, FIGURES AND TABLES** - Overview of boxes, figures and tables included in this framework	- What types of figures and tables are provided to guide the process of RR integration?

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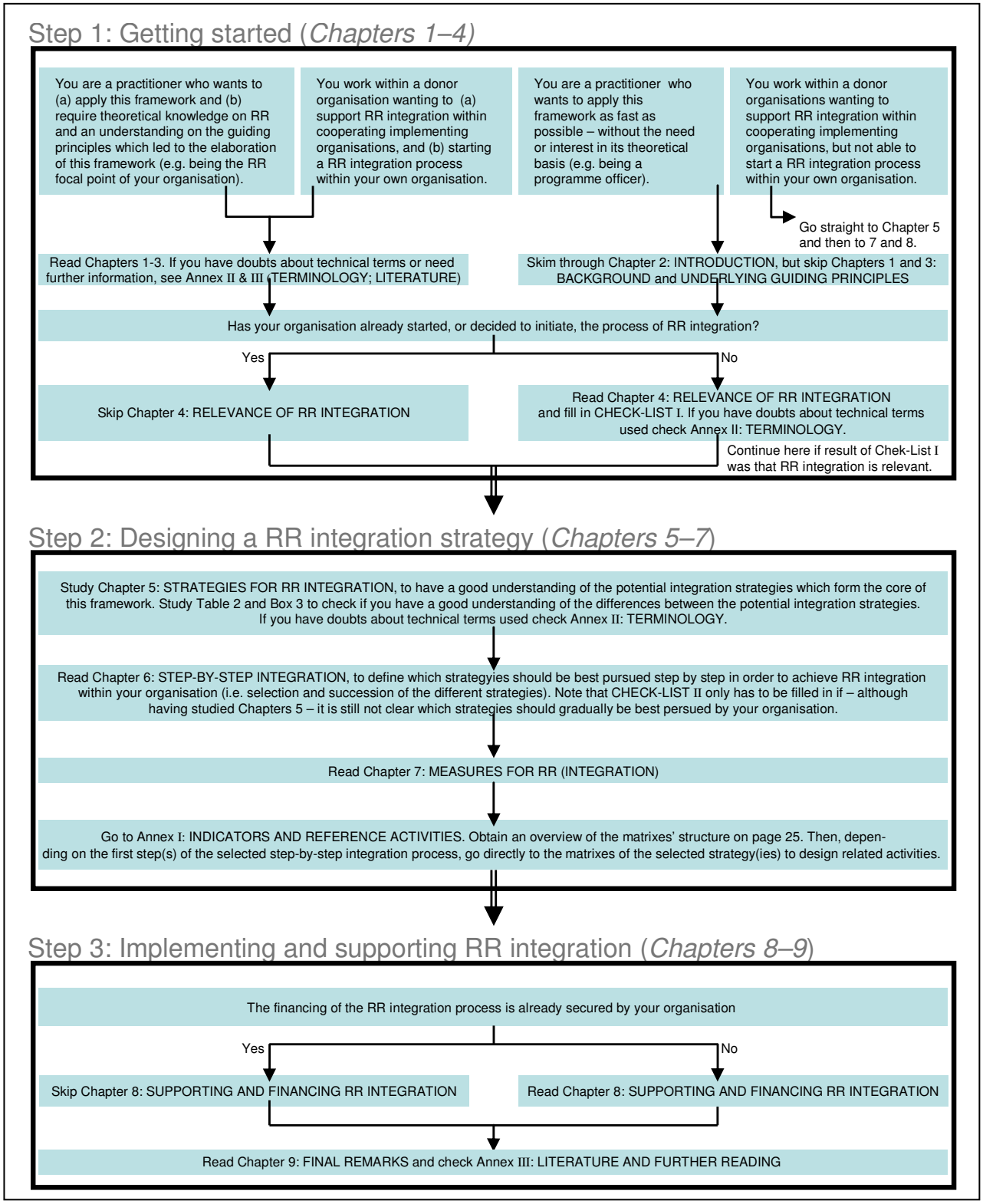
Box 2: Flowchart – How to use the Operational Framework?



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3 Underlying guiding principles

As previously stated, this Operational Framework is based on research undertaken between 2003 and 2007, which included the analysis of past RR activities and the experiences of a range of organisations engaged in disaster prone programme areas. The resultant lessons learned and the subsequent principles listed below have guided the elaboration of the framework. They characterise, and thus form the basis of, its present form.

Lesson N°1: Disaster risk is a complex and long-term development problem (since disaster risk is a product of past and current failures in development and development programming).

⇒ ***Guiding Principle N°1:*** There are no universally valid and easy 'ready-made' solutions to reduce disaster risk, and thus the answer cannot be based on a rigid, pre-determined 'menu' of successive RR measures, which are equally applicable to every context and programme framework.

*

Lesson N°2: Currently, most of the active response to natural disaster risk is in the form of RR programming (i.e. explicit and direct RR). For instance, after Hurricane Mitch in 1998 in Central America—and with the support of international agencies—pilot programmes (or specific programme components) on RR started to 'spring up like mushrooms'. The same occurred worldwide during the same period after similar large-scale disasters.[4] However, usually neither the new programmes nor the new programme components were (and currently, are often still not) in any way connected to the core activities, but are stand-alone adds-on (for example in the form of early warning systems, emergency committees or RR awareness training). In fact, organisations interested in RR usually tend to only identify ways in which they can *directly* address the problem of existing disaster risk. Consequently, the following problems can occur: (1) since many development aid organisations and their staff are not well suited and experienced in doing RR work per se, it may be ineffective or even result in non-desirable/negative outcomes; (2) taking on RR programming may cause their core work to suffer if they do not have sufficient capacity to perform both tasks; (3) even if the RR programming is carried out effectively, increased competition with other organisations and duplication of efforts is very likely to occur. Thus, whether or not organisations opt to ignore increasing disaster risks or to carry out RR programming (i.e. direct RR work), they fail to consider the basic strategy of responding indirectly, that is, through their core work. The outcome, therefore, is that the core tasks of the organisations involved do not address the problem—a fact, which can be harmful, or, at best, represent a missed opportunity to contribute to RR.

⇒ ***Guiding Principle N°2:*** To achieve efficient and effective RR, development organisations need, in the first instance, guidance in terms of adopting the indirect approach of *mainstreaming RR in their programme activities* (as opposed to RR programming itself, as an independent aspect of their work), which should be the basic and initial strategy for integrating RR into their work.

*

Lesson N°3: The afore-mentioned add-on and stand-alone programmes or programme components are not integrated in the core work of implementing organisations. Consequently, they are, generally, not supported and backed up by organisational or institutional mechanisms and structures. Thus, once the RR pro-

[4] Between 1997 and 2001 there were major floods, for instance, in East Africa, Latin America, the Caribbean and South and Southeast Asia; Hurricane Georges in Central America and the Caribbean; mudslides and debris flows in Venezuela; a cyclone in India (Orissa); and earthquakes in Turkey, El Salvador and India (Gujarat).

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grammes/components are completed, the work in RR cannot be continued (if no further funds for RR can be accessed).

⇒ ***Guiding Principle N°3:*** If development organisations are to become more of a solution then a cause of disaster risk, than every organisation has not only the responsibility to mainstream RR in their core activities, but also to internalise and ultimately, 'institutionalise' RR.

*

Lessons N°4 and 5: So far development organisations, and especially social housing organisations, have little existing practical experience in RR to draw upon, learn from, and possibly emulate. Whilst they hold the key to increase the disaster resilience of settlements, many programmes result in actually increasing disaster risk. This also relates to the fact (lesson 5) that, compared to other cross-cutting issues such as gender or HIV/Aids, the idea of mainstreaming RR is widely underdeveloped and/or misunderstood. In fact, related tools and ongoing discussions often serve to confuse and, hence, do not differentiate between the terms and concepts of 'mainstreaming' and 'integrating' RR.[5] Consequently, development (and relief) organisations often consider only two strategies for RR integration, and two measures to sustainably tackle disaster risk. Furthermore, social housing organisations give little importance to related non-physical/non-structural and small-scale measures.

⇒ ***Guiding Principle N°4/5:*** There is not only one or two, but seven identified and complementary strategies for the integration of RR into development organisations, as well as five ascertained and complementary measures to reduce risk within each of these integration strategies. As will be shown in Chapters 5 and 7, the integration strategies include, (1) implementing direct stand-alone RR, (2) implementing direct integrated RR, (3) programmatic mainstreaming of RR, (4) organisational mainstreaming of RR, (5) internal mainstreaming of RR, (6) the creation of synergies for RR (integration), and (7) educational mainstreaming of RR. The measures to reduce risk include: (a) prevention, (b) mitigation, (c) preparedness, (d) risk 'financing', and (e) stand-by for recovery. These must take into consideration the physical, socio-economic, environmental and institutional/organisational aspects of risk and RR integration in order to avoid increasing risk through the core work of organisations.

*

Lesson N°6: There has been a rapid increase in the obscure bulk of tools for monitoring and evaluating the progress in RR, mostly developed as a result of a top-down process created by national and international organisations. These address (mostly implicitly) different working levels and different stakeholders, and further confound the indicators used for assessing programme activities, outputs and impacts (see *Figures 1* and *2*). Paradoxically, whilst such tools for assessing progress in RR are increasingly being created, there is still not sufficient knowledge on the ground as to how disaster risk can be reduced in concrete, practical terms, and how a sustainable process of integrating RR can be achieved.

⇒ ***Guiding Principle N°6:*** Suitable tools for achieving progress in RR need to be generated in close cooperation with practitioners, in order to complement and fit with the work that they are doing and the things

[5] Whilst this differentiation is not common within the context of the RR field, it is partly used by experts working in the field of integrating and mainstreaming other cross-cutting topics in development organisations, such as HIV/Aids. An example is the outstanding work of Sue Holden: 'Mainstreaming HIV/AIDS in Development and Humanitarian Programmes', from which the currently described operational framework has greatly benefited. .See http://publications.oxfam.org.uk/oxfam/display.asp?isb=0855985305. Whilst there are broad similarities between RR and the programmes aimed at the reduction of HIV/Aids, there are also fundamental differences, which made the adaptation and extension of the different concepts for integration necessary. Integration of RR is, in fact, more complex since, in comparison to HIV/Aids, one can tackle RR directly and indirectly within the same type of project work. This is due to the fact that disaster risk is already a complex concept comprised of a combination of natural hazards and vulnerability factors.

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that they are trying to achieve. With this in mind, operational tools, which are based on praxis-oriented process indicators and related experience, are needed, and have to be developed to initiate—in the following—a 'bottom-up' development, which, in turn, can nourish the elaboration of adequate monitoring and evaluation tools at both national and international levels (see *Figure 1*).

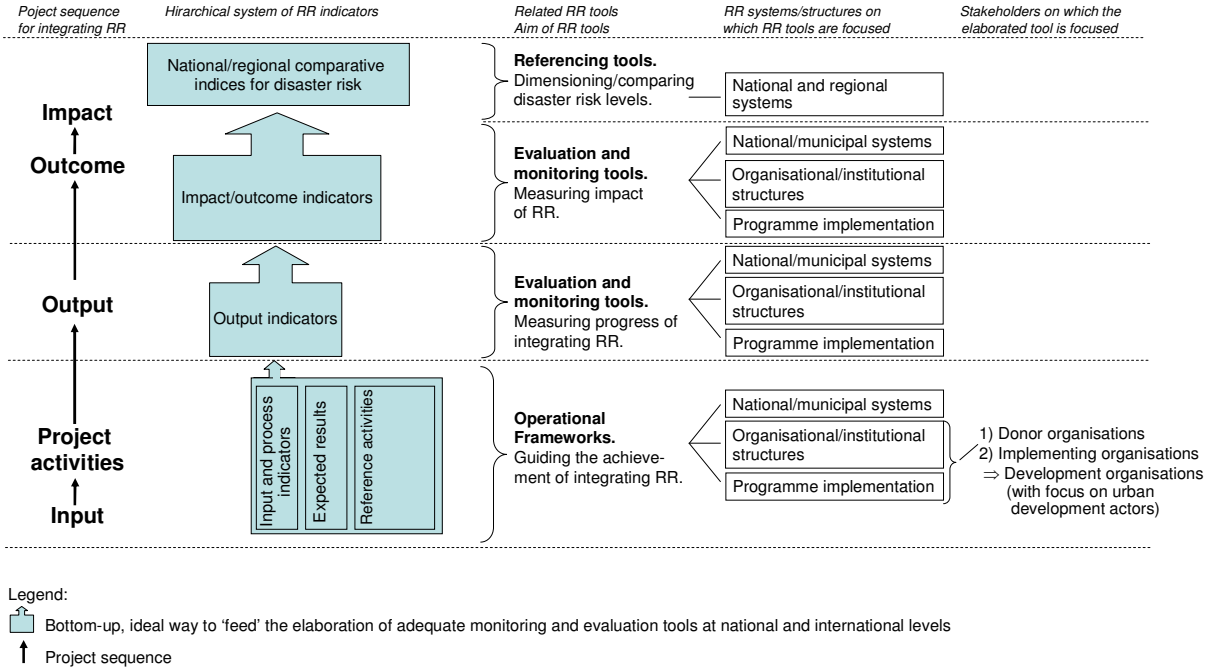

Figure 1: Placement of the present operational tool for integrating RR into the fast increasing and obscure bulk of tools offered for monitoring and evaluating RR

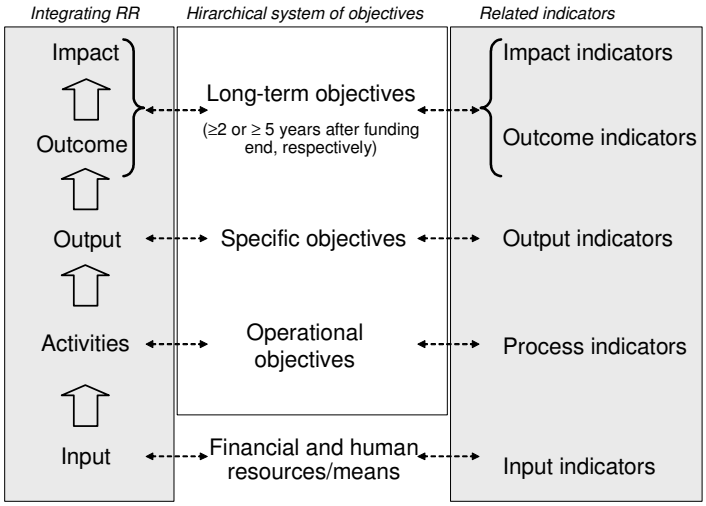

Figure 2: Overview of existing types of indicators. Note that the presented tool is mainly based on input and process indicators

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4 Relevance of risk reduction integration

If your organisation is still in two minds about starting the process of integrating RR into its work, the Rapid Assessment Check List I (see *Table 1*) provides a useful tool to assess this. In fact, if the listed questions are properly and thoroughly answered, it can assist in pre-assessing the relevance of RR for a specific development organisation. However, it has to be noted that—compared to RR programming—RR mainstreaming (including programmatic and related organisational and internal mainstreaming) is absolutely necessary for *all* development organisations working in disaster-prone countries (cf. *Table 3*).[6]

Table 1: Rapid Assessment Check List I to assess the relevance of RR for development organisations

Objective	Questions to be answered	Answers
Assessment of general importance/relevance of integrating RR into the organisation	Are your programme areas prone to natural hazards/disaster?	**Yes ☐ Partially ☐ No ☐**
	⇒ from flooding?	Yes ☐ Partially ☐ No ☐
	⇒ from earthquakes?	Yes ☐ Partially ☐ No ☐
	⇒ from volcanic eruptions?	Yes ☐ Partially ☐ No ☐
	⇒ from landslides?	Yes ☐ Partially ☐ No ☐
	⇒ from hurricanes?	Yes ☐ Partially ☐ No ☐
	⇒ from droughts?	Yes ☐ Partially ☐ No ☐
	⇒ from other hazards/disasters? Please note: _____	Yes ☐ Partially ☐ No ☐
	Do natural hazards/disasters affect your programme beneficiaries?	**Yes ☐ Partially ☐ No ☐**
	⇒ affecting their assets generally and thus obstructing their efforts to 'escape' from poverty	Yes ☐ Partially ☐ No ☐
	⇒ affecting their income generation?	Yes ☐ Partially ☐ No ☐
	⇒ affecting their natural environment?	Yes ☐ Partially ☐ No ☐
	⇒ affecting their health?	Yes ☐ Partially ☐ No ☐
	⇒ damaging their houses and community infrastructure?	Yes ☐ Partially ☐ No ☐
	⇒ affecting other aspects? Please note: _____	
	Do your programme beneficiaries live in spontaneous, precarious, informal, illegal and/or auto-constructed settlements?	**Yes ☐ Partially ☐ No ☐**
	Do your programme beneficiaries live in settlements, which lack vital, formal services/structures in the case of emergencies? (E.g. information, communication, infrastructure support, etc.)?	**Yes ☐ Partially ☐ No ☐**
	Do settlements/communities within your programme areas negatively affect their natural environment? (E.g. causing environmental degradation through erosion, deforestation, water, air and/or soil pollution, or other changes, which create new hazards/risk). Please note some of these effects: _____	**Yes ☐ Partially ☐ No ☐**
	Have past disasters negatively affected your organisation's work hindering its assistance (i.e. its work on improving the living standard and quality of life of the programme beneficiaries), thus ultimately obstructing your organisation's efforts to reduce poverty?	**Yes ☐ Partially ☐ No ☐**
	Is there a lack of transparency, lack of accountability, and/or corruption in sectors related to your organisation's core work, which may negatively influence the vulnerability of programme beneficiaries to natural hazards/disasters? (E.g. corruption in the formal and/or informal construction sector, which can, for instance, negatively influence the work of social housing organisations.)	**Yes ☐ Partially ☐ No ☐**
	Do national or municipal codes, leys or programmes exist which are based on adequate risk assessments, and which sufficiently protect your programme areas from natural disasters and their impacts?	**Yes ☐ Partially ☐ No ☐**
	Is there a need to improve or advance the knowledge and education of your organisation's personnel about potential, alternative and compatible ways of (integrating) RR?	**Yes ☐ Partially ☐ No ☐**
	Is there a need to improve or advance the knowledge and education of the programme beneficiaries about potential, alternative and compatible ways of RR?	**Yes ☐ Partially ☐ No ☐**

Preferably, the Rapid Assessment Check List I should be completed by the organisation's operational programme leaders and then discussed together with other operational and management staff before being summarised in *Table 2*. If the organisation's answers to this first check-list are mostly 'yes' or 'partially', the integration of RR should be seriously considered by the organisation's management.

[6] Where there is a relatively low level of disaster risk, the process can be scaled down or focused on a few relevant specific issues.

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Table 2: Summary of the answers to Check-list I (*Table 1*)

	Yes	Partially	No
TOTAL of all 10 questions			

5 Strategies for risk reduction integration

There are a total of seven strategies which, when combined adequately to a specific programmatic and institutional setting, can achieve a comprehensive and sustainable integration of RR within an organisation. The first three strategies (*Strategies I–III*) relate to the integration of RR into programme implementation at local household level, the following two (*Strategies IV–V*) to the integration of RR at the institutional level of the implementing and/or donor organisations, and the remaining two (*Strategies VI–VII*) to the promotion of sustainable RR in the work of other related implementing and training institutions. All strategies are presented in the following text and summarised in *Table 3*. Note that it is not always necessary for an organisation to implement all strategies in order to successfully reduce risk in the course of their work. This depends on the specific type of organisation, i.e. their core work, programme areas and institutional environment.

***Strategy I:* direct stand-alone RR.** This is the implementation of specific programmes for RR that are explicitly and directly aimed at reducing disaster risk. These stand-alone programmes are distinct, and they are implemented separately from other existing work carried out by the implementing development actors. Examples of these would be programmes of social housing organisations aiming to: (a) establish early-warning systems or organisational structures for risk reduction (e.g. specialised disaster risk management committees); (b) construct mitigation structures (e.g. levees and embankments to reduce floods); or (c) offer independent disaster insurance (i.e. insurance policies not included in housing financing schemes being offered to the poor).

***Strategy II:* direct integrated RR.** This is the implementation of specific RR activities/components alongside, and as part of, other sector-specific programme work. The only difference from *Strategy I* is that this work is carried out in conjunction with other programme components. An example would be the establishment of a local disaster risk management committee, or the offer of capacity building for socio-economic RR within the framework of a self-help housing project. Another example would be the implementation of disaster awareness campaigns and simulations alongside a slum, upgrading programme.

***Strategy III:* programmatic mainstreaming of RR.**[7] This is the modification of sector-specific programme work, so that the likelihood of any programme measures actually increasing risk is reduced and also that the programme's potential to reduce risk is maximised. Hence, the objective of programmatic mainstreaming is to ensure that the ongoing core work is relevant to the challenges presented by 'natural' disasters. In contrast to the two strategies described above, in this case the programme's main objective is not RR as such (but related to the general focus and specific sector of the organisation). The modifications and/or the modified activities can be of a physical/structural, environmental, institutional and organisational nature. An example of this strategy could be a slum upgrading programme that adjusts its loan system to meet the specific needs of vulnerable households at risk (e.g. offering smaller housing credits with more lenient conditions attached to them or offering integrated risk insurance that takes into account the beneficiaries' limited capacity to pay). Programmatic mainstreaming can also result in the elaboration of new activities within the organisation's working field that are required so that existing risk can be taken into account. An example of this would be a social housing or-

[7] Generally, 'mainstreaming' signifies the modification of a specific working field (within, for instance, development or relief work) so as to take a new aspect/topic into account and to act indirectly upon it. Thus, the term 'mainstreaming' does not mean to change an organisation's core functions and responsibilities, but instead to view them from a different perspective and to carry out any necessary alterations, as appropriate (see *Annex II*: Terminology).

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ganisation becoming engaged in land use planning and local urban governance programming for RR, or the offer of risk- and loss-financing schemes through their existing housing financing mechanisms.

Strategy IV: **organisational mainstreaming of RR.** This means the modification of the organisational management, policy, working structures and tools for programme implementation in order to back up and sustain RR programming and/or mainstreaming (i.e. direct and/or indirect RR) at the programme level and to further institutionalise it. In fact, if integrating RR into programme work is to become a standard part of what an organisation does, then organisational systems and procedures need to be adjusted. The objective is to ensure that the implementing and donor bodies are organised, managed and structured to guarantee that RR is sustainably integrated within their core programme work. This includes, for instance, the adaptation of institutional objectives as well as programme planning tools.[8] Moreover, organisational mainstreaming also means that new tools must be adopted to properly integrate RR into development programming. Examples could be risk mapping or causal loop diagrams for analysing the key variables, and their causal relations, underlying the complex system of risk and disaster occurrence.

Strategy V: **internal mainstreaming of RR.** This means modification of an organisation's way of functioning/operating and of its internal policies, so that it can reduce and transfer or share its own risk in terms of impacts created by disasters. The focus is on the occurrence of disasters and their effect on the organisation itself, including the staff, head office and field offices. The objective is to ensure that an organisation can continue to operate effectively both during and after a disaster. In practice, internal mainstreaming has two elements: (a) direct RR activities both for staff and for the physical aspects of the organisation's offices, for instance, the establishment of emergency plans and retrofitting; and (b) indirect RR to modify how an organisation is managed internally, for example, in terms of personnel planning and budgeting.

Strategy VI: **synergy creation for RR.** This is the promotion of 'harmonised' RR within the management and functioning of different (implementing) organisations, including both relief and development organisations. The idea is to create synergy as opposed to competition among these organisations, by fostering the co-ordination between and the complementation of each other's work. The co-ordination of the work of different organisations could be achieved by: (a) working with unified implementation structures (e.g. municipal committees for local development along with political and operational focal points for programme implementation), (b) the standardisation and unification of methods, scales and contents for the development of specific maps and plans, (c) the standardisation or flexible adjustment of the concept of RR within the different organisations, and (d) the co-ordinated inclusion of activities for capacity building and socio-economic development in terms of RR. Complementation and compatibility can be achieved by: (a) working through different municipal/local commissions (e.g. for relief, RR or programme implementation), (b) the development of compatible products and services, such as maps and plans with different contents and scales, and (c) the implementation of additional sector-specific activities (that take risk indirectly into account).

Strategy VII: **educational mainstreaming of RR.** This means support for a conceptual shift in the philosophy/understanding that drives related development work towards non-conventional development planning, in order to allow RR to be incorporated into the organisation's sector-specific sphere of activity. Such a change also assists in bringing together development actors and RR professionals by helping them to move towards an understanding of the risk faced by slum dwellers. Donor organisations could promote this conceptual shift directly by supporting, for instance, universities or ministries of education as their counterparts. A more 'bottom-

8 Examples are logical and results-based frameworks or vulnerability and capacity analyses. To date, social housing organisations are using capacity analysis during programme preparation; however, this tool is applied only in respect of peoples' existing capacities for housing financing and construction and not for coping with risk and disaster occurrence.

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up' approach would be the involvement of universities and training institutions in local programme implementation.

Table 3 provides an overview of the described strategies. Note that whilst existing RR activities may not always be easy to categorise and might belong to different strategies, the above-described categorisation is essential for the efficient and effective planning and design of new programme activities and related organisational changes. The following *Box 3* illustrates through a hypothetical example, how an organisation might be triggered to apply these strategies, step by step, to its work.

Finally note that this Operational Framework—and hence related descriptions and tools presented in the following Chapters and Annexes—is focused on *Strategies I–V*. For complementary information on *Strategies VI* and *VII*, please see annexed list of further literature.

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Table 3: Complementary strategies of integrating RR

Strategies for RR integration	**Methodological approach** (direct-indirect; external-internal, etc.)		**Aim**	**Area of concern**	**Possible ways to implement the strategies**	**Main questions to be answered in order to identify relevant and adequate RR measures**
I) Direct stand-alone RR	Direct RR (=RR programming)	'External' integration of RR, i.e. integration of RR into the organisation's projects/programmes	RR programming, that is, direct reduction of disaster risks through RR programming or adding RR programming elements to core activities.	Specific programme work for RR to tackle problem of disaster risk in programme area(s).	Partial engagement in measures of direct RR, or full engagement in direct RR. Independent engagement (i.e. without forming co-operation/partnerships with other implementing organisations), or complementary financial and/or technical partnerships with more specialised RR experts/organisations.	How do disasters affect poor communities? More specifically, how do they hinder the communities' efforts to reduce/fight poverty? ⇒ What dedicated programmes or programme measures can be implemented additionally to the organisation's core work to specifically address risk and disaster occurrence?
II) Direct integrated RR						
III) Programmatic mainstreaming of RR	Indirect RR (RR mainstreaming)		RR mainstreaming in programme activities, that is, adapting core work in order to ensure that it is relevant to the challenges presented by natural disasters, by firstly, not increasing risk as a result of programme activities and, secondly, if possible, maximise its positive effects on reducing risk.	The organisation's core programme work of tackling the problem of disaster risk in programme area(s), as well as the concern regarding the potential impacts of the organisation's core work on increasing risk.	Independent engagement (i.e. without forming co-operation/partnerships with other implementing organisations) or complementary financial and/or technical partnerships with more specialised RR experts/organisations. Co-ordination with other organisations to share expertise and information. Support through the employment of external consultants for monitoring and assisting the process of integration.	How do disasters hinder the organisation's efforts to reduce/fight the poverty of their programme beneficiaries? How does the current work of the organisation make programme beneficiaries less resistant to disasters? ⇒ What can be done within the core work of the organisation to reduce risk and increase the coping capacities of programme beneficiaries in respect of risk and disasters? (Or, at least, to ensure that risk is not increased and capacities not reduced).
IV) Organisational mainstreaming of RR		'Internal' integration of RR, i.e. integration of RR in the organisation's management and functioning	Ensuring sustainable integration of RR in core work and institutionalisation of RR mainstreaming and programming.	Organisational management, policy, and working structures of the organisation to sustain programmatic mainstreaming activities and/or direct RR (both stand-alone and integrated).		What can be done to sustain and back up RR mainstreaming (and programming) so that RR becomes fully institutionalised?
V) Internal mainstreaming of RR	Direct and indirect RR		Reducing the organisation's own risk to natural hazards/disasters.	The organisation and its staff concerning the security of the organisation itself.		How do disasters affect the organisation and its ability to work effectively? ⇒ What measures can be taken so that the organisation (i.e. its offices and staff) becomes more disaster-resilient?
VI) Synergy creation for RR	Direct and indirect RR	Co-ordination for improved RR (integration)	Co-ordination and complementation for improved RR integration.	Sustainable integration of RR by avoiding increased competition between and duplication of the efforts of different organisations.	Co-ordination with other organisations, eventually with the support of employing external consultants for assisting and complementing the process of integration.	How can RR mainstreaming (and programming) activities of the organisation be co-ordinated with and be complementary to the work of other (implementing) organisations?
VII) Educational mainstreaming for RR	Direct and indirect RR	Influence of the organisation's sector-specific sphere of activity	Shift towards non-conventional development planning to integrate RR into the organisation's sector-specific sphere of activity.	Sustainable integration of RR through sector-specific changes, thus achieving long-term changes.	Specific support of universities or ministries of education as programme counterparts, or involvement of universities and training institutions in local programme implementation.	What has to be done so that universities and other training institutions (decide to) facilitate the sustainable integration of RR into the sector-specific sphere of activity of the organisation?

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Box 3: Example to illustrate the seven different ways of integrating RR within one organisation. Hypothetical example of how an organisation—a Mexican social housing organisation called UNAGI—was triggered to apply the different strategies of integrating RR into its work

After a recent disaster, and in response to the increased funding for disaster risk management being offered by international donors, UNAGI employs a new staff member with expertise in risk reduction and financing, who designs and implements a pilot programme on disaster RR. The pilot programme aims to raise community awareness in respect of disaster risk through the distribution of leaflets and the establishment of local RR committees. Thus, UNAGI becomes engaged in the **stand-alone direct RR strategy**.

With the experience gained from the pilot programme, UNAGI then starts to include RR activities in its ongoing housing programmes. For instance, it begins to raise risk awareness and promotes community emergency funds alongside its community training for self-help housing. Thus, it becomes involved in the **direct integrated RR strategy**.

One year later, UNAGI's managers decide that all programmes should take greater account of disasters and seek to maximise their positive effects on reducing risk. Accordingly, UNAGI carries out research, analysing the links between its social housing activities and disaster risk. In one programme area, it finds that offering housing credits based on income capacity makes it impossible for those people, who are most vulnerable to disasters to qualify for UNAGI programmes. Without doing any direct RR work, UNAGI responds to this finding by offering them partial housing subsidies and smaller housing credits for physical mitigation measures in existing houses. In another area, community research provides evidence that beneficiaries are vulnerable to disasters because of their dependency on informal vegetable trading and that past housing programmes had increased their socio-economic vulnerabilities by resettling them far from their income-generating activities. It is also discovered that these housing programmes used very expensive roof tiles that were not durable. Acting on these findings, UNAGI sets up a local workshop to produce concrete roofing tiles in order to provide a more disaster-resistant and cheaper construction material. At the same time, the workshop provides some households with the opportunity to diversify away from vegetable trading. In addition, in both programme areas, advice on disaster-resistant construction techniques is disseminated, risk maps elaborated, disaster insurance mechanisms included in the housing credits and neighbourhood and women's associations established, which campaign for greater transparency in the government and grassroots participation in urban planning and related decision-making. Thus, they increasingly build up a stake in municipal development planning (e.g. as regards land legalisation). In this way, UNAGI becomes involved in the **programmatic mainstreaming of RR**.

To reduce competition with other implementing organisations and to complement each other's RR work, UNAGI initiates—in cooperation with the national Housing Ministry—a process of standardisation and unification of methods, scales and contents for the development of risk maps and related land use plans. It thus starts the process of **synergy creation for RR**. In addition, UNAGI decides to increasingly involve universities and other training institutions working in settlement development planning in the implementation of their local programmes, for instance, with the aim of improving the development of disaster-resistant construction techniques and the elaboration of risk maps, thus also pushing forward the **educational mainstreaming of RR**, which constitutes a conceptual shift in the philosophy that drives urban development work towards non-conventional settlement development planning.

Over time, UNAGI realises that despite its various efforts in the field of RR programming and mainstreaming, the integration of RR into their programmes is not sustainable in the long term because it is not institutionalised and/or anchored within the organisation's general management and programme planning cycle. It thus starts to engage in **the organisational mainstreaming of RR**. As an initial step, the organisation revises its policy to formalise its commitment to integrating RR, and develops a financial strategy to sustain this integration. In addition, risk assessments and capacity analyses (including the analysis of local coping strategies) become routine tasks in the planning phase of all social housing programmes.

Several months later, there is an earthquake in Mexico. Unexpectedly, UNAGI is affected: its head office is damaged, four staff members are severely injured and there are problems communicating with field offices. This forces the organisation to engage in the final strategy: **internal mainstreaming of RR**. A team is formed to predict the likely impacts of future disasters on the organisation's finances and human resources, analysing potential direct and indirect losses (e.g. costs related to damaged buildings, vehicles, reduced reputation, staff absences and sick leave). Based on this work, UNAGI acquires an organisational insurance policy and improves its working structure by installing an enhanced communications system, introducing better processes for information sharing, and revising its workplace policy. In addition, the head office is retrofitted to become more disaster-resistant.

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6 Step-by-step integration

The implementation of this Operational Framework is an iterative process, not a single event. To initiate the process of integrating RR, each organisation has first to (a) select those integration strategies presented in Chapter 5 that are most relevant to and appropriate for its programmatic, institutional and organisational setting, and (b) define the combination and succession of the selected integration strategies. The Rapid Assessment Check List II (see *Table 4*) was designed to assist in this process. If the listed questions of Check List II are answered properly by the operational and management staff of an organisation, this can actually help to analyse the relevance and prioritisation of the potential integration strategies. To do so, an external specialised consultant may eventually need to be hired to assist the operational and management staff in analysing the listed questions.

Each of the four sections of *Table 4* (namely 'Implementing direct RR'; 'Programmatic mainstreaming of RR'; 'Organisational mainstreaming of RR'; and 'Internal mainstreaming of RR') are comprised of four main questions, the answers to which are written in bold type and with a grey background. The sub-questions should be used in order to cross-check the correct answer to the main question, that is, if the answers to the sub-questions are in the category 'partially/partially true' or 'no/not true', the answer to the main question cannot be 'yes'. The subsequent *Table 5* can be used to summarise the answers to *Table 4*. Based on the number of negative answers for each section, including 'no/not true' and 'partially/partially true', an organisation can immediately obtain an indication of which integration strategies would probably be the most relevant ones for it to apply.

Table 4: Rapid Assessment Check List II to analyse the relevance and prioritisation of the potential strategies to integrate RR into an organisation

Implementing direct RR (i.e. RR programming, stand-alone and integrated) *Strategy I & II*	Despite existing disaster risk in your programme areas, the vulnerability of the inhabitants, and/or their incapacity to cope, there is no extreme or acute need to carry out specific measures to explicitly and directly reduce disaster risk?	**True □ Partially true □ Not true □**
	Are experienced organisations already carrying out direct RR in your programme areas?	**Yes □ Partially □ No □**
	There are (a) insufficient human resources and knowledge available, or (b) no possibilities to form complementary partnerships to enable your organisation to engage in direct RR without negatively influencing its core work?	**True □ Partially true □ Not true □**
	Your organisation has no access to existing specialised funds for RR or other financial sources designed for RR programming so that it could engage in RR programming without negatively influencing its core work?	**True □ Partially true □ Not true □**
Programmatic mainstreaming of RR *Strategy III*	Have thorough assessments been recently carried out on how your organisation's core work relates to disaster risk (inter-connection/reciprocal influences), and also an analysis of how past programme activities have helped/hindered the beneficiaries to reduce their vulnerabilities in respect of disasters and to improve their coping capacities? (In the case that the answer to this question is positive: Was the result of the assessment that the organisation's work does not relate to disaster risk and does not hinder the beneficiaries from reducing their vulnerability or from improving their coping capacities?)	**Yes □ Partially □ No □**
	Past disasters have not negatively affected your programme activities and, consequently, they have not negatively affected the effectiveness of your programmes?	**True □ Partially true □ Not true □**
	⇒ The efforts of your developing programming to reduce poverty were not 'set back' by the occurrence of natural hazards/disasters?	True □ Partially true □ Not true □
	⇒ Physical programme measures (e.g. assisted programme housing) carried out within the framework of your programmes were not destroyed/damaged by natural hazards/disasters?	True □ Partially true □ Not true □
	Your programme activities did not negatively affect existing disaster risk through the creation of additional/increased vulnerabilities, hazards and/or a lack of coping strategies/capacities? E.g. decreased income opportunities, increased erosion and deforestation, or others. Please note:_____	**True □ Partially true □ Not true □ Not known□**
	Do programme activities actively take into account existing disaster risk of the implementing areas?	**Yes □ Partially □ No □**
	⇒ through own analyses of existing hazards? (carried out by experts and in combination with participative analyses with beneficiaries and other stakeholders)	Yes □ Partially □ No □
	⇒ through the analysis of physical, socio-economic, environmental and institutional/organisational vulnerabilities?	Yes □ Partially □ No □

	⇒ through the consideration of existing national/municipal/local risk analyses?	Yes ☐ Partially ☐ No ☐
	⇒ through the elaboration of inventories to identify/classify the physical vulnerability of residential and public constructions (services, infrastructure, and equipments)?	Yes ☐ Partially ☐ No ☐
	⇒ through the analysis of existing local coping capacities/strategies?	Yes ☐ Partially ☐ No ☐
	⇒ through other means? Please note: _____	
Organisational mainstreaming of RR ____ *Strategy IV*	Did your organisation carry out an estimation/calculation of past disaster losses which are related to its programme activities including direct and indirect losses (e.g. repairs of assisted programme houses, loss of reputation, etc.)? (In case that the answer to this question is positive: Was the result of the estimation/calculation that there are no significant losses?)	**Yes ☐ Partially ☐ No ☐**
	Is the integration of RR in programme planning, implementation and evaluation a standard procedure and part of the everyday work of your organisation?	**Yes ☐ Partially ☐ No ☐**
	⇒ Does your organisation dispose criteria and tools to analyse risks in programme areas and to integrate RR within the organisation's core work and makes use of them?	Yes ☐ Partially ☐ No ☐
	Are there organisational/institutional structures and mechanisms to sustain and backup your programme work in RR (RR programming and/or mainstreaming)?	**Yes ☐ Partially ☐ No ☐**
	⇒ Are there sufficient human resources (a) to support the integration of RR in programme planning and implementation, and (b) to control its quality?	Yes ☐ Partially ☐ No ☐
	⇒ Has the organisation a financial mechanism to finance RR (integration)?	Yes ☐ Partially ☐ No ☐
	Has your organisation a formalised organisational strategy and policy to back up its programme work in RR?	**Yes ☐ Partially ☐ No ☐**
	⇒ Is RR /RR integration included in your organisations values, aims, working descriptions, etc.?	Yes ☐ Partially ☐ No ☐
Internal mainstreaming of RR ____ *Strategy V*	Have past disasters affected your organisation itself, i.e. its staff and/or its functioning, and thus its ability to continue working effectively?	**Yes ☐ Partially ☐ No ☐**
	⇒ directly, as a result of damages to head or field offices, or other capital infrastructure?	Yes ☐ Partially ☐ No ☐
	⇒ indirectly, through staff sick leave and/or reduced personnel?	Yes ☐ Partially ☐ No ☐
	⇒ through organisational problems or any other aspects? Please note: _____	Yes ☐ Partially ☐ No ☐
	Did your organisation carry out an assessment on how disasters affect its functioning, which includes an estimation/calculation of potential disaster losses (incorporating direct and indirect losses)? (In case that the answer to this question is positive: Was the result of the assessment that there are no significant losses?)	**Yes ☐ Partially ☐ No ☐**
	Has your organisation a financial system and strategy capable of covering eventual costs through direct and indirect losses caused by disasters?	**Yes ☐ Partially ☐ No ☐**
	Has your organisation a formalised organisational strategy/policy for protecting their staff from the impact of disasters? (E.g. adequate workplace policies and working structures)	**Yes ☐ Partially ☐ No ☐**

Table 5: Summary of the answers to Check-list II (*Table 4*)

TOTAL	Implementing direct RR (stand-alone and integrated)	Yes/True=	Partially/Partially true=	No/Not true=
	Programmatic mainstreaming	Yes/True=	Partially/Partially true=	No/Not true=
	Organisational mainstreaming	Yes/True=	Partially/Partially true=	No/Not true=
	Internal mainstreaming of RR	Yes/True=	Partially/Partially true=	No/Not true=

Note that the Rapid Assessment Check List II should only be completed by those organisations that—despite having thoroughly read Chapter 5—are still unsure about which strategies would be best pursued in their particular case (cf. *Box 2*). In general, whilst all strategies of integrating RR complement each other, development organisations working in disaster-prone countries should first engage in programmatic mainstreaming, that is, adapt and/or improve their core work, rather than starting with RR programming.[9] This is important so as to ensure that the organisation does not increase the risk of the poor, to avoid competition with other organisations engaged in RR, and not to place undue strain on the capacities of the organisation (cf. Chapter 3). To achieve this in practice, *Strategies III, IV* and *V* could be gradually implemented, with programmatic mainstreaming (*Strategy III*) being initiated by implementing a related pilot programme. Another possibility would be to start working in parallel with *Strategies III–IV*. Whilst all three mainstreaming strategies could be carried out independently, i.e. only by the organisation's own staff, complementary partnerships are absolutely vital

[9] The process can be scaled down or focused on a few specific issues, where there is a relatively low level of disaster risk.

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(see *Table 3*). In addition, mainstreaming RR is likely to require the services of external specialised consultants to guide the integration process, for instance, in respect of carrying out training or feasibility studies on particular programme modifications, predicting future disaster impacts, advising on sector-specific aspects related to RR, or establishing outcome indicators for monitoring the process of mainstreaming (see *Table 3*).

In the case that the organisation (also) gets engaged in RR programming (*Strategies I* and *II*), it should—as far as possible—always be carried out through the utilisation of complementary partnerships with specialised RR (or relief) organisations or experts. Both *Strategy I* and *Strategy II* (i.e. RR programming including direct stand-alone RR and direct integrated RR) can consider a partial engagement in a few, selected elements of RR, or a fuller and more extensive engagement (see *Table 3*).

Table 3 indicates the alternative and complementary implementation strategies depending on the type of RR integration pursued by the organisation. In line with *Strategy VI*, a development organisation should—if possible—always link together with specialised RR (or relief) organisations to prevent competition, create synergies, and thus become more effective. Related complementary partnerships for both RR mainstreaming and RR programming can encompass the purely technical co-operation of different organisations with different funding sources, or a purely financial co-operation with one main implementing organisation and a subcontracted one. However, in practice, specialised organisations may not exist, or, if they do, they may not cover all aspects of RR, or they may be unable to extend themselves to form meaningful partnerships. Within the organisations, 'champions' are vital to introduce and promote the process of integration. 'Champions' are staff members interested in RR, who are starting to learn about the concept and the underlying processes, who promote RR and who inspire and encourage others. Once the idea of integration is formalised, specially trained staff and/or focal points can further promote the process from within the organisation itself.

7 Measures for risk reduction (integration)

Once the appropriate strategies are selected and prioritised by an organisation, the related changes required for sustainable RR integration need to be defined. To do so, the last column of *Table 3* includes questions that can help to guide this selection process. On this basis, the Operational Framework offers matrixes for the formulation of concrete measures to be taken. *Annex I* provides these matrixes for each of the five RR integration strategies that are divided into various sub-sections, which present the steps to be taken. For an overview please see page 25. The overview shows that, whichever strategy is considered the most appropriate for a particular organisation to start with, each one initially requires capacity building and research to be carried out in order to identify the existing disaster risk and its relation to the core programme work and functioning of the organisation. The steps within each integration strategy, which follow such capacity building and risk identification, can then be carried out concurrently. For each step, the matrixes include:

a) input and process indicators,
b) output indicators, and
c) general recommendations and reference activities.

The first column on the left provides *input and process indicators* to get the RR integration process started. The second column indicates *input and process indicators* in the form of benchmarks, i.e. the operational state, which an organisation should seek to achieve with the integration of RR. *Input indicators* refer to the necessary human and financial resources needed to integrate RR, whilst *process indicators* indicate related opera-

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tional aspects (cf. *Figure 2*).[10] All the listed indicators within one matrix should be considered simultaneously, not consecutively.

The third column from the right contains some guidelines in the form of general recommendations and reference activities as regards the practical implementation of the listed benchmarks. These are particularly aimed at providing guidance for implementing organisations working in social housing and settlement planning. However, they can also be used for other types of development (or relief) organisations, since the general advice and illustrative set of practical ideas given, can also be partially applied or extrapolated by these organisations. At present, social housing organisations have not experimented with the idea of integrating RR long enough to have developed a solid body of practice. Thus, with increasing experience, training and education in the practical application of the different integration strategies and the gradual 'institutionalisation' of RR into these organisations, the reference activities will require updating.

In the second row of the matrixes, some indicators are included to specify the *output* at which the implementation of the input and process indicators is aimed (cf. *Figure 2*). These *output indicators* can form an initial basis for monitoring and evaluating the progress in the process of RR integration.[11] The means of verification would have to be defined for each organisation and its sector-specific work. On this basis, a complementary component to this framework could be developed in order to provide the means of monitoring and evaluating the progress of RR integration.

The correct application of the matrixes and the related indicators by the operational and management staff of an organisation requires an in-depth understanding of the potential measures for reducing risk that each organisation could—and should—apply, to achieve holistic and, therefore, sustainable RR integration. All these potential RR measures, need to be considered within a development context and be combined and within each of the selected integration strategies. They include:[12]

1) **Prevention**: measures to avoid or reduce the potential intensity and frequency of natural hazards that threaten households, communities and/or institutions,
2) **Mitigation**: measures to minimise the vulnerability of households, communities, and/or institutions to 'natural' hazards/disasters,
3) **Preparedness**: measures to establish effective response mechanisms and structures for households, communities, and/or institutions so that they can react effectively during and in the immediate aftermath of potential hazards/disasters,
4) **Risk 'financing'**: measures to transfer or share risk, so as to establish a 'security system' (safeguard) for households, communities, and/or institutions that comes into force after potential hazard/disaster impacts, and helps to obtain 'readily available' compensation (both monetary and non-monetary).
5) **Stand-by for recovery**: measures to establish appropriate recovery mechanisms and structures for households, communities and/or institutions that are accessible after a potential hazard/disaster. This includes mechanisms and structures for both rehabilitation and reconstruction.

[10] Note that input and process indicators do not indicate programme outputs, outcomes or impacts.

[11] Monitoring and evaluation tools for controlling RR integration are important since, despite the testing of the framework and analysis of related challenges for its implementation, the Operational Framework may lead to the development of policies and good ideas, which may then be ignored or misapplied. Also, proposed programme measures and related methods may not always lead to the expected outcomes, and, therefore, may need to be revised.

[12] More detailed definitions are given in *Annex II*. Note that during 2008, the matrixes of *Annex I* will be revised to explicitly categorise the examples listed within the reference activities, as well as expanded where no examples are given for all the five RR measures. Further note that *Annex III* includes literature recommendations that include examples of the five RR measures described.

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8 Supporting and financing risk reduction integration

The present Operational Framework provides technical input needed by development organisations for RR integration. In order to achieve its implementation, further questions require to be answered:

- How can international organisations support and encourage the implementation of this framework through their local partner organisations?
- How can national implementing organisations financially sustain the application of this framework?

With reference to the first question, there are essentially three possible approaches that international donor organisations can pursue in support of the integration of RR. Within each of the three approaches, there are again three alternatives included, giving a total of nine options:

Approach 1: Offering partner organisations technical support, links to specialists and/or funding for:

a) RR programming,
b) RR mainstreaming, or
c) Comprehensive RR integration (i.e. a and b combined), but leave the partner organisations to decide whether, how, and to what extent to engage in RR.

However, note that full external funding of direct RR might detract from or discourage a sense of ownership among staff.

Approach 2: Imposing funding conditions to enforce the implementation of:

a) RR programming,
b) RR mainstreaming, or
c) The comprehensive integration of RR (i.e. a and b combined).

However, note that conditionality on of the part of international donor agencies has to be considered carefully so as not to hinder the development of successful partnerships for poverty reduction.

Approach 3: Offering programmes for which interested NGO's can apply, which include technical assistance and seed grants, for the purpose of guiding and accompanying the process of:

a) Integrating RR programming,
b) RR mainstreaming, or
c) The comprehensive integration of RR (i.e. a and b combined).

Unfortunately, to date, the first choice of international organisations seems to be 1a), that of offering partner organisations funding for RR programming. This leads to unsustainable RR: once donor funding ceases, RR activities end. International funding organisations urgently need to recognise the importance of mainstreaming, and must be willing to support it financially. Consequently, the strategy of mainstreaming RR should become an integrated and vital part of all their funding and related evaluation processes. In this context, donors also have to recognise that their partners may need more technical support in programmatic mainstreaming than in RR programming, particularly in terms of understanding the indirect links between their core work and RR, and in terms of devising comprehensive and appropriate modifications of their organisation and programmes. Thus, donor organisations should provide support beyond funding, such as capacity building and assisting partners in their community research and in their process of defining and experimenting with various programme modifications and alterations. Unfortunately, the few organisations, which already provide funding for RR mainstreaming, in the majority of cases, solely look at the programme work of organisations, that is, they support only programmatic mainstreaming of their partner organisations. However, without the allocation of

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funding for organisational and internal mainstreaming, the donor money provided will deflagrate without any positive long-term effects.

The third approach is illustrated in *Figure 3*. Here, the idea is that the international donor organisation accompanies the whole RR integration process of selected partner organisations, starting with capacity building, from offering the possibility of applying for seed grants for RR integration, to mentoring and following-up its implementation. Such approach has already been successfully tested in respect of the integration of other cross-cutting topics, such as HIV/Aids.[13]

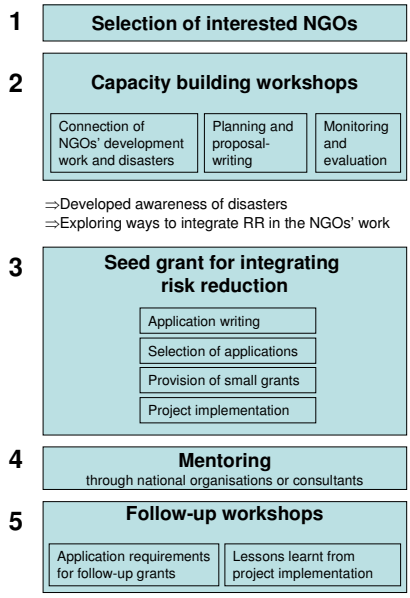

Figure 3: Programmes for guiding the process of integrating RR

It is important to emphasise that those international organisations that wish to promote—in whatever way—the integration of RR through their partner organisations, must, themselves, be committed to RR and its integration if they are to prove effective in supporting their partners to do the same. In fact, they may use the Operational Framework at hand, not only to assess the viability of proposed programmes and promote RR integration, but also to assess themselves.

Once the process of integration into an implementing organisation is initiated, personnel training undertaken, the required structures in place, and the necessary tools adapted or developed, only little additional operational costs should remain. In fact, related research and other available data suggest that RR integration could possibly be achieved at relatively little additional cost, while significantly increasing levels of achievement and success. Nevertheless, answers are needed on how national implementing organisations can financially sustain the implementation of the presented framework—both, in terms of initiating it without donor funding and sustaining it in the longer term. The following options exist:

- To counterbalance higher operational costs that are generated through the integration of RR with reduced disaster losses, related improved reputation, access to additional funding sources from international donor organisations which support RR (integration).
- To convince governmental agencies within the organisation's country to allocate additional subsidies for organisations, which offer programmatic mainstreaming of RR, by arguing the point in relation to post-disaster costs, which often have to be covered by the state, and which, hereby, could be reduced considerably.

[13] One example comes from South Africa, see http://www.policyproject.com/pubs/NGOBooklet/SA_NGO_Booklet.pdf

- To convince governmental agencies within the organisation's country that all subsidies offered for programme implementation should include the criterion/condition that the programmes in question must not create additional disaster risk, and that they maximise the positive effects on reducing risks.
- To form complementary partnerships for programme implementation with specialised RR (or relief) organisations and sector-specific training institutions.
- To expand existing sector-specific financing mechanisms of the organisation (e.g. for social housing) to finance RR (integration).
- If programme activities include the offer of credits for social housing or other issues, the additional core costs for sustaining RR integration could—in some cases—partially be included in the credit payments of the beneficiaries.
- To expand the organisation's portfolio of programme measures so as to include risk 'financing' and stand-by for recovery measures, thus also reducing potential future losses of the organisation (for instance by stimulating household/community saving systems as part of the organisation's programme activities).

Ideally, the different options should be combined so that the additional operational costs can be distributed between international donor organisations, the state government, the implementing organisation and the beneficiaries. Matching funds could be used to support such distribution. *Annex III* provides literature that presents further options and concrete examples of how specific options may look in practice.

9 Final remarks

The Operational Framework presented here provides a comprehensive basis for the sustainable integration of RR within the work of development (and relief) organisations. It is a significant step towards reducing the risk faced by the poor, providing an extension of existing RR models and concepts. It includes and integrates both RR programming and RR mainstreaming, differentiates between different, complementary levels of mainstreaming and tackles physical, socio-economic, environmental and institutional aspects at both the programme and organisational level. However, organisations engaging in RR integration need to be aware of the following aspects that may act as obstacles or barriers to the implementation of the presented Operational Framework:

a) The advocacy and funding of RR (both through RR programming and the mainstreaming of RR) is challenging since the outcomes or results are not, by the very nature of the work, very visible. In addition, there is still a lack of experience in RR, and thus an absence of hard evidence that promoters of RR integration can offer to support their arguments.

b) RR is generally not a high priority for donors, mainly because it does not fall within the categories of existing budget lines designed for either development or emergency assistance.

c) Mainstreaming RR is a difficult concept to promote, particularly when compared to the task of advocating for RR programming (i.e. direct RR work). To begin with, mainstreaming is not an obvious strategy; it requires people to think in a new way, and the arguments behind it are rather complex.[14] Thus, donors are more willing to support RR programming (*Strategies I* and *II*) rather than the complementary RR mainstreaming strategies (*Strategies II–IV*).

d) Donor-dependent implementing organisations may similarly prioritise RR programming and other immediate issues, simply being forced to obtain another grant very quickly for their own survival—at the expense of long-term planning. This is because only a few donor agencies are willing to commit their resources to long-term partnerships.

[14] This can be confirmed by the fact that the mainstreaming of other cross-cutting topics, such as HIV-AIDS and gender, was also difficult initially.

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e) Donors may wrongly ascribe higher operational costs of implementing organisations, which result from these organisations' work on integrating/mainstreaming RR, to bad management, and may, therefore, choose to support other development organisations that appear to offer programmes with 'better value'.

The listed barriers show that the development of appropriate frameworks is not, in itself, sufficient to stimulate the integration of RR into sector-specific development programming. In fact, the general conditions required for the implementation of such technical policy instruments are: (a) scientific input and (b) political will/commitment. Nevertheless, the framework itself (i.e. the proposed conceptual strategies and resulting activities) could help, in the following respects, to overcome this constraint:

- There are many competing demands on the resources of international and national development organisations and national and municipal governments, which can negatively influence political commitment regarding RR. However, the framework supports the perception of RR as a working field and cross-cutting topic that should—as a matter of good practice—be incorporated into development planning and programming; it is not viewed as an additional area of investment that is directly competing for funding.
- The successful implementation of the framework would directly lead to a number of policy strategies and instruments—at national and municipal levels, and at the institutional levels of development organisations—to promote the integration of RR into development programming, without duplicating efforts and resources. Ideally, it would also lead to agreements on the principles of good practice in development programming, which include RR objectives, thus further pushing for a political commitment to this issue.

Finally, it has to be noted that awareness-raising on the existence and training in the use of the framework is crucial in respect of influencing political will. Such training needs to address not only operational but also management staff (i.e. executive managers and the chief officers of municipalities). In this context, workshops on this framework, combined with practical exercises in the field and conducted in both English and Spanish, have been regularly held since 2006.

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Annex I: Indicators and reference activities

Overview

Strategies I and *II*: Implementing Direct RR (= RR programming)

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Strategy III: Programmatic Mainstreaming of RR

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Strategy IV: Organisational mainstreaming of RR

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Strategy V: Internal Mainstreaming of RR

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Strategies I and *II*: Implementing direct RR (= RR programming)

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
The organisation's management does not show resentment towards the concept of RR, is open for new ideas, and supports staff members interested in the idea of RR integration who are starting to learn about this concept and its underlying processes, and who inspire others. First awareness raising and basic training on disaster risk and RR for personnel. Analysis of the organisation's capacity to carry out direct RR (in respect of human resources). Note that direct RR includes RR programming in form of implementing specific, stand-alone RR programmes or specific, integrated RR programme components.	Selection, designation and eventually employment of employees with adequate skills to formally take the responsibility for integrating direct RR (i.e. RR programming). The organisation provides the selected staff with time, resources and some level of influence/authority to do this work. Regular training for personnel on disaster risk, the concept of RR, and the different existing strategies of RR integration in development organisations (with special focus on direct RR).

⇒Expected results (output indicators)

⇒ Sufficient person power and existing knowledge for carrying out direct RR (i.e. RR programming).

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

1.1.1 As RR programming is not directly related to the organisation's core work, it may be important to employ additional staff for implementing and effecting the new field of work. However, if possible, it is recommended that the RR programming is carried out by means of co-operative partnerships, without getting the organisation itself directly involved in direct RR. See also Matrix 1.3.

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Preparation and initiation of research in selected risk areas (areas of ongoing or potential programme work) with the aim to: a) understand how disasters affect specific communities; b) identify existing risk factors (i.e. hazards, vulnerabilities, and lack of coping capacities); c) understand existing variables underlying the complex system of risk and disaster occurrence; d) identify the communities assets/capacities to resist disasters; and e) find measures to directly reduce existing risk (through prevention, mitigation, preparedness, risk 'financing', and/or stand-by for recovery). Analysis of existing local needs in order to analyse the relevance of carrying out RR programming in form of direct integrated or direct stand-alone RR. Compilation and analysis of existing data bases on hazards and vulnerabilities at international, national, municipal and local levels. Compilation and analysis of relevant tools for risk identification and risk presentation at international, national, municipal and local levels (e.g. use of risk indices).	In selected programme areas: - Elaboration of participative and easy to understand local and/or municipal risk maps (including hazard maps, vulnerability maps and capacity maps) to summarise the research outcomes. Regular updating. - Elaboration of technical inventories for RR (e.g. vulnerability analyses of public and residential buildings). Regular updating. - Ongoing participative process with communities/municipalities to discuss research outcomes. Systematic collection and monitoring regarding the following aspects: a) disaster risk in programme areas, and b) capacities and risk perceptions of local communities, municipalities and other programme stakeholders. (Note that if related mechanisms or tools are established for the systematic collection and monitoring of all RR programmes, this activity forms part of organisational mainstreaming.)

⇒Expected results (output indicators)

⇒ Good understanding of personnel (involved in direct RR) as to how disasters affect communities/municipalities by hindering their efforts to reduce risk.

⇒ Highly vulnerable and hazard-prone groups, settlements and facilities are identified within the programme areas.

⇒ Existing risk database for programmes to follow-up relevance and efficiency of direct RR work (if applied to all programmes, this is part of organisational mainstreaming).

⇒ Local governments/communities have access to adequate risk information (which is easy to understand and –in the case of maps– portrayed in the appropriate scale).

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

1.2.1 Vulnerability and hazard maps are here mainly used as a tool for:

a) risk awareness;

b) establishing committees for emergency and/or RR; and

c) the identification of measures for direct RR work.

Please see also Matrix 2.2 on 'programmatic mainstreaming', section 'risk identification and community research', notes 2.2.1 – 2.2.6.

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I/II: IMPLEMENTING DIRECT RR
1.3 Programme components (general)

Input and process indicators for integrating RR	
First Steps **— Getting started —**	**Benchmarks** **— Where to go —**
Analysis of information obtained through the community research and capacity building (see Matrixes 1.1 and 1.2) to discuss and develop in a participatory way programmes and/or programme components for direct RR.	Design and implementation of RR programming in form of stand-alone programmes or integrated programme components to directly reduce disaster risk. Establishment of cooperation (i.e. cooperative partnerships) with more specialised RR organisations for the cooperative implementation of RR programming.

⇒Expected results (output indicators)

⇒ Implemented programmes directly and explicitly reduce risks.

⇒ Established cooperation partnerships for the implementation of RR programming.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

1.3.1 The aim of programmes, which include direct RR work, is generally reflected explicitly in their stated aims, objectives and/or purposes.

1.3.2 Both integrated and stand-alone programmes of direct RR should –if possible– be undertaken by means of cooperative partnerships together with more specialised RR (or relief) organisations. See also under 1.1.1.

1.3.3 All direct RR activities could be carried out in an integrated way (i.e. along with other sector-specific activities), or in combination with other direct RR activities (i.e. as stand-alone RR programmes). They can only be justified in a situation where an area faces immense existing risk and at the same time an absence of organisations specialised in RR programming.

STRATEGIES I/II: IMPLEMENTING DIRECT RR
1.4 Physical programme components

Input and process indicators for integrating RR	
First Steps **— Getting started —**	**Benchmarks** **— Where to go —**
Analysis of existing physical vulnerabilities and physical protective assets (and related capacities).* Adherence of all physical programme activities to relevant legal documents (e.g. building and territorial land use codes). Capacity building of personnel on adequate physical RR measures (e.g. disaster-resistant construction designs and techniques). Public promotion and training in programme areas on appropriate physical RR measures.	Implementation of physical RR measures. Quality control of the physical RR measures and their implementation (including aspects such as adequate structures, technical tools used, specialised personnel and participation). (Note that if related mechanisms are established and implemented for all programmes, this activity forms part of organisational mainstreaming).

⇒Expected results (output indicators)

⇒ Municipalities/community leaders provide their members with adequate information to help direct appropriate (i.e. resilient) settlement development.

⇒ Decreasing physical risk, for instance, decreasing housing in hazard-prone areas and/or improved building use in programme area.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

1.4.1 Physical/structural measures of mitigation or prevention are, for instance, watergates or protective barriers (embankments) for flood control; securement of slopes and retaining walls against landslides; resettlement of people living in high-risk zones; and physical improvement of constructions and infrastructure to become disaster-resistant. Special attention has to be given to schools and hospitals.

1.4.2 Physical/structural measures of preparedness are, for instance, the construction of emergency accommodations or the construction of floating schools.

1.4.3 Physical non-structural RR measures include for instance:

- Support of legal control systems which influence future physical developments (i.e. laws and codes for constructions and land use);

- Elaboration of digitalised risk, hazard or vulnerability maps for RR;

- Territorial land use planning for RR;

- Integration of RR in development plans; and

- Actions to reduce migration to disaster prone urban areas.

Note: 1) if the mentioned RR measures were included in programmes to protect and/or sustain the core programme activities (i.e. not be part of RR programming), they would be classified as a programmatic mainstreaming activity. 2) Please check also the measures listed under 'physical programme components' in section 'programmatic mainstreaming'. See Matrix 2.4.

*Note that the data collection and analyses should be (partly) already conducted within the framework of the 'risk identification and community research' (see above under *Matrix 1.2*).

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STRATEGIES I/II: IMPLEMENTING DIRECT RR
1.5 Socio-economic programme components

Input and process indicators for integrating RR

First Steps — Getting started —	**Benchmarks — Where to go —**
Analysis of existing socio-economic vulnerabilities and socio-economic protective assets/capacities (e.g. personal or community safety nets for RR.)* Analysis of potential socio-economic measures for direct RR. Dissemination of RR information. Carrying out of risk awareness activities, and training on disaster risk and RR for programme beneficiaries (e.g. selected local groups, and/or municipalities).	Implementation of measures to support households' and communities' socio-economic protective assets/capacities. Development of new socio-economic systems/structures for RR. Regular dissemination and training of beneficiaries on how to reduce existing risk.

⇒Expected results (output indicators)

⇒ Local groups and municipal staff are trained to identify local hazards, vulnerabilities, and lacking local coping capacities.

⇒ Easy available risk information.

⇒ Population of programme area is aware of existing local risk.

⇒ The programme beneficiaries are clear about the fact that physical improvements alone do not solve their risk situation (i.e. level of risk).

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

1.5.1 Possible direct RR measures include for instance risk 'financing' and stand-by for recovery, such as:

- establishment of formal and/or informal disaster insurance mechanisms for households or communities;

- establishment of specific household or community saving schemes for RR;

- support for the establishment of community contingency funds;

- offer of specific credits for future RR, recovery or reconstruction; and

- creation of economic incentives for RR.

1.5.2 Other RR measures, such as preparedness and mitigation can include:

- disaster simulations and risk awareness campaigns in appropriate media and accessible language; and

- community organisation training for RR.

*Note that the data collection and analyses should be (partly) already conducted within the framework of the 'risk identification and community research' (see above under *Matrix 1.2*).

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STRATEGIES I/II: IMPLEMENTING DIRECT RR
1.6 Environmental programme components

Input and process indicators for integrating RR	
First Steps **— Getting started —**	**Benchmarks** **— Where to go —**
Analysis of existing environmental vulnerabilities, hazards, as well as the communities' natural protective assets (and related capacities).* Analysis of potential environmental protection measures for direct RR. Compliance with environmental standards (e.g. tree cover preservation, land use, and agricultural and water quality standards, etc.). Dissemination of information and training on how to reduce environmental risk.	Implementation of measures to reduce environmental risk and to foster natural protective assets/capacities. Regular training on how to reduce environmental risk.

⇒Expected results (output indicators)

⇒ Decreasing environmental risk.

⇒ The programme beneficiaries are clear about the inter-connection between risk and environmental deterioration.

⇒ Local groups are trained to identify and protect environmental systems that stabilise hazards or buffer potential hazard effects.

⇒ Local groups understand the role of environmental management practices in the increase of vulnerability and risk, and know how to assess the causes of environmental decline (soil erosion, deforestation, beach erosion, loss of mangroves, etc.).

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

1.6.1 Environmental measures of mitigation and prevention aim, for instance, at conserving eco-systems (e.g. forests and coral reefs) to reduce or buffer the impacts of weather-borne disasters. Examples of such measures are:

- proper watershed management to minimise landslides and floods;

- mangrove protection to reduce flooding;

- forestation for landslide and flood control; and

- soil treatment, securing of slopes and planting for erosion and landslide control.

*Note that the data collection and analyses should be (partly) already conducted within the framework of the 'risk identification and community research' (see above under *Matrix 1.2*).

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STRATEGIES I/II: IMPLEMENTING DIRECT RR

1.7 Institutional and organisational programme components

Input and process indicators for integrating RR	
First Steps **— Getting started —**	**Benchmarks** **— Where to go —**
Analysis of the existence of other organisations carrying out direct RR (i.e. RR programming) in the (potential) programme areas. Search for possible cooperation and co-ordination partners at national, municipal and local levels (including governmental and non-governmental agencies). Analysis in programme area of: a) existing institutional and organisational vulnerabilities; b) peoples' and communities' institutional and protective protective assets/capacities; and c) institutional implementing structures of other organisations working in RR.* Analysis of potential institutional measures for direct RR. Dissemination of information and training on how to reduce institutional vulnerabilities.	Establishment of specific institutional and organisational structures for RR programming at different levels. Establishment and work through a co-ordinated RR implementing structure. Implementation of measures to reduce peoples' and communities' institutional and organisational vulnerabilities and to foster their protective assets/capacities (including related educative activities).

⇒Expected results (output indicators)

⇒ Beneficiaries and municipal technical staff are aware of the inter-connection between the risk of communities and the functioning/existence of institutional and organisational structures, and therefore assume their related responsibilities.

⇒ Existing and active local committees for RR with adequate knowledge, as well as access to risk maps at local/municipal level and technical skills to identify risk and plan related measures for RR.

⇒ Local risk information is shared and transmitted upwards to municipal and national institutions.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

1.7.1 Examples of institutional/organisational RR measures are for instance:

- establishment of local and municipal RR committees;

- decentralisation of control, co-ordination and information structures for RR;

- institutional capacity building for RR;

- support for the creation of legal structures for RR (e.g. related laws and directives);

- support of a municipal/national policy for RR;

- support of municipal development plans for RR;

- establishment of inter-institutional early warning systems;

- improvement of disaster risk communication systems (e.g. improved information flow between national-regional-local levels);

- support for the establishment of organisations specialised in aspects related with RR (e.g. organisations for monitoring and modelling hazard and vulnerability development).

*Note: The data collection and analyses should be already (partly) conducted during the 'risk identification – community research' (see above under *Matrix 1.2*).

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Strategy III: Programmatic Mainstreaming of RR

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
The organisation's management does not show resentment towards the concept of RR, is open for new ideas, and supports staff members interested in the idea of RR who are starting to learn about this concept and its underlying processes, and who inspire others. Recognition by the organisation's management that their programme work should take RR into account. First awareness raising and basic training on disaster risk and RR for personnel. Initial awareness raising and specific training for programme leaders (being the responsibles for programmes which pursue programmatic mainstreaming) on disaster risk, RR and the links between development, poverty, low-income settlements and disasters.	Selection and designation of one or more employees with adequate skills to formally take the responsibility for mainstreaming RR in the organisation's core programme work. The organisation provides the selected staff with time, resources and some level of influence/authority to do this work. Regular training for personnel on disaster risk, the concept of RR, and the different existing strategies of RR integration in development organisations (with special focus on programmatic mainstreaming).

⇒Expected results (output indicators)

⇒ Sufficient person power for mainstreaming RR in selected programme work.

⇒ Adequate knowledge and understanding of personnel (involved in programmatic mainstreaming) about the links between their work and disasters.

⇒ Motivation of personnel (involved in programmatic mainstreaming) to address disaster occurrence indirectly through modifying and permanently revising their core programme work.

⇒ Understanding and awareness of personnel (involved in programmatic mainstreaming) as regards the importance of including urban/territorial planning in social housing programmes (as a consequence of programmatic mainstreaming).

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

2.1.1 With the increasing interest in RR, many organisations have started to provide seminars/workshops to their staff on related subjects. However, these seminars are generally only one-off events focusing on the topic of direct RR (i.e. RR programming). Thus, the organisation must ensure that attention is given to regular RR training with a focus on a more integral approach. The most basic awareness training workshops should present the facts and misunderstandings regarding the occurrence of disasters, disaster statistics, and RR measures used to prevent or minimise disaster impacts (i.e. measures of prevention, mitigation, preparedness, risk 'financing', and stand-by for recovery). These have to be repeated and completed with regular capacity building on the different strategies for RR integration in the organisation (i.e. programmatic mainstreaming, organisational mainstreaming, internal mainstreaming, and implementing direct RR (integrated or stand-alone)).

2.1.2 It is important to assess the knowledge and attitudes of the seminars' participants before and after their training (e.g. through the use of questionnaires) in order to adapt the seminars' content to the participants' knowledge/ability and further to monitor the impact of the capacity building on effective and efficient RR.

2.1.3 Capacity building can be carried out in two different ways: 1) internally through the training of personnel by external consultants or especially skilled staff members, or 2) staff members can participate in RR courses offered by other organisations. The latter is suitable for general RR awareness training and knowledge building. However, the RR approach promoted by other organisations must be checked carefully in order to be sure that it includes programmatic mainstreaming of RR. When it comes to the specific work on analysing the interplay between the organisation's core work and RR, and –on this basis– the analysis of different strategies and measures of integrating RR, then external consultants will probably have to be hired.

2.1.4 For the RR seminars/workshops, the use of active and participatory methods is probably more appropriate than common lecturing. Programme visits could be carried out to explore the difference between direct and indirect RR (i.e. RR programming and RR mainstreaming). Case studies could be carried out in some of the programme areas, in order to reveal the complex causes of risk and their interplay with: a) low-income settlements, and b) the organisation's programme work. Thus, the combination of capacity building of the personnel with community research is recommended (see next Matrix 2.2).

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Preparation and initiation of research in areas of ongoing or potential programme work with the aim to: a) understand how disasters affect the specific communities involved; b) identify existing risk factors (i.e. hazards, vulnerabilities, and lack of coping capacities); c) understand existing variables underlying the complex system of risk and disaster occurrence; d) identify the communities capacities to resist disasters; e) increase knowledge on how the programme work is/will be helping or hindering the beneficiaries from reducing their risk; and f) find measures to indirectly reduce existing risk (through prevention, mitigation, preparedness, risk 'financing', and stand-by for recovery).	Elaboration of participative and easy to understand hazard, vulnerability, capacity and risk maps at programme level to summarise the research outcomes. Regular updating. Elaboration of technical inventories for RR. E.g. vulnerability analyses of public and residential buildings. Regular updating. Regular participative process with communities/municipalities in programme areas to discuss research outcomes.
Compilation and analysis of data bases on hazards and vulnerabilities at national, municipal and local levels.	Based on ongoing community research, permanent evaluation/monitoring of the programme activities as regards their impact on the existing level of disaster risk.
Compilation and analysis of relevant tools for risk identification and risk presentation at international, national, municipal and local levels (e.g. use of risk indices).	Systematic collection and monitoring of: a) disaster risk in programme areas, and b) capacities and risk perceptions of local communities, municipalities and other project stakeholders. (Note that if related mechanisms or tools are established for the systematic collection and monitoring of all core programmes, this forms part of organisational mainstreaming.)

⇒Expected results (output indicators)

⇒ Good understanding of personnel (involved in programmatic mainstreaming) as to how disasters affect the communities/municipalities of the programme areas, and as to how disasters are relevant to the design of the core programme activities in order to help and not hinder the reduction of risk.

⇒ Highly vulnerable and hazard-prone groups, settlements and facilities within selected programme areas are identified.

⇒ Existing risk database for programmes to follow-up relevance/efficiency of programme modifications (if applied to all core programmes, this is part of organisational mainstreaming).

⇒ Local governments/communities in the selected programme areas have access to adequate risk information (which is easy to understand and –in the case of maps– is portrayed in the appropriate scale).

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

2.2.1 There is a range of different tools for risk identification. Therefore, to analyse in an appropriate way the relevant local risk factors in the programme areas and to allow a co-ordinated information exchange between stakeholders at international, regional, national, municipal and local levels, it is important to check the status of the ongoing discussions and the most common tools used. In general, the most basic data which has to be selected over a certain period of time (also retrospective and anticipatory) in order to quantify and qualify risk levels and existing RR activities are: the impact of disasters on the communities, trends in the impact of disasters, households affected, changes in attitudes towards RR, ways of responding to disasters so far, household coping behaviour and strategies, existing beliefs about the causes of disasters, and existing RR measures. Eventually, external consultants are needed for the identification and systematisation of risk and the calculation of risk indices.

2.2.2 For the data collection, participative, qualitative and quantitative methods have to be used. Guided discussions and single interviews are crucial, as well as the work with peer groups (e.g. forming separate groups of younger and older people, or of men and women). In fact, discussions focusing on the question if the programme reduces or increases risk should be conducted separately for different peer groups. 'Walk-through' analysis with the communities are recommended to identify in a participative way existing risk.

2.2.3 Collected empirical data can be used not only for adapting programme measures and comparing the level of disaster risk of different programme areas, but also for advocating RR integration.

2.2.4 The identified risk level of different settlements could be publically displayed with 'risk traffic lights'. This can help to increase awareness, commitment and public comparability between communities.

2.2.5 Community research and risk identification are important capacity building tools. In fact, they can be best carried out in parallel or immediately following the capacity building activities for personnel (see Matrix 2.1).

2.2.6 The organisation should use existing standards for hazard, vulnerability and risk mapping as regards scales, content and methods for their elaboration. If such standards are not existent, efforts should be made to informally co-ordinate these aspects with other stakeholders and to promote their standardisation.

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STRATEGY III: PROGRAMMATIC MAINSTREAMING of RR

2.3 Programme components (general aspects)

Input and process indicators for integrating RR

First Steps **— Getting started —**	**Benchmarks** **— Where to go —**
Analysis of information obtained through community research and capacity building (see Matrixes 2.1 and 2.2) to discuss and develop, in a participatory way, the required modifications to improve the organisation's core programme work.	Modification of the programme work in such a way as to: a) reduce the likelihood of increasing risk; and b) maximise the core work's positive effects on reducing risk. Eventually, establishment of cooperation (i.e. cooperative partnerships) with other sector-specific organisations and/or more specialised RR organisations for the co-operative implementation of the modified programme components/programmes.

⇒Expected results (output indicators)

⇒ All implemented programmes take disaster risk actively into account, thus do not increase risk and –where possible– have positive effects on reducing risks.

⇒ Eventually, established cooperation partnerships for the implementation of RR mainstreaming.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

2.3.1 In order to reduce the likelihood of increasing risk and to maximise positive effects on reducing risk, the programme activities should support protective assets and related capacities, that is:

- only make use of physical/structural programme measures which are disaster-resilient;

- strengthen beneficiaries' pre-emptive coping strategies (i.e. coping strategies for risk reduction and self-insurance) through sector-specific measures of prevention, mitigation, preparedness, and risk 'financing';

- strengthen beneficiaries' reactive coping strategies(i.e. coping strategies for recovery) through sector-specific measures of stand-by for recovery;

- build up new protective and sector-specific assets/capacities;

- improve the programme activities' accessibility so that the most vulnerable households are reached,

- replace assets which are lost or destroyed through the programme activities by other compensating assets/capacities,

- include additional measures to protect/secure the programme's activities from natural hazards, and/or

- support legal control of future resilient developments in programme areas.

2.3.2 The aim of the programmes will not change through the process of programmatic mainstreaming. If the aim is, for instance, 'improved living conditions (quality of life) and sustainable livelihoods through social housing and settlement planning', it will stay the same. Eventually, minor aspects can be re-formulated (e.g. 'improved living conditions and sustainable livelihoods through resilient social housing and settlement planning').

2.3.3 The design of new programme proposals/modifications, being based on the outcomes of the community research, could probably be best done through a programme group (comprised of personnel, stakeholders and community leaders), and with consultation and revision at community level, in order to make sure that the existing disaster risk is adequately taken into account.

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STRATEGY III: PROGRAMMATIC MAINSTREAMING of RR

2.4 Physical programme components (structural and non-structural)

Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Analysis of: a) the existing physical vulnerabilities; b) protective physical assets (and related capacities) of the programme beneficiaries and their communities; and c) the influence of ongoing or planned physical programme measures on the existing risk level.* Technical revision of the physical programme elements as regards their resilience and safety (e.g. programme houses, infrastructure and basic services). Adherence of all physical programme activities to relevant legal documents (e.g. building and territorial land use codes). Capacity building of personnel on adequate physical RR measures (e.g. disaster-resistant construction designs and techniques). Public promotion and training in programme areas on appropriate, programme-related physical RR measures.	Modification of the core programme work in such a way as to ensure that the physical programme activities (structural and non-structural) are disaster-resistant and do not destroy (but rather build up) protective assets/capacities. Active use of additional physical measures to protect the programme against natural hazards. Support of information availability and legal control systems which influence future physical and disaster-resilient developments in the programme areas. Quality control of all physical programme measures (including related structures, technical tools used, specialised personnel implementation strategies, etc). (If related quality control mechanisms are established and implemented for all programmes, this forms part of organisational mainstreaming).

⇒Expected results (output indicators)

⇒ Physical programme measures (i.e. constructions) are of higher resistance.

⇒ Technical personnel are familiar with and observe the laws of construction and land use, and use additional complementary mechanisms for quality control (i.e. adequate structures and tools).

⇒ Municipalities/community leaders provide their members with adequate information to help direct appropriate, i.e. resilient, settlement development.

⇒ Programme beneficiaries and/or municipalities analyse critically the proposed standards and measures of new construction and upgrading programmes.

⇒ Decreasing physical risk, for instance, decreasing settlement developments in hazard-prone areas and/or improved building use in programme area.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

PHYSICAL/STRUCTURAL ACTIVITIES

2.4.1 Use of disaster-resistant construction materials, construction techniques and building procedures which also do not progress environmental deterioration. For example avoidance of the use of non-adequate wood trusses leading to deforestation; or the use of non-adequate latrines leading to erosion and contamination of the ground water.

2.4.2 Selection of appropriate locations, design and structure of housing and infrastructure, based on elaborated local and/or municipal risk assessments, vulnerability, capacity and hazard mapping, and codes and land use plans.

2.4.3 Inclusion of urban/territorial planning in programme design in order to reduce physical risk and promote future resilient developments.

2.4.4 Inclusion of physical structures to protect programme activities (e.g. contention walls to protect programme houses from destruction as a result of landslides).

2.4.5 Special attention given to the resilience capacity of hospitals and school in the programme areas.

2.4.6 Elaboration of technical inventories of physically vulnerable facilities (i.e. buildings, infrastructure and basic services).

PHYSICAL/NON-STRUCTURAL ACTIVITIES: KNOWLEDGE AND INFORMATION

2.4.7 Conduction of awareness campaigns to demonstrate construction code and land use plan benefits (e.g. effected by the distribution of layman summaries of code requirements).

2.4.8 Provision of information (e.g. public displays, flyers) and training of beneficiaries on: a) building code and land use plan compliance; b) disaster-resistant construction designs/techniques.

2.4.9 Provision of information and further educational training courses for manual workers and municipal technical staff on: a) building code and land use plan compliance; b) disaster resistant construction designs/techniques, and/or c) elaboration of hazard, vulnerability and risk maps and its relation to land use planning.

2.4.10 Development of links to educational, research and private bodies, which are specialised in engineering or in disaster-resistant construction, in order to assess constructive aspects, enhance knowledge and capability of personnel, manual workers, municipal technical staff, and the programme beneficiaries, as well as to build up sustainable structures for RR (Note that this is also related to the RR Integration Strategy VII (cf. Chapter 5).

*Note that the data collection and analyses should be (partly) already conducted within the framework of the 'risk identification and community research' (see above under *Matrix 2.2*).

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STRATEGY III: PROGRAMMATIC MAINSTREAMING of RR
2.4 Physical programme components (structural and non-structural)

Input and process indicators for integrating RR	
First Steps **— Getting started —**	**Benchmarks** **— Where to go —**
CONTINUATION See above	CONTINUATION See above

⇒Expected results (output indicators)
CONTINUATION See above

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

2.4.11 Establishment of construction advisory services to provide information on materials and techniques which protect from disasters.

PHYSICAL/NON-STRUCTURAL ACTIVITIES: CONTROL MECHANISMS

2.4.12 Support of municipal policies and laws in the fields of construction, relocation and urban territorial (land use) planning (e.g. support of related design, procedures, documentation, dissemination and/or implementation).

2.4.13 If no adequate national standards/codes are existent, the organisation has to develop its own quality standards and related control mechanisms.

1.4.14 Institutional support of municipalities to create a 'control department/group' with appropriate knowledge, capacity and powers to review and control housing and other construction programmes.

2.4.15 Support of construction firms to improve the quality (i.e. disaster resistance) of the materials produced and production techniques used.

2.4.16 In terms of disaster impact and risk creation, one of the main problems in housing programmes is the potential for corruption. To tackle this problem, awareness raising, and the increased involvement of beneficiaries are important (e.g. vigilance of the construction process with appropriate incentives to compensate their time). In addition, the use of appropriate mechanisms for reporting and dealing with complaints is crucial.

2.4.17 Legalisation of properties and/or land which is important to motivate beneficiaries to work on reducing the risk they face.

2.4.18 Support actions to reduce displacement to urban disaster-prone areas (e.g. through the promotion of the development of middle-size cities).

2.4.19 Signposting of high-risk areas to prevent the construction of new residential housing in risk areas.

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STRATEGY III: PROGRAMMATIC MAINSTREAMING of RR
2.5 Socio-economic programme components

Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Analysis of: a) the existing socio-economic vulnerabilities; b) protective socio-economic assets/capacities of the programme beneficiaries and their communities; c) the influence of ongoing or planned socio-economic programme measures on the existing risk level; and d) the programme beneficiaries' possibilities to have access to the programme activities.* Training of beneficiaries on the relation between the programme activities and RR.	Modification of the programme work in such a way as not to diminish (but rather foster) protective socio-economic assets/capacities. Modification of the programme activities so that they are accessible to the most vulnerable. Inclusion of the programme activities so as to replace/compensate socio-economic assets, which were lost or destroyed through the programme activities. Inclusion of socio-economic measures required for the sustainable implementation of the programme's physical measures/activities.

⇒Expected results (output indicators)

⇒ The programme activities take programme-related socio-economic aspects, which influence beneficiaries' risk, actively into account.

⇒ Programme activities are accessible to vulnerable households/communities.

⇒ The programme beneficiaries are clear about the fact that risk is mainly a social construct and, hence, physical improvements alone do not solve their risk situation.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

PERSONAL SEFETY NETS

2.5.1 Support of the maintenance and/or improvement of income through:

- the creation of economic activities or employment opportunities as a result of the way in which the programme activities are designed and/or carried out. The choice of a more labour intensive way of construction can, for example, help to reduce (at least temporarily) socio-economic vulnerabilities. A more sustainable approach would be to use local materials for the construction of assisted programme houses and to build up local and permanent material production centres. Another possibility is, for example, to provide the manual workers, who construct the programme houses, with some practical and theoretical training, which is formally recognised and thus can be certified. In turn, such certified training would support them to become better qualified, raise their confidence, productiveness and quality of work, and thus, enabling them to find easier and/or a better work in the longer term.

- the diversification of existing economic activities; e.g. training of laymen/other professionals (e.g. informal vendors) to also become (certified) manual workers.

- securing economic programme-related activities. Examples are the support for the development of co-operatives for manual workers.

- the adoption of low-risk income-generating activities. An example could be the training of inhabitants to become professional manual workers (working outside the own settlement, i.e. in an area with less/different risk).

2.5.2 Improvement in the organisational coherence of the beneficiaries' community. This training could be included in the organisational training of the beneficiaries on self-help housing.

2.5.3 Inclusion of insurance schemes for programme houses (taking into account standards and independent reviews of compliance).

KNOWLEDGE – INFORMATION

2.5.4 Capacity building of programme beneficiaries in order to ensure that they understand the complex concept of risk and are clear about the fact that: a) risk is mainly a social construct, and hence b) physical improvements alone do not solve their risk situation (level of risk).

*Note that the data collection and analyses should be (partly) already conducted within the framework of the 'risk identification and community research' (see above under *Matrix 2.2*).

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Input and process indicators for integrating RR	
First Steps **— Getting started —**	**Benchmarks** **— Where to go —**
CONTINUATION See above	CONTINUATION See above

⇒Expected results (output indicators)

CONTINUATION
See above

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

REPLACING LOST ASSETS

2.5.5 If socio-economic assets are reduced through the programme activities, they should be replaced as far as possible (e.g. resettlement programmes could include the development of socio-economic activities at the new location where not all the inhabitants can continue their former work).

REACHING THE MOST VULNERABLE

2.5.6 Improved access to the programmes' activities/services through the offer of smaller housing credits/partial loans so that also the most vulnerable can access them to reduce their vulnerabilities through, for example, house repairs or small-scale physical mitigation structures such as roof repairs or the construction of necessary contention walls.

2.5.7 Improved access to the programmes' activities/services through adequate rules/criteria for accessing credits (e.g. rules as regards repayment, house location), etc.

2.5.8 Support of community saving schemes (e.g. of a simple community bank) so that people who are excluded from the housing credit schemes –because they are too economically vulnerable– can save money and, in time, gain access to them.

SUSTAINABLE PHYSICAL MEASURES

2.5.9 Involvement of national training institutions in capacity building of beneficiaries. This permits the certification of capacity building and also the continuation of training courses when programmes come to an end.

2.5.10 Training of beneficiaries on maintenance and community responsibility for infrastructure to guarantee its proper functioning (e.g. organised regular maintenance and cleaning of sanitation systems for flood mitigation).

2.5.11 Establishment of local material production centres to guarantee the sustainable availability of appropriate building materials and the sustainable use of disaster-resistant construction materials.

2.5.12 House ownership contracts which guarantee that owners do not run the risk of increased socio-economic vulnerability, for instance, due to the house's utility bills such as extra charges for electricity etc., or the loss of the woman's ownership if the male head of the family and house owner deceases. Regarding the latter: introducing rules to protect house ownership and/or related savings of married female members.

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Analysis of: a) the existing environmental vulnerabilities; b) protective environmental assets (and related capacities) of the programme beneficiaries and their communities; and c) the influence of ongoing or planned environmental programme measures on the existing risk level.* Compliance with environmental standards (e.g. tree cover preservation, land use, and agricultural and water quality standards). Analysis of the potential impacts of the environment on the programme activities (e.g. impact of the occurrence of disasters on programme activities).	Modification of the programme work in such a way as not to diminish (but rather foster) protective environmental assets (and related capacities), and to actively use such assets to protect the programme activities against hazards. Inclusion of programme activities to replace environmental assets (and related capacities) which were lost or destroyed through the programme activities. Inclusion of environmental activities/measures needed for the sustainable implementation of the physical programme activities.

⇒Expected results (output indicators)

⇒ The programme activities take programme-related environmental aspects, which influence beneficiaries' risk, actively into account.

⇒ The programme beneficiaries are clear about the inter-connection between their risk and environmental deterioration.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

KNOWLEDGE – INFORMATION

2.6.1 Inclusion of environmental aspects in capacity building of programme beneficiaries, manual workers, and municipal technical staff to demonstrate, for instance, the inter-connection between their vulnerability/risk and environmental deterioration.

SUSTAINABLE PHYSICAL MEASURES

2.6.2 An example would be the combination of the construction of basic sanitation with training on environmental practice (e.g. prevention of garbage dumping in gullies, etc.) and the implementation of an improved waste management system.

2.6.3 Another example could be the conversion of a re-settled high-risk area to an eco-park, enabled by the vigilance and maintenance provided by the inhabitants of the neighbouring areas.

2.6.4 Vegetation is a natural asset which can be actively used as a wind break, and to prevent soil erosion and landslides. Such measures can improve and even protect other programme activities.

2.6.5 The destruction of protective natural assets through the programme activities has to be avoided through careful programme design, community research and environmental impact assessment (EIA). EIA is an instrument which can help to forecast negative impacts of the programme activities on the environment. An example of the destruction of protective natural assets could be environmental deterioration through deforestation due to the use of local wood as construction material, the non-adequate use of latrines, etc. This may even lead to additional hazards (e.g. to erosion and landslides). (In these examples, vegetation and compact/stable soil are the environmental assets.)

REPLACING LOST ASSETS

2.6.6 If, for example, trees have to be cut and/or water sources are contaminated as a result of programme activities, measures such as reforestation and appropriate water management should be implemented to reduce the harm done.

PROTECTING PROGRAMME ACTIVITIES

2.6.7 Hazard assessments can be used to assess the impact of the natural environment (natural hazards) on the programme. This is important to complement EIAs, which are only one-way analyses, i.e. analyses of the impact of the programme activities on the environment, but not vice versa.

*Note that the data collection and analyses should be (partly) already conducted within the framework of the 'risk identification and community research' (see above under *Matrix 2.2*).

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Analysis of: a) the existing institutional and organisational vulnerabilities; b) protective institutional/organisational assets/capacities of the programme beneficiaries and their communities; and c) the influence of ongoing or planned institutional/organisational programme measures on the existing risk level; and d) organisational implementing structures of other organisations working in social housing, urban planning and/or RR.*.* Search for possible cooperation and co-ordination partners at international, regional, national, municipal and/or local levels (including governmental and non-governmental agencies). Where possible, creation of alliances with the municipalities as implementation partners.	Modification of the programme work in such a way as to not diminish (but rather foster) protective institutional and organisational assets/capacities. Inclusion of institutional and organisational measures needed for the sustainable implementation of the physical programme activities. Establishment and work through a co-ordinated implementing structure. Support of institutional/organisational structures needed to control or influence future resilient settlement developments.

⇒Expected results (output indicators)

⇒ The programme activities take programme-related institutional and organisational aspects, which influence beneficiaries' risk, actively into account.

⇒ The programme's implementing structure positively influences RR.

⇒ Beneficiaries and municipal technical staff are aware of the inter-connection between the risk of communities and institutional/organisational structures, and assume their related responsibilities.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

2.7.1 Stakeholder analysis can be a useful tool to help identify all programme-relevant stakeholders.

SUSTAINABLE PHYSICAL MEASURES

2.7.2 Promotion of an improved linkage between local, municipal and national stakeholders. For example, the work with the beneficiaries in community organisation can result in their representation in the district board of their municipality, involving them in: the discussion of the city's problems, the legalisation of their individual tenure, and development of new infrastructure programmes.

2.7.3 Revision and amendment of municipal ordinances/laws/codes/standards for settlement planning and construction in order to include RR as a cross-cutting aspect.

2.7.4 Establishment of institutional partnerships with organisations working in RR and other social housing NGOs at national, municipal and local levels, in order to reduce institutional vulnerabilities and potentialise efforts of the various organisations (as regards programme implementation and information exchange (e.g. risk data bases)).

2.7.5 Building up of cooperatives of manual workers or creation of partnerships with universities and capacity building institutions to sustain the programme activities.

2.7.6 Co-operation with the private/academic sector to advance:

- *insurance premium reductions available for the use of hazard-resistant building and retrofitting techniques,*
- *the inclusion of RR aspects in university curricula and technical training institutions curricula, and*
- *building code compliance of construction industry.*

KNOWLEDGE – INFORMATION

2.7.7 Institutional capacity building is crucial to reduce existing risk. Important topics for the training of municipal technical staff are: programme management and budgeting for housing and settlement planning to include RR.

IMPLEMENTING STRUCTURE

2.7.8 Co-ordination of the modified core work, for instance, with the municipal committees for local development planning and –if existing– their sub-committees for RR. The work could then be carried out through sub-committees for programme implementation.

*Note that the data collection and analyses should be (partly) already conducted within the framework of the 'risk identification and community research' (see above under *Table 1.2*).

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Strategy IV: Organisational Mainstreaming of RR

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2.6 Partnerships and external Relations	50

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
The organisation's management does not show resentment towards the concept of RR, is open for new ideas, and supports staff members interested in the idea of RR who are starting to learn about this concept and its underlying processes, and who inspire others. Recognition by the organisation's management for the need to adapt their organisational management system, policy and working structures to back up, formalise and make sustainable the process of integrating RR in their programme work. Active involvement of the personnel in the discussions on and planning of the process of 'organisational mainstreaming' of RR. Initial awareness raising and basic training on disaster risk and RR for *all* programme personnel.	Selection and designation of one or a number of employees with adequate skills to formally take the responsibility for encouraging and supporting the process of integrating/mainstreaming RR into the organisational management system, policy, and working structures. The organisation is providing the selected staff with time, resources and some level of influence/authority to do their work. Modification of all relevant job descriptions, terms and conditions of employment, and related appraisal mechanisms to include the responsibility of the personnel to consider the issue of disaster risk and RR within the context of their everyday work. Regular training for personnel on disaster risk, the concept of RR, and the different existing strategies of RR integration in development organisations (with special focus on programmatic and organisational mainstreaming).

⇒Expected results (output indicators)

⇒ Sufficient person power for integrating/mainstreaming RR in the organisational management system, policy, and working structures.

⇒ Adequate knowledge and understanding of personnel in respect of the links between disasters and the organisation's core work, organisational management, policy and working structures.

⇒ All staff members consider disaster risk and RR within the framework of their everyday work.

⇒ Among senior and influential staff, there is commitment and 'political will' –which is based on adequate knowledge– to promote and actively advance the comprehensive integration/mainstreaming of RR.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

3.1.1 In the job descriptions, the responsibility of the personnel to consider disaster risk and RR within the framework of their everyday work could be formulated as: '… have to be alert to, and act upon, the ways in which the programme activities can increase or decrease vulnerabilities.'

See further notes under 2.1.1 – 2.1.4

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Input and process indicators for integrating RR	
First Steps **— Getting started —**	**Benchmarks** **— Where to go —**
Revision of information obtained through the 'risk identification' undertaken as part of direct RR, programmatic RR and/or internal mainstreaming of RR (see *Matrixes 1.2, 2.2* and *4.2*).	Complementation of existing data bases and research to obtain information needed for the process of organisational mainstreaming. Establishment of mechanisms and tools for systematic collection of experiences in organisational mainstreaming. Establishment of mechanisms and tools for systematic collection and monitoring of: a) disaster risk in programme areas, and b) capacities and risk perceptions of local communities, municipalities and other programme stakeholders.

⇒Expected results (output indicators)

⇒ Existing systematic risk identification procedures and structures, as well as related risk databases for all programmes to follow-up relevance/efficiency of the RR integration.

⇒ Data and information on 'organisational mainstreaming' is gathered by the organisation and used to adequately modify their own organisational management, policy, and working structures.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

3.2.1 Apart from the gained knowledge of the 'risk identification' undertaken as part of direct RR, programmatic RR and/or internal mainstreaming of RR, it would be useful to compile information on the existing needs of programme staff to back up their work, as well as on the experiences of other organisations that have already begun the process of organisational mainstreaming of RR. In the case that no such experience exists, related concepts, theory and experiences of organisations with the organisational mainstreaming of other cross-cutting topics such as gender, environment, etc., could be analysed.

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Recognition by the organisation's management of the need to consider and reduce disaster risk within every step and aspect of the programme cycle management (as opposed to ad hoc decision-making). Selection of staff members to revise the organisation's working structures and procedures for carrying out programmes (including their planning, implementation, monitoring and evaluation) and the related technical tools in order to assess their relevance for: a) protecting programmes from disaster impact; b) ensuring that the programmes do not augment disaster risk; and c) fostering the positive effects of programmes on reducing risk.	Development and/or adaptation and use of standards and tools related to RR in respect of: a) hazard, vulnerability, capacity and risk analyses (e.g. assessments and mapping); b) disaster-resistant construction (standards for construction techniques and building materials, etc.); c) appropriate programme planning for reducing risk (i.e. planning tools such as logical framework approach (LFA), etc.); d) monitoring of the process of integrating RR within specific programmes; e) monitoring of the process of organisational mainstreaming. In the case that direct RR work is carried out: linking of RR programming to the organisation's core development programmes.

⇒Expected results (output indicators)

⇒ Routine consideration of RR in all steps of the programme cycle (with the help of adequate tools).

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

PROGRAMME CYCLE

3.3.1 Inclusion of 'risk assessments' within the organisation's 'needs assessments', 'capacity assessments' and/or 'feasibility studies' carried out for programme planning, thereby considering current and likely future disaster impacts and related risk.

3.3.2 For feasibility studies, use of environmental impact assessments (EIAs) that include special attention to natural hazards.

2.3.3 Whilst designing programme activities, exploration of possible effects and outcomes of the planned activities in a participative way, in order to anticipate and prevent problems which might increase risk of programme beneficiaries.

3.3.4 The programme's operational objectives should refer to features of the design which are intended, amongst other things, to enhance the way in which the programme works to reduce risk.

3.3.5 Development and/or adaptation of adequate programme monitoring and evaluation measures which take RR into account. As there is little experience with integrating RR, monitoring and evaluation are crucial. Recommendations arising from monitoring and evaluation inform programme cycle processes and are valuable for advocating RR.

3.3.6 Apart from monitoring/evaluating programme work (including programmatic mainstreaming of RR and RR programming), the integration process of RR in the organisation should be assessed. An adequate monitoring/evaluation system should thus be set up.

3.3.7 Control of risk augmentation or reduction as a standard procedure for programmes' reporting, monitoring and evaluation processes.

3.3.8 Important programme outcomes/products are often local/municipal development and land use plans, related municipal laws and policies, local maps/analyses of hazards, vulnerabilities and risk, and maps/analyses for land use of the respective programme areas. It is crucial that their elaboration is co-ordinated with other organisations, is based on the standardisation of the concept of risk and RR between different organisations, and makes use of specified and unified/standardised methods, scales and contents. Note that this is also related to the RR Integration Strategy VI (cf. Chapter 5). This is important to coordinate existing efforts and to achieve that the different plans, laws and maps are compatible and complementary. Therefore, already existing plans, laws and maps have to be considered. The enactment of municipal legal frameworks based on local/municipal development and land use plans/maps is of special importance to achieve sustainability of the programmes.

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'STRATEGY IV: ORGANISATIONAL M. of RR
3.3 Working structure and procedures

Input and process indicators for integrating RR	
First Steps **— Getting started —**	**Benchmarks** **— Where to go —**
CONTINUATION See above	CONTINUATION See above

⇒Expected results (output indicators)
CONTINUATION See above

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

3.3.9 The developed and adapted tools have to be sufficiently flexible to recognise that local hazard conditions, cultural norms and administration patterns are variable, requiring localised adaptations.

3.3.10 All gained experiences in RR, whether through the implementation of RR programming or the mainstreaming of RR should be used to learn from (e.g. through an internal system of lessons learnt).

STRUCUTRES/CONSTRUCTION QUALITY CONTROL

3.3.11 Establishment of a specialised department/group for construction quality control.

3.3.12 During the absence of adequate building codes, the organisation should elaborate their own check-lists and/or 'safer building seal of approvals'.

3.3.13 A formal organisational working structure of the organisation is needed (reflected in the organigramme) in order to ensure that RR can become a standard procedure of what the organisation is doing (e.g. focal points to promote and monitor RR integration in the organisation).

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Recognition by the organisation's management of the need to adapt their organisational policy and strategy to back up, formalise and make sustainable their RR integration process (as opposed to ad hoc decision-making). Selection of staff members to revise the organisation's strategy and policy in order to assess their relevance for: a) protecting programmes from disaster impact; b) ensuring that the programmes do not augment disaster risk; and c) fostering the positive effects of programmes on reducing risk.	Inclusion of the commitment to respond to disaster risks as a programmatic mainstream issue (and eventually also as an issue requiring RR programming) in key documents, outlining the organisation's policy, vision, mission, purpose, approach, values and priorities. Development and implementation of a participative strategy with realistic and achievable goals for RR integration.

⇒Expected results (output indicators)

⇒ Formalised commitment of the organisation to integrate RR in a sustainable way in their core programme work.

⇒ The 'public face' of the organisation reflects its engagement in RR.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

3.4.1 Based on the new organisational strategy reflected in the organisation's policy and strategy, a system for its monitoring should be set up (cf. Matrix 3.3)

3.4.2 During the last years, a range of organisations included RR in their mission statements or extended mandates of certain departments. However, as this process was often carried out in a top-down manner, and seen more as a strategic than a required change, in practice little has changed. Thus, changes as regards the organisation's policies and strategies have to be developed in a participatory way and require an adequate knowledge base in RR.

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Search for donor organisations which fund activities related to RR (RR mainstreaming and RR programming). Selection of staff members to revise the organisation's financial management in order to: a) assess costs related to: protecting programmes from disaster impact, ensuring that the programmes do not increase disaster risk, and fostering the programmes' positive effects on reducing risks; b) assess if the organisation's current financial management or the organisation's funding sources impede work in RR (e.g. through their budget lines, earmarking, etc.); and c) identify additional funding means within the organisation.	Design and implementation of a financial strategy for the RR integration process. Regular training of staff for proposal writing and fund acquisition for programme work and organisational changes related to RR. Establishment of linkages and cooperation with funding agencies at international, national and local levels which support RR.

⇒Expected results (output indicators)

⇒ The organisation/personnel has the capacity to make funding for RR available (internally and externally).

⇒ Sufficient financial resources/budget available for proper and sustainable integration of RR.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

3.5.1 The financial strategy aims to cover additional operational costs, which arise from integrating RR and finding solutions to reduce barriers to implementing RR. Resultant measures could include, for instance, increased/additional budgeting for RR through additional financial programme partners or the alteration of internal budget lines.

3.5.2 To search for complementary financial partnerships, a stakeholder analysis is a useful tool for identifying collaborating bodies (e.g. other agencies, NGOs, the private sector and academic bodies).

3.5.3 In order to identify an adequate financial management system, extensive financial analyses need to be conducted. Please also see the analyses mentioned under 'financial management' of the 'internal mainstreaming' strategy (see Matrix 4.5).

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Recognition of the organisation's management that it cannot act alone to reduce effectively disaster risk. Search for other organisations working in the same sector which also want to engage (or are already engaging) in integrating RR. Search for complementary partnerships for RR with organisations/experts which are specialised in RR.	Establishment of linkages and cooperation with key stakeholders at international, national, municipal and local levels, as well as relevant regional coordinating or networking bodies, in order to develop cooperative RR work, to exchange related information and lessons learnt, and eventually to develop shared strategies for RR.

⇒Expected results (output indicators)

⇒ Complementary partnerships are established to improve the organisation's work in RR, creating synergies, and thus prevent competition with other organisations. (Note that this is also related to the RR Integration Strategy VI (cf. Chapter 5)).

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

3.6.1 In order to search for complementary technical partnerships, a stakeholder analysis is a useful tool, identifying implementing partners and collaborating bodies (e.g. other agencies, NGOs, private sectors and academic bodies).

3.6.2 Consultation with experts is indispensable, especially when it comes to mainstreaming RR within an organisation's core work and functioning.

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Strategy V: Internal Mainstreaming of RR

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
The organisation's management does not show resentment towards the concept of RR, is open for new ideas, and supports staff members interested in the idea of RR who are starting to learn about this concept and its underlying processes, and who inspire others. Recognition by the organisation's management that they have to protect their own organisation (i.e. offices and staff) from the impact of disasters in order to be able to guarantee both sustainable programme work and RR. Initiation of training/workshops for the employees to discuss how disasters relate to them personally, that is, their private and professional life. Assessment of further needed capacity building for reducing the organisation's own vulnerability/risk.	Based on the outcomes of the 'risk identification and staff research' (see following *Matrix 4.2*), regular information and training on personnel safety. The selected personnel for supporting the process of integrating RR (selected within the strategies of RR programming, programmatic mainstreaming of RR and/or organisational mainstreaming of RR) also includes internal mainstreaming in their fields of duty (cf. 'human resources and capacity building', *Matrixes 1.1, 2.1. and 3.1*).

⇒Expected results (output indicators)

⇒ Sufficient person power and knowledge to support internal mainstreaming of RR.

⇒ All personnel is aware of the internal mainstreaming activities and makes use of them.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

4.1.1 Training modules on personnel safety should include: general RR awareness, simulations of disaster situations in head and field offices and other preparedness measures (e.g. improvement of emergency communication and other procedures and structures to be followed during disasters), etc.

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V: INTERNAL MAINSTREAMING. of RR
4.2 Risk identification and staff research

Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Initiation of research to analyse how disasters are directly affecting the organisation, and how they are likely to affect the organisation in the future. Analysis of risk which the personnel faces through the work at the organisation (e.g. by working in different disaster-prone areas; existing risk on the way to programme areas, stay at vulnerable areas/places within the office buildings, etc.) See also under 'financial management' (*Matrix 4.5*).	Establishment and permanent updating of a data base to track and analyse over time the disaster impacts and risk faced by the organisation and its staff.

⇒Expected results (output indicators)

⇒ The organisation has adequate information for advocating internal RR.

⇒ The current/future impacts of disasters on the organisation are assessed/predicted.

⇒ A monitoring system is in place to follow up changes of the impacts disasters have on the organisation. Where problems exist, ways of addressing them are researched.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

4.2.1 To assess the current impact of disasters on the organisation, firstly the following has to be considered:

- existing personnel data (e.g. sick leave, work interruptions, treatments for injured/affected employees, etc.),

- technical stability/performance of the organisation's office buildings.

Secondly, interviews with personnel should be carried out, especially in respect of their views of and attitudes towards risk faced over recent years.

4.2.2 External expertise is eventually required to predict future disaster impacts.

Note: please see also Matrix 4.5 under section 'financial management'.

STRATEGY V: INTERNAL M. of RR
4.3 Working structures and procedures

Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Designation of personnel to analyse the existing working structure and procedures as regards their relation to the vulnerability of the organisation itself, i.e. its internal functioning, offices and staff.	Participative development or adaptation of working structures and procedures so that the organisation itself, i.e. its internal functioning and staff, becomes less vulnerable and/or is better prepared for potential disaster occurrence.

⇒Expected results (output indicators)

⇒ Reduced impact of disasters on staff.

⇒ Sufficient person power for carrying out the organisation's programme work, also after the impact of major disasters.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

4.3.1 In order to reduce the risk of staff, the following measures could be carried out:

- improvement of communication/information structures and equipment (e.g. walky-talkies) to improve the ability of personnel to continue working effectively in the case of a disaster;

- improvement of information and procedures on how to behave and respond effectively in the case of a disaster (e.g. signposting of emergency exits). See also under 'human resources', Matrix 4.1.1;

- in high-risk areas: work in teams (as opposed to working alone in the field);

4.3.2 In order to reduce the vulnerability of the organisations functioning, the following could be done:

- improved share of RR responsibilities (e.g. have at least two people as RR focal point);

- improved share of RR knowledge (e.g. knowledge on RR not only held by programme leader, careful documentation of and access to information on RR activities, etc.).

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Input and process indicators for integrating RR	
First Steps **— Getting started —**	**Benchmarks** **— Where to go —**
Designation of personnel to analyse the existing internal policies and strategies as regards their relation to the vulnerability of the organisation itself, i.e. its internal functioning, offices and staff.	Participative development or adaptation of internal policies and strategies to reduce the vulnerability of the organisation itself, i.e. its internal functioning, offices and staff: - Development or adaptation of workplace policies; - Inclusion of the commitment to respond to disaster risk as an internal mainstream issue in key documents, outlining the organisation's internal policy, approach, values and priorities; - Etc. -

⇒Expected results (output indicators)

⇒ Formalised commitment of the organisation to internally integrate RR.

⇒ Workplace policies have –amongst other things– the explicit objective to reduce the risk faced by the personnel.

⇒ The organisation's management and employees know the contents of the adapted or created policies and strategies and –when needed– utilise them.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

4.4.1 Workplace policies have to be adapted to:

a) formalise the organisation's responsibilities to its employees in case of disasters (e.g. post-disaster benefits and treatments for injured/affected employees); and

b) reduce the risk of personnel by defining RR actions (e.g. secure workplace and equipment, etc.).

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Input and process indicators for integrating RR

First Steps — Getting started —	Benchmarks — Where to go —
Designation of personnel or employment of external consultants in order to estimate and analyse the organisation's costs of past and likely future disaster impacts (e.g. for repairs, lost material (vehicles, etc.), reduced reputation, sick leave, work interruptions, etc.). Initiation of research to identify potential risk transfer and/or loss sharing schemes.	Development and implementation of a financial strategy which: a) prevents or 'buffers' financial loss incurred by the organisation and its staff, which is evoked by the occurrence of disasters; b) provides a financial back-up system for the inevitable limitations of programme activities and the accepted risk levels.

⇒Expected results (output indicators)

⇒ The organisation has the capacity to deal with (increasing) financial impacts of natural disasters on the organisation and its staff.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

4.5.1 The financial strategy can include different risk transfer and loss sharing mechanisms (cf. Chapter 7 for information on risk 'financing' and stand-by for recovery). Examples are:

- *health insurance for personnel;*
- *disaster insurances for the organisation itself;*
- *disaster insurances for specific programme activities/constructions;*
- *inclusion of disaster insurance within the offered social housing credits schemes;*
- *increased organisational budget for RR (through additional funding sources, as well as change of internal budgets);*
- *development of a special fund for coping with disaster impacts (e.g. allocation of contingency disaster funds in the organisation's annual budget, based on actuarial probabilities);*
- *support of legislation mandating insurance for properties valued above certain thresholds –which cover low-income households free of charge when achieving a certain coverage of the inhabitants.*

4.5.2 To assess the financial impact of disasters on the organisation, firstly the following has to be considered:

- *existing personnel data,*
- *technical stability/performance of the organisation's office buildings.*

4.5.3 External expertise is eventually required to predict further financial disaster impacts, such as health costs (e.g. sick leave, treatments for injuries), indirect costs to the organisation (e.g. absence from work, loss of reputation, quality of work), etc.

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Input and process indicators for integrating RR	
First Steps **— Getting started —**	**Benchmarks** **— Where to go —**
Analysis of the data obtained through the research carried out (cf. *Matrix 4.2*) in order to assess potential measures of directly reducing the organisation's vulnerability/risk (i.e. offices and staff).	Implementation of RR measures to directly reduce the organisation's vulnerability/risk (i.e. RR programming for offices and staff).

⇒Expected results (output indicators)

⇒ The organisation can continue to operate effectively, despite existing (increasing) disaster frequency and intensity.

⇒ The risk faced by the personnel is considerably reduced.

Notes and reference activities for practical implementation (with particular focus on social housing organisations)

4.6.1 Internal mainstreaming has two elements: a) direct RR activities for staff and the physical location of the organisation's offices; and b) indirect RR by modifying the ways in which the organisation is managed internally, for example, in terms of personnel planning and budgeting. The latter was demonstrated in the foregoing sections. In respect of the former, the following could be put in place:

a) setting up emergency plans (signposting) (see also under 'human resources', Matrix 4.1.1);

b) carrying out simulations;

c) improving communication and information structures;

c) retrofitting/upgrading of head and field offices.

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Annex II: Terminology

The following definitions are drawn from different sources. However, most were expanded, adapted and/or newly elaborated by the author of this framework to, first, reflect related research outcomes and, second, match the needs of the framework's target group/readership.

(Coping) capacity	The means by which households, communities or organisations use available resources and abilities to tackle adverse effects that could lead to (and are caused by) a disaster. While the term usually refers only to the (coping) capacity to respond to disasters and hence to related preparedness measures, it also includes the (coping) capacity to recover from hazards/disasters. Note that in contrast to response, recovery includes more long-term activities related to reconstruction and rehabilitation. (Coping) capacity can further refer to: - (Coping) capacity to resist disasters, which is related to vulnerability of households, communities or institutions, and hence to the mitigation measures that they take; and - (Coping) capacity to reduce or avoid hazards, and hence is related to measures of prevention.
Coping strategies (of people living at risk)	Constantly changing and adapting cognitive and behavioural efforts to manage disaster risk or disaster impacts on the part of households and communities at risk. These efforts influence the key variables, and their causal relations, underlying the complex system of risk and disaster occurrence in specific (slum) areas, and can be carried out deliberately or automatically/instinctively.
Development programmes/ programming	Development programmes are initiatives in developing countries supported and/or implemented by so-called development organisations with the aim of alleviating poverty and achieving sustainable development through different sector support. Development programming is the act of supporting and implementing such sector-specific programmes (or programme components). Their focus is, as such, on the developmental context (i.e. not relief, rehabilitation or reconstruction). Note that in this study the terms 'programme' and 'project' are used as synonyms.
Disaster ('natural')	Serious disruption triggered, amongst other things, by a natural hazard causing substantial damage, disruption and possible casualties, and leaving the affected communities unable to function normally without outside assistance. It includes everyday and large-scale disasters. A disaster occurs when hazards strike in vulnerable areas where inhabitants have little coping capacity. Disaster management literature commonly distinguishes rapid-onset disasters, such as water surges or earthquakes, which cause immediate loss and disruption, and slow-onset events, notably drought.
Disaster risk reduction (RR), also called disaster risk management	Range of activities/programmes to minimise the likelihood, intensity or frequency of a disastrous occurrence, preferably carried out before potential disasters take place. RR is thus the generic term for measures of: (1) prevention, (2) mitigation, (3) preparedness, (4) risk 'financing' and (5) stand-by for recovery. Risk assessment is not listed separately as it is understood as an inherent part of all five measures that is needed for identifying and planning related activities. Disaster risk management can be implemented and is essential before, during and after disasters.
Disaster RR programmes/ programming	Programme or programme components that aim to improve existing disaster risk management. Disaster RR programming is hence the act of supporting and implementing such dedicated sector-specific programmes (or programme components). The integration of disaster RR programming into sector-specific programmes includes 'direct stand-alone DRM' and 'direct integrated DRM', which to become sustainable should be complemented by organisational, internal and educational mainstreaming, as well as synergy creation for DRM (see *Table 3*). Note that in this study the terms 'programme' and 'project' are used as synonyms.
Hazard (natural)	A natural hazard may cause a 'natural' disaster (of both small or large scale). It is a geological, atmospheric, or hydrological event (e.g. earthquake, landslide, volcanic eruption, windstorm, wild fire, drought, flood, and water surge) that has the potential to cause harm or loss (e.g. death or injury, property damage, social and economic disruption, environmental degradation). Natural hazards are not necessarily caused by purely natural forces. In fact, human activity can also contribute to their creation. A landslide caused by environmental degradation is one example of such a 'human-induced hazard'.
Integrating/integration of disaster RR	Integration of disaster RR aspects into the work of organisations, here, with a focus on development organisations. This includes RR mainstreaming as well as RR programming (see *Table 3*).
Mainstreaming of disaster RR	Generally, the term 'mainstreaming' signifies the modification of a specific type of core work of an organisation (e.g. modification of the social housing activities of a specialised development organisations) in order to take into account a new aspect (e.g. disaster RR) and to act indirectly upon it. Thus,

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	'mainstreaming' does not mean to completely change an organisation's core functions and responsibilities, but instead to view them from a different perspective and to make any necessary modifications/amendments, as appropriate. Thus, the integration of completely new sector-strange programmes or programme components is not part of mainstreaming (cf. RR programming). There are different complementary strategies for mainstreaming: programmatic, organisational, internal and educational mainstreaming, as well as synergy creation for RR (see *Table 3*).
Mitigation	Measures to (increase the capacity to) minimise the vulnerability of households, communities and/or institutions, thus reducing existing disaster risk. Mitigation is part of RR (see above).
Preparedness	Measures to (increase the capacity to) establish effective response mechanisms and structures of households, communities and/or institutions so that they can react effectively during and in the immediate aftermath of potential hazards/disasters, thus reducing existing disaster risk. Preparedness is part of RR (see above).
Prevention	Measures to (increase the capacity to) avoid hazards or reduce the potential intensity and frequency of human-induced hazards that threaten households, communities and/or institutions, thus reducing existing disaster risk. The potential intensity can refer to both time span and magnitude of hazards. Prevention is part of disaster RR (see above).
Resilience	Capacity of a community, system, or society to withstand/resist hazards and/or disasters, and thus maintain an acceptable functional and structural standard—even in the case of a hazardous/disastrous occurrence—by 'bouncing back' rapidly, as well as adapting so as to be able to deal adequately with future threats. To put it simply, resilience is the opposite/antithesis of vulnerability. More precisely, it reflects a functioning disaster risk management system that works before, during and after disasters. The idea of resilience suggests a proactive stance towards risk.
Risk	The probability of harmful consequences or losses (e.g. deaths, injuries, property damages, social and economic disruption, environmental degradation) resulting from interactions between natural and human-induced hazards, vulnerable conditions, and the lack of capacity of households/communities/institutions to respond to and recover from disasters. Note that in this study the terms 'risk' and 'disaster risk' are used as synonyms.
Risk financing (risk transfer/sharing)	Financial instruments of disaster risk management which aim to assure readily available post-disaster funds (e.g. through formal insurance systems). These instruments are conventionally called 'risk transfer' or 'risk sharing' as risk of individuals or organisations is partly 'transferred to' or 'shared with' other parties.
Risk 'financing'	Measures to (increase the capacity to) transfer or share risk so as to establish a 'security system' (safeguard) for households, communities and/or institutions that comes into force after potential hazard/disaster impacts and helps them to obtain 'readily available' compensation. The aim is to recover from hazard or disaster impacts, that is, to 'bounce back' quickly and to a reasonable level. In contrast to the conventionally used term 'risk financing' (see above), this measure includes formal *and* informal, and monetary *and* non-monetary mechanisms. Examples are formal and informal disaster insurance systems. Risk 'financing' measures are part of RR (see above).
Social housing organisation	Organisations that work in settlement development planning and whose core work is related to social housing and/or settlement planning, and which are thus a specialised subgroup of urban development actors (see below). They include both governmental and non-governmental organisations. Note that in this study the terms 'organisation' and 'institution' are used as synonyms.
Stand-by for recovery	Measures to (increase the capacity to) establish appropriate recovery mechanisms and structures for households, communities and institutions that are accessible after a potential hazard/disaster. The aim is to recover from hazard or disaster impacts, that is, to 'bounce back' quickly and to a reasonable level through appropriate recovery mechanisms and structures. These mechanisms and structures relate to the rehabilitation and reconstruction of damaged, destroyed or lost belongings, assets, structures and systems. Stand-by-for-recovery measures are part of RR (see above).
Urban development actors	Umbrella term for stakeholders/organisations that work at the international, national, municipal and local household level in the field of settlement development planning and/or programming (without necessarily specialising in this sector). Social housing organisations are a more specific subgroup (see above). Note that in this study the terms 'organisation' and 'institution' are used as synonyms.
Vulnerability	Degree to which systems (i.e. households, communities and/or organisations) are susceptible to loss, damage, suffering and death in the event of a 'natural' hazard/disaster. It thus describes the existing condition and setting of an area exposed to hazards, where a vulnerable area is understood to being incapable of resisting their impacts. Both vulnerability and its opposite/antithesis, resilience, are determined by physical, social, economic, environmental, organisational and institutional factors that are the result of human conduct. An example of physical vulnerability is the susceptibility to hazards of

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the built environment (including technical and social infrastructure). Examples of social vulnerability are influenced by the levels of literacy and education, compliance with laws, systems of good governance, access to basic human rights, existence of peace and security, and the existing traditional values and ideological beliefs. Economic vulnerability characterises, for instance, a local economy with high levels of corruption and lacking a diverse productive base, as well as less privileged people who suffer proportionally larger losses. 'Less privileged' relates to class or caste, ethnic minorities, the very young and old, the disadvantaged, and are often women who are primarily responsible for providing essential shelter and basic needs for their families. Environmental vulnerability refers to the extent of natural resource degradation (e.g. contaminated air, water and soil caused by inadequate sanitation). Examples of organisational and institutional vulnerability are the lack of institutions, related organisational structures, laws and regulations for disaster risk management or secure social housing provision, as well as the lack of inter-institutional cooperation and learning.

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Annex III: Literature and further reading

Note that most publications listed below (both by the author of this study and others) include analytical, conceptual and strategic frameworks that complement this Operational Framework.

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Wamsler (2004) 'Managing urban risk: perceptions of housing and planning as a tool for reducing disaster risk', *Global Built Environment* (GBER) 4(2):11–28.

Wamsler (2006) 'Mainstreaming risk reduction in urban planning and housing: a challenge for international aid organisations', *Disasters* (Journal of Disaster Studies, Policy and Management) 30(2):151–77.

Wamsler (2006) 'Integrating risk reduction, urban planning and housing: lessons from El Salvador', *Open House International* (OHI) 31(1):71–83, special issue on 'Managing urban disasters'.

Wamsler (2006) *Marco operativo para la integración de la gestión del riesgo para organizaciones trabajando en el desarrollo de asentamientos humanos* [Operational framework for integrating risk reduction for aid organisations working in human settlement development], Disaster Studies Working Paper No. 14, Benfield Hazard Research Centre (BHRC), London.

Wamsler (2006) 'Tackling urban vulnerability: an operational framework for aid organisations', *Humanitarian Exchange* (HE) 35:24–26, special issue on 'Humanitarian action in urban contexts'.

Wamsler (2006) 'Understanding disasters from a local perspective: insights into improving assistance for social housing and settlement development', *TRIALOG* (Journal for Planning and Building in the Third World) 91(4):4–8, special issue on 'Building on disasters'.

Wamsler (2007) 'Bridging the gaps: stakeholder-based strategies for risk reduction and financing for the urban poor', *Environment and Urbanization* 19(1):115–142, special issue on 'Reducing risks to cities from climate change and disasters'.

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Wamsler (2007) 'Integrando la gestión del riesgo, planificación urbana y vivienda social: lecciones de El Salvador' [Integrating risk reduction, urban planning and housing: lessons from El Salvador], *INVI* (International Journal of the Institute of Housing, Faculty of Architecture and Urban Planning, University of Chile), 59:93–114.

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Strategies for Low-income Housing. A comparative study on Nicaragua, Mexico, Guatemala, Cuba, Panama, Costa Rica and El Salvador. ISSN 1103-6508	Graciela Landaeta	Teknologie Licenciat	1994
Estrategias para el hábitat popular.	(Versión en español)		
Design for Desert. An architect's approach to passive climatisation in hot and arid regions	Hans Rosenlund	Teknologie Doktor	1995
NOUR – Daylighting and thermal effects of windows in desert houses	Djamel Ouahrani	Teknologie Doktor	1999

The damage caused by the dramatic worldwide increase in 'natural' disasters is staggering, with the poor in developing countries being most at risk. Disasters make their already precarious living conditions worse, creating a vicious circle of poverty from which they find it hard to escape. To achieve sustainable poverty reduction, more and more attention has thus been given to the need to reduce disaster risk through development work. Despite related efforts, organisations working in urban settlement development still struggle to effectively tackle disaster risk in their daily work.

To address this challenge, the present research aims to demonstrate how disaster risk management could be integrated into settlement development programming (i.e. social housing, upgrading and/or local urban governance programmes). The research methodology used is an innovative combination of case studies, grounded theory and systems analysis. Case studies of four settlement development programmes were carried out in 15 disaster-prone slum communities in El Salvador, Central America, and their wider context analysed at the municipal, national, and global levels. The outcomes were complemented and generalised with investigations in a series of other countries. The research methods included interviews, group discussions, walk-through analyses, observations, text reviews, questionnaires, research workshops and 'hands-on' practice.

This study shows, on the one hand, that while architects, planners and other urban development actors have the responsibility for developing secure and sustainable settlements, they have nevertheless been unconscious contributors to the increase in disaster risk. In fact, they can negatively influence all three components of risk: hazard(s), vulnerability, and coping capacity. The reasons for this relate to: (a) the lack of knowledge regarding the two-way and multifaceted relationship between disasters and urban settlement development; (b) the separation between the working fields of disaster risk management and settlement development planning from the local to the global level – as well as among these levels; and (c) the substantial gap between what households and communities need or do to cope with risk and disasters and the ways in which urban development actors support them. On the other hand, the research importantly demonstrates that urban development actors – through their programmes, organisational structures and mechanisms for social housing provision and financing – can offer a potentially powerful platform for effectively tackling disaster risk.

The empirical and theoretical knowledge developed by this research is of an intra-, trans- and interdisciplinary/intersectoral nature. Based on the identification of the nexus between disasters and urban settlement development, and of the incomplete approaches to disaster risk management and its mainstreaming, analytical, conceptual and operational frameworks were elaborated. The resulting 'Analysis and Adaptation Model' combines seven strategies for the integration of disaster risk management into development programming with five complementary measures to reduce disaster risk. The model provides a comprehensive understanding of the meaning and scope of disaster risk management integration (which applies to the pre- and the post-disaster context). This assists in both analysing organisations' work and taking action to improve programme implementation. In conclusion, the research demonstrates how urban development actors working at the local, municipal, national and/or international level might exploit their potential to address the increasing disaster risk of the poor and thus enhance the sustainable reduction of both risk and poverty.

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