

Global Assessment Report  
on Disaster Risk Reduction



Creating an enabling environment for reducing  
disaster risk: Recent experience of regulatory  
frameworks for land, planning and building in  
low and middle-income countries

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**Creating an enabling environment for reducing disaster risk: Recent experience  
of regulatory frameworks for land, planning and building in low and middle-  
income countries**

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*"If people did not choose to locate in hazard-prone areas, the problems posed by development would be greatly diminished. However the reality is that certain types of hazardous areas are often among the most desirable for development"* (May and Deyle, 1998, p. 60)

*"We have technologies to build sturdier buildings... that take into account possible fault lines. We know a great deal about how to... ensure that urban settlements are more secure. So many parts of the world are not benefiting from this knowledge and these technologies. Disaster risk reduction measures must not be a luxury that only some states can afford."* UN Secretary General Ban Ki-moon

*'It is our nature to speculate that growth from natural disaster results from inadequate control of what is being built, and that the answer therefore is more and better regulation. Most writers suggest, either implicitly or explicitly, that there is a need for government action through legislation and its enforcement as vital elements of a long-term plan.'* (Robin Spence, 2004, p. 392.)

*'A few innovative jurisdictions—those with extraordinary local leadership and those that have suffered severe losses in the past—will plan for managing land use in hazardous areas. Most, however, will not, either because they lack the adequate information about hazards and planning, or, more importantly, because there is no local constituency pushing in this direction. Thus hazard mitigation requires partnership. Impetus for land-use planning and management must come from above, but the actual planning and conduct of programs must occur at the local level.'* (Burby, 1998, p. 21).

*'Disaster risk reduction is not a single piece of legislation that cures all ills, but a system that needs to be woven into the societal fabric in a way that will make it invisible and acceptable. The associated cost should be made affordable through incentives and other inducements. Violations need to be penalized in appropriate ways so that good professional conduct is rewarded. My impression is that much emphasis has been placed on formulating the right legislation, but these have been piecemeal and lacking in effective enforcement and meaningful social espousal'* (Gülkan, 2010, case study on Turkey prepared for GAR11).

## Table of Contents

<b>ACKNOWLEDGEMENTS</b>	<b>4</b>
<b>ACRONYMS</b>	<b>5</b>
<b>INTRODUCTION</b>	<b>6</b>
<b>METHODOLOGY OF THE STUDY</b>	<b>7</b>
<b>PART 1: PLANNING AND LAND MANAGEMENT</b>	<b>8</b>
<i>i) Legislation for disaster risk reduction related to planning and land</i>	<i>8</i>
<i>ii) Urban planning and implementation of plans</i>	<i>10</i>
Regional Coordination	10
Multiple Stakeholders	11
Implementation of plans and regulations	14
<i>iii) Reducing disaster risk in informal settlements through planning, land management and upgrading</i>	<i>17</i>
Security of tenure, evictions and risk reduction	17
Socially sensitive responses to urban upgrading	19
Safe Land	20
<b>PART 2: BUILDINGS AND CONSTRUCTION</b>	<b>22</b>
<i>i) Designing and developing appropriate codes and standards</i>	<i>23</i>
<i>ii) Regulations and practices surrounding the application and enforcement of building standards</i>	<i>26</i>
Challenges in drafting a legal basis and lack of capacity at municipal level to enforce codes:	
Evidence from Turkey	27
Lengthily and complicated procedures for obtaining building permissions	30
Advocating a 'compliance culture': shift away from a system of policing to one based on awareness and education	30
<b>SUMMARY OF REGULATORY INSTRUMENTS AND THEIR EFFECTIVENESS FOR DRR</b>	<b>32</b>
<b>CONCLUSIONS AND RECOMMENDATIONS ARISING FROM THE STUDY</b>	<b>35</b>
<i>Recommendations</i>	<i>35</i>
<b>Additional References</b>	<b>39</b>

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## ACRONYMS

AFAD	Disaster and Emergency Management Authority of Turkey
BHRC	Building and Housing Research Centre, Iran
CBO	Community-based Organisation
DRR	Disaster Risk Reduction
GTFBC	Global Task Force on Building Codes
HFA	Hyogo Framework for Action
IIED	International Institute for Environment and Development
ITDG	Intermediate Technology Development Group (now called Practical Action)
NGO	Non-governmental Organisation
RICS	Royal Institute of Chartered Surveyors
TOKI	Housing Development Administration of Turkey
ISDR	International Strategy for Disaster Reduction
UNU	United Nations University

## INTRODUCTION

**In what ways can government action and regulation help reduce future losses from natural hazards?** In answering this question, this study seeks to draw out evidence of how regulatory frameworks for planning, land-use management and building are and are not providing an enabling environment for disaster risk reduction. The focus of the study is on which governance mechanisms, partnerships, institutional frameworks and incentive structures are effective for the design and implementation of plans, codes and regulations in both formal and informal settlements, with reference to what political/economic/cultural conditions contribute to this.

Urban populations will continue to increase in coming decades, especially in low elevation coastal zones and in seismically active urban areas in low- and middle-income nations (McGranahan et al., 2007; Satterthwaite, 2007; Nicholls, 2008; Johnson, 2010). Given that urban areas will be growing and expanding, it is vital now to institutionalise good planning and building practices that take into account disaster risks. Past experience has shown us that once land is settled on, it is very difficult to move people and nearly impossible to undertake large-scale retrofitting. Thus, action is needed now to avoid disasters in the future.

In addressing vulnerability in the built environment, there are two major approaches: the first is the *location approach*, which is to use planning to limit the amount of development in areas that are deemed to be at risk for hazards, which is usually done through some form of land use planning. The second is the *design approach*, which is to make development in hazardous areas safer by altering the way buildings and infrastructure are built, usually through the implementation of building codes (Burby, 1998) (See Box 1).

### ***Box 1: Two Approaches to reducing disaster risks in the built environment***

The *location approach*, which seeks to limit development in hazardous areas, is most commonly achieved through the process of land use planning. Land use plans must first identify areas that are at risk from hazards and then designate these areas, through zoning or strategic spatial planning, for some low intensity development. Land use planning and zoning may also be used to set aside open areas that can be used for evacuation or emergency housing in case of a disaster and to plan for lifeline infrastructure that cities manage (water, drainage, transport and energy infrastructure).

The *design approach* to urban and regional planning allows development in areas at risk to hazards, but seeks to control how buildings are designed and built. Designing safer buildings may limit some of the damage if a hazard strikes but it does promote more development in the hazardous areas, and thus the potential for losses is greater. In cities, where the demand for land is intense, the design approach is more realistic than limiting development. This is because the land is valuable or people would rather live in centrally located areas, accepting the risk, rather than move further away (Burby, 1998).

## METHODOLOGY OF THE STUDY

The method of the study is three-fold:

1. A literature review of research and publications from international sources relating to:  
a) disaster risk reduction and disaster mitigation through urban and regional planning and  
b) the design and implementation of building standards and codes that aim to reduce disaster risk.
2. Five case studies have been commissioned as part of this study to focus specifically on the design and application of regulatory frameworks for planning and/or building in particular countries, cities and communities. The commissioned case studies are:
  - Turkey/Istanbul: 'Post 1999 developments in Disaster Management in Turkey: The regulatory frameworks and implementation of land use planning for disaster risk reduction in Istanbul.' By Ayşe Yönder (Pratt Institute) and Handan Türkoğlu (Istanbul Technical University).
  - Turkey: 'Disaster Risk Reduction in Turkey: Revisions for Building Code Enforcement Since 1999.' By Polat Gülkan, Middle East Technical University.
  - Namibia: 'A Review of the Informal Settlement Disaster Risk Preparedness in Oshana Region of Namibia.' By Jane Gold with Melkisedek Namupolo and Anna Muller, Namibia Housing Action Group
  - Argentina: 'The Relationship between disaster risks and urban planning in Argentina.' By Florencia Almansi, IIED-América Latina
  - Iran: 'Building and construction safety regulations against earthquake in Iran.' By Building and Housing Research Center, Iran
3. A small working-group meeting was held London in September 2010, which drew together local experts to gather their perspectives on the main issues of regulations with regard to planning/building/DRR (See Annex 1).

The review of literature, the case studies and the meeting notes are used to draw out the main issues and considerations of how planning and building regulations are contributing to disaster risk reduction. The excerpts from the commissioned case studies are used throughout the paper to present evidence of the findings.

The study is divided into two main parts, the first part is concerned largely with planning and land management and is organised into three main sections: i) Legislation for disaster risk reduction related to planning and land; ii) Urban planning and implementation of plans iii) Reducing disaster risk in informal settlements through planning, land management and upgrading. The second part looks at regulations for buildings and disaster resistant construction, and is divided into two sections: i) designing and developing appropriate codes and standards; ii) regulations and practices surrounding the application and enforcement of building standards.

Although these are mentioned in passing, this study does not consider in detail the regulatory frameworks concerned with the retrofitting of buildings nor does it deal with insurance mechanisms that may be used as part of a risk reduction strategy, such as private homeowners insurance. However, references to some works in this area are given.

## PART 1: PLANNING AND LAND MANAGEMENT

### i) Legislation for disaster risk reduction related to planning and land

*Key questions: Many countries or regions have instituted legislation related to reducing disaster risk through regulating land uses in areas at risk. How are these being used in practice and what are the implications for different groups of people?*

Priority Action 1 of the Hyogo Framework for Action (HFA) outlines legislative frameworks as a key basis for integrating disaster risk reduction into development policies and planning: “Countries that develop policy, legislative and institutional frameworks for disaster risk reduction and that are able to develop and track progress through specific and measurable indicators have greater capacity to manage risks and to achieve widespread consensus for, engagement in and compliance with disaster risk reduction measures across all sectors of society’ (ISDR, 2005, p 6).

In relation to land management and urban planning this statement of the HFA means that legislation needs to specify that disaster risks be considered in land and development planning. This includes a multi-stage approach, first of all knowing what the multi-hazard risks are through risk and vulnerability mapping; using this knowledge as the basis for developing plans and policies for land management; ensuring that the local institutions, especially local and in some cases regional governments, are sufficiently capable to implement the plans and policies.

Often, legislation that prohibits certain land uses in areas determined to be at risk have been reactionary, coming as amendments to existing laws in reaction to a recent disaster event that has exposed the risk in that area. For example, in lieu of national level legislation or policies about land management, the province of Buenos Aires, Argentina as a consequence of severe floods in the area the state enacted provincial laws<sup>1</sup> in 1957, which established minimum distance of 50 metres from rivers, streams and canals and 100 metres around the perimeter of lagoons, and which prohibited sub-divisions of land in all areas below +3.75 metres above sea level. In 1977, another law<sup>2</sup> created strict regulations for the production of urban plots, defining minimum plot sizes (as 300 square metres), the layout of the necessary infrastructure (water, sewers, paved roads, public lighting, storm drains) and assigning land to the state at no charge for roads and paths, green spaces, free spaces and spaces reserved for facilities. This law also used the earlier definitions regarding flood elevations, prescribing that houses had to be built above a certain established flood elevation, in order to obtain approval. After this law was introduced the cost of urban land increased. As this cost was directly transferred to the costs of purchasing the plots it meant that large sections of the lower-income population could no longer afford to purchase plots.

These laws, as exemplified in the case of Buenos Aires, are positive for enabling disaster risk reduction in that they recognize flooding risk as a land use problem and enact preventative zoning to regulate the development in flood zones. However, these laws can have adverse effect on the poor, making it unaffordable for the poor to obtain legal land, because regulating land through zoning law that details specific distances, sizes and heights, etc., are very inflexible in terms of accounting for other realities of development, i.e. they do not account for increasing land costs or people’s abilities to pay. Nor do they account for environmental variations in the possible levels of flooding or the possibility that it may be feasible to make

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<sup>1</sup> N° 6.253 on the Conservation of Natural Drainage and Law N° 6.254.

<sup>2</sup> Executive Decree N° 8.912 ‘Land Use Planning and Territorial Organization Law’

some land habitable through other mitigation measures, i.e. drainage, pumping, embankments, etc.

More recent legislations regarding DRR and land-use, such as those in Turkey, are less specific in terms of prescribing exact zoning regulations and thus have the possibility to offer more flexibility in terms of how legislation is implemented. This may have more positive impacts in terms of tailoring development to local needs, however it also requires a more sophisticated decision-making mechanism at the project or plan approval stage, and decision-making can become politically motivated.

At the national level in Turkey, Yönder and Türkoğlu (2010) outline how improvements were made to the land use development process at the national level through amendments to the Development Law<sup>3</sup> of 1985 and related legislation that introduced the concept of disaster management and risk reduction into the land use and development process. Based on the law, geological studies are now required prior to plan preparations and construction permits, and soil conditions and seismic risk areas help identify areas in development plans where no development is allowed. The law requires that large scale regional, sub-regional and environmental plans be prepared based on geological disaster risk maps prepared by the Ministry of Public Works and Settlements, and master plans in metropolitan municipalities with a population over a million residents be superimposed on geological micro-zone maps.

These laws offer an enabling environment for risk reduction in that they specify what type of information is needed about geological risks and that development plans and projects need to account for these risks (although they do not specify details for other hazards, for example flooding is becoming increasingly important in Turkey). Moreover, they appear to offer flexibility in terms of how planning and construction takes into account these risks, which should in theory allow them to account for local level environmental variations and social needs.

The effect of this flexible application is that during implementation municipal council decisions can still allow development in unsafe areas or at higher densities than allowed in the plans. Such decisions have also in some cases been supported by the Central Government's Disaster and Emergency Management Authority –AFAD.<sup>4</sup> For example, in 2010, a decision by the AFAD reduced the 150-meter wide no-construction buffer zone along the local fault line in Sakarya-Akyazı to 20 meters. Furthermore, in March 2010, the municipal council in Burdur rejected a development plan revision that incorporated the local fault line and the no development buffer zone into the plan<sup>5</sup>. In some of the former informal settlement areas of Istanbul, for example in Sariyer Municipality, the actual densities are already higher than what is specified on the 2009 Istanbul Metropolitan Master plan, putting district municipalities in an awkward position of trying to reduce densities in long-established informal settlements if they are to conform to the plan. In support of the residents, the Mayor of Sariyer Municipality is asking for metropolitan level revisions to these prescribed densities<sup>6</sup>.

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<sup>3</sup> *Imar Kanunu* No. 3194 of 1985

<sup>4</sup> *Disaster and Emergency Management Authority (AFAD) - Başbakanlık Afet ve Acil Durum Yönetimi Başkanlığı (in Turkish)*

<sup>5</sup> N. Uyar, President of the Chamber of Urban Planners. “Zaman Geciyor, Deprem Unutuluyor, “Fay” Hatlarının “Pay” Hatlarına Donusumu Hizlanıyor.” (Time is Passing, Earthquake is Forgotten, “Fault” Lines are Quickly Turning into Profit Lines). August 16, 2010. [http://www.tmmob.org.tr/genel/bizden\\_detay.php?kod=6308&tipi=9](http://www.tmmob.org.tr/genel/bizden_detay.php?kod=6308&tipi=9)

<sup>6</sup> Personal communication, Mayor of Sariyer District Municipality, Mr. Şükrü Genç, 14 May 2010.

Laws regarding the location of hazardous facilities are also important for enabling risk reduction. For example in Argentina there is provincial laws<sup>7</sup> that legislate the prevention of risks from industrial activities. These laws regulate the installation of industrial establishments by category of environmental complexity, requiring the approval of certificates of Environmental Fitness. The environmental complexity takes into account the activity of the industry, the quality of effluent generated, the potential risks of the activity, the size of the enterprise and the location of the company. All works, projects and activities (even public ones) that could produce any negative effects to the environment or natural resources must first obtain an Environmental Impact Statement.

Yönder and Türkoğlu (2010) note that, in Turkey, the revised Development Law does not make any provisions for the location of hazardous facilities. The fact that gas stations and stores that sell natural gas tubes for cooking/heating are located in residential areas without any code requirements, and hazardous industrial facilities, high energy lines, natural gas, military and LPG pipelines are all in close proximity to each other and to residential areas, all create high potential risks especially during earthquakes.

In summary, legislation for planning and land management requires:

- National level legislations that takes into account multiple risks and mandate planning at the local level
- Strategic and forward-looking legislation, rather than reactionary legislation in response to a disaster event(s).
- Legislation that is flexible enough to allow for local adaptation based on the development needs in specific areas, i.e. smaller plots or relaxation of requirements for more affordable land for the poor, possibilities to make some areas safe through design approach.
- Active counterbalances (can be civil society or other governmental bodies) that ensure development decisions are not only profit seeking, but have carefully considered the social, environmental and economic costs of benefits of a particular proposal.

## ii) Urban planning and implementation of plans

*While most governments do see the need to mainstream DRR into planning and building, they also struggle with limited budgets and capacities, either to make land use plans based on good information about disaster risk and/or to implement and enforce plans or zoning. What are the main problem governments are facing in planning, implementing and enforcing land use planning? What kinds of governance structures are working and why?*

### Regional Coordination

A level of regional coordination in planning is effective for enabling risk reduction, and in large urban centres this may entail the coordination of planning across metropolitan areas. This is not to say that regional or metropolitan-level should replace local-level planning and decision-making (it should not), but rather the necessity for some form of regional coordination that enables sharing information and can reach consensus on priorities for land management with regards to disaster risk reduction. A United Nations University (UNU) study, which looked at social geography of urban disaster vulnerability found that out of the four megacities included in the study, Tokyo, Los Angeles, Manila and Mexico City, the

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<sup>7</sup> La ley 11.459/93 de Radicación Industrial, El decreto 1741/96, reglamentario de la Ley de Radicación Industrial y ley 11.723/95, modificada por ley 13.516.

municipalities with legally established, strong and well-financed metropolitan government structures, those being Manila and Tokyo, allowed for more inter-sectoral and intercity coordination for disaster mitigation planning (Wisner and Uitto, 2009).

For risk reduction, the acknowledgement of the region of the physical geography of risk is important, i.e. management of a flood plain in its entirety (Burby, 1998). The case study from northern Namibia offers an example of how a lack of regional level planning can result in the transfer of risk from one place to another. The topography of Oshana Region is extremely flat with very little elevation. Since 2008, the area has seen intense seasonal flooding, where in some places the water stays for up to 6 months. The flooding does not follow a defined water-course, but slowly moves into the low lying ground which makes up most of the region. The towns of Ondangwa and Oshakati, each have their own plans for dealing with the flooding, but the plans for both towns are isolated, designed solely for the purpose of dealing with floodwaters in the locality of their respective areas. For example, the channel that is proposed to manage the floodwater in Ondangwa simply drains directly into a village south of the town, exacerbating the flooding there (Gold, 2010).

This regional planning jurisdiction also aids in the preparation of uniform disaster risk mapping for earthquakes and in prioritising high-risk areas for intervention. For example in Istanbul municipal boundaries were expanded to match the province boundaries since 2004<sup>8</sup>. This enables the municipality to plan for the larger region and to better coordinate its activities with the Provincial Administration. 1/5000 scale geological studies were prepared for the metropolitan region at the level of micro-zones that provide the basis for metropolitan-level master plans. The district municipalities are now working on 1/1000 scale geological studies that will be the base for the district-level implementation plans.

### Multiple Stakeholders

Methods for integrating risk reduction into planning outline the importance of combining local knowledge of individuals and communities at risk with scientific information and also highlight the importance of equality in participation in decision-making across genders, religious and ethnic groups (for example, Wamsler, 2008 or Maskrey, 1989). One of the common methods for gaining broad-based representation in planning for disaster risk reduction is having an advisory committee of the major stakeholders (Burby, 1998; Pearce, 2003). Advisory committees can advise on legislation and policies at the national level and at the regional, local and district level may assist the governing body on developing and implementing land use plans or formulating projects related to disaster risk reduction. An advisory committee would normally include representatives from government departments, representatives of community-based organisations and civil society, experts, and those representing private interests.

The UNU study on urban social vulnerability finds that municipalities benefit from having NGOs or community-based organisations (CBOs) participating in disaster risk reduction planning, particularly because municipalities lack the detailed information about vulnerable groups that CBOs and NGOs have, and also that municipalities lack the trust of vulnerable groups, which CBOs and NGOs have built up through frequent and positive contacts. "The overall conclusion of the UNU study is that municipalities and NGOs/neighbourhood groups need to cooperate, they need to share their strengths and make up for one another's weaknesses. However such cooperation is hard to put into practice" (Wisner and Uitto, 2009, p.10).

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<sup>8</sup> Law No. 5216

The case studies show that legislation and regulation regarding the participation of multiple-stakeholders in planning and development in general is becoming more commonplace. In practice, however, the preparation of plans and projects related to risk reduction still tends to be technical and the inclusion of multiple stakeholders, such as advisory committees or community-based initiatives is either limited or these perspectives are not implemented.

In Namibia, the national-level decentralization policy aims to promote participatory democracy, empowering people at the grassroots levels to actively participate in the affairs affecting their livelihood. The National Policy for Disaster Risk Reduction (2005) has aimed for an inclusive and transparent policy that aligns itself with international human rights. But the role and input of informal settlements and people themselves have been overlooked. In all the documents on policy about climate change and disasters none include any reference any type of community-based organisation (Gold, 2010).

In the Oshana region of Namibia, a Regional Disaster Risk Management Committee was established from 2008, to co-ordinate the management of the flooding as well as supply of emergency services. The committee comprised members from the Ministry of Health and Social Services, Ministry of Gender Equality and Child Welfare, Ministry of Education, Rural Water Supply, Red Cross, Oshakati Town Council and Oshana Regional Council. This committee is centred on the ministries, regional and local government and it did not include the broader spectrum of stakeholders, such as representation by the informal settlements affected by the floods. The other major towns of Ondangwa and Ongwediva have also been unrepresented (Gold, 2010).

In Turkey the legislative framework has several concessions regarding multi-stakeholder participation in building, planning and disaster risk reduction. However, as the case studies reveal, in practice, these forums have actually provided little in terms of consensus planning. In the year following the 1999 earthquake, The National Earthquake Council<sup>9</sup> was established as an independent body affiliated with the Scientific and Technological Research Council of Turkey, and charged with providing information to the public, determining priority research areas, and offering advisory services to public agencies. The council was a forum of universities, professional organizations, civil society organisations, and the private sector. In 2002, the Council prepared a report entitled, "National Strategy for Disaster Mitigation" that focused on comprehensive middle and long term measures, followed by another in 2005, that proposed an earthquake disaster mitigation research agenda (Yönder and Türkoğlu, 2010). However, since the council had been created through a prime ministerial directive, it lacked legislative power and its broad range of recommendations related to disaster mitigation was not implemented. Since 2007 the council did not convene (Gülkan, 2010).

In 2009, along with the creation of the AFAD, the law states that there is to be an Advisory Board comprised of representatives from the relevant ministries and para-public institutions, university departments, and representatives of civil society organisations.<sup>10</sup> It is quite important in terms of multi-stakeholder representation, as it will be the only forum for the participation of the scientific and academic community, and even if to limited degree, professional and civil society organizations in the formulation of disasters-related policy at the national-level (Yönder and Türkoğlu, 2010).

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<sup>9</sup> *Ulusal Deprem Konseyi* in Turkish

<sup>10</sup> In fact the law (Law No. 5902 Item 5) is very prescriptive of who is to be a part of the advisory board, it states: Ministry of Public Works and Settlements, the directors of the Bosphorus University Kandilli Observatory, the Disaster Research Institute, the Mineral Research and Exploration Institute, TUBITAK, and the Red Crescent Association of Turkey, and five faculty members involved in disaster research (selected by the AFAD director from among at least ten, nominated by the Higher Education Council) and three members from accredited relevant civil society organizations.

At the municipal level there has also been legislation regarding multi-stakeholder participation. Recent modifications to the Municipalities Law have seen an opening for mandated citizen participation in urban development objectives. As a result, Citizen Councils (*Kent Konseyleri*) have been set up in community centres in most district municipalities in Istanbul and in some municipalities, mayors conduct weekly public meetings with their constituencies. However, it is not clear both in the law and in terms of implementation what is meant by participation, and in most cases, *Kent Konseyleri* is still only existing only on paper, or advertised on websites (Yönder and Türkoğlu, 2010).

### **Box 2: Prevalence of technical approaches to risk reduction, case of Turkey**

The two cases about Turkey produced for this background paper make strong mention of the fact that most of the disaster management efforts have been technical and legal and that only small attempts have been made at public participation and education. It should be mentioned though, that the lack of multi-stakeholder representation in Turkey is not only related to disaster management, but rather the technical approach and strong government intervention persists in most aspects related development.

Yönder and Türkoğlu (2010) write, “There is no public forum for independent academic and professional policy and program input. Government campaigns in Istanbul for increasing public awareness and preparedness are insufficient, and geared mainly to disaster response within the first 72 hours. Local, community based initiatives on disaster resilience, such as those by autonomous women’s groups, do not get any support from disaster agencies and very limited support from municipal governments. Disaster mitigation is still considered to be an area of technical expertise and a matter of training individual local “heroes”, rather than community organizing and development.”

Gülkan (2010) writes: “Turkey is a prime paradigm for countries that address their disaster reduction policies through exclusively the legislative fiat, at the expense of community-based measures for mitigation and their sustained enforcement. Passing into law irreproachable measures for dealing with hazards and risks is a way of creating the illusion that the occurrence of disaster will pass uneventfully, with some public authority in full control of events. Turkey needs to integrate nationwide, regional and urban development plans such that it becomes feasible to maintain up-to-date data on hazards and vulnerabilities, and to prepare risk assessments to use as the basis for urban development plans and decisions. Legislators may pass bills but it is up to the local governments to ensure that this information and the plans for urban resilience are readily available to the public and fully discussed with them.”

Beyond the participation of multiple stakeholders in urban and regional planning through advisory committees, it is also important to highlight that undertaking a participatory process in neighbourhood design is important in achieving a broad consensus about the best way forward for reducing disaster risk. Barangay Rizal, is an informal settlement with legalised tenure in Makati City, Metro Manila, Philippines, in which a planning project seeking to reduce risk to earthquakes and floods was done through a process of participation involving local officials and zone leaders in partnership with an INGO, the Earthquakes and Megacities Initiative (<http://www.emi-megacities.org/home/>). The project leaders found that engaging all of the important stakeholders from outset was critical in forging consensus on the planning process for risk reduction. However to implement the plan will be a more difficult step—in order to address the physical vulnerabilities, the plan proposes to relocate, to nearby-by mid-rise housing, families who are living within five metres of the fault line, in very high-risk

structures and along the riverside. The idea is to create more open space in the neighbourhood both for parks and playgrounds and also to create space that can be used for temporary evacuation in a disaster. The plan also included widening of access road and designation of emergency routes. The difficulties lie in that households have very limited resources for relocation and would need to be convinced of the project. As well, appropriate legal mechanisms will need to be developed to administer the relocation. "To achieve the redevelopment objectives the Makati City government as well as the [city subdivisions] council will need to forge agreement among the project partners not only on the physical improvement plan but on a package of incentives as well, in order to provide a conducive environment for the proposed development to materialize (Eindiedel et al., 2010, p. 41).

### Implementation of plans and regulations

Even though legal frameworks and plans that provide an enabling environment for risk reduction may be in place, it becomes the responsibility of the local/municipal government to implement the measures. From a multi-year study looking at land-use planning and hazards in the United States context, Burby (1998) comes to the conclusion that the critical barriers to local government implementation of land use planning for risk reduction is based on two distinct, yet inter-related factors, those being *commitment* and *capacity*. Most local governments may lack commitment to disaster risk reduction because in their context other concerns such as basic infrastructure, unemployment, housing and education are much more critical. Local government are more willing to advocate measures if their constituencies suffer chronic losses from disasters. Most local governments struggle with having the capacity to implement measures, which is usually due both to a lack of expertise and lack adequate staff to undertake reviews and inspections. Burby advocates that the central government needs to take a lead role in building local capacity and commitment for planning-related risk reduction.

In the past, there has been an operational and professional separation between urban and regional planning and disaster management. Although bridges across these disciplines are being made, a divide is still prevalent in most governments. Disaster management has been the domain of government civil protection units and has generally been focussed on contingency planning to respond to disasters. In the past, urban and regional planning has engaged little with aspects of disaster risk, except in the aftermath of a disaster. While government initiatives to mainstream activities for reducing disaster risk into urban and regional development is becoming more commonplace, there are still traditional divides between the ways the government departments are organised and also in the background and the training of the staff (Pearce, 2003).

The case studies and other research uncover more detailed on why the divide between risk management and planning are problematic. First of all, the separation between the functions of departments within local government can hinder implementation because it relies a strong degree of coordination across departments, which remains difficult to achieve. For example in Turkey, preparation of disaster risk maps is now conducted under the AFAD, but the Ministry of Public Works and Settlement oversees land use planning, development and building controls carried out by municipalities. Thus, in Turkey, as in many other countries, there are essentially two different Ministries carrying out the activities related to land use planning and to disaster risk reduction.

In Canada the federal, provincial and municipal agencies all have a role in managing flooding. The federal government does research, flood mapping, and training of emergency management officials. The provincial (regional) governments are responsible for establishing regulatory flood levels, setting building standards, flood mapping, and advising local

governments in flood management. Municipalities in turn must pass bylaws on building codes and prepare land use plans and emergency response plans. The system in Canada does involve higher levels of government supporting the local governments in a way that should help to reduce flood losses. However, some have criticised this system because the way it is set up governments can end up passing on the responsibility to others and thus no one is ultimately responsible for flood management (Shrubsole, 2010). In the region surrounding Montreal, Canada, it has been found that flood risk mapping and subsequent designation by the Quebec provincial government of flood-risk zones actually does very little to reduce development in the area nor has little affect on property values—both of these despite the fact that property owners cannot purchase flood insurance (Robert, Forget and Rouselle, 2003). Strong development pressures and the necessity to increase the tax base means that municipalities in the province of Quebec continue to permit development in the floodplains (Christin, 1997).

Another aspect illustrated by the case studies, follows on from the point made by Burby (1998) about capacity – that **local governments are responsible for approving development projects and building plans and they are the front-line of risk reduction in planning and building. However many local governments, especially in smaller towns or poor districts, do not have adequate staff with the adequate technical capacity.**

Lack of staff and technical capacity at the municipal level has impacted both on production of good plans and ability to encourage safe building in Turkey. Gülkan (2010) explains that with the development law of 1985, 'powers of plan-making and ratification have been delegated to the local governments, irrespective of size and manpower-resources,' and that with respect to the enforcement of building codes, 'municipalities and governorates are known to be understaffed, and cannot fulfil even the task of keeping registers for contractors active within their jurisdictions...in practice, municipal engineers were not able to check thoroughly all of the design calculations because of their heavy workload or their professional qualification. This has always been identified as one of the core reasons for failure of code enforcement'

Hardoy & Pandiella (2009) in a study looking at urban poverty and vulnerability to climate change in Latin America conclude that disaster risk is shaped by, "the long-evident incapacity of governments to address risk and to integrate development with the reduction of vulnerability. Meanwhile, within local governments, there is generally an institutional incapacity to address this issue or to control pollution and protect natural resources; and also a lack of accountability to citizens in their jurisdiction and little or no scope for citizen participation" (p.204).

A study looking at flooding in African cities concludes, "local authorities are best placed to cope with flooding from small streams whose catchment areas lie almost entirely within the built-up area. They administer the regulations and by-laws concerned with land use planning and should be involved in local disaster management. However, most African local authorities lack the human resources and financial power to carry out such responsibilities effectively. They may be able to form partnerships with NGOs but they should be supported by national governments and regional agencies to map flood risk areas, maintain urban stream channels, control building in flood channels and on floodplains and provide emergency assistance" (Douglas et al., 2008, p. 203)

**In some localities, the need to satisfy short-term concerns for profits or for other development needs underwrites the decisions of municipalities to uphold disaster risk reduction measures, especially in localities where there are not frequent disaster events.** In a study looking at earthquakes and urban planning in Turkey, Sengezer and Koç

(2005) provide an interesting account of planning processes in seismically active cities of Erzincan, Adapazari and Avcilar (latter is now a district of Istanbul). In each of the areas, the earthquake risks were well-understood and urban plans accounted for risk reduction either by limiting building heights, types and densities or encouraging development in areas with more stable soil conditions. However in each of the cases, the pressures to offer higher densities as the populations expanded, made it so that subsequent planning decisions allowed for relaxation of these regulations, even though the areas were at high risk (see Box 3).

**Box 3: Tracing the development decisions that lead to risk in urban areas: case of Adapazari, Turkey**

Adapazari, a city in the north-western Marmara region of Turkey, has suffered earthquakes in 1943, 1967 and in 1999. After the 1943 earthquake, the 'Adapazari City Development Commission Report' recommended that the city be expanded to the terrace areas to the south-west of the city, which it was observed had undergone less damage in the earthquake and delimited areas which should not develop due to unstable soil and high ground-water conditions, especially along the rivers. A plan produced in 1957 complied with these recommendations. In 1957 the population of the city was 65,000 and the density was 100 persons per hectare. After the earthquake of 1967, it was suggested that the height of buildings should be limited to three storeys, as it was the higher buildings that proved to be more vulnerable in the earthquake. By 1985 the population of Adapazari had reached 200,000. The development plan of 1985 called for development towards the riversides, violating the principles of the 1957 plan, which had prohibited construction in this area due to geological concerns for earthquake risks. In the 1990s, growth of industry in the city increased, including the opening of the Toyota automobile plant, and most of the industrial parks were located in the alluvial agricultural areas. By 1997, the population had reached 300,000 and the density was 350 persons per hectare (up to 600 persons per hectare in the city centre). In the 1990s, 'numerous modifications to plans, some of which were limited to an avenue, a street, or even a building lot, were made in order to increase building densities regardless of ground conditions and the risk of an earthquake' (Sengezer and Koç, 2005, p. 178).

In summary, the main points to be made regarding *urban planning and the implementation of plans* are:

- Local governments are the 'front-line' of risk reduction in planning and building, responsible for approving development projects and building plans. However many local governments, especially in smaller towns or poor districts, do not have adequate staff with the adequate technical capacity.
- Commitment of local governments to risk reduction is impacted by competing interests, such as economic growth. This is especially prevalent in localities where there are infrequent disaster events.
- Traditional separation of the departments of disaster management and urban planning is still prevalent in most jurisdictions. Disaster management is still seen largely as contingency planning for disaster response rather than a larger perspective on urban resilience.

- The importance of regional-level planning, especially in areas with potential to be impacted by a similar event, i.e. a flood plain, a coastal region, a fault line. Regional planning enables uniform information about risks, and ensures that risks reduced in one place displace risk to another locality.
- Despite legislation enabling multiple stakeholders' inputs into planning for drr, nations and cities do not easily achieve a true multi-stakeholder perspective; although positive examples to exist. Challenges seem to lie in the capacity of planning offices to overcome the purely technical approaches to disaster management and planning and instead embracing pluralist perspectives.

### iii) Reducing disaster risk in informal settlements through planning, land management and upgrading

*As an increasing number of city and national governments support upgrading in informal settlements as a key part of their policies, what kinds of regulatory frameworks are used to ensure and support disaster risk reduction in the upgrading process? What are the unintended consequences of risk reduction on tenure security?*

#### Security of tenure, evictions and risk reduction

Security of tenure in informal settlements generally enables investment in infrastructure and in better housing quality, thus reduces risk to flooding, fires and other hazards. Additionally, stronger social networks are made through longer-term tenancy and these social networks are important coping mechanisms for disaster events (Jabeen, Johnson, Allen, 2010).

However findings from the case studies indicate that regulatory frameworks may negatively impact on the security of tenure of informal settlements, in turn increasing the level of risk for those people. In the cases presented here, there are examples of regulations that aim to prohibit development in hazardous areas (location approach), or seek to replace informal settlements by higher income uses in which the designs and new construction can be made to a hazard-resilient standard (design approach). In both of these situations, legal tenure cannot be granted to settlements already located in these areas and in some situations former tenure arrangements may even be revoked in an effort to reduce risk, meaning that those settlements cannot upgrade, or are removed or both. The difficulty here lies in that while overall this may reduce the risk of a disaster in a certain locality, i.e. along a river course, it is also increases the vulnerability of people because they cannot upgrade settlement or because they may be forced to relocate. In most situations, given the choice, people would choose to remain where they are. In some cases, communities may choose to relocate and negotiate the terms for these that are beneficial for them. However, more often, relocation means that people are living in areas further from livelihood opportunities and do not receive just compensation for what they have had to leave behind (Cabannes, Yafai and Johnson, 2010). Also in the new settlements, buildings may need to conform to existing building standards and plot sizes, which in most instances is difficult to comply with given what people can afford to spend.

The case study in Namibia explains that in Oshakati, subsequent to the master plan developed for the city by external consultants, the town council has prohibited permanent construction in Oshoopala settlement, as this settlement is designated to be developed into middle and high-income housing. It is likely that the current informal settlement in Oshoopala will be resettled in another area. The residents issued the following statement, "As a long term plan, we the residents want to construct retaining walls and increase the level of the ground so that the shacks can be sited on higher ground. This would prevent the water from entering the

shacks in the first place. But we may not do this since the Town Council has prohibited the construction of any upgrading to permanent structures in informal settlements due to our insecurity of tenure. The Oshakati Town Council master plan has provided for the relocation of the settlement and the development of this site into a formal upmarket water front development. Since we do not have right of ownership to occupy the land it is also difficult to apply building codes and improve the houses by building permanent flood proof houses.” In Oshakati, security of tenure is required for people to obtain financing or permission to upgrade their houses. Before the towns were officially declared, families had obtained permission to occupy the land and construct their houses from the traditional authorities, but with the newly declared towns or inclusion of the informal settlement into towns the local authorities have to formally include the informal settlements in the town planning schemes and develop services before development could start legally. Due to the fact that permission for occupation was obtained under the traditional land allocation many households did construct more permanent houses, while this permission has now to be obtained from the Local Authority (from Gold, 2010)

In Buenos Aires a similar situation is true. Legal restrictions for land use, building and hydrology make it so that informal settlements formed in areas in which development is restricted because of flood risk, have not been able to achieve security of tenure. Figure 3 outlines the regulation required for formally registered land, which indicates that formally registered land must pass a series of requirements, including those that are meant to reduce flood risks. However, the reality is that people have settled on parcels of land that do not meet these requirements.

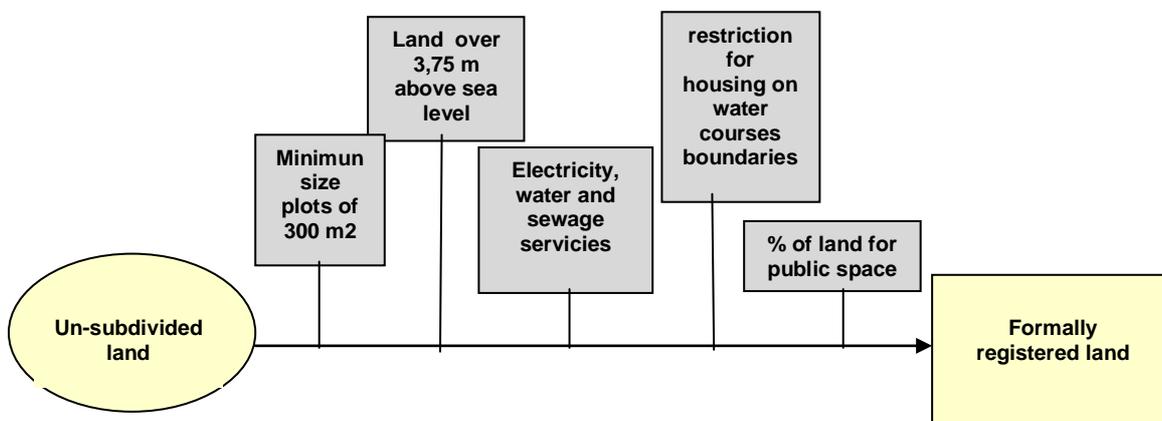


Figure 3: Requirements for the regulation of urban land according to the law in Buenos Aires, Argentina. Source: Almansi et al., 2003.

In Istanbul, Turkey, the earthquake mitigation strategy is to improve the resilience of the largely informally built housing stock through the demolition of these settlements and the construction of new buildings in their place. This is done under a newly established legal framework on urban transformation<sup>11</sup>, which gives municipalities the power to rehabilitate urban areas or to mitigate disaster risk (figure 4). In metropolitan areas, district municipalities can implement such projects within their jurisdictions with the approval of the metropolitan municipal council. However, under these urban transformation projects the new houses are unaffordable for the original occupants of that land, who are generally relocated to the periphery areas of the city. Even then many people cannot afford the price for the new houses that they are relocated to (Cabannes, Hasan and Baysal, 2008). The Housing

<sup>11</sup> In June 2010, Law No. 5998, an amendment to the Municipal Law No5393 of 2005, expanded item 73 on urban transformation (*kentsel donusum*).

Development Administration of Turkey (TOKI) is a key partner to municipalities in the implementation of urban transformation projects (see box 4).

Box 4 Supreme powers of urban transformation: The Housing Development Administration of Turkey (TOKI) (from Yönder and Türkoğlu, 2010)

TOKI was established in 1984 under the Prime Minister's Office with a mission is to create "an opportunity [for citizens] to own their home, or live in a neighbourhood with modern schools, business areas, hospitals, mosques and libraries... [Its] long-range strategic plan is to create low and medium income social housing, facilities and infrastructure. TOKI will also revitalize blighted neighbourhoods, restore and reconstruct buildings of historic importance and create the infrastructure for rural areas and provide housing, infrastructure and social facilities for the victims of disasters" (from TOKI website: <http://www.toki.gov.tr/>). From 2003 to 2010, TOKI developed 430,000 units of housing and is aiming to reach 500,000 units by the end of 2011.

TOKI is a relatively autonomous entity with its own budget outside the regular budget, which has played an increasingly important role in urban renewal and development over the past decade. TOKI has the authority over master plans to establish new development areas, in some cases, the boundaries of environmentally sensitive sites can be changed to accommodate its development projects, as in the case of an old city landfill in Halkalı, Istanbul.

The municipalities' partnership with TOKI is initiated through a request by the municipality, and after the geological analysis of the development site is completed, a protocol is set up between the two entities to determine the liability criteria. Priority is given to the transformation of high-risk areas, and suitability of the development site is analyzed in relation to the master. Recently, TOKI announced that, over the next five years (until 2015), it will build 50,000 units of disaster housing. It imposes minimum and maximum size limits on the areas to be transformed, according to the head of TOKI, the new policy will be to transform unsafe areas of the city "lot by lot", tearing down buildings if 51 percent of homeowners are in favour. This is allowed under the Law passed in June 2010, Law No. 5998, an amendment to the Municipal Law No5393 of 2005, expanded item 73 on urban transformation (*kentsel donusum*) projects to give municipalities the power to initiate Urban Transformation Projects to rehabilitate urban areas or to mitigate disaster risk. In metropolitan areas, district municipalities can implement such projects within their jurisdictions with the approval of the metropolitan municipal council.

### **Socially sensitive responses to urban upgrading**

The PROMEBA programme in Argentina, which facilitates upgrading of informal settlements has been able to reduce risk in informal settlements through upgrading that enables legalisation of land tenure (Almansi, 2010). PROMEBA is a national program that was launched in 1997 and aims to improve the quality of life for residents of the villas and informal settlements that lack titles, infrastructure and basic services. The programme focuses on sectors where at least 75 per cent of households have unsatisfied basic needs, where income levels are below the poverty line and where the habitat shows serious deficiencies. The items financed include basic infrastructure networks (water, sewers, electricity and gas) and community use facilities (public kitchens, primary health centres, sports facilities). This programme is limited in its implementation since it can only work in areas where it is feasible to legalize land tenure, that is, the informal settlements that have been occupied for a certain time and are consolidated, but were not regularized principally by hydraulic constraints contained within the regulations. PROMEBA has worked with three

settlements that are in the boundaries of the old channel of the Reconquista River in Buenos Aires. This is a restricted area for human settlements for two reasons: 1. It is below the flood level set by the Law No. 6254 and 2. It does not respect the distance of 50m to the boundaries of the river as established by law No. 6253, and also the plots are 100 m<sup>2</sup> (200 m<sup>2</sup> less than regulation standards). But since ten years ago public works began to modify the course of the Reconquista River. This has consequently modified the risk map that flattens the curve of flood, so currently it is possible to regularise these settlements. Through the promotion and approval of the hydraulic plan implemented by the program, which shows that these areas are not flooding any longer, the legal barrier it can be overcome and land can be legalized. In actuality however, there are no comprehensive studies that can provide information about the behaviour of the entire basin. The programme only focused on the situation of these settlements and their surroundings.

Work of the Philippines Homeless People's Federation illustrates that it is possible that people will voluntarily resettle to other lands if their current areas are at high risk and if they can negotiate or find good conditions for resettlement onto safe lands. Having a strong community-based organisation enables this kind of articulation of needs and negotiation. This was the situation Iloilo, Philippines, a city of 41,870 households including 16,754 households that live in informal settlements (year 2000). After Typhoon Frank inundated many coastal settlements in Iloilo in June 2008, the Philippines Homeless People's Federation were able to negotiate with the municipality to relocate almost 2000 families to safer lands in San Isidro (Dodman, Milton and Rayos Co, 2010). After a trash slide in 2000 in Quezon City, Philippines, the Homeless People's Federation who were working to voluntarily transfer people living in the risk-prone areas, to resettlement sites, found that one of the hindering factors in the recovery was the stringent regulations and requirements for land and housing construction, citing examples of agricultural land conversion clearances, building permits, fees and taxes (Co, 2010).

In Istanbul, Zeytinburnu, one of the earliest squatter settlements in the city has developed into a high-density moderate-income district after regularization of tenure. The Merkez Efendi neighbourhood was selected as pilot for a participatory design process, The Matra REGIMA Project, initiated by a proposal by the Dutch Ministry of International Affairs. The project was carried out in partnership between the district municipality and the Istanbul Technical University and involved working with one third of the residents of a single urban block to make a proposal for redesign of the neighbourhood (Yönder and Türkoğlu, 2010).

### Safe Land

Once people have settled on land, resettlement is often not possible because of social pressures for people to stay on the land that they have occupied for many years. Thus, as urban areas continue to grow, people need land to settle on that is safe from disasters. In many cities, the provision of safe land is the most vital aspect that local governments can undertake for controlling disaster risk in urbanising areas going forward. This entails developing the regulatory mechanisms that enable the urban poor access to land that is not in high-risk areas and regulations that allow them to have tenure security, both for business and housing, in an affordable manner.

The case study from Argentina makes the point that the planning regulations and laws, which try to regulate the land market in Argentina, "have had a central impact in determining land values, and in population distribution in cities. These planning regulations are essential in determining the process of spatial segregation, by setting standards for building unattainable by the poorest sectors of the population and by keeping the areas best located and better served with infrastructure for residence and activities of the privileged sectors...people need

land to settle on that is safe from disasters, otherwise the land market and city economy are working at odds. Land policies favour rich, which is putting poor more at risk of hazards, thus the land policies need to be addressed before hazards can be really be addressed” (Almansi, 2010)

In Windhoek, the capital city of Namibia, with a population of 223,000, a network of urban poor groups, Shack Dwellers International, has been working with the local government as well as NGO professionals to develop progressive regulations for land and housing policies, which is enabling people to access safe land in an affordable manner. In Windhoek, 26 percent of people are living in informal settlements and thus the policy revision came about in part because of the recognition that former housing policies were not working for the very poor and were making health conditions worse for them. Under the new policy, the municipality recognizes the different levels of affordability that households have and makes propositions for types of tenure based on affordability. Changes to the tenure laws allow the very poor to access land by making it possible to have more than one family sharing ownership of a plot. Plots sizes have also been reduced so people can hold titles to smaller plots, depending on what is affordable. One aspect that makes this policy possible is that there is no value placed on the land, and the municipality is only interested in cost recovery of the services it installs (Mitlin and Muller, 2004).

In summary, the main points to be made regarding the reducing disaster risk in *informal settlements* are:

- The social and economic impacts of regulations on households, especially those living and working in informal settlements need to be better understood. Regulations, policies or projects that aim to reduce risk to hazards can also have detrimental impacts on poor or those living without secure tenure. It can make access to well-located land unaffordable for people, cause evictions, and force people to relocate to periphery areas, which may be too far away from livelihood opportunities, services social networks.
- One of the most important things that municipal governments can do to provide an enabling environment for drr, in terms of land and planning, is to enable people to have access to safe land on which to build. This is especially important for rapidly expanding urban areas.
- Strong CBOs, in partnership with local government, can help to influence better policies for land management and upgrading.

We now turn to an examination of the other key aspect of regulatory frameworks for risk reduction, that of enabling safe building and construction.

## PART 2: BUILDINGS AND CONSTRUCTION

Improving the development and application of building codes is central a central concern for disaster risk reduction. With respect to building codes, the Hyogo Framework for Action specifies: 'Land use planning and building codes' under priority action 4, stating: 'Encourage the revision of existing or the development of new building codes, standards, rehabilitation and reconstruction practices at the national or local levels, as appropriate, with the aim of making them more applicable in the local context, particularly in informal and marginal human settlements, and reinforce the capacity to implement, monitor and enforce such codes, through a fostering disaster-resistant structures.' Furthermore the current ISDR Resilient Cities campaign, which offers a ten-point checklist for reducing risk in cities includes building regulations as key component stating, 'Apply and enforce realistic, risk compliant building regulations and land-use planning principles.' (ISDR, 2010)

There are several different terms used regarding regulatory frameworks for building (see box 5). However, ISDR uses a unified terminology defining *Building Codes* as: Ordinances and regulations controlling the design, construction, materials, alteration and occupancy of any structure to ensure human safety and welfare. Building codes include both technical and functional standards. This paper uses terms *Building Code* as per ISDR terminology, unless otherwise specified.

In US, UK, Japan and Australia good regulations, which define design loads, specify construction details, provide hazard zoning have been shown to minimise damage and save lives (Spence, 2004). However benefits of regulations are less clear when concepts and prescription of advanced codes are transferred to countries less able to apply them rigorously. Another problem with the application of codes in many low and middle income countries is that attaining standards increase costs of building beyond what poor can afford.

In informal settlements for example, people prefer upgrading rather than construction on a new piece of land partly because they are then less constrained by building codes & planning regulations. In a new site, they must meet all these standards, but in incremental buildings these are not necessary, thus it is much cheaper to build there. In some instances, people are able to adapt their building methods in informal settlements to reduce risk for more frequent disasters (i.e. annual flooding in Dhaka, Bangladesh) (Jabeen et al., 2010).

### Box 5: Terminology on regulatory frameworks for building

There is a difference between *statutory* Building Regulations/Building Legislation, and Building Codes/Building Standards that *support regulations with the technical requirements*. Some definitions include (source: Yahya et al., 2001, p. 143-144)

- **Building Legislation:** Encompasses **all legal instruments** for controlling building operations. It normally takes the form of one or more acts of parliament or legislature, for example a Building Act or Housing and Urban Development Act.
- **Building Regulations (or rules):** A set of detailed controls for the construction of buildings. They expand on Acts, but on their own are **statutory**. These detailed rules may therefore address such elements as site conditions and use, water quality, means of access, natural lighting, ventilation, fire resistance, lighting and earthquake protection of

buildings. Both regulations and rules are administrative edits drafted for the purpose of implementing a particular policy or strategy

- **Building codes:** A set of practical, technical and administrative rules and requirements for the construction of buildings. Building codes are **not statutory, unless made so in the regulations**. In most instances, regulatory and mandatory issues are contained in the regulations, whereas the codes support the regulations with technical requirements and details.
- **Building Standards:** Covering the physical characteristics, materials, components and buildings and how they will be deemed as satisfactory for use in the given context. They regulate design by specifying such items as room size, distance from adjacent buildings, types of material and construction techniques. There are also standards for specific materials. **Standards, to which codes and regulations often refer, are normally published separately.**

### i) Designing and developing appropriate codes and standards

*While most countries do have building codes of some kind, the challenge here is developing codes that are appropriate for the local economic and environmental conditions and that respond to current building practices and technology. What are some examples of responsive building codes and how have they been developed?*

Findings from a multi-country study by Practical Action<sup>12</sup>, looking at the design and application of building codes in low-and middle-income nations concludes that *codes need to be locally developed and related to the local system of design and building so that they match the capability of the local professionals or those who will be applying the code* (Yahya et al., 2001). In many countries, codes have been directly transferred from the colonising country and few revisions have been made; building to the standards of the codes is not affordable by half the population. Very often they do not allow incremental development, going for a uniform solution that is trying to suit everybody. Keep income generation separated from housing. In other countries, each time there is a disaster event, new aspects of the code are added, and codes have become increasingly sophisticated requiring specialists to decipher them. In some cases, simple 'deemed to satisfy rules' whose application is obvious (e.g. limiting storey heights, prescribing positioning and size of openings) might be more appropriate than more complex performance specifications. It is generally easier to modify rules than to train and employ a cadre of professionals to apply and police codes that are unrealistic.

The Practical Action case study in Kenya illustrates this point: "50-70% of urban residents in Kenya live in informal settlements where a substantial portion of the population makes use of earth and timber-based products. Local by-laws completely ignore this fact, specifying instead modern materials and techniques: cement and mortar, steel and electrical and sanitary installations that are appropriate for middle and high income housing, and commercial and industrial developments. Since majority of low-income urban residents cannot afford these materials or techniques, most building in the rapidly growing informal settlements (whether or public or private land) contravenes both land-use controls and building standards," (Yahya et al., 2001, p.75.)

Based on its study findings, Practical Action offers some principles to guide code revision efforts:

- **Relevance:** revisions should be relevant to environmental and economic circumstances and deeply rooted in local cultures and living habits

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<sup>12</sup> Formerly called Intermediate Technology Development Group (ITDG)

- Cost reduction: changes must result in cost reductions so that adequate and affordable shelter is attainable for all
- Focus: focus on improving conditions for poor in informal settlements
- Participation of all sectors of housing delivery process
- Flexible to allow for interpretations, variety of materials and technical solutions, innovations
- Access: legislation should be easily accessible and widely disseminated
- Incremental improvement of dwelling and surroundings can happen
- Procedures: plan approval fast, free from corruption and inexpensive for builder.

(Yahya et al. 2001)

An example from Bangladesh shows how codes are in direct contradiction to what people actually live and build. The Bangladesh National Building Code (BNBC) identifies only government bodies or public agencies to be responsible for planning minimum standard housing development for the low-income people in urban areas. It defines the minimum standard housing to have a density of 75 units/hectare with average 5 persons/dwelling. The minimum plot size varies between 30 sq. m to 25 sq. m in dense metropolitan areas. Minimum width of walkways is to be 3 m while the requirement for infrastructure follows the regular development requirements. Individual plot can have maximum of 75% land coverage with 1.5 m open space at the front. Minimum size of the 1<sup>st</sup> habitable room is 9 sq. m and the 2<sup>nd</sup>, 6 sq. m making of 15 sq. m in total. There is no option of incremental development to improve living environment while still living in self built construction. Also there are no considerations about addressing risk varying in different locations (from Jabeen and Mallick, 2009).

The photograph below shows an example of how people can realistically afford to live in an informal settlement in Mohammedpur, Dhaka. In these rental units, families averaging six to eight people in size are living in a 9 sq. m one-room dwellings cantilevered over the water (thus there is actually even no plot of land). The walkways are 1.5 metres and there is no outside space.



Figure 4: Informal settlement in Mohammedpur, Dhaka does not conform to Bangladesh National Building Code (source: Huraera Jabeen)

In Bhuj, Gujarat in 2001, traditional dwellings built with low-strength masonry, as well as modern, reinforced concrete buildings were the major causes of deaths and damages from the earthquake. India had a long-established seismic code, first published in 1962 and periodically updated. However before the 2001 earthquake, even though the code existed, it was left to the discretion of owner, builder or engineer about whether to apply the seismic code provisions, although it was required for public buildings. Thus most of the private buildings, including apartment blocks built by developers, did not conform to the code. After the Bhuj earthquake, compliance with the Code has become mandatory in all areas of highest seismic risk. However, two municipalities, Bhuj and Anjar, which were the worst affected in the 2001 earthquake, decided to simplify the rules for reconstruction, prohibiting all construction higher than two stories. The rationale was that they were more accessible for people and could be simplified in terms of procedures (Spence, 2004). In the long term, this kind of standard may not be realistic given required urban densities, however it does illustrate the point that simple and achievable standards may be better at achieving risk reduction than those that are too sophisticated to be implemented properly.

A case study on Kenya, which was part of the Practical Action study, illustrates some important findings about developing and applying appropriate standards (Yahya et al. 2001):

- Firstly, the study finds that in Kenya there are actually fifteen different national legislations that are relevant to housing and a similar number of government agencies responsible for policy, legislation, enforcement and control of housing. Existing

statutes are in some cases contradictory. This web of legislation is cumbersome and expensive, making things confusing for developers and extremely costly for them to obtain permits. The end result is that codes are, 'no more than minor irritants that they ignore' (Yahya et al. 2001, p75).

- Secondly, it is apparent from the Kenya case study that the challenge of reforming the building standards does not end with official recognition of the new standards, but instead it requires an aggressive dissemination strategy of how to apply the new standards. In Kenya, there have been several concerted actions by both national and international actors to review regulations and to create revised standards that are locally developed and better matched to the way people build. In 1995 a set of amendments to the building code that applied to low-cost housing and a manual of 'deemed to satisfy' solutions were formally adopted by the Minister for Local Government. Even though 30 local authorities adopted the regulations, they have not been uniformly applied; most of the implementation of these standards has been on a project-by-project basis. This lack of application of the revised standards is attributed to four factors: poor information flow, lack of general institutional support at both local and national levels, inadequate resources and bureaucracy

**Box 6: The creation of an earthquake building code in Iran (from Building and Housing Research Centre, 2010)**

In Iran, the destructive earthquake in Bueen Zahra in 1962 was a turning point in achieving a national consensus on the necessity for special regulations regarding design and construction of buildings. In 1964 the Plan and Budget Organization of the Government released report of a research on "Temporary regulations for protection of buildings against earthquake". This was followed by establishing of a "Committee for Regulations" in the Ministry of Development and Housing and the release of a report on "Regulations for safety of buildings against earthquake" in 1967. In these regulations, constructions of buildings with more than three floors and higher than 11 meters were permitted only with steel skeleton or armed cement constructs. The Building and Housing Research Center (BHRC) of the Ministry of Housing and Urbanization initiated the revision of the "Regulations for Safety of Buildings" with the aim of reducing the loses and damages caused by earthquakes. Toward this objective, the BHRC in cooperation with a committee of academic experts organized a seminar on "The impact of earthquake on conventional buildings" and carried out extensive studies and researches which resulted in the release of "The regulations for building plans against earthquakes" in 1987. These regulations with the cooperation of the Organization for Standardization and Industrial Researches was adopted under number 2800 and considered as the main national standards for building design and plans against disasters. The Iranian Standard 2800 was endorsed by the Cabinet of Ministers and put officially into effect for implementation in 1987. The major destructive earthquake occurred in 1990 in Rudbar and Manjil in North West of Iran reflected the importance of Standard 2800 in reducing the risk of earthquakes. Since then, the Standard 2800 has been applied in almost all certified buildings in Iran.

## ii) Regulations and practices surrounding the application and enforcement of building standards

*Enforcement of building codes is extremely problematic in low and middle-income countries. Building supervision and site inspections of the building process can be marred by lack of capacity to do checks or sometimes corruption, leading to disastrous results. What is being done to improve the practice of building code enforcement? What are the political and economic constraints and opportunities?*

As outlined in the previous section, the revision of building codes or standards so that they are obtainable by low-income households can enable safer construction. However, as also indicated above in the case of Kenya, the adoption of good codes does not mean that they will be applied nor does it mean that they will be enforced. There are two particular aspects with regards to enforcement that are central to this study.

The first aspect is that good codes, which are simple to understand, thoroughly disseminated and accompanied by awareness raising and education campaigns can create a 'compliance culture', where builders are in support of safe building and complying with codes does not impact on costs. The idea is that regulatory frameworks could be a process for enabling us to do things better, not as a centrally produced laws that inhibit development.

The second aspect is about the enforcement of building codes. The damage from many large-scale disasters, especially for earthquakes can be partly attributed to the lack of application of building codes-- the failure to enforce codes and to verify the quality of construction during the building period. This appears to be especially important when reinforced concrete is being adopted as a new building technology in urban areas, as we have witnessed from most of the intensive earthquake disasters in the last ten years. Thus in addition to a having appropriate building codes and the enabling of a 'compliance culture' where building codes are adhered to, this study puts forth that there are three points that need attention with respect to the application and enforcement of codes:

- A legal basis that ensures a system whereby responsible entities are accountable for the safety of buildings;
- Adequately trained staff and budget at the municipal level to carry out checks
- Simplification of procedures for approval of projects

Each of these aspects, in addition to the 'compliance culture', is explained below with reference to examples.

### **Challenges in drafting a legal basis and lack of capacity at municipal level to enforce codes: Evidence from Turkey**

As outlined in the Turkish case study by Gülkan (2010), in Turkey, the estimated number of detached buildings is thirteen million. Experience shows that the average earthquake resilience of these buildings was very poor, caused by a combination of poor (or nonexistent) codes, poor code enforcement, absence of workmanship qualification, ad-hoc material standard enforcement and absence of legal mechanisms to seek meaningful redress of grievances. After the earthquake in 1999 in the Marmara region caused the collapse or severe damage of one hundred thousand buildings, it became apparent that a new regulatory system was required to ensure that buildings would be built safely. The case provided for this background paper details the story of how, following the 1999 earthquakes, the country tried to create a strong regulatory system of building supervision. Even though there was a lot of momentum behind developing a accountable system in the wake of the destruction from the earthquake, interestingly, the new system ultimately failed to be passed into law, due to lack of support by some interest groups and the fact that such far reaching changes to the system

also required changes to civil law, commercial law and insurance laws. The point to be made here is that even **though there may be a strong commitment to making the necessary regulations for enforcement of codes, and ultimately for risk reduction, the political and economic realities of getting laws passed and implemented can sometimes cloud the good intentions.**

Another point illustrated by this case study, is that in **order to develop a system whereby adherence to codes is created through regulations, there needs to be a legal basis which places responsibility on an entity (organization or institution) that is ultimately accountable for the safety of the building.** In most countries, it is ultimately the municipality or local government that is responsible for approving building plans and ensuring that buildings are properly built according to the plans. However, as was discussed previously in this paper, in most low and middle-income countries, local governments lack the capacity to carry out these checks thoroughly, either because they do not have the technical expertise, the manpower, or both. In countries where there is a mortgage system that requires private insurance for homes and businesses, it often means that in order to receive a mortgage, the owner must be able to purchase insurance. These two mechanisms have a positive impact on ensuring that buildings are safely built (and located), since insurance companies will be hesitant to underwrite buildings if the risk is very high. However, in countries where home or business mortgages are less prevalent, it ends up to be the understaffed municipality, which is bearing the brunt of this responsibility.

To illustrate these points, a synopsis of the system of building supervision in Turkey and the efforts to amend it, is drawn from Gülkan, 2010 in Box 7.

**BOX 7: The system of building supervision in Turkey and the efforts to amend it following the devastating 1999 earthquakes (quoted from Gülkan, 2010)**

Development Law No, 3194, is the principal instrument governing how buildings are created. Control over enforcement of building codes in privately owned buildings is possible within municipal bounds, defined loosely as townships with more than 2000 population where municipal engineers theoretically have powers to enforce compliance with regulations. Building plans are submitted to the municipal authorities with the signature of a design engineer who is responsible for code compliance. In practice however, municipal engineers are not able to check thoroughly all of the design calculations because of their heavy workload or their professional qualification. This has always been identified as one of the core reasons for failure of code enforcement.

Additionally, the law holds municipalities (or governorates for buildings outside of urban areas) responsible for project supervision. Construction supervision is entrusted to engineer of record. Holders of deeds or parcel assignment certificates submit petitions to either the relevant municipality or the governorate to acquire building permits. In addition to the certificate of land ownership the applicant must submit architectural, structural, and mechanical designs as well as a schematic drawing of the buildings location. The law has granted much freedom to local governments in discharging of their responsibility of design checks. It is not clear what qualifications checkers must possess in controlling the designs submitted to them. Some municipalities have transferred this duty to the local branches of the Chambers of Civil Engineers or Chambers of Architects through informal agreements. In the opinion of Polat Gülkan, this is a dangerous and ultimately illegal act because the law clearly holds the local government liable for ensuring the life and property safety of the

people it serves. The customary procedure is that the technical offices of municipalities function as rubber stamps in their approval work. Municipalities and governorates are known to be understaffed, and cannot fulfill even the task of keeping registers for contractors active within their jurisdictions.

The Development Law does not specify what measures are to apply if incorrect or flawed designs are approved. Legal precedent appears to hold the design engineer responsible in this regard, even though others may have approved it. The seismic requirements are of course really for the municipal governments to enforce when they issue building construction permits on the basis of project designs that have been submitted to them, but this fact is overlooked in the wording of the Regulation. There exist a number of penalties for the contractor or the engineer if certain provisions of the law are not fulfilled. In general, the penalty clauses of the law are not enforced, and violations are tolerated. A glaring omission exists also in that no guidelines are given in the text of the law as to how the engineer is to supervise the construction for which he is responsible.

A more serious situation is that, even though the engineer of record is charged with the protection of the rights of the property owner, in the case of private build-sell agreements between parcel owner and contractor, he usually receives his salary from the latter. The prospects are illusory for the site engineer of record to exercise a vigorous control on the person he is supposed to be supervising when that person remunerates his salary as well.

Following the earthquake in 1999, a 'Decree with Power of Law,' No. D595 pertaining to "Building Construction Supervision" was enacted. In it, the outline of an oversight administration was created for all buildings to be constructed in 27 provinces (out of 71 provinces in the country) that of course included those that had been impacted by the Kocaeli and the Düzce earthquakes. Essentially, the decree defined four principal actors in the housing delivery process. These were the design engineer, contractor, site engineer and the building construction supervision firm. Firms were categorized into three classes depending on the size and nature of technical staff they had on their payrolls. Better-staffed firms could be entrusted larger and more demanding construction responsibilities. The building construction supervision firm assumed the functions of the municipality in the supervisory role in checking both the design calculations and the actual construction activity at the building site. In that regard the firm served as a public agent ensuring that materials, workmanship and detailing requirements were fulfilled. The firm needed to have a ten-year duration liability insurance coverage for each job that had been tasked to it.

Interest groups, led strangely by the professional associations of architects joined in an opposition campaign against D595 once the earthquake dust settled. Polat Gülkan's interpretation is that architects felt that they had been excluded from the chain for quality assurance for buildings, their natural domain. The scope was of course much broader than just regulating private construction. Concomitant changes needed to be made in civil law, commercial law and insurance law with their relevant legislations and precedents.

Turkey's Constitutional Court rescinded the Decree on May 26, 2001; a severe blow to the long-existing national endeavor for achievement of building quality and disaster resilience of the building stock. Following that, a less controversial legislation that went into effect on July 31, 2001. The scope of applicability of L4708 was limited to only 19 provinces, so that in the remaining 62 provinces of the country the flow of business went on, adding millions of risky

buildings to the existing stock during the intervening years. Finally, legislation was passed on July 13, 2010 when a decree was adopted by the Council of Ministers of Turkey to expand the implementation of L4708 to all provinces. While L4708 represents a step forward, even under the best circumstances its improvements in building quality will become visible only after decades. Until then the enormous risk must be managed by a combination of retrofit programs, incentives and insurance.

### **Lengthy and complicated procedures for obtaining building permissions**

Several case studies make the point that the process of obtaining building and planning permissions is extremely complicated, time-consuming and therefore expensive. The end result of these lengthy procedures are that builders prefer to construct outside of the official processes, and thus buildings do not conform to codes or standards. Of all the regulatory constraints, it seems that onerous administrative procedures are invariably one of the greatest barriers to conformity of building codes.

In Peru, for example, in the historical centre of Lima, it was identified that to obtain an Automatic Building License requires an average of 222 working days (311 calendar days) *under optimum conditions*. Standards are so high and regulations so rigid that owners prefer to let buildings collapse (Geoff Payne, meeting notes).

A study about the experiences of the Philippines Homeless People's Federation in community-driven response to five disasters which impacted on low income groups in the Philippines (the Payatas trash-slide in Manila; the landslide in *barangay* Guinsaunon; the Mount Mayon mudflow and floods; the fire that devastated the Lower Tipolo Homeowner Association land in Cebu; and the flashflood in Iloilo) identifies that regulations are one of the limitations inhibiting community-based response. Stringent land use subdivision and conversion regulations inhibit local governments being able to make land available for people to settle on for temporary and permanent housing. Delays and difficulties in processes land and housing permits, obtaining clearances for developing relocation sites identified and acquired by communities, and getting agreement and official permission for needed actions that often require the agreement of many different bodies were some one of the difficulties that the Federation faced in the different disaster situations. The study recommends that one of the important things it can do to help communities recover is to change government policies to streamline these processes into a one-step process to make it simple and faster for people to build (Rayos Co, 2010).

### **Advocating a 'compliance culture': shift away from a system of policing to one based on awareness and education**

As outlined in the presentations at the meeting organised for preparing this background paper, there is a general paradigm shift away from policing of building codes to developing a basis of awareness and education about safe building methods<sup>13</sup>. The cultivation of a 'compliance culture' is being advocated by several international groups which have been working on the application of building codes in low and middle-income countries, including the Global Task Force on Building Codes (GTFBC), Practical Action's work on Building codes in Africa, and by the Royal Institute of Chartered Surveyors (RICS) in the UK, the latter which has been doing work on codes in Haiti since before the earthquake. The case study from Iran also mentions these the need for a trained and skilled labour force as one of the major challenges

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<sup>13</sup> Presentation notes from Garry de la Pomerai (Global Task Force on Building Codes), Shailesh Kataria (Royal Institute of Chartered Surveyors), Theo Schilderman (Practical Action - ITDG)

for implementing the earthquake standard (BHRC, 2010). The major impetus behind this shift is that in order to 'police codes' it requires that buildings are built through formal means, obtaining the required permits, and that the institutional basis at the local government required for checking designs and construction is enough to cope with the demands of the on-going construction. As has been shown in this paper, all of these aspects are problematic due to the fact that local governments do not have the capacity to meet the demands of policing codes and regulating all building. Furthermore, a substantial amount of construction is informal and thus outside of any regulatory controls.

The GTFBC (<http://www.unesco-ipred.org/gtfbc/>) puts forth the idea that a compliance culture should target in the short-term strategies of capacity building within the construction industry (construction companies, management, labourers, financiers) and users of the buildings about knowledge of safe building practices. In the long term, establishing systematic disaster reduction education commences with the children, with explanations of 'why' safe buildings are important and the consequences if they are not built correctly. It advocates using schools as critical infrastructure examples both visually and as community focal points, and which will serve as a constant reminder to communities and the workforce. The school can be available for inspection by all potential self-builders and the 'expectation' message being disseminated back into the communities with the aide of the children and students. The philosophy of displaying the school as an example has multiple benefits: Providing confidence to users and parents, ensuring that the school meets the standards required, providing the necessary visual example of construction methods, for even amongst the illiterate home builders. Each critical phase either leaves exposed a visual critical section or has a duplicate next to it for all to view, from foundation to internals of ring beams and reinforced pillars to roofs. This should include clear instruction of the process and installation of the concrete, if used and should all be supported by photographic history of the construction process.

In summary, the main points to be made regarding the design and implementation of appropriate building codes are:

- Safe building practices are one of the most important tools for reducing risk.
- Codes need to be locally developed, simple and sensitive to the local building technologies. 'Deemed to satisfy' regulations, which set out uncomplicated rules may make codes more attainable for non-engineered structures (see above for Practical Action's 'principles to guide code revision efforts' cited from Yahya, et al., 2001).
- Changes to the institutional practices of regulating construction quality are not simple to achieve, neither through legislation (as described in the case of Turkey) nor in practice due to lack of capacity at the level of the local government that is doing the supervision.
- It is necessary, through legislation, to make a 'responsible party,' which is accountable for building quality. If local governments are to be responsible, they require greater resources to carry out checks and administer programmes.
- Process for obtaining building permits is in some jurisdictions too lengthy. This increases the likelihood that building will be carried out informally, or that existing buildings fall into disrepair. In these case efforts are needed to streamline the processes.
- Beyond building codes and enforcement is the creation of a Compliance Culture where everybody knowledgeable about good building practices and capacity building efforts targeted at all the stakeholders the construction industry. Use of schools as the basis for learning about safe building.

## **SUMMARY OF REGULATORY INSTRUMENTS AND THEIR EFFECTIVENESS FOR DRR**

The table on the following two pages offers a synopsis of the types of regulations covered in this paper and a summary of their effectiveness for risk reduction

<b>Type of regulation</b>	<b>What is included</b>	<b>Implementing agencies</b>	<b>Theoretical Effectiveness</b>	<b>Actual Effectiveness</b>	<b>Caveats</b>
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			for DRR	for DRR	
<b>Building regulations</b>					
Building Codes	Technical and functional; standards for design, construction, materials, alteration, occupancy structure	Local government	Buildings safe from hazards up to a given threshold	-Useful if well-designed and adhered to; -Can increase damages overall if hazard is above the given threshold; -Difficulty to enforce; -Standards are too expensive for poor to obtain; -Many buildings do not conform to codes.	-Matching of technical standards to local building abilities and affordability
Regulations for implementation or enforcement of codes/standards	Conformance to codes, construction supervision process	Local government, private partners	Ensures that buildings meet code requirements	-Local governments lack of capacity and knowledge means that implementation is weak; -Can produce false sense of security	-Requires adequate investment in institutional capacity
<b>Planning Regulations</b>					
Land-use plans	Physical and spatial/environmental aspects; Regulating type, location, density, min. plot sizes	Local or regional government	Keep development away from hazardous areas	-High-risk areas may be built on anyways because of pressure to develop -Plot sizes and infrastructure requirements too expensive for poor to obtain -Can negatively impact on tenure security -Possibility of forced evictions	-Local governments need to be motivated to reduce risks
Strategic development plans	Integrated social, economic, spatial, and environmental approaches to land and development	Local or regional government	-Keep development away from hazardous areas; -Integrate multiple aspects of risk reduction -Multi-stakeholder perspective	-Effective if properly designed and implemented -New style of planning that many governments have not yet adopted -Can integrate informal risk reduction for informal settlements	-Requires capacity to undertake strategic planning -Larger burden of decision-making at local level for project approval stage
Statutory instruments for DRR	Laws or Acts outlining responsibilities in disaster and for DRR	National, regional and local government	Gives clear directives for rights and responsibilities	-Recently adopted laws and acts based on Hyogo framework place emphasises on risk reduction -Local governments given responsibility but do not have capacity to take action -Laws that make national governments ultimately responsible for disaster losses can reduce initiative at local or grassroots level.	-Requires institutional and budgetary capacity for implementation

Statutory instruments for land use and building codes	Laws defining standards for land use, building, densities, setbacks from flood plains, etc.	Regional and local government	Ensures land is safe for development and buildings are safe	-Overly prescriptive and rigid -Can reinforce existing inequalities in access to safe land -Can negatively impact on tenure security	-Requires institutional and budgetary capacity for implementation
Major urban projects	Urban transformation and regeneration projects	Local government, private sector	New developments are hazard-resilient	-Project based approach can reinforce inequalities in access to safe land -Can cause eviction of informal areas	-Needs to be integrated within strategic development planning approach

Table 1: Planning and building regulations and their effectiveness for disaster risk reduction

## CONCLUSIONS AND RECOMMENDATIONS ARISING FROM THE STUDY

This study outlines that regulations for planning and building can serve as a driver of disaster risk reduction and sometimes as an impediment to risk reduction. Some drivers of building and planning regulation that *enable* DRR:

- Recognition on the part of the (local) government of the needs of the poor, and motivation to be accountable to them.
- Mandates coming from national government, giving responsibility to local government for safe building and planning while also enabling them with the technical expertise and resources to make and implement plans and enforce building codes.
- Plans and codes/standards that are developed with multiple stake-holders, including perspectives of businesses, residents and diverse communities
- Flexibility of regulatory frameworks to accommodate changing realities of economies, environments, building densities over time
- Recognition of informal building processes and encouragement of safe building practices through education and advocacy

Building and planning regulation can impede DRR if they:

- Make safe building or secure land tenure unaffordable or unobtainable by the poor.
- Enforce greater inequalities in access to land or housing
- Lead to forced evictions or reduced tenure security of people in informal settlements
- Do not account for the existing realities on the ground, i.e.: construction of small dwellings/workspaces or use of alternative building materials because they are more affordable; Already existing densities in urban areas

### Recommendations

Some recommendations regarding the use of regulatory frameworks for achieving disaster risk reduction are clearly highlighted by this study:

1. **Enabling access to safe land.** Making safe land available for development so that people can build in areas that are less exposed to hazards. As urban areas continue to grow in coming years, especially those urban areas in low elevation coastal zones, exposure to flooding is going to become more prevalent. Growth also in areas exposed to earthquakes. Resettlement once people have occupied land for some time is often

not feasible unless communities agree to this. Thus, in the context of urban growth, simplest solution is to make safe land available in the beginning, so that expensive structural measures (or resettlement programmes) are not required later on.

2. ***Adopt regulations that require less oversight from government.*** Municipalities and local governments have limited resources and competing priorities for development. Instituting regulations, which require less government control to supervise, yet result in risk reduction is a better alternative to complicated regulations, which cannot be feasibly followed up or implemented by local governments. Examples of regulations which require minimum oversight include: making access to safe land (if people are building on land that is already safe than building controls become less important), simple building codes and planning regulations, i.e. 'deemed to satisfy' standards, and developing a culture of compliance to building standards through education about safe building practices for builders and for general public. Investments in stricter planning and building controls can then be instituted only for larger engineered structures, for public buildings and larger infrastructure works.
3. ***Laws and policies from the national level that require local governments to take responsibility for planning and building and include budgets and resources that enable local governments do this.***
4. ***Need for investments in the capacity of local governments to plan for and encourage safe development.*** It is the local governments that are at the front line of decision-making and implementation for planning and building regulations, however, as the case studies have shown, regulations require technical expertise to develop and manpower to implement. In most municipalities in low- and middle-income countries, municipalities are lacking the capacity to plan, implement plans and encourage safe development. More specifically, this study has highlighted a few areas where investments in capacity at the local level are necessary for disaster risk reduction in planning and building:
  - a. **Multi-stakeholder development of plans and codes:** urban and regional plans and building codes or standards which respond to the needs of multiple stakeholders will be more likely to be adopted and result in overall risk reduction. This needs to include also the perspectives of community-based organisations, residents, businesses and private sector, experts, as well as concerned government departments. This kind of planning or revision of codes requires sometimes a change of approach at the local level, a technical capacity to integrate the multiple perspectives and also requires time and budgets to undertake the activities.
  - b. **Supervision of building process for engineered structures:** implementing set of regulations that enable accountability for the design and building of engineered structures. If this is local government, ensuring that local government has the technical and staff capacity to undertakes these checks. Other innovative examples of possibilities to place this accountability to private sector, i.e. through private engineering firms backed by private insurance may by an option to decrease reliance on over-burdened local government for this function.
  - c. **Safe building practices for non-engineered structures:** increase the capacity of local government to raise awareness about safe building practices. This includes using media and pamphlets for raising awareness of safe building methods, investing in training at community-level and training of building professionals and across government departments. This kind of approach can also be implemented by non-governmental groups and supported by other levels of government

- d. **Streamlining of permits and land development processes:** The process of getting permits for building or land in many municipalities is time-consuming. The end result can be increased risk as more buildings are built outside the formal system with little application of building standards. Local governments need to look at this system and where possible revise the system to make it easier for people or for developers to obtain clearances for building.

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## Annex 1: Programme of the Expert Meeting

### **Meeting: Regulatory frameworks in planning and building for disaster risk reduction**

For the 2011 Global Assessment Report on Disaster Risk Reduction (GAR11)

Secretariat of the United Nations International Strategy for Disaster Reduction (UNISDR)

Wednesday, 15 September 2010, 9:30 - 16:30

Room 101, Development Planning Unit, University College London  
34 Tavistock Square, London, WC1H 9EZ

Phone 0207 679 1111 (dpu) or 07503 100 928 (cassidy's mobile)

Directions to DPU: <http://www.ucl.ac.uk/dpu/contact>

### Participants and Meeting Programme

#### **Participants**

Camillo Boano – Development Planning Unit, UCL

Bina Desai – UNISDR Global Assessment Report on Disaster Risk Reduction

Alain Durand-Lasserve – National Centre for Scientific Research

Iman Hasan – Development Planning Unit, UCL

Cassidy Johnson – Development Planning Unit, UCL

Shailesh Kataria – RICS Disaster Management Commission

Tony Lloyd Jones – School of Architecture and the Built Environment, University of Westminster

Michal Lyons – London South Bank University

Geoff Payne – Housing and Urban Development Consultant, Geoffrey Payne and Associates

Garry de la Pomerai – ISDR Global Task Force for Building Codes

Tiziana Rossetto – Earthquake and People Interaction Centre, UCL

David Satterthwaite – IIED

Theo Schilderman – Practical Action

Patrick Wakely – DPU Associates

Each participant is invited to make a short comment, max 10 minutes in length, outlining their perspectives on the major issues on regulations/planning/building and drr. See related questions below and also outline of conceptual framework for the paper attached. Powerpoint will be available if required, although solely verbal interventions are fine too.

#### **Programme**

Start meeting at 9:30. Participants can arrive from 9 onwards for coffee/tea.

##### *Morning session*

Welcome – Caren Levy, Director of DPU and Cassidy Johnson

Participants' introductions

Global Assessment Report and key issues for the meeting to consider – Bina Desai

#### **Focus on regulatory issues around land and planning**

David Satterthwaite – Influence of community-driven DRR on planning and building

Geoff Payne – Effective land use planning and regulations for drr

Camillo Boano – Land use and planning for recovery

Michal Lyons – Institutional issues in post-disaster reconstruction

Discussions around:

- Governance: what kinds of partnerships, institutional frameworks and incentive structures are effective for the design and implementation of plans that contribute to DRR?
- Safe land: What are the main problems governments are facing in providing safe land for development? What practices are working?

- What are the positive examples of multi-stakeholder planning practices?
- What practices are working to reduce disaster risk in informal settlements?

**Lunch: There will be a catered lunch at DPU**

*Afternoon Session*

**Focus on building standards and regulations**

Garry de la Pomerai – Perspectives of the Global Task Force for Building Codes

Shailesh Kataria – Work of the RICS on building standards

Theo Schilderman – Practical Action’s work on the usefulness of regulation to help reduce disasters and achieve better reconstruction

Annika Grafweg – Infrastructure standards, guidelines and policy-writing for Rwanda National Schools

Tony Lloyd Jones – The role of built environment professionals in preparing and implementing building standards

Discussions around:

- Under what conditions are building standards effective for reducing disaster risk? Under which conditions are they not?
- What are good examples of methods for developing building standards? What are the criteria for good building standards?
- What are the issues with regards to application and implementation of building standards, supervision of construction within the realities of development? What are good examples of training programmes?
- How can building standards be useful for drr in informal building?

**Restating and feedback of major points from the discussions to feed into the Global Assessment Report**

**Discussion of future actions and follow-up**

**Close**