

Background Paper prepared for the Global Assessment Report on
Disaster Risk Reduction 2013

**Private sector investment decisions in building and construction: increasing,
managing and transferring risks**

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Private sector investment decisions in building and construction: increasing, managing and transferring risks

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1 INTRODUCTION

The Concept Paper for the fourth session of the Global Platform for DRR (UNISDR, 2012) states that around 85% of all investments worldwide stem from the private sector, including companies but also small and medium enterprises and individual investors. Much of this investment goes into construction projects. The private sector therefore has been identified as playing an important role in helping to incorporate DRR into the development (and redevelopment) of communities across the world.

The UNISDR 2013 Global Assessment Report seeks to investigate how private investment can become a vehicle for risk reduction and aims to present policy research on the business case for investing in disaster risk reduction (DRR).

This background paper for the 2013 Global Assessment Report aims, firstly, to make the case about how the private sector investments in building and construction are increasing levels of disaster risks, to understand what are the causes behind this, and to explore what this means for governments or other sectors of society who bear the burden of this risk. Secondly, this paper aims to explore new methods, incentives, regulations and examples of how private sector can/is contributing to risk reduction in the built environment.

The research is based on four commissioned case studies from: Bangladesh (Dhaka), Nigeria (Lagos), Thailand (Bangkok), and the United Kingdom. It will draw together evidence about the influence of the private sector on development decisions, within the context of regulatory frameworks, governance, and the larger political economy of development. The commissioned case studies are complemented by a review of literature from the fields of Construction Management, Disasters and the Built Environment and Urban Development.

The questions guiding this research are:

- In what ways are private sector investments in building and construction increasing levels of disaster risks? What are the underlying factors behind this? What does this mean for governments or other sectors of society who bear the burden of this risk?
- How does local regulatory environment (land-use planning, environmental management and building standards, fiscal policies for investment etc.) facilitate disaster risk reduction within the building and construction sector? When and why does it not facilitate risk reduction?
- What is the potential for the private sector in building and construction to adopt risk reducing measures in their projects? What kinds of incentives exist, or could be developed and how could these be scaled up?

Definition: by private sector in building and construction we mean 1) real estate developers who are building housing, commercial premises or other, and 2) companies that are building for their own productive purposes (factories, production plants, office buildings, commercial premises, etc.). It is recognized that these actors also interact with building and construction professionals, which also operate in the private sector, such as architects and urban designers, engineering firms and surveyors.

2 THE PRIVATE SECTOR IS BUILDING CITIES: THE MACRO-ECONOMIC CONTEXT OF URBANISATION AND URBAN RISK

2.1 Global trends in city development, and a growing role of private sector

Main Points:

- Since the 1970s there have been very large increases in urban populations in low and middle-income nations. This has occurred in the context of neo-liberal policies in which the role of the state is diminished. For urban planning and construction, this has meant little regulatory control and a perspective that the role of the state is to enable markets to work, which for the construction sector means enabling investments construction through provision of infrastructure, financial mechanisms and making land available for development. Reduced regulatory control means that disaster risks, and other environmental concerns, are often poorly considered in development decisions.
- More recently, in the era of globalisation, cities have become competitive entities, which compete on the world market for capital investment. In this context, disaster risks have a tendency to be downplayed lest they affect competitiveness (unless major risk reducing infrastructure has been invested in, in which case these are widely reported). Investments in infrastructure (both public and public-private) have been made to support capital investments. Many cities in low and middle-income nations are still lacking investments in basic infrastructure to support their growing populations and reduce disaster risks, especially for the poor and in informal settlements.

The global economic crisis that gripped advanced capitalist nations in the early 1970s resulted in movements against government interventions in planning and toward planning systems that were strongly market-oriented. Market-oriented planning could allow private capital more leeway way in investments in construction. State interventions in which government centrally controlled land use, construction and urban planning processes was practiced in the majority of countries in the period after the World War II (Glesson and Low, 2000). However, state interventions seemed unable to control the parallel growth of unemployment, inflation and interest rates, so neo-liberal interests took advantage of the sense of crisis to promote radical political reform programmes that sought to dismantle much of the welfare state's institutions and regulatory regimes, including state interventions in planning.

These movements and forces have produced “a well known ideological trilogy of competition, deregulation and privatization”, distinguished for its hostility to all forms of spatial regulation, “including urban and regional planning, environmental policy and economic development policies” (ibid, pp. 270-271). The planning rationality, its methods, its processes, and overall its legitimacy, were heavily questioned. This led to the movements that were suggesting complete exclusion of planning and regulation of urban processes through reliance on market mechanisms. Such attitude is reflected in the movement that Alexander (1986) defines as ‘non-planning’, which was based on a premise that “people’s behaviour and interactions will eventually produce socially optimal outcomes with a minimum of regulation” (p. 78).

This neo-liberal reform was, at the same, coupled with intense growth in urban populations, especially in low and middle-income nations (see figure 1). In these cities, the governance capacities and state was, and in many cities today, still is, unable to regulate urban development or to provide the necessary infrastructure to adequately support the increase in populations. This growth in urban populations, especially in low and middle-income nations in Asia and Africa, is expected to continue for at least the next twenty years. It is the cities in these regions were we see intense investments in building and construction.

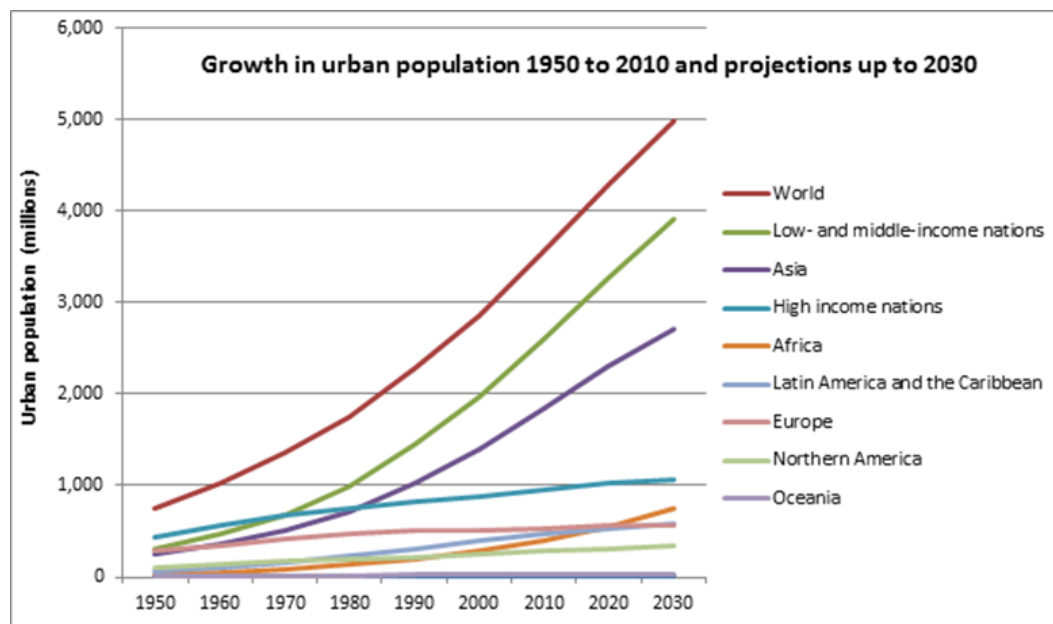


Figure 1: Growth in urban population 1950 to 2010 and projections up to 2030 (source, United Nations United Nations, Department of Economic and Social Affairs, Population Division, 2012).

The policies promoted by the international development agencies in low and middle income nations were about working more closely with market-actors and reducing the involvement of the State, in order to achieve progress in housing and urban development sector. For example, World Bank's policy paper from 1993, "Housing: Enabling Markets to Work" provided a list of recommendations for introducing the "enabling the markets" approach in housing and urban development policies in low-income countries. The key recommendation on how to implement these policies was deregulation. It was assumed that the bigger part of the problem lies on the supply rather than demand side, with supply being influenced by a combination of policies regarding land use, zoning, tax and competition in the building industry – unresponsive systems of land and housing supply, with more strict regulations, result in higher costs of housing construction, which in turn results in housing shortages and higher prices. In such situation, regulations dealing with building codes, infrastructure standards and land use were seen as a main obstacle to efficiently accommodate such rapid growth, and deemed cumbersome, overly expensive to implement, irresponsive to demand and too complicated (World Bank 1993: 24). In essence, the World Bank's report was calling for removing as many regulations as possible, followed by housing privatization (Mukhija 2003).

Therefore, in the concept of "enabling the markets", governments are giving up the direct provision and management of services, instead focusing their resources and efforts on creating

the environment that will enable private sector companies to provide enough jobs, housing and services, more efficiently than it was previously done by public sector. Accordingly, housing policies, as one of the biggest segments of urban development, were greatly influenced by these changes. "Most governments across the world have been anxious to encourage home-ownership and, over the past twenty or thirty years, owner-occupation has generally increased in most urban areas. This is fairly consistent tendency across countries whatever their level of development" (UN HABITAT 2003:11). The driving force of policy in the affluent as well as low- and middle-income economies thus became stimulating economic growth through the construction sector. As a consequence of such trends over the last 20 to 30 years, private sector became the main actor in urban development. Private sector has particular interests in urban land and housing markets, which are at the same time essential for the disaster risk management.

Today, the twin processes of globalization and rapid urbanization continue to transform cities in low and middle-income nations. For cities and regions that are part of the world market in competition for capital investments, globalization has helped to achieve high rates of economic growth with rising per capita incomes and new patterns of consumption linked to world consumer markets. As Figure 2 shows, around 97% of the world's gross domestic product (GDP) is generated by industry and services. About 65% of the world's economically active population works in industry and services and a very high proportion of all industry and services are in urban areas (Satterthwaite, 2007). Most of the world's largest cities are in the world's largest economies; national governments have adopted policies to steer public resources and private investment towards turning their principal metropolitan centre into a "world city", as a means of gaining advantage over competing candidate urban regions in other countries (Douglass, 2002). In this context, disaster risks or other environmental dimensions are downplayed in an effort to remain competitive, while concentration of capital also increases risks to major losses in the event of a disaster.

Globalization has also produced a number of undesired impacts in cities. Its spatially polarizing effects have concentrated benefits of economic growth in a handful of cities, while provincial towns and rural regions have experienced slow growth or stagnation, with economically debilitating population losses in some regions. Many, if not most, cities either do not have the wherewithal to engage in global contests for investment or are too distant from major trunk transportation lines to be able to attract it (Douglass, 2002). In most cases, local decision-making powers are very limited, budgets depend heavily upon revenue transfers from central governments, and personnel are insufficient in number and training. This has also resulted in an increase in disaster risks, especially for the poor and those living in informal settlements who do not have access to the necessary infrastructure to reduce risks or who are not protected because of lack of application of regulatory frameworks to guide development.

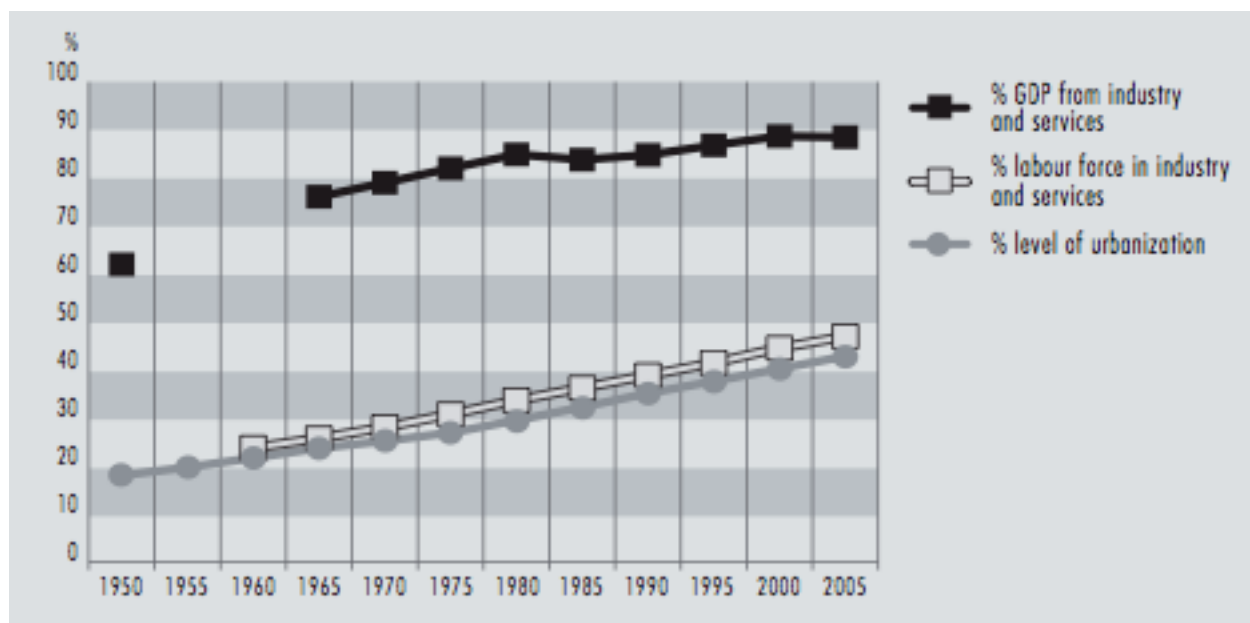


Figure 2: Changes in the proportion of GDP for low and middle-income nations, 1950-2005 (Data from Satterthwaite, 2007; figure from 2010 World Disasters Report).

These forces of industrialisation, globalisation and de-regulation, and political power come to play in different ways in different cities. The example below of Dhaka (Box 1), the primate city in Bangladesh, exemplifies the situation in many urban contexts in low and middle-income nations where capital investments in construction and industry are outweighed by investments in infrastructure and in environmental protection.

Box 1: An example of the reasons behind the proliferation of speculative development and investment in factories: Dhaka, Bangladesh¹

Until the end of 2009 speculative development in Dhaka, mostly in the form of apartment development, flourished for several reasons. Due to robust and sustained macro economic growth in Bangladesh for years, per capita income of many middle and high-income households increased. Also at the same time there was a decrease in bank interest rate. Usually in the past these households would have saved money in the bank. Decreased bank interest along with increased income of the group of working population who had access to financing system raised their affordability to invest as well as gave them access to credits from financial institutions. They were looking for assured investment opportunities, and investing in property development seemed more rewarding than any other available opportunities.

These households changed the socio-cultural pattern of family formations, living style and even construction trend in the city. Formation of more nuclear families demanded more housing and the number of first-time homebuyers increased. Also the financial and legal arrangements of purchasing lands and the time consuming management of construction discouraged individual

¹ Jabeen, H. (2013). 'Case Study on Dhaka.' In Johnson, C. et al. (2013) Private sector investment decisions in building and construction: increasing, managing and transferring risks. Background Paper for UNISDR 2013 Global Assessment Report, UNISDR, Geneva.

households to invest resources and time for individual house constructions like the past. Rather they opted for the complimentary service facilities that apartments offered such as power-generators, garbage disposal, central satellite TV connection, lift, roof top facilities and associated services that are well managed by the developers. In addition the modern living amenities increased rents in apartments in comparison to privately constructed flats. House rent in Dhaka increased by 250% between 1990 and 2007 (REHAB, 2012). All these factors motivated investing in real-estate development.

The result of all these factors was high demand for housing and land for development. REHAB, an umbrella association of real-estate companies estimated housing demand through their consumer responses. Although they have delivered around 9,000-10,000 units of housing and 5,000-6,000 plots for housing per year in the past; they projected that demand for houses in upcoming three years will be around 30,000 to 40,000; growing to around 95,000 to 130,000 in upcoming 10 years. In case of flats, estimated demand in upcoming three years will be around 75,000 to 100,000; while in upcoming 10 years demand will remain around 70,000 to 95,000 (REHAB, 2012). Against this scenario of high demand, the public sector will have very limited contributions; they do not invest in housing development and the number of serviced land they offer to various income groups are insignificant comparing to the demands. The private sector will be capitalizing on these opportunities.

Inflow of remittances in the country was another important factor that contributed in private sector investments in property development. Until the global recessions of 2008, the amount of remittances continued to grow; in 2007-08 Bangladeshis living outside the country sent back home USD 7914.78 million (BBS, 2010) as remittances. These contributions increased every year and kept the country's economy afloat even during global recession. However, the opportunities of investing these resources in diversified sector remained limited; on the other hand speculative property market offered high rate of return on investments. The real-estate companies considered the remittances as an easy means of project financing. Nevertheless, by the end of 2009 the effects of the global economic slowdown, stock market crash, non-availability of utility connections, and withdrawal of the single digit housing loan scheme by Bangladesh Bank as well as liquidity crisis in the commercial banks resulted in a gloomy business situation, and the industry took a 'U'-turn (Dewri, 2012).

Not in the same scale as property development, but some of these investments went in the development for productive purposes as well. The open market economy paved the path for upsurge in industrial and business activities, especially in some new economic sectors. The ready-made garment industries flourished to generate major foreign exchange revenue from their contribution of more than 70 percent of the country's net exports. The number of enterprises rose from 30 in 1980 to about 5150 in 2010-11 fiscal year (Bangladesh Garment Manufacturers and Exporters Association, n.d.). A significant number of these enterprises' factories, production plants and office buildings are based in and around Dhaka. Similarly, growth in services such as IT, Telecom and Pharmacy industries raised the demands for office and industrial spaces. Similarly a considerable rise in consumerism created demand for newer avenues for entertainment, leisure and shopping facilities. As a consequence, Dhaka experienced major private investments in buildings and construction industry.

2.2 The extent of private sector construction in cities today

“Like it or not, development of the built environment in Dhaka city is absolutely driven by the private sector”- commented a renowned young Architect from Dhaka.

Main Points in this section:

- **Construction is an important part of national economies**
- **Investments in construction and in real estate are predominantly coming from the private sector**

Private sector investment in construction projects have become the dominant method for of building in cities today. Private sector investments are going into speculative developments of housing and commercial premises, development of production facilities, and development of infrastructure projects. As Box 1 outlined, in Bangladesh, high population growth rate and associated demand for development in the absence of major public sector investments in building and construction has encouraged the private sector to invest extensively in Dhaka city. In Dhaka most of these investments are made through speculative development as well as development for productive purposes. Since the public sector changed their position from providers to facilitator, private real-estate developers dominated the housing market to meet growing demands in market-based economy. Moreover, country's economic development necessitated investments in industries and infrastructure close to the administrative centre and communication routes. The private investors have invested in factories, production plants, office buildings and commercial premises in and around the city.

In the development of infrastructure, both developed and low-income countries are increasingly relying upon private sector's investment capital, planning, implementation and management capabilities (Hart, 2007). “The private sector's role in providing capital and know-how has become increasingly important in both developing and OECD countries” (p. 27). At the same time that private sector investment in infrastructure has been increasing, government expenditure on infrastructure has been decreasing as a percentage of GDP. “Private financing of infrastructure is even more significant in developed countries. In 2005, loan commitments to infrastructure projects worldwide reached approximately \$121 to \$140.3 billion, reflecting a continuing trend toward increasing private investment in infrastructure. Borrowers domiciled in OECD countries accounted for approximately 71% of private infrastructure loans. Private lending, bonds and equity investments in infrastructure have all increased during the past decade” (Hart, 2007, p. 28).

In **Nigeria**, there have been high amounts of growth in construction sector in recent years; in 2006 to 2007 the growth was 20%. However construction sector is still quite low compared with other sectors; the construction sector's contribution to the country's GDP remains very low at 1.83% in 2008. This is partly because of difficulties in doing construction business in Nigeria (See Box 2). 93.3% of all real estate construction in the country is for residential purposes, and most of it in the urbanised regions of Lagos, Abuja and Niger-Delta. Public housing provision has not able to satisfy demand and therefore 90% of the nation's housing stock is provided by private sector, both through formal and informal construction. Private real estate developers can only

build for middle to upper incomes because of cost, which means that the majority of construction for the poor and low-incomes is through informal means. Government has introduced specific reforms to stimulate and assist the private sector to play the leading roles in housing production and delivery. There is a very strong need for infrastructure investment in Nigeria. Also most of infrastructure is done now through Public-private partnerships (see Box 2 for more detail).

In **Bangladesh**, construction activities have been a dynamic source of growth since the early 1990s. The construction industry has been a significant source of job creation for skilled and semi-skilled labour, 2.4 million people were employed in 2010 (BBS 2010). In 2009-2010 the construction sector represented 9.1% of GDP. The overall construction sector was expected to achieve high growth due to increased construction activities including public sector construction. The construction sector was estimated to grow by 6.37 percent during FY2010-11 against 6.01 percent growth in FY 2009-10. The sector is expected to remain a source of higher growth and employment in the medium term of the sixth five year plan between 2011-15 (Planning Commission, 2011).

The private sector accounts for a significant proportion of overall investments in the country, although this is not reported specifically for the construction sector. The Ministry of Finance (2011) reported that in Fiscal Year 2010-11 both private and public investment increased. Gross investment accelerated to 24.73 percent of GDP from 24.41 percent in the previous fiscal year; of which private investment accounted for 19.46 percent of GDP, up from 19.40 percent in the previous fiscal year.

In the **United Kingdom**, analysis of the value of commercial, industrial and other buildings (this does not include residential buildings) shows that in 2008, 48% of these buildings are held by the private sector (shown in figure 3 as private non-financial and financial). This is actually reduced from 2006, when the private sector held 60% of all commercial, industrial and other buildings². There is also a significant amount of property that is owned by overseas investors and therefore does not appear on the UK balance sheet (unless it has been accounted for as a financial lease by the occupier).

² It is important to recognise that commercial, industrial and other buildings include not only the property that is considered a core part of the property investment market (office, retail and industrial property) but also specialist buildings such as schools, leisure centres, court buildings etc. This will be particularly a feature of the public sector property assets. In terms of value, these specialist assets will not show such volatility as they are not a core part of the property investment market.

Figure 5.1: Value of commercial, industrial and other buildings on the UK balance sheet (2008) (£ billion and %)

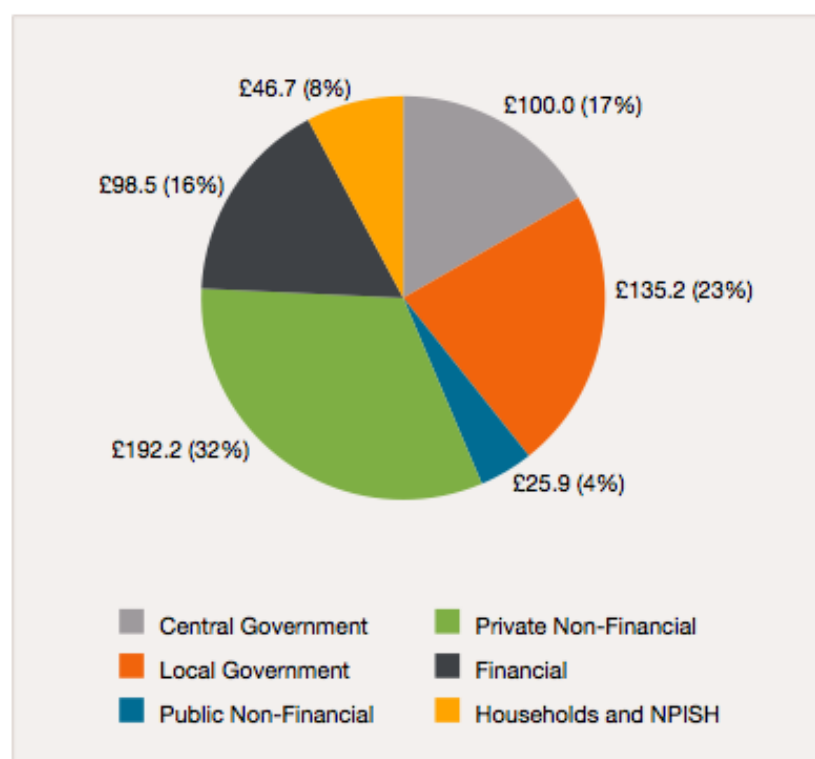


Figure 3: Value of commercial, industrial and other buildings on the UK balance sheet. Source: Gibson and Bamidele, 2010

Box 2: The prevalence of private sector construction in Nigeria³

In Nigeria, the building and construction industry is characterised by a prevalence of private sector investments. The building and construction industry in Nigeria is a fast growing sector of the economy, which recorded a growth rate of more than 20% between 2006 and 2007. This growth has, however, not been commensurate with the growth of Nigeria's total GDP as the overall contribution of the construction sector to the country's GDP remains very low at 1.83% in 2008.

Key factors that have contributed to the growth in the construction and property sector include high demand for buildings across all sectors of the economy; the focus on infrastructural development by state and federal governments; the adoption of privatisation and commercialisation as instruments of federal government policy and attempts at controlling regulations relating to how the construction business is carried out in the country (Trade Invest Nigeria, 2012).

³ Reference as : Adelekan, Ibidun O. (2013). 'Case study of Lagos, Nigeria.' In, Johnson, C. et al. (2013) Private sector investment decisions in building and construction: increasing, managing and transferring risks. Background Paper for UNISDR 2013 Global Assessment Report, UNISDR, Geneva.

Major constraints have been identified in the development of the sector. The World Bank 2011 ranking on “Ease of Doing Business” indicates that out of 183 countries Nigeria ranks 167th in “Dealing with Construction Permits”, 97th in “Enforcing Contracts” and 59th in “Protecting Investors”. The number of days for dealing with construction permit is 350 in Nigeria, which is considerably higher than the average of 268 days for sub-Saharan countries. The bottlenecks in land acquisition, and general laxity in contract enforcements are additional regulatory impediments to infrastructural development in relation to the growth of the construction industry (Vetiva, 2011).

The real estate sector in Nigeria comprises two main segments – residential and non-residential. According to NBS (2010), residential real estate segment accounted for 93.3% of real estate construction in the country in 2008, while the non-residential real estate sector was distributed among commercial (4.6%), industrial (0.5%) and others (1.6%) for roads, bridges, ports and airports etc. Three areas of significant growth in building and construction activities in Nigeria are (i) Lagos, the commercial nerve-centre of the country, (ii) Abuja, the Federal Capital Territory which has witnessed a major rise in construction activities in the past decade, especially as population influx into the city has necessitated expansion into new towns and (iii) the Niger-Delta region, base of Nigeria’s oil industry.

Given the capital-intensive nature of infrastructure projects, governments have been the biggest spender on infrastructure in Nigeria. The changing landscape of infrastructure financing on the African continent has, however, resulted in increasing focus on private sector participation, especially in form of Public Private Sector Participation (PPP). Private sector investment in residential real estate development in Nigeria has been one of the responses to the limited success of governments with provision of public housing since initial efforts by the Lagos Executive Development Board (LEDB) in 1928.

Public housing provision in Nigeria has consistently not been able to satisfy the demand for housing, as almost 90% of the nation’s housing stock is provided by the formal and informal private sector (FGN, 2002; UN-HABITAT, 2006; Olatubara, 2007). Analysis of the different public housing programs initiated by government between 1962 and 1999 shows that only about 14% of the planned housing units were actually completed (Ibem et al, 2011). The huge capital outlay committed into projects undertaken by private estate developers means that houses built are only affordable to individuals in the high and upper middle-income class thereby excluding the low-income and urban poor from benefitting from such arrangement.

Specific reforms introduced by government to stimulate and assist the private sector to play the leading roles in housing production and delivery include support of the establishment of the Real Estate Developers Association of Nigeria (REDAN), Building Materials Producers Association of Nigeria (BUMPAN); the reduction of interest rates on national housing fund loan to members of REDAN and restructuring of the housing finance sub-sector to include the introduction of secondary mortgage market (Henshaw, 2010). The Real Estate Developer’s Association of Nigeria (REDAN) is the principal agency of the organized private sector recognized by government and approved by the Federal Mortgage Bank of Nigeria. In south-west Nigeria alone, 498 real estate property firms are registered with REDAN.

2.3 Understanding the location and scale of urban risk⁴

A number of studies have attempted to rank urban centres most at risk. For example Munich Re Group (2005) created an Index for cities taking a multi-hazard perspective. While there is clearly no one size fits all assessment for urban risk, there are some cities which attract far greater attention in the literature than others. Analysing 30 large cities in low and middle income countries and 20 in high income nations, the report rated Tokyo as the city at highest risk, followed by San Francisco. This is because it defined risk as the value of exposed assets, which will be greater in high-income countries.

Another assessment for cities at risk could be the proportion of residents residing in informal settlements. These areas tend to have poor quality and overcrowded housing (often rented) combined with inadequate infrastructure and services, which increases the resident's vulnerability to hazards such as floods, landslides and biological pathogens and places them at high risk of fire, violence and epidemics.

The impacts of climate change are and will be highly localised, although the scale of climate change risk in the majority of African, Asian and to a lesser extent Latin American urban centres is largely unknown due to a lack of local analysis (IPCC 2007, Kithiia 2011). The IPCC (2007) report has identified, with varying degrees of certainty, regions (and therefore cities within them) that will be the most vulnerable to the impacts of climate change, and recognised Africa as the continent most vulnerable due to the multiple stresses described above.

A number of studies have attempted to rank cities according to their vulnerability and risk to the impacts of climate change, with varying outputs again dependent on the indicators used to determine 'risk'. For example a WWF Report (2009) looked at the risks of climate change to ten Asian Cities, concluding that the most vulnerable cities, Manila, Dhaka and Jakarta, were those with both the highest exposure and the lowest adaptive capacity. In another study, the OECD (Nicholls *et al*, 2007) looked at the exposure (of population and assets) of 136 port cities with over 1 million people to one-in-100 year surge induced flood events. The Index showed that cities in Asia have the highest absolute population exposure now and in the future in addition to asset exposure by the 2070s. Cities that were deemed to experience the highest percentage population exposure increase in future were mainly in sub Saharan Africa, such as Luanda and Mogadishu, with cities such as Dhaka and Chittagong experiencing the highest absolute exposure, putting them at risk of larger-scale flooding disasters (figure 4).

⁴ Reference as : Dodman, D, Katie Francis, Jorgelina Hardoy, Cassidy Johnson and David Satterthwaite (2012). *Understanding the nature and scale of urban risk in low- and middle-income countries and its implications for humanitarian preparedness, planning and response*. A synthesis report produced by the International Institute for the Environment and Development (IIED) for the UK Government's Department for International Development (DFID).

Figure 2.5

Port cities with highest exposed population in 2005 to one-in-100-year, surge-induced flood events

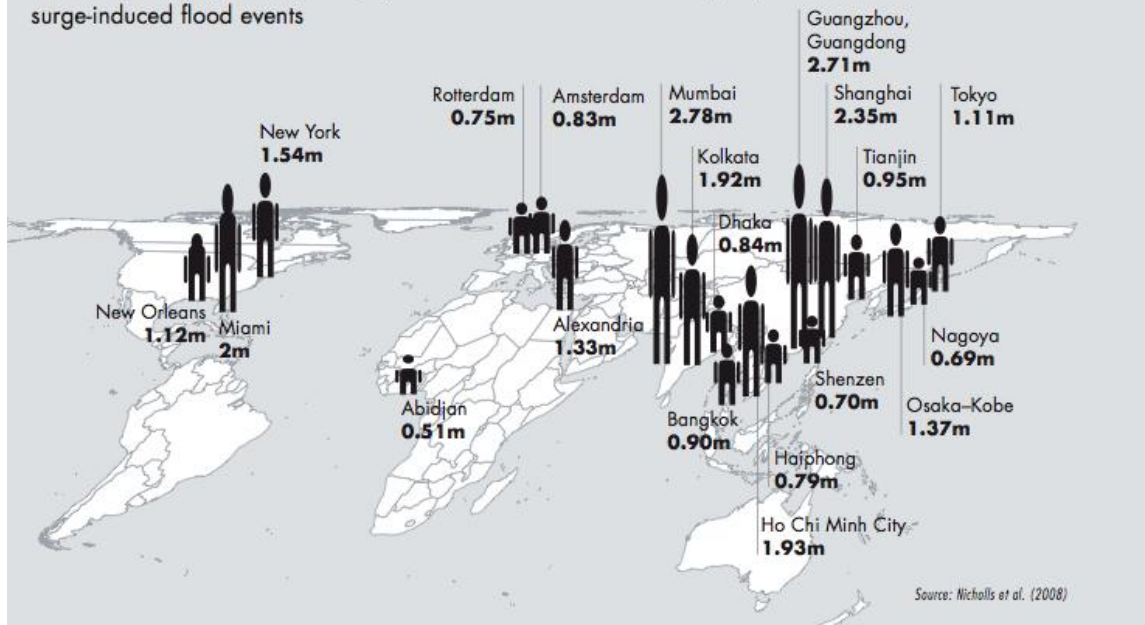
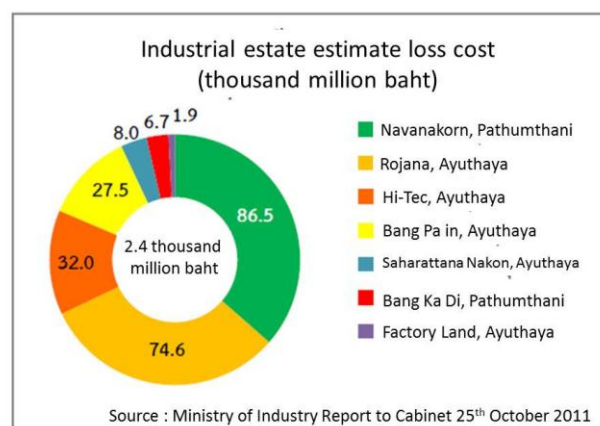


Figure 4: Port Cities with highest exposed population in 2005 to one-in-100-year surge induced flood events (data source: Nicholls et al. 2007; image from IFRC 2010)

In Thailand, in 2011, this exposure to flood risk manifested itself. The floods in the fall of 2011, covered almost two thirds of the country, and heavily impacted Bangkok and surrounding areas causing unprecedented losses for the industrial sector and for residents (Marome, 2012). In Ayuthaya and Pathum Thani alone, damage to almost 1,000 factories in seven industrial estates in these provinces resulted in over 700 billion baht in insurance claims. Preliminary estimates by the World Bank in early December 2011 put the total economic damages and losses at THB 1,425 Bn (US\$ 45.7 Bn), with US\$ 32 bn in the manufacturing sector alone⁵.



⁵ <http://www.worldbank.org/en/news/2011/12/13/world-bank-supports-thailands-post-floods-recovery-effort>

Figure 5: Estimates of losses in Industrial estates in Thailand from the floods in 2011. Source: Marome, 2012.

Even in high-income countries, such as in the UK, extensive risks for flooding can be acute, and the costs associated with emergency response and losses have increased in recent years (Box 3).

Box 3: The extent of flood risk in England⁶

Flood risk in its various guises is a major problem in England and according to Government figures is a problem that has got worse over recent decades and is predicted to get even more severe, affecting more people and causing more damages. For instance, the Environment Agency (quoted in Bennett 2012) has calculated that:

- One in six homes in England is at risk of flooding.
- Over 2.4 million properties are at risk of flooding from rivers or the sea in England, of which nearly half a million are at significant risk.
- One million of these are also vulnerable to surface water flooding with a further 2.8 million properties susceptible to surface water flooding alone.⁷
- 55% of people living in flood risk areas knew they were at risk and for these three out of five of them had taken some action to prepare for flooding.

It has also been acknowledged that flood damages in England amount to £1.1bn per year (NAO 2011) and the Association of British Insurers (ABI) have claimed that the cost of damage caused by flooding to property across the United Kingdom (UK)⁸ has increased by 200% decade on decade, rising from £1.5bn (1990 – 2000) to £4.5bn (2000 – 2010) (ABI 2010). These damages are widely predicted to rise further, due to increased urbanisation and an intensification of the hydrological cycle in the coming century (Huntington 2006), which in turn may lead to an increase in frequency and magnitude of intense precipitation events, which can cause flooding (Bates et al. 2008).

3 The Relationship between private sector construction and urban risk

⁶ Reference as : Boshier, L. (2013). 'Flood risk management and the roles of the private sector in England.' In, Johnson, C. et al. (2013) Private sector investment decisions in building and construction: increasing, managing and transferring risks. Background Paper for UNISDR 2013 Global Assessment Report, UNISDR, Geneva.

⁷ It should be noted that pluvial flooding (typically associated with abundant rainfall in a localised area, and exacerbated by insufficient capacity of urban drainage systems) has also increased in prominence on the flood risk agenda in light of the Summer 2007 floods (Boshier et al. 2009). For instance the flooding that inundated the coastal city of Hull affected 8,600 homes and 1,300 businesses and has now largely been attributed to the city's drainage network being totally overwhelmed by heavy and prolonged rain (Coulthard et al. 2007).

3.1 The underlying drivers of risk in private sector building and construction

Main points:

- Private sector decision-making about where and how to construct influences disaster risks. These disaster risks are often transferred to the public sector and to individuals, who bear the burden of losses when a disaster happens
- The case studies show that the underlying drivers of risk in private sector building and construction are:
 - The amount of information available about hazard risks;
 - The prevalence of other factors in making a return on investment means that hazard risks may not be a priority
 - Availability of insurance (at an affordable price) makes development in hazard prone areas less of a risk
 - Regulations may be weak or it is possible to flout them
 - Investors take a short-term view about the financial gain from the project therefore are not interested in disaster risks which may be longer term

The decisions made by private sector in building and construction has an influence on urban risk; yet **all of these decisions are made in an environment where there are constraints on availability of land**, as is the situation in most urban places. In some cities, the most lucrative areas for development are along the coastlines, such as on the Lekki peninsula in Lagos; but these are also regions strongly susceptible to erosion, sea level rise and storm surges. In other cities, such Dhaka, the entire city is a high-risk area for flooding and earthquake hazards. While urban growth has followed natural choices of flood-free lands initially, the deficiency of flood-free land in compare to demand for development has encouraged many private land developers to fill out rivers, canals and water bodies for housing and industries; these have led to obstruction of the flow of water, reduction in flood plain areas, and increased flood risks as well as earthquake risks.

Decisions about where to build are also influenced by the financial viability of the project; ownership of the land can influence that financial viability. For example, in Dhaka, due to socio-political and institutional arrangements more than 70% of the people living in the city do not own any land; among those who own, 10% own more than 60% of the city's private land (Islam 1999: 43). Therefore, this small group of city dwellers, who own land in Dhaka, remains the key stakeholders in city development. New developments take place through land fragmentations by the owners without any concern for availability or capacity of the services. The real-estate developers negotiate with these landowners for speculative developments.

All of this has the effect of transferring risks either to the public sector or to individual homeowners when a disaster does occur. Investments in speculative development tend to be short-term, and most disaster risks occur over a longer time frame. Again, for example in Dhaka, to date there is no definite guidance or monitoring on how the developers should take responsibility to reduce damage to roads, footpaths and drainage they use during any construction work. They take advantage of these facilities, but do not bear any responsibilities for their maintenance or reconstructions. Furthermore since they sell the property to a client or a client group, they tend not to take in consideration the long-term effects the projects for the sake of their immediate benefit or quick economic return. Thus, the risks and costs of fluvial flooding

are transferred either to the public authorities responsible for maintenance of infrastructure or the users.

Another example on how risks created by the private sector are transferred to the public comes from Lagos, Nigeria, where flooding has become much worse in the last two decades because of urban developments in coastal parts of the city and also changes in land use cover from development in watershed areas. Dredging and sand-filling activities for urban developments taking place on Lagos shoreline are making the area susceptible to storm surges. This is affecting private developments and also slum settlements in the area. In Lekki Peninsular, since development began there in 1983, the severity of disasters has increased. Large projects, like Eko Atlantic, are said to be impacting on flooding in the area. Flooding in 2011 resulted in very high amount of insurance claims for flooding both for residential and commercial properties. Some property owners in a residential development on Lekki Peninsular, the Lekki phase II, have had to abandon their buildings because of flooding. Costs associated with putting in the necessary infrastructure have to be borne by owners, some of them who cannot afford.

The case study from the UK makes the point that **there are two driving factors that influence the production of urban risk and concern the private sector in building and construction. These are the efficacy of regulations and the existence of insurance.** Discussions with representatives of the private housing sector in England indicate that the sector is disincentivised to adopt DRR measures unless these are regulated or at least incentivised through insurance benefits or a clear business case (Bosher 2012). As is the case in England, despite regulations regarding not building on flood risk areas if there is no other suitable land available then it is possible for local authorities to allow construction in flood plains. Furthermore, the situation whereby it is possible to purchase insurance in flood prone areas (it is legislated that insurance must be available to homeowners) means that buyers also have little incentive to think about the hazard risks. Similar situations in other countries, whereby regulatory controls on flood risk are not upheld by local authorities, and the availability of insurance cover, have led to the very large amounts of construction in highly exposed areas – for example the eastern seaboard of the United States, which was affected by Hurricane Sandy in October 2012.

An example from Pricewaterhouse Coopers⁹, based on an initiative they are undertaking with UNISDR on disaster risks with several of their client multi-national companies, shows that **the availability of insurance is a crucial factor in the decision-making for multi-national companies and multi-national companies rarely talk to the local government before making a decision to invest.** For example, if a company wants to locate its new headquarters in a particular country, they will do their own research about the benefits and costs of locating there and then they will call an insurance company. The insurance company will come with an assessment of exposure. Very rarely will the company have a dialogue with a public organisation. It is therefore the public organisations that need to convince the insurance companies that a particular location is safe. The companies do not speak to local government organisations; they will likely only speak to the insurance company. However, insurance companies will not provide an assessment of the site. Following speaking with the insurers, the company will send their own people to the site to do the eyeballing of the site; then they can then identify the risk exposure. (i.e. new company expanding there that will impact on sewage system). When they have huge,

⁹ This example is based on a verbal explanation from Oz Ozturk from Pricewaterhouse Coopers, during his presentation 'UNISDR and PwC: Working together to reduce disaster risks' at the GAR13 meeting Florida International University, Miami on 29th November, 2012.

large complex investment – i.e. a five million dollar plant, the company might talk to the public sector because they want a tax break. Companies are surprised to hear about the disaster risk models that exist. Companies would be interested to have more information about disaster risks that they could integrate into their own in-house risk models. All very interested in publically available risk models.

Another relates point is that **construction companies may not be interested to promote that their clients, who are the investors, think about disaster risk, or they might lose the contract.** As Boshier (2012) indicates, at a time of economic recession it is understandable that most private sector companies will need to focus upon minimising the financial risks of development projects; a point articulated during an interview with the director of a construction company:

“From a business point of view we need to ensure that we do not ‘scare off’ the developer or client by saying we will be considering hazard mitigation issues. Nine times out of ten the developer or client will assume these measures will cost them more money; so they may ditch us and go for the company that they perceive as being better value for money, or in other words is perceived to be the ‘cheapest’ option. The developers and clients are the “keystones” to the attainment of building in resilience.”

(Director – Large construction company)

The availability of information about disaster risks, at a scale small enough to be useful for decisions about where to build, does not exist yet in most places. A study from Rosario, Argentina, found that, like many cities, it needs a stronger understanding of the likely local impacts of climate change because without this type of information it is difficult for city administrations and private sector developers to buy into climate change adaptation and provide the political support needed to advance this. Climate change adaptation needs specific knowledge of how risks are likely to change (and continue changing over time), who is at risk and who is vulnerable to the impacts. Developing and maintaining this is resource intensive and requires an updated and comprehensive database. Some of the data are available within the city administration but it is difficult to get this shared between city offices (Hardoy and Ruete, 2013)¹⁰.

Another pervasive aspect of development processes is corruption in the construction industry. The construction industry is considered to be the most corrupt sector of the world economy. **The more corruption there is in construction — whether it consists of construction companies using substandard materials or of governments granting permission to build in zones unsuitable for habitation — the likelier people are to die or have huge losses if a disaster happens** (Kenny, 2007). Using data from Transparency International's Corruption Perception Index, Ambraseys and Bilham (2011)¹¹ calculated that 83% of all deaths from building collapses in earthquakes in the last 30 years took place in countries that were "anomalously corrupt" — that is, in countries that were perceived to be more corrupt than you would predict from their per-capita income .

¹⁰ Hardoy, Jorgelina and Regina Ruete (2013), "Incorporating climate change adaptation into planning for a liveable city in Rosario, Argentina", Environment and Urbanization (forthcoming)

¹¹ Nature 469,153–155 (13 January 2011)doi:10.1038/469153a

The following examples from Dhaka, Bangladesh (Box 4) and Lagos, Nigeria (Box 5) exemplify some of the factors that influence the extent to which the private sector considers disaster risks in its decisions. These issues are then synthesized in Tables 1 and 2 below.

Box 4: Increased and transferred risks from unregulated development in Dhaka, Bangladesh

Dhaka experienced three major flooding in 1988, 1998 and 2004 after the private sector started investing in speculative development and development for productive purposes in and around the city. The flooding were resultants of overflowing of surrounding rivers, runoff from excessive rainfall that could not flow into the surrounding rivers as the river stage was higher than the inside flow as well as failure to operate the regulators (sluice gates) and a lack of timely pumping of accumulated water (Alam & Rabbani, 2007). In 1998, 30 per cent of housing in the Dhaka metropolitan area sustained damage; while during 1988 flooding 85% of the area of the city was submerged under 0.3 to more than 4.5 metres flood water for several weeks (IFRC, 2010). Any such fluvial flooding in future will cause severe disaster in the city.

In recent years intense rainfall are creating pluvial flooding in the city as the drainage system are not capable to manage events like 290 mm rainfall in 6 hours in 2009 (Staff Correspondent, 2009). The city drainage systems were not designed to serve the dense development that resulted from rapid real-estate development. Very few developments consider water logging in an area for the increase of built environment and lack of natural runoff with an assumption that it is responsibility of the city-corporation to provide drainage for the city. Even some of these drainages often are clogged from construction materials reducing their efficiency. To date there is no definite guidance or monitoring on how the developers should take responsibility to reduce damage to roads, footpaths and drainage they use during any construction work. They take advantage of these facilities, but do not bear any responsibilities for their maintenance or reconstructions. Furthermore since they sell the property to a client or a client group, they tend not to take in consideration the long term effects the projects for the sake of their immediate benefit or quick economic return. Thus, the risks and costs of fluvial flooding are transferred either to the public authorities responsible for maintenance of infrastructure or the users.

Similarly, the encroachment of wet-land and low-lying areas for housing development around the city are increasing the risks of both fluvial and pluvial flooding in future. They block the natural water-flow and increase risks of water-clogging as well. Moreover, many of the factories and production plants drain their industrial waste into these wet-lands causing severe water pollutions (Staff Correspondent, 2012c). The natural habitats are destroyed as a consequence of development for production near the wetlands. Furthermore, during any major flooding the polluted water penetrate with flood waters and cause various water-borne diseases. During 1998's flooding people who had to wade through flood waters complained about more skin diseases (Rashid, 2000). Many brick kilns have been established in these low-lying areas to use the top soils of the land during dry season. They are causing major air pollution for the city.

Again, the high density development of Dhaka is depended on ground water for water supply for the city. Dhaka Water Supply Authority lift 1,250 million litres water a day from underground; they supply 1,560 million litres a day against a required 2,000 million litres (Roy, 2012). As a consequence the ground water level has been lowering every year with increased demand and inadequate recharging from less runoff absorption. One study predicted that Dhaka is sinking over half an inch a year on average because of excessive extraction of groundwater and inadequate recharging of the vacuum it creates below the surface. The lowering water level also

increases the risks of earthquake (ibid). However, these predictions could not be supported by any scientific data yet.

Box 5: Real estate development and flood risk in Lagos, Nigeria

Developed land comprising residential, industrial, commercial, transportation and other use increased from 85.4 km² (43.36%) to 111.9 km² (56.8%) of the total land area of Lagos between 1986 and 2002 (Okude and Ademiluyi, 2006). Significant loss (38-100%) in wetlands as a result of urban development in coastal parts of the city was also recorded during the period 1986-2006 (Taiwo, 2009). Subsequent changes in the hydrological fluxes arising from changes in land use land cover in the urban watershed have resulted in increasing flood hazard and risk in many parts of the metropolis. Although flooding has become widespread in the city it is the urban poor in slum communities that are mostly affected due to their hazardous locations and their limited adaptive capacity (Adelekan, 2010). Lagos is presently assessed to be one of the 50 cities most exposed to extreme sea levels and is projected to experience more than 800% increase in population exposure by the 2070s. (Nicholls et al, 2007). The recent flood events of 2010 and 2011 in Lagos exposed the risks of building developments mostly by private individuals and poor urban dwellers in hazardous areas.

The large scale real estate property development in the Lekki Peninsular, the newly developing area of Lagos expansion, especially since 1983 when the Lagos state government began to allocate land here for urban development provides an example of how real estate property development is influencing disasters (Adelekan, 2010). The physical development of the Lekki Peninsular which is being undertaken with little or no consideration for sea level rise and the possible risk of coastal flooding make this rapidly urbanizing area and its growing population highly vulnerable to associated disaster risks. In the last three years real estates which have been developed by different developers on the Lekki Peninsular and other coastal locations in Lagos have been exposed to flood risks and ocean surges. Extensive dredging and sand-filling activities taking place on the Lagos shoreline for urban development by private developers in recent years has been adduced for the increased intensity of ocean storm surges along the Lagos coast which has affected not only the beneficiaries of such projects but also those residing in poor communities along the coast. The on-going Eko Atlantic City project is particularly considered by the public to have implications for increasing flood risks on the Lagos coast. The project being executed by a privately-owned company with the support of the Lagos State Government was initiated to undertake extensive reclamation towards recovery and protection of the eroded Lagos coastline and construction of an 850 hectare island. It is projected that Eko Atlantic City will provide a new business centre for Lagos, offering high-value residential and office space and recreational opportunities that will support some 400,000 residents and 200,000 daily commuters (van der Spek, 2009).

The exposure to flood risks in these locations has resulted in varying costs to property owners and also the public sector. While some residents in Lekki Phase II have abandoned their buildings others have remained to face the risks with the associated coping costs. The property market in Lekki has been affected and some property owners have had to sell their buildings at half the economic cost in order to avoid total loss. At Goshen Beach Estate, Lekki an ocean surge protection levy of N1million was placed on property owners to raise fund towards saving the estate from destruction.

The total cost of the 2011 floods in Lagos, in terms of goods and properties, was estimated by the Nigerian insurance industry as NGN30 billion (USD200 million). The 2011 Lagos floods resulted in the highest claims settlement in the history of the Nigerian insurance industry, with only one company making claims of over NGN7 billion (USD46 million). Another consortium of 10 insurance firms were said to have paid NGN1 billion as interim settlement to another company (Popoola, 2011). Yet, a broad category of properties damaged or lost to flood are not insured and are owned by middle-class and poor residents, many of whom live in informal settlements.

For the urban poor that were displaced by the severe floods of 2010, 2011 due to their location in high risk areas especially along the Ogun River and canals, huge public spending was committed by Lagos state government to the establishment of three relief camps in different parts of Lagos state and for the provision of relief materials, medical supplies and feeding.

Looking at the examples illustrated by the cases developed for this report, show that there are different types of risk-inducing construction practices and that these also influence who bears the burden of this risk (See Table 1).

Table 1: Types of risk-inducing construction practices and who bears the burden of risk

Types of risk-inducing construction practices	Who bears the burden of risk
<p>Building in hazard-prone locations</p> <ul style="list-style-type: none"> • Building on flood plains • Building in coastal areas subject to storm surge • Building on seismic fault lines or areas prone to liquefaction • Building on steep slopes at risk of landslides • Building near to bushfire or forest fire areas 	<ul style="list-style-type: none"> • Businesses and residents that are users of the buildings are directly impacted when there is a disaster event • Losses not covered by insurance must be covered by public sector or by individuals
<p>Construction in one area exacerbates risks in neighbouring areas</p> <ul style="list-style-type: none"> • Coastal erosion in adjacent areas caused by engineering techniques used in the project • Infilling of wetlands, lagoons, swamps, mangroves increases flooding in other areas • Flood reducing infrastructure, i.e. pumping, embankments, causes greater flooding elsewhere • Use of non-porous surfaces increases run-off • Pumping out groundwater is causing subsidence and increasing earthquake risks 	<ul style="list-style-type: none"> • Businesses and people located nearby who feel worse impacts (i.e. more intense flooding) because of the development • Risks are passed onto the public sector, who often becomes responsible for recovery and risk reduction • Impacts felt most strongly in informal settlements lacking infrastructure
<p>Building designs or construction methods that do not account for known risks. Lack of risk reducing infrastructure</p> <ul style="list-style-type: none"> • In seismic areas, designs or construction methods that are not safe for earthquakes • In flood areas, buildings that are not raised, or having critical building infrastructure located in basements • Foundations that are not deeply set can cause buildings to move in floods • Inadequate site drainage 	<ul style="list-style-type: none"> • Businesses and residents that are users or owners of the buildings are impacted when there is a disaster event • Losses not covered by insurance must be covered by individuals or by government

Building on evidence from the cases, the following table synthesises the different factors that are influencing how the private sector takes into account disaster risks in its decision-making (see Table 2). Indicated at the bottom of each factor are the cases that exemplify this.

Table 2: Factors influencing how the private investors in construction view disaster risks in deciding where and how to build

The underlying drivers of risk in private sector building and construction

The amount of information available about hazard risks

Hazard risks are often not made clear to investors. This can be because there is a lack of data, for example, there are no risk maps, or risk maps are out of date, or scale is too large to be useful. There may also be uncertainties about how climate change will impact a locality. In some situations, sharing risk information publically could scare off investors or impact on property prices.

Examples:

- Thailand Board of Investment claims that a lack of information hazard risks and mitigation investments increased insurance costs for industries located in Bangkok.
- In Lagos, Nigeria, land allocated by the government to private developers has been subject to intense flooding – due to unforeseen hazards (heavier precipitation resulting in floods, fluvial flooding and increased frequency of storm surges) that are related to climate change. Inadequate information about climate change impacts, have lead to projects along the coastline being abandoned.

The prevalence of other factors in making a return on investment means that hazard risks may not be a priority

Even though a particular location may have a known hazard risk, it will be advantageous for the investor to build there because there can be a good return on investment. Financial viability of the project is the most important element and disaster risks may only be one factor in the decision about where to build the project. The location can be made safer by building necessary infrastructure (such as for floods) or using construction techniques that will reduce hazard risks.

Examples:

- In Dhaka, Bangladesh, high return on investments in apartment construction has caused the infilling of water bodies to make more land available for construction.
- Lagos, Nigeria, private developers accessing land because of availability of infrastructure, security, and where there will be a market for them to sell the units. For this reason, private developers are also developing on marginal lands, flood prone and coastal areas – which is contributing to flood disasters and making vulnerability worse in general
- England, the practice of a ‘sequential test’ and other practices of flood plain management has lead to 11% of new developments being built on flood prone land

Regulations are not strongly applied or it is possible to get around them

Regulations guiding urban development differ across regions. In some places regulations regarding hazard risk are legislated through law, in some places they are guidelines or policies, which are open to interpretation and different methods of application. In many countries, it is the norm for regulations to be flouted if an investor has political connections or is willing pay bribes. Since investments in construction are a necessary part of the local economy, local governments are likely to welcome investments and reducing disaster risks may be less important than other priorities;

hence a relaxing of the regulations. Checks on construction practices may not be thorough.

Examples:

- Since the introduction of regulations about flood plain development there has been almost no development on flood plains in Scotland, yet in England there has been 11% of new development on flood plain areas. This is partly because regulations in England are less strict about development in flood plains than regulations in Scotland.
- Regulations guiding urban development in Dhaka are often not upheld, this is partly because the detailed area plans have not been approved and partly because a system of bribes and corruption that allow powerful groups to get around the regulations.

Having a short-term view about financial gain

Investments in speculative construction are short-term, as properties will be sold after the project is completed. Thus from the investor's perspective, disaster risks are only a factor if it is something that is likely to happen during the project. Safe construction methods or risk reducing infrastructure can be important marketing points.

Examples:

- Dhaka, Bangladesh, since private developers sell the property to a client or a client group, they tend not to take in consideration the long term effects the projects for the sake of their immediate benefit or quick economic return

Availability of insurance covers losses in the event of a disaster

As long as investments can be protected by insurance, at a rate that is economically viable for the project, then disaster risks that come from building on hazard prone become not important. Insurance can work as a dis-incentive to think about disaster risks.

Examples:

- In the UK, mandatory insurance coverage in flood plain areas is a dis-incentive to consider disaster risks in development decisions.
- Multi-national companies base their decisions about a location to invest partly on the availability of insurance underwriting at an economically viable cost

As is depicted in figure 6, construction in the urban environment can be characterised by a number of different building practices, such as 1) Speculative development of all kinds; 2) Construction of commercial premises, i.e. services or production by businesses; 3) infrastructure development; 4) individual housing, either formal or informal. The private sector in building and construction is active in all of these areas, (although this paper is mostly concerned with its activities in speculative development and commercial premises of businesses). As the figure below shows, there are several factors that can potentially influence the urban construction environment. The motivations and interests of different actors, for example local governments and their regulations, insurance industry, built environment professionals, investors, insurance companies, and land owners all influence how and where investments in construction are made.

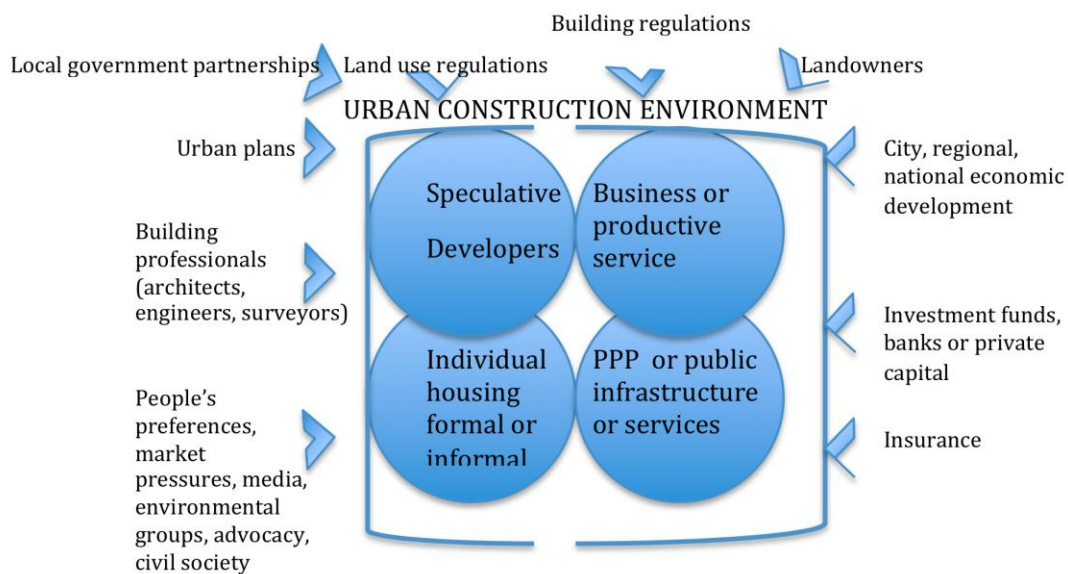


Figure 6: Factors potentially influencing the production of risks in the urban construction environment.

3.2 PLANS AND REGULATIONS ARE NECESSARY, BUT NOT SUFFICIENT FOR INFLUENCING PRIVATE SECTOR TO REDUCE RISKS

Key points:

- **Regulations do guide development and are an important part of making safe land available for development and guiding how construction should be undertaken. However, regulations do not necessarily result in reducing disaster risks. Because of competing priorities of local governments to be competitive for development interests, regulations are often something that can be gotten around if necessary.**
- **Planning is a dynamic process that has multiple actors influencing it, not a technocratic process of checks. Therefore engagement with developers, companies, and built environment actors is a necessary part of planning and needs to accompany regulatory frameworks. This helps to incentivise the different actors.**
- **Although mitigating flood risks to particular localities will reduce risks to the industrial investors, it does not take a comprehensive approach to recusing risks across the city.**
- **Investors in building and construction have many things to take into account to get projects done, so disaster risks may be only one factor they consider.**

3.2.1 How different types planning regulations impact on development in flood plains, example of England and Scotland¹²

¹² Reference as : Boshier, L. (2013). 'Flood risk management and the roles of the private sector in England.' In, Johnson, C. et al. (2013) Private sector investment decisions in building and construction: increasing, managing and transferring risks. Background Paper for UNISDR 2013 Global Assessment Report, UNISDR, Geneva.

Within the UK, the resilience of the built environment has been given increasing attention over the past decade, with a range of non-legislative policies and incentives to aid in reducing the vulnerability of the built environment to the plethora of hazards, threats and major accidents that pose a risk to it (Bosher et al. 2007). However, some of these advances could be seriously undermined due to the proposed reductions to government spending on flood defences, with resources capped at £540m per annum over the next three years resulting in an 8% reduction since 2010 in real terms (Bennett 2012). Nonetheless, advancements have occurred in recent years particularly in relation to the areas of urban planning.

Urban planning in England is highly regulated to the extent that the planning system has often been accused of constraining development and in some cases stymying private sector investments (see Balen 2006; Evans and Hartwich 2006). The publication of *“Planning Policy Statement 25: Development and Flood Risk”* (PPS25) by the Government was intended to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk (DCLG 2006).

However, the figures in Table 3 suggest that the publication of PPS25 in 2006 has had a negligible impact in reducing the proportion of dwellings being built in flood prone areas. Table 3 shows Government figures for the percentages of new dwellings¹³ built within areas of high flood risk¹⁴ between 1989 and 2010 (DCLG 2011). Table 3 shows that the average proportion of new dwellings built in areas of high flood risk has fluctuated annually between 7 and 11% with some regions such as London, Yorkshire and Humber and the East Midlands regularly surpassing these averages. The consequence of this is that on average nearly 1 in every 10 new dwellings is built in flood prone areas in England. In real terms this equates to approximately between 10,000 (based upon the 102,830 dwellings built in 2010)¹⁵ and 17,000 (based upon the 175,560 peak of dwellings built in 2007)¹⁶ dwellings being built in high flood prone areas every year for the last two decades. *However, it should be noted that there have been some more positive results in the reduction of the amount of developments being built in ‘Very significant flood risk areas’ (greater than 1 in 20 year return) and ‘Significant flood risk areas’ (greater than 1 in 75 year return) as defined by another Government agency, namely the Environment Agency (EA 2011)¹⁷.*

Since there has been continuing development of flood plains, even after the introduction of the PPS25, it has called into question the relevance of this regulatory instrument for limiting development in high-risk area. Specifically, the PPS25 has been criticised because it can permit development in flood plains if there is nowhere safer to build through an approach called ‘The Sequential Test’ (Crichton 2012). The planning policy requires Local Planning Authorities (LPA) to apply a “sequential Test to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed¹⁸.” The approach seeks to place less constraint on development, while still

¹³ A ‘Dwelling’ in the context of this data is defined as a ‘self-contained unit of residential accommodation’.

¹⁴ *The figures in Table 1 are for dwellings in ‘floodplains’ with a 1 in 100 year return period and ‘coastal areas’ with a 1 in 200 year return period.*

¹⁵ Green (2011)

¹⁶ Ramseh (2012)

¹⁷ *The Environment Agency (EA 2011) claim that approximately 98 per cent of planning decisions in flood risk areas in England were either amended in line with the EA’s advice to address flood risk or withdrawn. However, the report lacks sufficient details explaining what proportions of the objections by the EA were eventually accepted with minor or no modifications or through the addition of flood defences.*

¹⁸ Planning policy statement 25 : Development and Flood Risk, p.7

accounting for flood risks in development decisions. However, this approach can be abused, as explained during an interview with an insurance expert.

“In practice this test can be, and has been, used by developers to get permission to build in flood prone areas because they have argued that there are no non-flood prone areas available to build upon. This argument has increasingly been used successfully to get planning permission in Greater London.” (Insurance and flood risk practitioner, London)

Table 3: Land Use Change in England: Percentage of new dwellings built within areas of high flood risk, by region, between 1989 to 2010

Year	Regions of England									England
	N. East	N. West	Yorks & Humber	East Mids.	West Mids.	East of England	London	South East	South West	
1989	1	4	11	13	3	7	17	8	7	8
1990	1	4	13	12	2	6	16	7	6	7
1991	2	3	15	8	5	4	13	5	5	7
1992	5	3	11	7	4	5	19	6	7	7
1993	1	4	10	12	4	4	15	6	5	7
1994	2	4	10	9	4	5	17	6	8	7
1995	4	3	11	10	3	5	21	6	7	8
1996	2	2	9	10	4	4	25	5	7	7
1997	3	2	9	11	4	7	24	6	9	8
1998	1	3	6	4	4	5	23	7	7	7
1999	2	3	9	7	4	6	24	7	8	8
2000	1	5	11	9	2	6	22	7	8	8
2001	2	5	11	10	3	5	18	7	9	8
2002	2	4	11	12	3	7	20	6	11	9
2003	2	5	12	11	2	7	28	7	8	9
2004	1	3	9	11	4	7	27	6	7	9
2005	1	5	12	9	3	8	15	6	8	8
2006	1	4	15	12	4	9	19	8	7	9
2007	2	6	14	12	5	6	16	5	5	8
2008	3	2	14	10	4	5	23	5	7	9
2009	1	3	10	10	3	10	21	9	8	11
2010	2	8	11	7	4	4	21	5	7	9

Source: DCLG 2011

Notes: The data in the table above are based on records received from Ordnance Survey up to March 2011

It has also been suggested that continued flood plain development in England has had an effect that has not really been fully appreciated by the English government. For instance, Crichton

(2008) states that 'property developers'¹⁹ are increasingly using flood plains to build social rented housing for low-income families, homes for the elderly/disabled as well as schools and hospitals; to the extent that there are over 2,000 schools and 80 hospitals in flood hazard areas in England (Crichton 2008). This indicates that the legacy of ineffective planning policy in England have contributed to creating urban areas where some of the most vulnerable members of society (i.e. children, the elderly and the ill) inhabit highly flood prone areas. In some cases, these building uses do not possess adequate insurance cover. In the wake of the 2007 floods in the UK, the government's subsequent report noted that the residents of public housing are often the least resilient and are most unlikely to have insurance (Cabinet Office 2008).

In the UK, it has been argued that agreements between the government and the insurance industry have left an increasing number of vulnerable people without adequate cover against natural hazards such as flooding (Wamsler and Lawson 2011). There is currently an agreement between the Government and the insurance industry, called the '*Statement of Principles*' that obliges insurance companies to offer flood cover as part of standard policies in most cases. The agreement, that is due to expire in June 2013, does not guarantee cover for some properties, including properties that continue to have a significant flood risk. Nonetheless, while the agreement has been in place it has meant that many properties in flood prone areas have received flood cover as a standard component of their household insurance cover and some have proposed that this may have de-incentivised property owners to proactively address or avoid flood risk (Cabinet Office 2008).

The key message is that despite a raft of guidance for planners and restrictions for developers it appears that the development of flood prone areas in England persists and in some regions has actually increased (DCLG 2011).

Crichton (2012) suggests that there are 42 lessons that can be learnt on this matter from England's neighbours in Scotland, but just a couple of major lessons will be briefly discussed here. For example, the '*Flood Prevention and Land Drainage (Scotland) Act 1997*' and the '*Scottish Planning Policy 7: Planning and Flooding*' imposes a clear statutory duty on local councils to maintain watercourses, initiate flood defence projects, and issue reports every two years on all flooding problems and what they are doing about them. These are noted to have been the first planning policy to be legislation and therefore mandatory in mainland Britain. As a result of this legislation, where developments are proposed in flood prone areas, the local councils have been given an incentive to ensure that flood risk to new and existing developments is not increased. If it is, then the developer is obliged to provide funds for the construction of flood defences or other flood risk management features such as sustainable urban drainage systems (SUDS). Crichton (2012) states that legislation in England is not as stringent as in Scotland, arguing that tighter regulation has been the case in Scotland since 1995, and this firm approach has meant that developers have now sold almost all their land banks in high-risk areas and accepted that they will never get permission to build there. Therefore, while PPS25 allows building in flood hazard areas if nowhere else is available, the Scottish Planning Policy does not permit the building of residential property in areas where flood risk exceeds the 200-year return period. Comparing the proportion of new building in flood hazard areas in recent years, shows that there is a significant

difference between England and other parts of Britain (see Table 4). In England, 23.1% of the existing properties are at risk and 11% of new builds are in flood hazard areas. In Scotland, there has been negligible amounts of building since the first flood-related regulations in 2004. According the Critchton (2012), this is partly a result of more strict regulations, and also the inclusion of multi-stakeholder teams addressing regional flood risks. There are other lessons from Scotland that could also be listed, related to better flood mapping, lower housing density, and obligations to keep watercourses free of debris but these are more suitably explained in Critchton (2012).

Table 4: River, coastal flood and surface water flood exposure in Britain. 100-year return period for river and surface water flood in England, Wales and Northern Ireland. 200-year return period for Scotland and coastal flood²⁰

Country	No. of households in 2011 (millions)	Population in 2009	Flood exposure in 2011			
			Pop (000)	Pop per sq. km	At-risk households (000)	Proportion of existing properties at risk
England	22.52	50,016	383	5,200	23.1%	11%
Wales	1.28	2,935	141	357	27.9%	Negligible under 2004 planning policy
Scotland	2.41	5,056	64	109	4.54%	Negligible except in Moray (since 1995)
Northern Ireland	0.83	1,744	124	46	5%	Negligible (since 2006)

Sources: Office for National Statistics, the Environment Agency, DCLG, the Welsh Assembly, the Scottish Government and the Northern Ireland Rivers Agency.

²⁰ 100-year figure for Scotland is negligible

Note 1: The Environment Agency suggests that 2.8 million households are at risk of surface water flood in England. Figures for Wales include surface water flooding.

Note 2: It is clear that Wales has by far the biggest problem with flood exposure. Wales stopped allowing flood plain development under a new planning policy issued in 2004. However, Carwyn Jones AC/AM, Minister for Environment, Planning and the Countryside, issued circular [CL 09-06](#) on 10 November 2006, to instruct planners to resume allowing new building in flood hazard areas. Presumably this was following pressure from property developers. It is not yet known what effect this has had or whether planners followed his instructions, as obviously this is not something the Assembly wish to publicise. If you have any information about this matter, please [let the author know](#).

Note 3: These figures do not include properties within the danger zones of dam break risk. Dam break maps started appearing in 2011. There are 680 large reservoirs in Scotland and 2010 in England and Wales. 69 per cent of large reservoirs in England and Wales are a risk to the public according to the Environment Agency.

3.2.2 Limitations in Implementation of Planning Guidelines and Regulatory Frameworks in reducing disaster risk in Dhaka, Bangladesh²¹

In Dhaka, Bangladesh, the Dhaka Metropolitan Development Plan (DMDP 1995-2015) covers three geographical levels: sub-regional, urban and sub-urban. It is comprised of three components: a structure plan, an urban area plan, and detailed area plans (DAP).

Despite the existence of these regulatory frameworks and planning guidelines, urban development in Dhaka has yet to be strongly influenced by them, meaning that environmental issues (including hazard risks) are less likely to be taken into consideration in development decisions. The implementation of these plans is marred both by the quality of the regulations and capacity to implement them, and by powerful groups exerting control over the development process.

Authorities paid little attention to build capacity of the city development authority, known in Bangla as RAJUK - Rajdhani Unnoyon Kotripokkho, to implement the Metropolitan Development Plan. Although the structure plan was formulated in early 1990s, it took almost two decades to prepare the detailed area plans (DAP). As of 2011, many of the detailed area plans (DAP) are still awaiting legal authorization; this is not expected to be resolved soon for the lack of political will and pressure from the real-estate developers.

This issue of powerful groups exerting control over the development process also manifests itself in an established corrupted system whereby the regular process of approvals can be surpassed. The private investors in real estate and land development are influential groups who can influence governmental decisions for their financial contributions. Moreover, some of the influential land grabbers have political power to defy the regulations and increase the risks for the city as a whole. Many complaints are raised against officials, while some private developers bribe the officials to get approvals and clearances. The 'established' corrupted system discourages the private investors to go through the regular process of taking approvals. An architect (Riyaad Anwar) described that when a large development is required to get clearance from Department of Environment (DoE), usually the criteria are quite general and easy to fulfil. However often it becomes economical to bribe the officials to get approvals rather than spending for energy efficiency or incorporating risk-reducing measures in the buildings and constructions. Similarly, although filling up any wetland or natural water bodies is a punishable offence under the Bangladesh Environment Preservation Act, 1995 (Amendment 2010) (Staff Correspondent, 2012a), in recent years many private land developers fill out the peripheral low-lying lands and water ways in order to create plots for housing development (UNISDR GAR, 2011; Rahman, 2010). When concerns for such activities are raised in the media or by environment protection groups, in many instances the High court or the DoE issue 'show cause notices' or impose fine for the offence (Editorial, 2012; Staff Correspondent, 2012b). However in many instances the offenders continue not to comply with the rules for lack of monitoring as well as pressure from vested interested groups. Poor monitoring and improper management of the

²¹ Jabeen, H. (2013). 'Case Study on Dhaka.' In Johnson, C. et al. (2013) Private sector investment decisions in building and construction: increasing, managing and transferring risks. Background Paper for UNISDR 2013 Global Assessment Report, UNISDR, Geneva.

natural resources and natural hazards combined with unequal development have degraded the overall environment of the city (Rabbani et al., 2011).

Furthermore, **overlapping jurisdictions mean that authorisations can in theory be obtained from different bodies, allowing the easiest one to be chosen.** There are several ‘pourashava’ (municipality) apart from Dhaka City Corporation within the DMDP area. All of them have their own planning departments along with some authorizing power. In theory they are suppose to follow the structural plan of DMDP; however there are limited co-ordination between all of these public authorities. Even the new DAPs have variations between their four administrative zones. Private investors take advantage of these overlapping authority and discrepancies when it comes to take approval for any development. They submit their development plan to the authorities from where they will get most benefit out.

Another important issue is that the **policy makers of RAJUK still see development control through land-use planning as administrative in nature, rather than a dynamic process of engagement of multiple actors involved in development.** Any strategic planning for incorporating dynamic development requires institutional capacity through engagements of adequate number of professionals like urban planners, architects and environmental planners, which the present authorities’ policies and practices are not oriented towards. Such limitations in institutional arrangements failed to guide the private sector investors. All of these factors have resulted in increased and transferred risks to the public sector and city-dwellers in general.

3.2.3 Planning for disaster risk management in Bangkok, Thailand

In Bangkok, Thailand, city-wide planning and regulatory frameworks have also had a limited effect on influencing the building and construction of private sector actors. In 2006, the Bangkok Comprehensive Plan was introduced, which was the first time to have a clear framework for development, including spatial ratios and plot size. Before that there were only zoning regulations, Floor Area Ratio and open Space Ratio. Disaster risk reduction concerns – that is extending beyond relief to adaptation and resilience – are strongly reliant on the capacity of Thailand’s urban planning system to deliver long-term improvements. Inefficient and fragmented controls on urban planning and land use have meant that private construction and real estate has frequently been driven solely by speculation, profit and short-term economic gain. The devastation of the 2011 flooding highlighted the cost of improper and inconsistent land use development, such as the obstruction of natural flood drainage systems.

The industrial parks are one of the most visible intersections of industrial development and urban planning in Thailand. These estates, totaling 42 across the country, are allocated specially designated zones by the Ministry of Industry, and then developed by private sector partners and investors. With a minimum size of 500 Rai (about 0.8 square Kilometers), 60-70% of which is designated for factories, these ‘cities’ usually boast all the infrastructure of a typical urban area, such as electricity and sanitation. Importantly, this also includes flood protection²². The development of these estates is circumscribed by some degree of governmental regulation. In particular, the Industrial Estate Authority of Thailand (IEAT)’s requires the industrial sector to select an appropriate area for its activities, with estates located on low-lying areas and a polder

²² http://ns.boi.go.th/korean/how/industrial_estates.asp

higher than 50 cm capable of withstanding a 10-year flood event. However, industrial flood mitigation can often be excessively dependent on infrastructural prevention, designed around past flood events and limited return periods that may prove irrelevant in the wake of an extreme future flooding event. Although mitigating flood risks to these particular localities will reduce risks to the industrial investors on the estates, it does not take a comprehensive approach to recusing risks across the city for all people.

3.2.4 Regulatory environment in Lagos, Nigeria

In Lagos Nigeria, there is an existing regulatory environment that does take into account for disaster risks. However, due to other development pressures, **disaster risks may be one of only many considerations that developers and speculators to take into account when making decisions about where and how to build.**

About 70 per cent of the population in Lagos live in slums due to the inability of private and public institutions to provide land for housing or housing; these developments are not all influenced by the regulatory environment. The scarcity of decent and affordable housing in good locations of Lagos means poor migrants are forced to reside in areas that are either susceptible to flooding or build in such a manner that hinders flow of storm water.

The existing framework for urban development in the city is guided by land use plans and zoning regulations in terms of permissible developments, height, density and building setback provisions. Real estate developers in Lagos are expected to build according to zoning regulations. To this effect the regulatory frameworks contain provisions that provide safeguards to disaster risks e.g. regulations on the minimum setback to the ocean, lagoon, river and creeks, and gorges/canal/drainages respectively. Government also allocates land to private developers in various locations of Lagos state for building.

There are however other influences other than government regulations and guidelines that affect property developer's decisions on where and how to build. These include funds available to build, target market, availability of infrastructure, affordability of cost of land, direction of urban growth (i.e. areas where a lot of developments are going on) and security. This has resulted in recent pattern in private sector investments observed in the extension of residential and commercial property into marginal lands, flood-prone and coastal areas which have contributed to increasing vulnerability of urban population to natural disasters especially floods.

There are however instances where land allocated to property developers by government in the past has resulted in present risks for the people as a result of non-consideration of possible future effects of climate change as is being experienced currently (e. g. heavier precipitation resulting in floods, fluvial flooding, increased frequency of ocean surges). Examples of this are the prime real estates along the Lagos coast especially in Lekki Phase II and the private developer's scheme in Isheri North located on the flood plain of the Ogun River.

4 WAYS FORWARD IN INFLUENCING THE PRIVATE SECTOR IN BUILDING AND CONSTRUCTION TO THINK ABOUT DISASTER RISKS

4.1 Making information about hazard risks available to the private sector

Main points:

- **One way to leverage a change in perceptions of the importance of disaster risks in the private sector is to make more information available about the risks. This can help to guide private-sector decision-making and also influence insurance.**

Box 6: Information on hazard risks in Lagos Nigeria

In Lagos, Nigeria, to discourage development on marginal land, the government is providing land to private estate developers at less than premium cost. However, decision-making for private real estate developers about where and how to develop land is based on a number of factors (funds available to build, target market, availability of infrastructure, affordability of cost of land, direction of urban growth, and security). For example, one private sector developer, which is working on a project in Lekki-Ajah, Lagos describes how:

“Development decisions are hinged on feasibility studies carried out by technical experts in order to determine the viability of proposed projects. Also, land that was to be acquired by the company was reported to have been owned by ten families. The company was obliged to develop the area for commercial purpose in order to defray the cost of purchase from the communal land owners. This is the rationale behind the Victoria Garden City and the Ikota Shopping Complex in Ajah area of Lagos state. The area was initially swampy but was eventually sand filled and developed”.

Presently, Lagos does not have any flood hazard/risk maps, to inform decision making in urban development. The availability of information about hazards risks would be helpful for private sector real estate companies to factor into feasibility studies for a proposed development.

When land was being allocated to some property developers some years ago in Lagos, the effects of climate change (e. g. heavier precipitation, increased frequency of ocean surges) was not envisaged. This has affected prime real estate along the Lagos coast especially in Lekki Phase II and the private developer’s scheme in Isheri North located on the flood plain of the Ogun River. The exposure to flood risks in these locations has resulted in varying costs to property owners and also the public sector.

While some residents in Lekki Phase II have abandoned their buildings some have remained to face the risks. The property market in Lekki has been affected and some property owners have had to sell their buildings at half the economic cost just to avoid total loss. At Goshen Beach Estate, Lekki a levy of ₦1million (US\$6,300) was demanded of property owners as ocean surge protection fund towards saving the estate from destruction.

Government has ceased to allocate land for development in Isheri North and physical development in other areas liable to flooding and wetlands, which were initially approved for

building has been stopped. However, huge costs have been incurred in reducing exposure to flood risks. In 2000, the Lagos state government earmarked ₦2.93 billion (US\$18.6 million) to demolish buildings on drainage paths (The Guardian June 8, 2000).

Box 7:Thailand: Information about flood risks for the Board of Industry

Source: Interview with Mr. Pitak Pruittisarikorn, an executive vice president of Honda Automobile (Thailand) Co Ltd²³

The company was not only impacted by direct damage to the industrial site and the significant number of cars destroyed during the 2011 flooding but there were also substantial opportunity losses due to the closure of factories and industrial plants as a result of disruptions to the global supply chain. Following from this experience, he thought the industrial sector had two main disaster responses: 1) distributing its risk by choosing sites in different locations, and getting insurance coverage for its assets, and 2) building flood prevention walls. Concerning the second option, the larger industrial estates are better placed to respond quickly to future risk by constructing and maintaining flood protection infrastructure. Large industrial sectors have the financial capacity to raise the advance budget for flood prevention and can be relied on to pay back loans, which is not always the case for smaller industrial estates. The Board of Investment in Thailand (BOI) also launched a special tax incentive for flood-affected companies and industrial estates to invest in flood prevention infrastructure.

Furthermore, Mr. Pruittisarikorn also reported that, in terms of investment, the 2011 flood disaster had to some extent affected decision-making among some companies on their future expansion. The alternatives were to expand elsewhere within Thailand or even relocate to a neighboring country instead. The decision to do so usually factored in other natural risks such as earthquakes as well. Nonetheless, Thailand is generally still considered desirable by the foreign industrial sector due to the long history of collaboration and trust that has been developed over decades.

In terms of the public sector's role, Mr. Pruittisarikorn emphasized that how the Thai government chooses to support the industrial sector in the implementation of their plan is crucial. Moreover, **it is important for the government to take greater steps to reduce risk to the private sector beyond the current framework. The government could share flood data and information with the Board of Investment. The Board of Investment could also translate this output into different languages and disseminate it to foreign industrial companies through its network. This would greatly help the industrial sector in their analysis and decision making, enabling them to manage data much more quickly and so further reduce risk.**

Concerning the government's tax incentive, he considered that it was only a short term response. This is because insurance company is not likely to levy insurance on disaster, the cost is higher. It is important that **the government ensures efficient water management to boost the**

²³ Reference as : Marome, A. M. (2013). 'Case Study of Thailand.' In, Johnson, C. et al. (2013) Private sector investment decisions in building and construction: increasing, managing and transferring risks. Background Paper for UNISDR 2013 Global Assessment Report, UNISDR, Geneva.

confidence of the insurance company in the industrial sector, which will in turn reduce their insurance premiums. This would greatly help smaller businesses that, unlike the larger industrial companies, do not have the ability to transfer risk to different insurance companies. In this light, risk policies should include not only flood and water management plans, but also include measures aimed at the insurance sector and its premiums.

4.2 Built Environment professionals influence private sector construction decisions

Key messages:

- **There are many stakeholders that should/could be more involved in DRR related activities.**
- **Built environment professional (architects and engineers) also can influence how risk reduction is incorporated into the project**
- **Specific stakeholder optimal inputs should be targeted at times when the inputs can be most relevant.**

Private and private/public sector stakeholders (for instance, clients and architects can be both private and public sector) have a potentially critical role to play in whether or not DRR is incorporated into urban developments. The private and private/public sector stakeholders (in *Italics*) are listed in Table 5, which shows the particularly important pre-project and pre-construction stages where DRR inputs should be considered (Bosher et al. 2009). This is based largely on the UK context outlined in Appendix A.

Risk managers and emergency planners consulted as part of the UK case study research reported that their inputs on any DRR related matters (i.e. flood risk assessments or flood mitigation) tended to be requested far too late in the process (i.e. when everything was planned and built, and any hazard mitigation measures were afterthoughts and subsequently tended to be less effective and more expensive).

Table 5: Summary of selective key public sector stakeholders that should be involved, and where optimal inputs should be made

Planning, design and construction phase	Formal specified input	Formal unspecified input
Pre-project stages [Including design brief, concept, technical design]	<i>Urban planners/designers</i>	<i>Emergency/risk managers</i>
	<i>Client</i>	<i>Architects/designers</i>
	<i>Developers</i>	Utilities companies
	<i>Civil engineers</i>	Structural engineers
		Investors
Pre-Construction [Including proposals, planning, tender documentation and procurement]		Insurers
	<i>Architects/designers</i>	<i>End user</i>
	Engineering consultant	Professional organisations/institutions
	<i>Urban planners/designers</i>	Insurers
	<i>Civil Engineers</i>	
	<i>Emergency/risk managers</i>	
	<i>Developers</i>	
	Contractors	
Construction [Including project planning and construction]	<i>Client</i>	
	Utilities companies	
	<i>Architects/designers</i>	<i>Client</i>
	<i>Civil engineers</i>	Materials supplier
	Engineering consultant	<i>Emergency/risk managers</i>
Post-Completion [Operation, maintenance and change of use]	Contractors	<i>Developers</i>
	Utilities companies	
	Specialist contractors	
	Insurers	Contractors
Post-Completion [Operation, maintenance and change of use]	Utilities companies	Structural engineers
	<i>Client</i>	

End user

Architects/designers

Emergency/risk managers

Developers

Urban planners/designers

Key: Primarily Private sector stakeholders

Primarily Public-private sector stakeholders

Source: after Boshier et al. (2009)

Box 8: An example of how built environment professionals can influence risk reduction in construction projects²⁴

Approximately three years ago a large construction company was in the process of compiling a tender to bid for the redevelopment a large mixed use site (civic buildings, retail and residential) in Greater London. The construction company were partners on a programme of DRR-related research being conducted by academics in the UK. The academics advised the construction company that the proposed development had areas that were prone to flood risk and the nature of the development also made it a possible target for terrorist attacks and general criminal activity. A 'design workshop' was undertaken with the project team (consisting of architects, engineers, quantity surveyors and urban designers) involved in producing the tender documentation. During the workshop a range of structural and non-structural flood risk management, counter-terrorism and crime reduction solutions were suggested to the project team, many of which were eventually incorporated into the revised designs for the development.

When the tender documentation was later presented to the client, it was made explicit that (although not requested by the client) there were a range of risk reduction measures designed into the proposed development and that these had been incorporated at no extra cost. The tender was competitively priced and was ultimately chosen by the client; it was noted that the client liked the proactive risk reduction initiative that the construction company had taken and it was a key factor in their decision to award the construction company the project. The construction company clearly recognised the benefits of taking a proactive approach to incorporating DRR at the earliest planning and design stage. When the research team asked the construction company if they could provide a figure as to how much extra money the risk reduction measures had cost, the response was *"effectively it did not cost anything extra because we designed the structural and non-structural features in at the earliest stage. If it did cost anything more we would have just used slightly less high grade marble in the entrance lobby to the main building"*. The director of the construction company explained that at a time where margins were tight and competition for business was fierce, they clearly recognised the benefits of being seen to be a market leader at incorporating various types of risk reduction measures and also in giving the client the

²⁴ Reference as : Boshier, L. (2013). 'Flood risk management and the roles of the private sector in England.' In, Johnson, C. et al. (2013) Private sector investment decisions in building and construction: increasing, managing and transferring risks. Background Paper for UNISDR 2013 Global Assessment Report, UNISDR, Geneva.

impression that they were 'getting something extra for nothing' especially if these measures could lead to perceived reductions in the client's insurance premiums.

Box 9: Risk reduction measures adopted in private sector construction projects in Lagos Nigeria²⁵

Real estate built and maintained by private construction companies for the elites or high-income people have infrastructure in place to minimise disasters risks. Whereas low and middle-income housing estates in the same zones cannot afford to build this infrastructure, housing projects aimed at high-income groups have the ability to pay for the huge capital outlay that is required to build infrastructure to make the sites safe. Some of the risk reduction measures adopted include:

- Detailed study of sites in order to ascertain suitability for the proposed projects
- Collection of loan facilities to provide capital for the huge investments.
- Obtaining insurance for the properties
- Filling of the ground with artificial earth materials in order to reinforce its strength against any disaster
- The use of piles in building to reinforce the strength of foundations, rather than using deep raft foundations
- Maintaining the appropriate setbacks and reserve areas prone to flooding as conservation or recreational areas.
- Construction of low-rise buildings due to the nature of the terrain
- Provision of adequate drainage to convey excess runoff via underground canal to the adjoining lagoon etc.
- Further engineering correction techniques are carried out to withstand any impending disaster

These measures have, however, only partially limited the vulnerability of construction projects to flood disasters in spite of the advanced mitigation measures in place. The incentives available to aid disaster risks reduction come majorly from insurance companies who come in to indemnify for their clients in periods of disaster.

²⁵ Reference as : Adelekan, Ibidun O. (2013). 'Case study of Lagos, Nigeria.' In, Johnson, C. et al. (2013) Private sector investment decisions in building and construction: increasing, managing and transferring risks. Background Paper for UNISDR 2013 Global Assessment Report, UNISDR, Geneva.

4.3 Local governments engage with the private sector, involving them in multi-stakeholder decision-making

Main Points:

- **Participatory planning/multi-stakeholder engagement can enable the government and private sector to work toward the same goals, and both can serve their interests.**

Box 10: Flood Liaison and Advice Groups in Scotland: Dialogues with key stakeholders²⁶

Since 1995, there have been negligible amounts of construction in flood plain areas in Scotland. The current '*Scottish Planning Policy 7: Planning and Flooding*,' which had its roots in the 1995 National Planning Policy Guidelines, forbids building residential property in areas where the flood risk exceeds the 200-year return period. The Scottish approach has been characterised by a willingness to work with key stakeholders, including developers, insurers and those from the private sector, to solve problems together. An excellent example is the Flood Liaison and Advice Groups (FLAGs).

Until 2011, planners were obliged by law to set up FLAGs, which were non-statutory advisory groups of public and private sector representatives, convened by local government councils; the idea was to share concerns and knowledge and to provide advice on a wide range of planning and other flooding issues in an informal setting. Insurers play a key role in the FLAGs. Between 2000 and 2003, the Association of British Insurers (ABI) was instrumental in helping to establish 19 FLAGs with 28 Scottish local authorities covering more than 90 per cent of the Scottish population. These FLAGs brought together representatives from the ABI, property developers, landowners, Scottish Water, the British Waterways Board, emergency planners, hydrology consultants, SEPA, Network Rail, the police and fire and rescue services together with land use planners and development control officers for the local authority and neighbouring authorities.

All these representatives would informally resolve flooding issues on a catchment-wide basis. If developers are asked to commission hydrologist reports, they are archived and made available to FLAG members. Many of them would hold annual public events to tell the public what was happening. All of them published their minutes and talked to community groups.

There is no doubt that this was a very successful initiative, which helped to stop flood plain development in Scotland, and has been largely influenced by the insurance industry. Of those areas with a flood risk, only Moray refused to establish a FLAG with insurance representation and it continued to develop in the flood plain. Moray now has serious flood problems and many of their residents have difficulties obtaining flood insurance.

FLAGs provided much valuable advice to Scottish planning authorities and helped to spread best practice and catchment-scale policies. While most FLAGs have completed their aim of changing

²⁶ Reference as: Crichton D., (2012), *Flood plain speaking*, The Chartered Insurance Institute, London Available <http://www.cii.co.uk/knowledge/claims/articles/flood-plain-speaking/16686> (Accessed 14th August 2012)

the mindset in Scotland, a number are still meeting because the local planning officers find them so helpful.

This is in direct contrast to the system in England, which has no direct involvement of local communities and local knowledge and no system for planners to consult with developers, insurers or other key stakeholders and no system for consultations on a catchment wide basis.

Box 11: Private corporations engage in planning and learn about risk scenarios through the New York City Climate Change Action Task Force²⁷

In New York City, private sector firms provide many critical city services, particularly electricity distribution and telecommunications. In order to get private company representatives of the city's infrastructure entities to 'buy-in' to the planning process, they have engaged these critical stakeholders and decision-makers in a well-informed task force on climate change adaptation.

An element of the planning agenda for New York City, PlaNYC 2030, set out by Mayor Bloomberg, is to look at climate change adaptation within larger sustainability issues. In 2008 the city administration established an inter-agency Climate Change Adaptation Task Force, which was charged with identifying climate change risks and opportunities for the city's critical infrastructure and to develop coordinated adaptation strategies to address these risks. The task force consisted of approximately 40 city and regional public authorities and private companies that operate, maintain or regulate critical infrastructure in the region related to energy, transportation, water and waste, natural resources and communications.

To support the work of the task force, the city convened a group of climate change experts as the New York City Panel on Climate Change (NPCC) to advise the city on climate change science, potential impacts, adaptation pathways and climate protection levels specific to the city's critical infrastructure. The NPCC consists of climate change scientists and legal, insurance and risk management experts, and serves as a technical advisory body. It was designed to function in an objective, unbiased manner, with a role similar to that of the Intergovernmental Panel on Climate Change (IPCC) on the international stage for nation states.

The firms were part of the Task Force discussions had the opportunity to make inputs on the city's climate change adaptation planning framework, and to shape the expert knowledge on potential impacts of climate change in the region. Nonetheless, one of the challenges the private sectors firms faced was that they were less able to fully engage in planning efforts because of confidentiality and trade secret concerns.

²⁷ Reference as: Solecki, William (2012) Urban environmental challenges and climate change action in New York City. *Environment and Urbanization* October 2012 24 (2): 557-573.

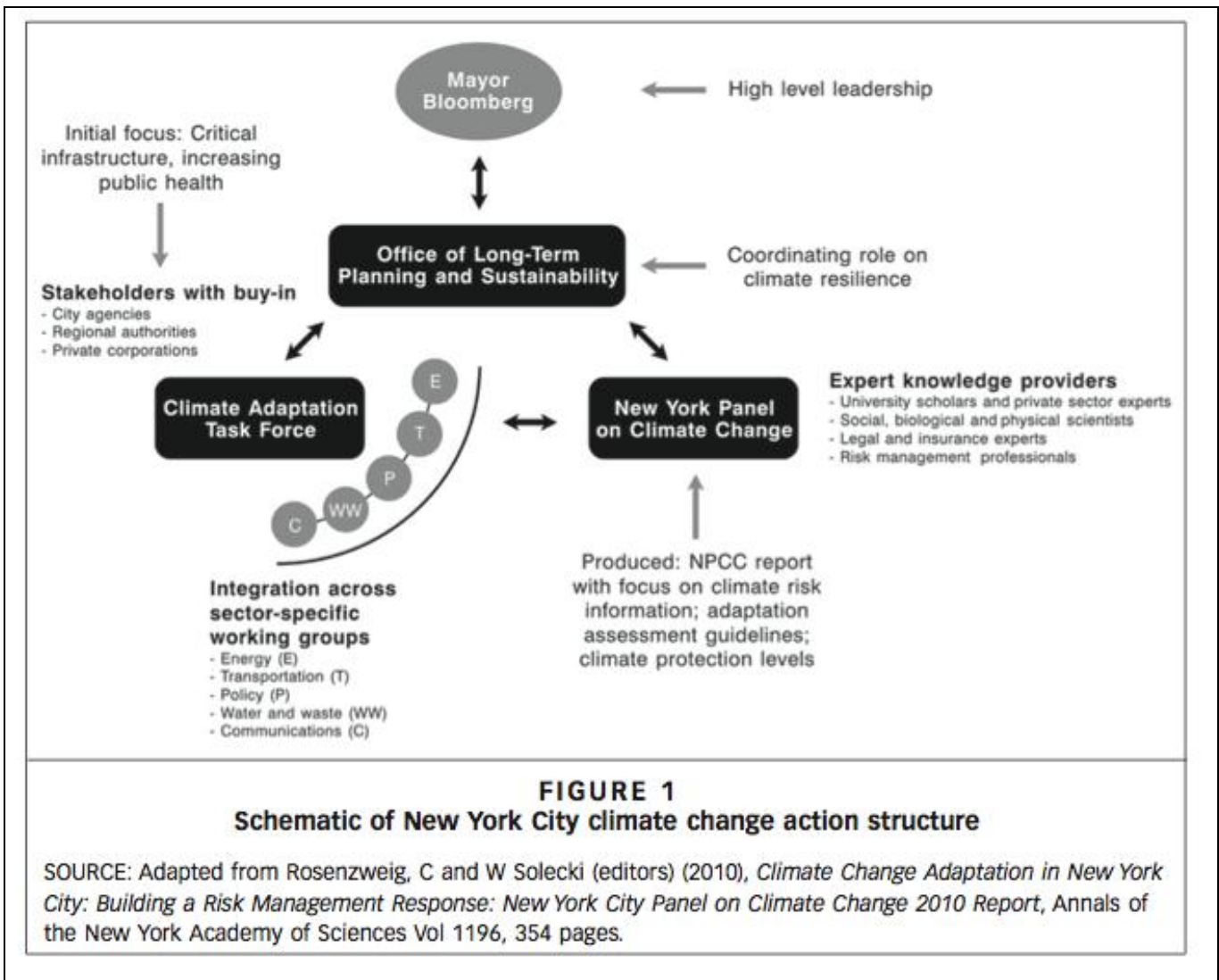


Figure 7: Schematic of the New York City climate change action structure, showing the role of the private sector in the Climate Adaptation Task Force (Source Solecki, 2012).

5 Conclusions

- There has been rapid growth in urban populations in low and middle-income nations, since the 1970s. This is expected to continue for next 20 years at least, especially in Asia and Africa. Urban development today is characterised by an environment of reduced regulation and competition for investments of global capital. For urban areas competing on this world market, this has meant providing the infrastructure to support large-scale capital investment. This has often been at the expense of investment in basic infrastructure, especially that which can protect the poor from disasters and less attention to environmental protection. Many cities also remain uncompetitive on the world market, unable to attract foreign investment and lack capacity to make investment in basic infrastructure that can reduce disaster risks.

- The real estate and construction sectors are important parts of national economies, and continue to increase their share, especially in low and middle-income nations. The demand for new housing, production facilities and infrastructure are being largely met through private sector investments and through speculative real estate development, and built by private sector construction companies. On the whole, it is the private sector that is literally building cities today. It is the middle and upper income people who can access these cities. Many of the low-income people are still housing themselves through informal means and self-building or accessing rental housing, some of which is built by the private sector.
- The concentration of populations in urban areas coupled with the concentration of capital in urban areas is increasing the potential for losses both for intensive and extensive types of disaster events. Climate change is likely to increase the impacts of disasters, especially in urban areas along coasts and in low elevation zones. Localised risk, such as at the urban level or within urban areas is still poorly understood in many cities.
- The cases written for this background paper outline three practices of the construction sector that are increasing hazard risks. These are: building in hazard prone locations; projects built in one location exacerbates risks in the neighbouring areas; projects that do not implement risk reducing building designs or infrastructure. In most situations, these hazard risks are not borne by the private sector developers, but are predominantly passed onto the public sector or to individual owners of buildings or homeowners.
- The cases written for this background paper uncover several issues that are driving the production of disaster risk in private sector construction projects.
 - The first is that disaster risks are often poorly considered in construction projects; this is partly because there is a lack of publically available information about the disaster risks and how these risks are likely to change in the future. The cases also show that making more information about hazard risks publically available could also act as an incentive for private sector actors to consider risk in development decisions.
 - A second driver is that private sector companies are predominantly interested in the financial viability of the project and disaster risks may not impact on the financial viability.
 - Thirdly, regulations, in most countries, are either lacking in substance or legal applicability or they are not strongly upheld in implementation. These problems are resulting in planning and building regulations that are possible to get around if necessary. The construction sector is also characterised by a high degree of corruption, which results in building projects that do not conform to regulations.
 - Fourthly, many construction projects, especially speculative development takes a short-term view about risk. In speculative development the investors will be interested in gains in the short-term and disasters risks are usually something that comes into effect in the long term. Although, the reputation of their company may cause a developer to think about the disaster risks that they may be passing onto their buyers. For example, one real estate developer in Dhaka advertises on their website that they only build on land that is 'RAJUK approved,' that is, approved for construction by the city development authority. Built environment professionals have an important role to play here in building risk reduction aspects into the project.

- A fifth driver of risk is the availability of insurance cover. Private companies see insurance as they way to reduce their risk to natural hazards. As long as they are able to purchase insurance to cover their assets then hazard risks are not important. Furthermore, legislation that requires that homeowners in hazard-prone areas have access to insurance coverage is leading to increased development in high-risk areas. Thus, the availability of insurance is actually leading to increased probability of disaster losses, increasing the concentration of risk.
- As many past studies have shown, regulations about building and planning are an integral part of disaster reduction practices. However the case studies for this background paper reveal that regulations on their own are not sufficient to reduce risks in private sector in construction projects. Technocratic planning processes tend to prevail, and what are needed are more dynamic planning processes that allow interaction between the multiple actors shaping the built environment. The Flood Liaison Support Groups that have been active in Scotland are an interesting example of how to incentivise different actors to think about hazard risks.
- The cases also show how in building projects, integrating hazard risk early on in the project process can increase the awareness about risk and incentivise risk reduction practices in building design. As was shown in Box 8, this can even make construction firms more competitive in construction tenders.

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Appendix A: Stakeholder identification and DRR inputs: Who should be involved and when should the inputs be made?

Generic planning/ design/build phases		Pre-Project phases				Pre-Construction phases				Construction phases				Post-Completion phase			
		Appraisal	Design Brief	Concept	Design development/ Tech. design	Outline proposals	Production information	Tender documents	Tender action	Project planning (mobilisation)	Construction to practical completion	Monitor cost procurement and quality	Post practical completion	Evaluation	Operation	Maintenance	Change of use
Sector (public/ private)	DRR inputs	Hazard Identification									Hazard Identification review						
		Mitigative adaptations															
		Preparedness planning												Preparedness planning (including response)			
		Recovery planning															
Mainly public sector	Architects/designers																
	Client																
	Civil engineers																
	Developers																
Mainly private sector	Utilities companies																
	Emergency/risk managers																
Public-private sector	Engineering consultant																
	Urban planners/designers																
Mainly public sector	Specialist contractors																
	Contractors																
	Structural engineers																
	Emergency services																
Mainly private sector	Local authorities																
	End user																
Public-private sector	Insurers																
	Government agencies																
Mainly public sector	Quantity surveyors																
	Materials supplier																
Mainly private sector	Professional orgs/institutions																
	General public																
Public-private sector	Trade org./representation																

KEY

Formal specified input

Formal open/unspecified input

Informal input

No input required

Mainly public sector

Mainly private sector

Public-private sector

These are the key stages for DRR inputs