

Building Better and Safely:  
Stimulating the Private  
Sector for Sustainable  
Solutions in Nepal



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# Executive Summary

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How can the private sector be engaged and profitably involved in building and improving safe structures in Nepal? What can be done to establish the framework and create the proper incentives? What lessons can be learned from other countries, especially from those that have large sections of their populations on low, informally earned incomes?

While the context in Nepal centres around the 2015 disasters, this paper also includes lessons that can be learned from areas that have not been impacted by those disasters, but where disasters might strike in the future.

“The standard of housing construction in Nepal is extremely low, which is why the damage near last month’s epicentre was particularly devastating.”<sup>1</sup> The National Planning Commission/GDFRR’s report indicates that many of the losses were due to the type of construction, which highlights an area to be strengthened when homes are rebuilt.

After a disaster in a developing country, much of the funding comes from donors and is used by non-governmental organisations that provide support to shelter those displaced. This is a critical and necessary function. For the longer term, it is imperative to find solutions that are sustainable and that bring in the private sector, particularly when most of the population has little access to resources.

Yet disasters also provide the opportunity to create new systems and new structures that are safer and stronger. These lessons not only involve reconstruction, which has been dealt with in other papers, but also includes how to create the systems to ensure that when new buildings are built or existing ones strengthened, they are done to a standard that is safe and durable. It also means expanding the resources to include not just donor funds and NGOs but also includes building standards, enforcement, insurance, finance, training and other areas.

This paper will show examples of how other countries have addressed many of these issues. It will include the cases of countries that have used disasters to strengthen their overall systems, such as Chile and Turkey, which can guide Nepal in how to create strong structures including those, such as Kenya, even if they have not faced a disaster.

It is critical that solutions be designed to match the resources that are available in the country and match how structures are built. That is why this paper starts with an analysis of what people earn, how they earn it and how they live.

As a low income country, Nepal ranks 145 of 187 countries in the Human Development Index. Only 16 percent of the population earns its income from formal salaried employment, with a great gender disparity. This means that solutions that rely on mortgage financing will only benefit those at the upper end of the income scale since regular employment is the key criteria of most mortgage underwriting.

In Nepal, 80 percent of residential structures are built by their owners, generally incrementally.<sup>2</sup> People build a portion of the structures and then add on as they save money to buy materials and have the time to build.

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<sup>1</sup> Nepal’s Second Quake Piles on the Pain, CNN Money, 2015

<sup>2</sup> Building Resilience in Nepal through Public Private Partnerships, World Economic Forum, 2015

According to the Global Assessment Report on Disaster Risk Reduction 2015<sup>3</sup>, in Nepal, “the vulnerability of the building stock makes a far greater contribution to risk.” It notes further that it is not a lack of building codes, but the implementation of them that causes major problems and notes “stark discrepancies between mandatory implementation and the actual adoption of codes.”<sup>4</sup>

The paper will make a number of key points:

- The solutions for how the country rebuilds, how it builds new structures even outside the disaster affected areas and how it strengthens existing structures must fit the resources of the population. This means understanding that incomes are low and informal and that most housing and small scale commercial structures, such as stores, are built incrementally.
- Rental housing needs to be a part of ongoing solutions, especially in urban areas. While 85 percent of the population owns their own housing, 40 percent of urban dwellers rent, as do nearly 60 percent of those living in Kathmandu. The numbers of renters will grow as the country continues to urbanize.
- The private sector is wide and diverse. It includes housing itself, as virtually all of the housing is in private hands. It also includes companies that supply the building materials, construction companies that are used for larger scale construction, labour that builds the structures, the funds that are used to pay for the building (including individual savings, remittances, small scale loans, mortgages and commercial financing), insurance and other areas. The areas of private sector involvement need to be prioritised for effective building in the future.
- There is a major distinction between residential building and small scale commercial that is built by individuals, and those built by developers, including schools, hospitals, commercial facilities and large-scale residential structures.
- The Government is the key actor in establishing the framework for how the private sector becomes involved. This includes:
  - Establishing building codes, some of which are already in place, but doing so in such a way so that incrementally built structures are brought into formality and not pushed out due to excessive regulations or costs. It also means ensuring that compliance and inspection systems are people friendly and effective.
  - Creating the framework for insurance products that can provide financial protection in the event of future disaster related loss and that are integrated into the system of building codes and permit existing structures to be strengthened and new ones built with structural protection.
  - Encouraging training and education in construction techniques, especially those that are tied into micro-finance and material sales.
  - Strengthening the framework for micro-finance and mortgage finance so that more products can be developed and accessed by the majority of Nepalese citizens.
  - Provide opportunities for community led construction projects based on international experience to be adapted to Nepal.

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<sup>3</sup> Global Assessment Report on Disaster Risk Reduction 2015, United Nations, 2015  
<sup>4</sup> GARDRR 2015

If the intent is to bring in the private sector, it is essential that the Government actively engage in establishing the overall framework and work in partnership with businesses and non-governmental organisations to construct strong and sustainable buildings in Nepal.

# SECTION 1

## Introduction

On 25 April 2015, an earthquake with a magnitude of 7.8 on the Richter scale struck Nepal. This was followed on May 12<sup>th</sup> by a second earthquake with a 7.3 magnitude. These earthquakes killed more than 8000 people. The initial damage estimates ranged from \$6 billion to \$10 billion, although these estimates could go much higher. In fact, the U.S. Geological Survey noted that it was possible that the damage could exceed the entire GDP of the country<sup>5</sup> which before the earthquake stood at \$19.5 billion.

According to a report published by the National Planning Commission<sup>6</sup>, the earthquake caused 498,852 homes to be destroyed and an additional 256,697 damaged. Of all of the damage and losses, half were in housing. The report considered all of these dwellings to be in the private sector. “The standard of housing construction in Nepal is extremely low, which is why the damage near last month’s epicentre was particularly devastating.”<sup>7</sup> The National Planning Commission/GDFRR’s report indicates that many of the losses were due to the type of construction, which highlights an area to be strengthened when homes are rebuilt or built anew.

The National Planning Commission’s report than highlights a number of areas in which action should be taken, including building disaster resilient core houses, proper repair and seismic retrofitting of those partially damaged, temporary living accommodations, and training for owner driven reconstruction. Other documents from organisations such as JICA<sup>8</sup> and UNDP<sup>9</sup> came to similar conclusions.

The main focus of this report, however, will not be on how to reconstruct that portion of Nepal that was damaged in the earthquake, although this will indeed be touched upon to set the context. Nor is it intended to outline ways in which donors can respond to this disaster, as that has and will be done in other studies.

Rather, the purpose of this document is to look to the future, with a particular emphasis on how the private sector can be stimulated to take action in non-earthquake impacted areas so that an effective strategy can be taken to prevent such devastating losses in the future.

To provide guidance on how private sector organisations can play a role in preventing unsustainable losses in Nepal in the future, two levels of assessment must be performed. The first requires an understanding of why damage occurred. This has already been performed by the Government of Nepal, National Planning Commission.<sup>10</sup> The second

<sup>5</sup> Damage in Nepal Estimated Up To \$10bn, May Exceed Entire GDP, RT. Com, 05. See also U.S. Geological Survey’s website at <http://earthquake.usgs.gov/>.

<sup>6</sup> Nepal Earthquake 2015 Post Disaster Needs Assessment, Government of Nepal, National Planning Commission, 2015

<sup>7</sup> Nepal’s Second Quake Piles on the Pain, CNN Money, 2015

<sup>8</sup> Kimio, T., “BBB Based Reconstruction for Urban (and Rural): Towards a Resilient Nepal, Japan International Reconstruction Agency, 2015

<sup>9</sup> A summary of the UNDP Document can be found at “Supporting Nepal in Building Back Better: Foundations for Housing Reconstruction, UNDP, 2015. An earlier report on building in selected areas can be found at “Report on Development of Building Code Implementation Guidelines and Regulatory Mechanism for Five Municipalities in Kathmandu Valley,” UNDP, 2011

<sup>10</sup> Post Disaster Needs Assessment: Nepal Earthquake 2015



requires an understanding of how people live, including what they earn, how they earn it and how people live, particularly whether people own or rent and how much they pay.

This document will not only look at models of recovery from disasters, but will look at examples of how safe housing has been built in situations where many people are poor and do not have the ability to access mortgage markets. For example, the case of housing construction in Nairobi, Kenya will be discussed, as it shows how those with informal and low incomes can gain access to safe housing through creative, community planning.

This document will also show what type of broad, nationally oriented policies can influence systematic changes to prevent this type of destruction from happening again, or at least to mitigate the damage. In particular, earthquake insurance and building codes and permitting have been used to create changes in how buildings are constructed to prevent loss of life and major damage in the future. This means that the Government has a critically important role to play in developing the private sector and in setting the framework for the future. As an example, the case of Turkey will be discussed where a Government sponsored but privately financed insurance program for housing was developed and in Chile, which took a broad multi-faceted approach to building, for both residential and non-residential structures.

# SECTION 2

## Initial Data and Mapping

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### 2.1 Understanding the demographics:

If the private sector is to be involved in any meaningful way, what needs to be added is an understanding of the demographics of the country and, in particular, the disaster impacted areas so that the proper solutions can be defined. This includes:

- Levels of income
- Formality and informality of income
- Formality and informality of land and property ownership
- Tenure status (ownership versus rental)
- Method of housing construction (incremental self-build versus purchased)
- Location of housing (in particular, level of occupancy in red zones)
- Development of mortgage markets and access to alternative types of finance
- Insurance penetration, particularly of non-life insurance, including property insurance.

### 2.2 Key Income and Tenure Data

In order to build towards solutions, the key demographics of the country must be understood.

- Nepal is low income country, which was ranked 145 of 187 countries in the Human Development Index.
- Nepal's 28 million people have the lowest spending ability of any Asian country, except for Afghanistan.<sup>11</sup>
- Only 16 percent of the population earns its income from formal salaried employment, with a great gender disparity.
- While approximately 85 percent of the population owns their own home, in cities there are high proportions of renters with 40 percent of the urban population living in rented housing and 59 percent in Kathmandu.
- There is a high correlation between poverty and land ownership, or lack thereof, a key factor that fuelled conflict and that led to continuing urbanization.
- The mortgage market is underdeveloped with a ratio of outstanding mortgage balance to the GDP of only 3.4 percent.<sup>12</sup> 80 percent of residential structures are built by their owners.<sup>13</sup>

What this means is that solutions that are tied to mortgages, such as mortgage insurance through the Federal Housing Administration in the United States and flood insurance through the Government as well would not reach the vast majority of people. Housing is primarily built and financed informally and incrementally.

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<sup>11</sup> Basak, S. "Nepal quake seen costing more than \$2 billion; few insured" Bloomberg News 2015

<sup>12</sup> Hofitnet.org

<sup>13</sup> Building Resilience in Nepal through Public Private Partnerships, World Economic Forum, 2015

It also means that the solutions cannot only be tailored to homeownership. Solutions for renters must also be developed, and there are models used in Haiti and the Philippines that can be tailored to work in Nepal. These cannot only assist the renters, but can be designed so that the rental units are strengthened to be much safer.

## 2.3 Insurance Penetration in Nepal

The total amount of insurance premiums collected by Nepal's insurance companies, was approximately \$277 million in 2013, most of which was spent on life insurance. Insurance for property-casualty coverage, including both automobile and homeowners insurance was approximately \$4 per person, compared to more than \$2300 in the United States.<sup>14</sup>

An earlier report<sup>15</sup> showed that the life insurance penetration rate and non-life insurance penetration rates in the country in 2009/2010 were 2.77% and 1.84% respectively.<sup>16</sup> This is one factor that demonstrates that Nepal "does not have the financial reserves or access to contingency financing to allow them to absorb losses, recover and rebuild following a disaster." As will be seen later in this document, this was also true of Turkey, which made dramatic changes through the creation and implementation of an earthquake insurance system including the effect that such a system had on the implementation of building standards.

Turkey faced similar challenges, particularly after the 1999 earthquake. The expectation was that in the event of a disaster, the Government and donors would be responsible for covering the reconstruction costs, an expectation that was not financially sustainable. Building codes were often not enforced and buildings would be built informally, without occupancy permits, creating high risks for the residents. This situation needed to change as well. The creation of the Turkish Catastrophic Insurance Pool (TCIP) went a long way to changing this situation, at least in urban areas.

## 2.4 Construction and Building Codes: Current Mapping<sup>17</sup>

According to the Global Assessment Report on Disaster Risk Reduction 2015<sup>18</sup>, in Nepal, "the vulnerability of the building stock" makes a great contribution to risk. It notes further that it is not a lack of building codes, but the implementation of them that causes major problems and notes "stark discrepancies between mandatory implementation and the actual adoption of codes."<sup>19</sup>

As the New York Times noted, many buildings collapsed that were "constructed after a modern code was put in place"..."this has ignited public alarm that the collapses exposed not only flaky concrete and brittle pillars, but also a system of government enforcement rotted by corruption and indifference."<sup>20</sup>

Following the 1988 earthquake in Nepal which killed over 709 people and damaged over 50,000 buildings, Nepal's Ministry of Housing and Physical Planning (MHPP) requested assistance from the United Nations Development Programme (UNDP) and their executing

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<sup>14</sup> Basak 2015

<sup>15</sup> Ghimire, R., "Growth of Insurance in Nepal in Post Liberalization Period," Academia.com, 2015

<sup>16</sup> Abraham, S., "Earthquake and Underinsurance: Twin Scourges of Nepal," Willis Wire, 2015

<sup>17</sup> This section was excerpted from material submitted by Elizabeth Hausler Strand based primarily on World Economic Forum, "Building Resilience in Nepal Through Public Private Partnerships," World Economic Forum, 2015. The full submission is included as Appendix 3.

<sup>18</sup> Global Assessment Report on Disaster Risk Reduction 2015, United Nations, 2015

<sup>19</sup> GARDRR 2015

<sup>20</sup> Buckley, C., "Nepal's Fast Urbanization and Lax Enforcement Add to Quake's Toll," New York Times, May 1, 2015

agency, the United Nations Centre for Human Settlements (UNCHS), to develop a national building code. With the aid of various consultants, the Nepal National Building Code (NNBC) was prepared in 1993. It was primarily based on the Indian building code (Indian Standard, IS) at the time and was officially published in 1994.

The building code was approved by the government of Nepal in 2003, issued by the Department of Urban Development and Building Construction (DUDBC) within the Ministry of Urban Development (MoUD), and by 2006 it was made mandatory in all municipalities. However, a deadline for the implementation of the building code was not established and the mandatory implementation of the building code did not extend to Village Development Committees (VDCs).

## 2.5 Labour and Materials

Nepal was facing a skilled labour shortage even before the Gorkha earthquake. Every year, thousands of Nepali men and women venture abroad in search of better economic opportunities. In the 2011 national census, Nepal reported 13.1 percent of the male population absent. This is likely an underestimate as it contains only formally reported migration, to India, the Middle East or Malaysia. The porous border between Nepal and India allows for many to leave Nepal informally. Factoring in age and informality, one-third of Nepal's working male population has migrated abroad. In 2011, 32 percent of households nationally had at least one member working abroad. The vast majority of migrants are men - 92 percent in the 14 priority districts - the heart of a productive workforce<sup>9</sup>. By the end of March this year, Nepal had sent abroad 44,712 skilled workers and an additional 282,541 semi- or unskilled workers. Many are hired by the private sector as construction labour. Due to dangerous working conditions, on average three return in coffins to Kathmandu, every day. Nearly 400 corpses returned by mid-March this year.

Though the Nepal construction industries suffered losses and production interruptions from the earthquake itself, local construction materials industries are expected to benefit in the long term because of high demand. Industrial analysts expect the market to grow by about 35-40% for the next few years and expect nearly Rs 670 billion to be required for all recovery.

## 2.6 Housing Finance

Housing finance is not available to the vast majority of people in Nepal. The mortgage market in Nepal is very small with the ratio of outstanding mortgage balances to the GDP at only 3.4%.<sup>21</sup> In a country of more than 27 million people, the total mortgage portfolio was \$769.35 million as of 2013 (Nepal Rastra Bank). In other words, the per capita amount of mortgage loans is only \$28. This grew from \$651 million at the end of 2012. Mortgage loans were 7.33 percent of outstanding commercial credits.

According to a 2014 article in the Kathmandu Post<sup>22</sup>, Nepal “has neither any state regulation nor a separate entity to govern the mortgage market system.” This will be necessary for the growth of this market and the downward trend on interest rates. There is no government housing bank in the country.<sup>23</sup> Currently, commercial banks, such as Standard Charter Bank, Nepal Investment Bank, Ltd and the Government owned Rastriya Banijya Bank, account for 70 percent of the lending in the real estate sector.

The maximum permitted Loan to Value by most lenders is 60 percent, although Standard Charter Bank will lend up to 67 percent. Borrowers have to come up with a significant down-

<sup>21</sup> Hofinet.org

<sup>22</sup> Pramesh, KC, Reality Check, Kathmandu Post, 2015

<sup>23</sup> Kathmandu, Nepal Fact Sheet, Global Housing Indicators,

payment. The maximum amortisation period is between 18 and 20 years. Interest rates range from 8-12 percent.

In the wake of the earthquake, some banks are offering low interest loans. Nepal Investment Bank Ltd together with Nepal Army Welfare Board (NAWB), for instance, will be offering below market loans (4.5%) up to Rs 400,000.

In short, the mortgage market in Nepal is in its early stages. Mortgage finance is only available for those with formal, documented income, which means that the vast majority of Nepalese cannot access this market.

## 2.7 Microfinance in Nepal

The industry has 1.1 million borrowers, although some borrowers have had multiple loans, and 1.6 million depositors with \$325 million in outstanding loans and \$153 million in deposits.<sup>24</sup> The Centre for Microfinance in Nepal was started with funding from USAID, Canadian Centre for International Studies and Cooperation and the Ford Foundation. It is now a “privately owned national network organisation that works to strengthen the microfinance sector and its member associations, institutions and individuals with a vision of “sustainable access to microfinance services for the poor.”<sup>25</sup>

While microfinance is more accessible than mortgage markets in Nepal, only a third of households below the poverty line have access to microfinance services.<sup>26</sup>

The industry is fragmented with the following characteristics:

- *21 Microfinance Development Banks classified under category ‘D’ by the NRB*
- *5 Regional Development Banks*
- *More than 20,000 Savings and Credit Cooperatives*
- *Forty-five Financial Intermediary NGOs licensed by the NRB<sup>27</sup>*

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<sup>24</sup> Source: MixMarket

<sup>25</sup> Source: CMF Nepal Website

<sup>26</sup> INAFI Nepal Website

<sup>27</sup> INAFI and Nepal Rastra Bank, January 2011. Banking and Financial Statistics. Bank and Financial Institution Regulation Department, Statistics Division

# SECTION 3

## International Programme Models for Long Term Reconstruction

The next section discusses examples from other countries that can be used to guide Nepal in its future planning. Some of these programs and models were created or used after a disaster. Others have been used for other purposes; most importantly to create better, safer and more affordable housing opportunities for low income people and those who live in informal settlements. This is important because the housing development models for low income people in long-term, post disaster reconstruction, too often focus on donor funding alone and do not always bring in the private sector.

### 3.1 Rental Housing (Haiti and Philippines)

Rental housing is critically important in Nepal, in that 40 percent of urban residents rent their dwellings and in Kathmandu, the figure is nearer 60 percent.

Rental housing vouchers were used in post-disaster Haiti, which had a very high percentage of renters, and where the program was tailored to those living in the camps, 90 percent of whom were renters at the time of the programs creation.<sup>28</sup> The way the program worked was that each family living in a camp was given \$500 in a housing voucher that was approximately the cost of a rental unit for a year. If the cost of the rental unit was less, the family was able to keep the difference. In the Philippines, a similar model was being developed to move people out of unsafe areas when Hurricane Yolanda hit, at which point the programme was developed as a pilot for post-disaster assistance.

A full manual was developed that outlined the programme and how it works<sup>29</sup>. This can be used by Nepal to design its future programmes. It can be used for evacuees of the current disaster or for those determined to live in dangerous situations, either because the location or the dwelling is considered unsafe. To be used Nepal, several issues would have to be addressed. First, should the rental assistance be given to the tenants as a housing choice or to the landlords? Second, an inspection protocol would need to be developed so that improvements to safety standards could be addressed. Third, there would need to be a system to manage these inspections, which would require a fiscal commitment and organisational capacity at both the national and local levels. Finally, beneficiary standards would need to be developed, such as whether owners could receive such assistance, which was not permitted in Haiti, but which is permitted in the Philippines programme. Further discussion of this topic is included in Appendix 5.

### 3.2 Building Codes, Permits and Mortgage Financing (Chile)

In Chile, the Maule earthquake of 2010 damaged or destroyed more than 220,000 homes caused between \$15 and \$30 billion worth of damage, but there was far less loss of life and property destruction than there was in the Haiti earthquake, despite being 8.8 on the Richter

<sup>28</sup> See Peppercorn, I. "Rental Housing Subsidies after an Urban Disaster: The Case of Haiti," International Housing Coalition, 2015

<sup>29</sup> World Bank, Rental Support Cash Grant Programs: Operational Manual, World Bank, 2014



Scale, it was 500 times as powerful. Moreover, much of the damage was in older communities, where the majority of the structures were built before modern day codes.

Chile responded to prior earthquakes, such as the strongest earthquake ever recorded in 1960 (Richter 9.5) and another major quake in 1985 by embarking on a comprehensive system that not only adopted building codes, but also that permeated the entire building finance system.

Building codes in Chile undergo a thorough review prior to adoption and are issued by the Instituto Nacional de Normalización (National Institute of Normalisation or INN).

The seismic code provisions for buildings are contained in the Official Chilean Code NCh433.Of 96 on Earthquake Resistant Design of Buildings, which was made official in the Ministerio de Vivienda y Urbanismo (Ministry of Housing and Urbanisation) signed into law through the Presidential Decree no. 172 December 5, 1996.

The Chilean Building code takes into account the seismic zone, of which Chile has three, the soil conditions, the structure of the building and the importance of the building. Chile is a case where both residential and non-residential structures are regulated, as well as both public and private buildings. In fact, the highest category of structures is governmental or public service buildings, such as power plants, police stations and television stations, as well as buildings that will be needed in case of an emergency, such as hospitals and fire stations.

Building structures are rated with the structural steel being the highest and clay bricks without reinforcement ranking near the bottom. A full technical explanation may be found in Lew, et al (2010).

These standards are integrated into Chile's building permitting system. A builder must acquire a permit prior to construction. This required an independent structural and seismic review. The builder must also submit drawings to the municipality in which the building will be located and these documents become part of the public record.

Yet it goes deeper than that and is embedded into law and culture. In Chile, builders are required to have ten years of responsibility for any damage in the structural elements of the building and five years in the non-structural elements.<sup>30</sup> Buyers have the expectation that the buildings will not only protect lives, but that they will not have major damage as the result of an earthquake.

A common technique is the use of "strong column/weak beam" system where "reinforced concrete in buildings is designed to break in certain spots on horizontal beams, which dissipates much of the quake's energy and saves the vertical columns, keeping the building up."<sup>31</sup>

It is also embedded in the private financial sector. Chile has a strong financial sector, with the soundness of banks rated as the fifth in the world.<sup>32</sup> The availability, affordability and access to finance are all ranked in the top 25 of 139. Most of the housing finance is market driven, although the government provides limited subsidies for lower income people, which are generally tied to savings plans. It should be noted that as earthquake insurance is compulsory for access to mortgages in Chile, the size of the population left with outstanding

<sup>30</sup> Lew, Naeim and Rojas, "An Overview Of Building Codes And Standards In Chile At The Time Of The 27 February 2010 Offshore Maule, Chile Earthquake," in The Structural Design of Tall and Special Buildings, John Wiley and Sons, 2010

<sup>31</sup> Bostwick, W., "Lessons from Chile: Better Building Codes Work So Why Don't We Have Them," Fast Company, 2010

<sup>32</sup> World Economic Forum, Global Competitiveness Report, 2010

debt on a damaged property was limited. Additionally, many banks offered lower interest loans to borrowers after the earthquake.

Chile has a unique hybrid of insurance in the private sector. In many countries with developed mortgage markets, mortgage insurance (also known as mortgage default insurance) is required if the loan to value on the property is above a certain level (generally 80 percent) or if it is a government insured mortgage. Disaster insurance is generally separate. There is another type of insurance that is a hybrid between mortgage insurance and disaster insurance. This exists in Chile where, in the event of a disaster when a home is destroyed, funds up to the value of the mortgage go directly back to the lender or investor.

The example of Chile is interesting in that it had very strong building codes, which can indeed be relevant to Nepal as it recovers. Yet the experience of Chile shows that it is not just building codes, but a comprehensive system that also includes the building permit system, guarantees from builders, and requirements in the mortgage finance markets.

### 3.3 Earthquake Insurance and Building Permits (Turkey)

There are numerous examples of earthquake insurance around the world including the Earthquake Commission in New Zealand, the California Earthquake Authority in the United States, and the Turkish Catastrophic Insurance Pool (TCIP).<sup>33</sup>

Turkey is a significant case because it has the third highest number of earthquake related deaths, after Iran and Yemen and developed an earthquake insurance program with the support of a number of partners including the World Bank. It was used to set standards, much as the way mortgage insurance disciplines originating lenders.

Large scale earthquakes can affect 70 percent of the population and 75 percent of the country's industrial facilities. The fiscal and social vulnerability caused by these disasters led Turkey to create the TCIP. It was intended to fundamentally change the roles of government and of the private sector. Prior to the creation of this pool, the expectation was that the Government would address the post-disaster needs, an expectation that was unrealistic. Turkey realised that excessive dependence on donor relief and retroactive lending would not be sustainable and also created negative incentives for risk mitigation.

In the past, people would not buy insurance as they assumed that the Government would compensate them in the event of disaster related losses. In fact, Turkish law prior to 2000 mandated that the Government was responsible for financing the reconstruction of houses damaged in the wake of an earthquake or other disaster. So Turkey embarked on a programme of disaster insurance, as a way to create a system in the private sector that would be sustainable and have an impact on building in the country.

The creation of the program had four key objectives:

- Affordable, yet actuarially sound rates for all registered urban dwellings
- Limiting the Government's fiscal exposure to natural disasters
- Building long term reserves in the fund to finance potential future losses
- Encourage disaster risk mitigation and reduction in residential construction

<sup>33</sup>

Much of the material in this section was taken from Gurenko, Lester, Mahul, and Galulal, "Earthquake Insurance in Turkey: History of the Turkish Catastrophic Insurance Pool, World Bank, Washington, DC, 2006. Important legal information was also taken from The Sentence Counted As Law (SCL) About Obligated Earthquake Insurance (OEI), which can be found at the following website: [http://www.adrc.asia/counterpart\\_report/Turkey\\_990817\\_01.htm](http://www.adrc.asia/counterpart_report/Turkey_990817_01.htm)



Since the program started in 1999, the insurance penetration has increased more than three times and now covers approximately 16 percent of the insurance housing stock. A discussion of this program is included in Appendix 6.

There are limits to the program as it applies to Nepal. Not all buildings in Turkey can be covered through TCIP. It is targeted to residential building, although commercial units and offices located in buildings with residential units qualify. These units must be formally registered. Those that are purely commercial and those that are considered public facilities do not. The program also does not cover residential units in villages. It is primarily an urban, residential program. Additionally, informal building still continues. In its highest year, it insured 18 percent of eligible buildings. It is clear that some owners still prefer to keep their buildings out of the formal system, even with the benefits of insurance.

### 3.4 Building Code Development and Informal Construction (Colombia)<sup>34</sup>

Colombia is no stranger to earthquakes. In 1983, the 5.5 magnitude Popayán earthquake killed around 380 people, injured a further 2,000 more and left another 10,000 homeless. Over a decade later, in the coffee-producing region near the city of Armenia, another earthquake struck. This time it was a 6.2 magnitude and it killed 2,000 people and caused \$1.2 billion in damage.

Colombia's capital Bogotá was hit by smaller earthquakes in 1966 and again in 1967. At the time, the metropolitan area had around 1.5 million inhabitants. Today it has a population of just over 9 million.

The Colombian authorities, both at city and national levels, have, for a long time, recognised this threat, and have taken measures to mitigate its potential impact. Strong codes with mandatory implementation is one policy. Colombia passed several codes for seismic-resistant building, first in 1984, then in 1998, and most recently in 2010. Most recently, directives to improve existing construction with the aid of subsidies have been issued.

These are major advances in comparison to other emerging economies. As a result, in the formal construction market, there is a good level of seismic safety in new buildings.

But only two of every five new homes built in Colombia today are built through the formal market. The other three are built spontaneously, do not follow any legal procedures and have no formal design. Most of these homes do not comply with current structural and architectural regulations.

Because of this, up to 60 percent of all urban plots in Colombia have an informal building on them. The chances are very high that this building would not withstand a large earthquake. This means that millions of Colombians live in disaster-vulnerable housing, most of them in dense, urban, informally built areas. With Colombia's significant advances in reducing crime, improving transportation and access to education and jobs, poor neighbourhoods have become more attractive, more densely populated, and more vulnerable.

Some municipalities, such as Bogotá and Medellín, have allocated funds to subsidise structural upgrades in neighbourhoods identified as priorities. In Bogotá, over 1,400 families have already requested retrofitting subsidies.

<sup>34</sup> The following section on Colombia was prepared by Elizabeth Hausler Strand, as was the related appendix.

But at the start of 2015, few retrofits had been completed, despite interest from both city governments and homeowners. Most of the subsidies have been allocated to cover easy-to-implement improvements, such as floor and kitchen finishes, and sanitation or roofing repairs. The current approach to evaluating and designing structural retrofitting has been expensive and difficult to implement, and the required paperwork and legal hurdles demotivate homeowners and even public officials. Meanwhile, more and more informal houses keep popping up.

Build Change has developed a code-compliant retrofit evaluation and implementation procedure in partnership with Servicio Nacional de Aprendizaje (SENA), Swisscontact, and the seismic engineering community in Bogotá. Based on this, two training modules were developed – one for engineers and one for construction workers. This gave a good starting point for generating local capacity to rapidly evaluate one to three-story masonry houses, design the structural upgrade if needed, and implement the retrofit.

The procedure was authorized for use in all of Colombia in May 2015 and a pilot programme is under way in Bogotá in partnership with Caja de la Vivienda Popular and the Habitat Secretariat, in charge of field implementation and subsidy provision. The programme promotes a large-scale risk-mitigation strategy to not only reduce existing risk, but to help formalise construction practice and enable safe future growth and densification. The general objective is to develop a way to evaluate and structurally strengthen homes, using public subsidies and private sector initiatives as incentives, initially in Bogota and Medellin.

This model, once proven and streamlined, could be scaled and replicated in other similarly configured Colombian and Latin American cities, to make sure these dynamic and prosperous places are able to continue growing in a safe way. A model of how this program works is included in Appendix 7.

### 3.5 Cooperative Housing (Thailand):

Another model that can be used to assist those living in unsafe areas can be seen in Thailand. In an effort to eradicate slums and to provide a better living standard for squatters, the Community Organizations Development Institute (CODI) takes a broad community development strategy where its housing is neither home ownership nor rental. Rather, it is an integrated community based strategy, which is based on a cooperative model.<sup>35</sup>

CODI works to train slum dwellers in community development, infrastructure construction, housing and finance. Once the local organization has been trained, CODI works to get title for the land on which the dwellings will be built. This is either through outright ownership or through a long term lease. It then uses a combination of its funds, governmental subsidies and resident funds to purchase the land, to build or fix the infrastructure and, subsequently, to build the housing. In some cases, the land is donated by the government, utility companies or religious institutions. A description of how CODI works is included In Appendix 8.

There are elements of CODI that can be used in Nepal. The parts that involve training, community planning, negotiating on low cost land and the design elements can be adapted. However, the program relies on large subsidies from the Thai Government in the form of direct grants and low interest loans that are passed through CODI. A source of these funds in Nepal's fiscal budget would need to be determined.

<sup>35</sup> This case is discussed in Peppercorn and Taffin (2013). Other information was taken from "The Community Organizations Development Institute (CODI) in Thailand,

### 3.6 Materials, Microfinance and Training (Mexico)

In Nepal, 80 percent of residential structures are built by their owners, generally incrementally. This means that there is a large role for materials companies to play in building and retrofitting safe houses. Another model for reconstruction is that of Patrimonio Hoy in Mexico, a program started by CEMEX, a leading global cement producer. While it was not designed for post-disaster related purposes, the ability to bring together materials, training and microfinance is directly relevant to Nepal.

CEMEX formed an organization that provided training and micro-finance to residents of low-income communities that enabled customers who normally build informally and incrementally to build faster and more safely. As noted in a case at the Harvard Business School, “Originally conceived as a project to understand the customers in the self-construction segment better, a major component of Mexican home-building concentrated in low-income neighbourhoods, Patrimonio Hoy has generated recognition and good will for the company. Its innovative approach reduces significantly the cost and time needed by the poor to improve their housing.”<sup>36</sup>

Given that the much of residential construction in Nepal is done incrementally and given the activity of materials companies in the country, an opportunity exists to develop a model similar to Patrimonio Hoy. Since this would be done with multiple companies rather than one, it would need a body that could organise the effort. It could involve multiple stakeholders including financial institutions, materials companies, universities, and non-governmental organisations. It is a much better fit to what is needed in the country than mortgage finance.

This type of effort could be useful in both urban and rural areas and, as was the case with Patrimonio Hoy, could be useful in adding to the stock of small scale rental housing. In rural areas, Nepal could look to use this in conjunction with a model similar to Umuganda in Rwanda where one morning a month, communities come together for community service projects.<sup>37</sup>

What would need to be included in Nepal to make it relevant to safe construction is a component that would address how it could be integrated into an overall construction project. It would certainly be possible to combine the subsidies for safe construction with micro-finance provided by or in conjunction with materials companies’ sales. They could certainly be encouraged to tailor a programme with lower than market interest rates as it could expand their materials sales business and bring in many new customers.

Research estimates that the market value of homes built through Patrimonio Hoy is approximately 30 percent higher as a result of the higher quality and functionality of the structures. Patrimonio Hoy creates jobs mainly among local masons and those trained as promoters; 95 percent of promoters are women, of which half had no previous working experience. Approximately one-third of participants use their homes, or extra rooms that they have built through their participation in Patrimonio Hoy, as a source of income, through their own business or through rent.

CEMEX notes that the benefits of the program have been as follows<sup>38</sup>:

- Participants gain access to the credit markets. Since inception, Patrimonio Hoy has advanced more than \$290 million in financing through micro-lending, and most

<sup>36</sup> Segel, A, Chu, M. and Herrero, G., “Patrimonio Hoy,” Harvard Business School, 2006

<sup>37</sup> Rwanda Governance Board, Umuganda website

<sup>38</sup> High Impact Social Programs, “Patrimonio Hoy,” CEMEX Website

participants say they would not have been able to build their house without Patrimonio Hoy.

- The market value of homes built through Patrimonio Hoy is approximately 30 percent higher as a result of the higher quality and functionality of the structures. Family members have more space and privacy, resulting in better learning conditions for children and improved family relations.
- Patrimonio Hoy creates jobs mainly among local masons and those trained as promoters; 95 percent of promoters are women, of which half had no previous working experience.
- Approximately one-third of participants use their homes, or extra rooms that they have built through their participation in Patrimonio Hoy, as a source of income, through their own business or through rent.

### 3.7 Community Savings, Design and Efficient Construction (Kenya<sup>39</sup>):

Given the low level of income in Nepal and, particularly, given the fact that the majority of income is informal, it would benefit the country by having systems that combine intelligent design, where housing is built safely, but affordable even to families with very low incomes.

The Kenyan Model is based on a federation of slum dwellers and informal market traders in Kenya that is affiliated with Slum and Shack Dwellers International (SDI). Muungano's membership is comprised of low income households that lack access to decent and affordable shelter and basic services.

Muungano has, been able to develop houses at its various sites at below the construction rates charged by the market, making them both affordable and sustainable for the urban poor. By using efficient design, small units that can be expanded, and strong, pre-cast components, housing was built that was at least 30 percent below the market cost.

The Muungano model shows one way that safe, durable housing can be built by and with low income families that are currently outside of the private housing markets.

Moreover, by organising the residents into savings groups, peer pressure exist to ensure that everyone pays. While this has not been used for disaster evacuees, it will be essential for costs to be reduced as much as possible, while still ensuring that safety standards are met. A detailed description of this programme is included in Appendix 9.

<sup>39</sup>

This section was adapted from materials written by Jane Weru, Executive Director of the Akiba Mashinani Trust in Nairobi, who has collaborated with the author on other projects.

# SECTION 4

## Critical Issues

While it was the intent of this paper to focus primarily on private sector issues there are many issues in which the Government must strengthen the enabling environment. In issue after issue, whether in building codes, insurance, property ownership or finance, significant government involvement is needed to ensure that its goals can be met.

Moreover, as earlier sections have demonstrated, the solutions to building and retrofitting safely must be tailored to the ways in which people currently earn - with the majority of income earned being informal, and the ways in which people live - with most residential structures being built by their owners, incrementally over time.

### 4.1 Building codes and standards

International experience has shown that a careful balance must be obtained when creating and implementing a system of building codes and standards. When they are too lenient, people's lives are put in danger. However, when they are too strict or not in line with the culture and norms of the particular country, the very same thing can happen. The reason is that owners will avoid bringing buildings into the formal sector if they consider the costs to be unaffordable. This could also occur if the owner believes bringing the building into formality will cause a significant tax burden. This is why Turkey has so many informally built properties and Gecekondus, the informally built housing discussed earlier in the document, continues to grow despite the changes made due to the insurance programs. It can also be seen in many countries in Africa, such as Kenya, where the building codes were based on outdated British laws dating back to 1947.<sup>40</sup>

A discussion paper from the World Economic Forum<sup>41</sup> noted some of the ways building codes could be introduced. It noted that 95 percent of the buildings that collapsed were built from low strength masonry. It noted that even simple improvements, such as using cement mortar can be effective. UNDP has developed a significant body of work a new building code in Nepal that tries to address many of these issues and that has support from the building community in Nepal.

There is a difference between the capacity to build to code for residential and non-residential structures. Since approximately 80 percent of housing is built by individuals, the capacity and willingness to build to code is far different than when a non-residential structure is built by a commercial developer or by a governmental entity.

### 4.2 Governance systems

The issue is not just about whether or not a building code exists, but making sure inspections are done accurately and that the system is free from corruption. As the New York Times noted, many buildings collapsed that were "constructed after a modern code was put in place"... "this has ignited public alarm that the collapses exposed not only flaky

<sup>40</sup> See Peppercorn, Kamunyoru and Cira, Urbanization In Kenya: Discussions on the Way Forward, Presentation to Stakeholders, World Bank, 2015

<sup>41</sup> "Building Resilience in Nepal Through Public Private Partnerships, World Economic Forum, 2015



concrete and brittle pillars, but also a system of government enforcement rotted by corruption and indifference.”<sup>42</sup> This will mean budgetary and organizational capacity, as well as training and monitoring at the local level to ensure that buildings are adequately inspected and to eliminate corruption in the inspection system. This is recognised in the New Economic Forum report and in the UNDP documents as well.

The governance system will not only need to be adequate for building inspection, it will have to be adequate for other systems as well, including any grants that are given out to strengthen homes which will need to be monitored to insure compliance with building standards. The same would be true in the event that the Nepalese Government decides to operate a program for rental assistance. While there is no indication that this has been contemplated to date, the experience of other countries has shown that home inspections are a vital part of the system.

Schools are a critical element in non-residential structures. The key challenge, however, is similar to that in the residential sector: a lack of inspectors and enforcement capability. “Monitoring and enforcing the Building Code, particularly for private schools, is often limited because of low government capacity.”<sup>43</sup>

### 4.3 Land and Property

While Doing Business ranks Nepal’s property registration system highly (27 of 189), land is a highly political and sensitive issue in the country. It will be difficult for the private sector to enter under these conditions. The ten year conflict between 1996 and 2006 displaced thousands of people. As a report by USAID noted, “Poverty is highly correlated to the size and quality of landholdings. There have been past efforts at land reform, but little success in equalising highly skewed land holdings, improving security of land tenure or eliminating exploitative tenancy relationships.”<sup>44</sup> A second report notes the effect that weak land governance systems have on vulnerable populations but how effective property reform can have a positive effect on disaster risk reduction.<sup>45</sup>

Effective property rights reform can lead to more secure land tenure, which, in turn, can also have a significant impact on housing finance markets. When land is not secure, it inhibits financial institutions from making mortgage loans that need to have an interest in a property. When there is insecurity in land markets, lenders will be cautious about originating loans and will add a premium into the interest rate to cover their risk. The work of Hernando de Soto shows that secure property rights can reduce the lenders risk and open markets, making lending more accessible across an array of income brackets.<sup>46</sup>

### 4.4 Insurance Market Development

Creating insurance markets for disaster related products takes a multifaceted effort. In designing the earthquake insurance program in Turkey, the Government’s role was significant. This is discussed in detail in “Earthquake Insurance in Turkey.”<sup>47</sup> It included:

<sup>42</sup> Buckley, C., “Nepal’s Fast Urbanization and Lax Enforcement, Add to Quake’s Toll,” New York Times, May 1, 2015

<sup>43</sup> World Economic Forum, 2015

<sup>44</sup> USAID Country Profile, Nepal: Property Rights and Resource Governance Profile, USAID, 2010

<sup>45</sup> USAID Issue Brief, Land Tenure and Disasters

<sup>46</sup> See De Soto, H, “The Mystery of Capital,” Basic Books, 2000 or Miller, M. “The Poor Man’s Capitalist: Hernando de Soto,” New York Times, July 1, 2001

<sup>47</sup> Gurenko, Lester, Mahul, and Galulal, “Earthquake Insurance in Turkey: History of the Turkish Catastrophic Insurance Pool, World Bank, Washington, DC, 2006

- Establishing the legal framework, including the legal and regulatory basis for the insurance pool
- Designing and managing the institutional structure and relationships, which meant establishing the roles for all parties and creating the governance structure.

It also meant dedicating a significant public relations effort so that the public understood this was something important and worth buying, rather than simply another government mandate.

Insurance is often complicated and difficult to understand. Even if a building owner has insurance, is it the correct type? Even if insurance is available in the country, it is important that the difference between homeowners insurance, which generally provides coverage for theft, fire and certain types of damage and the various types of insurance that are generally not included in the overall policy. Sometimes earthquake insurance coverage is included, more often it is not. Then there is damage from floods, winds and other types of natural harm. It is also different from mortgage insurance that protects lenders in the event of a default, but does not provide protection for the homeowner. An explanation of the different types of insurance, the level of coverage in different countries, and other issues regarding different countries' efforts to protect the uninsured can be found in "Post Disaster Assistance for Indebted and Uninsured Populations"<sup>48</sup>. An appendix of the different types of insurance and the levels of penetration in selected countries that was adapted from this paper has been included as an appendix.

It should also be noted that even though the development of a private sector insurance market can have a significant impact, it would not address all of the problems. Even in Turkey, the penetration of insurance reached an 18 percent maximum of eligible structures. Informal, unsafe housing continues to be built, as owners believe it is in their best interests to keep their properties out of the formal market due to tax and regulatory issues. Unfortunately, those that are at the most risk in these structures are often those with the least resources.

The Turkish insurance program was targeted at residential structures in urban areas. There is still a key need for insurance in non-residential structures, particularly in schools. The World Economic Forum report shows the need for such an insurance program, but gives little guidance on how it could be done.

## 4.5 Housing Finance

The housing finance system is in its early stages in Nepal. A strong legal and regulatory system would need to be put in place that address issues such as foreclosure and repossession, financial reserves for originating lenders, consumer disclosure, and a range of other issues would need to be put in place for the mortgage market to grow. While the majority of people in Nepal would not be able to borrow, given the nature of their income, the development of a mortgage market can bring down interest rates and make terms less restrictive, providing better access to more borrowers than currently exists. This will be important to lay the groundwork for the future as low interest mortgages have been part of the Government's strategy for this recovery and it is likely that this will also be the case for future disasters. An example what is necessary to build a mortgage market can be seen in "Providing Affordable Housing to the Middle- and Low-Income Population," by the World

<sup>48</sup> Peppercorn, White and Mahul, "Post Disaster Assistance for Indebted and Uninsured Populations: A Study of International Experience," GFDRR, World Bank, 2011

Bank.<sup>49</sup> This has examples of India, Tanzania and Egypt to show how mortgage markets can be built and targeted towards more affordable lending.

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<sup>49</sup> Walley, S., "Providing Affordable Housing to the Middle- and Low-Income Population," World Bank, 2014



# SECTION 5

## Conclusion

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The earthquake of 2015 that took thousands of lives and destroyed approximately half a million houses was not Nepal's first, nor will it be its last. Much of this was due to a low level of building standards in the country and to standards not being followed even when they did exist. This document outlined the case for how the private sector could help Nepal find solutions to building better and more safely and what the government must do to stimulate that effort.

It looked at examples of how safe housing has been built in situations where many people are poor and do not have the ability to access mortgage markets.

It also showed how broad, nationally oriented efforts, can stimulate the private sector. In particular, earthquake insurance and building codes and permitting have been used to create changes in how buildings are constructed to prevent loss of life and major damage in the future.

It is important that solutions be designed to match the resources that are available in the country. Ones that focus on mortgage loans to homeowners will not work as the vast majority of income is earned informally. That is why this paper also included case studies from Kenya, where slum dwellers organised and built much safer housing than they had before and from Mexico, where a non-disaster related model could be modified to help Nepal build back better.

In the residential sector, it is critical that solutions be found not just for homeowners. Renters comprise a significant portion in Nepal and solutions for them can have a long lasting effect, if done properly.

One of the key challenges for buildings in the housing sector applies to non-residential buildings as well; the importance of ensuring that there is budget and organisational capacity to inspect buildings. Several studies have pointed out that the issue was not just about building codes themselves, but about how these codes are enforced—or have not been enforced.

This study also showed how national efforts to stimulate private sector markets could have an effect on building safety. In particular, Turkey faced similar challenges to Nepal and responded by developing an earthquake insurance industry. While it has not solved all of the problems, particularly of informal and unsafe construction, it has had a significant impact.

Land and property rights are another issue where governmental action can strengthen and stimulate the private sector—in property, in finance, and in other areas.

While Nepal is a poor country, with a high level of informal income, in particular from remittances, other countries have taken the challenge of planning for the future, knowing that a disaster will strike at some point and developing solutions that bring in the private sector rather than relying on donors and the government.

## Appendix 1 Selected Bibliography

- Condor, Juhn and Rana, "External Evaluation of The Rental Support Cash Grant Approach Applied to Return and Relocation Programs in Haiti," The Wolf Group, 2013
- Gurenko, Lester, Mahul, and Galulal, "Earthquake Insurance in Turkey: History of the Turkish Catastrophic Insurance Pool, World Bank, Washington, DC, 2006
- Lew, Naeim and Rojas, "An Overview Of Building Codes And Standards In Chile At The Time Of The 27 February 2010 Offshore Maule, Chile Earthquake," in The Structural Design of Tall and Special Buildings, John Wiley and Sons, 2010
- National Planning Commissioner, "Nepal Earthquake 2015 Post Disaster Needs Assessment, Government of Nepal," 2015
- Peppercorn, I. "Rental Housing Subsidies after an Urban Disaster: The Case of Haiti," International Housing Coalition, 2015
- Peppercorn, White and Mahul, "Post Disaster Assistance for Indebted and Uninsured Populations: A Study of International Experience," GFDRR, World Bank, 2011
- Segel, A, Chu, M. and Herrero, G., "Patrimonio Hoy," Harvard Business School, 2006
- USAID Country Profile, Nepal: Property Rights and Resource Governance Profile, USAID, 2010
- World Bank, Rental Support Cash Grant Programs: Operational Manual, World Bank, 2014
- World Economic Forum, "Building Resilience in Nepal Through Public Private Partnerships," World Economic Forum, 2015

## Appendix 2 Insurance<sup>50</sup>

If a home or business owner has insurance, they are not necessarily covered for the effects of a disaster. One of the challenges in understanding the role of insurance after a disaster is that there are several types of insurance that are relevant. Many policy holders often do not know exactly what type of losses they are covered for and what they are not. This document will discuss the different types of insurance and the level of penetration in selected countries.

### *Mortgage Insurance*

This is sometimes known as “mortgage default insurance.” This is a benefit that accrues to the lender in the event of a mortgage default and foreclosure. In the United States, mortgages insured by a governmental agency, the Federal Housing Administration (FHA) pay the lender 100 percent of the outstanding mortgage balance. The borrower does not receive anything and, in fact, damages his credit rating if he defaults and the lender or investor must file a claim with FHA.

There is another type of insurance that is a hybrid between mortgage insurance and disaster insurance. This exists in Chile where, in the event of a disaster when a home is destroyed, funds up to the value of the mortgage go directly back to the lender or investor.

The following table<sup>51</sup> shows selected countries with mortgage insurance (MI) programs:

Selected Countries with MI Programs, 2008		
Country	Year of origin	Sponsorship
Algeria	2000	Public
Australia	1965	Private*
Belgium		Public (regional government)
Canada	1954 and 1963	Public and private
Colombia	2004	Public
Finland	mid-1990s	Public
France	1993	Public-private combination
Guatemala	1961	Public
Hong Kong, China	1999	Public-private reinsurance
Iceland		Public
India	ongoing project	Public-private combination
Ireland	1999	Private
Israel	1998	Private
Italy	2003	Private
Kazakhstan	2004	Public
Latvia	**	Public
Lithuania	1999	Public
Mali	1998	Public-private combination
Mexico	2004 and 2007	Public and private
Morocco	2004	Public
New Zealand	1997 and 2004	Private and public
Netherlands	1957	Public-private combination
Peru	1999	Public
The Philippines	1950	Public
Portugal	2003	Private
South Africa	1989	NGO/private reinsurance

<sup>50</sup> This appendix was adapted from Peppercorn, White and Mahul, “Post Disaster Assistance for Indebted and Uninsured Populations: A Study of International Experience,” GFDRR, World Bank, 2011

<sup>51</sup> Housing Finance Policy in Emerging Markets. Eds. Chiquier, Loic and Lea, Michael. World Bank, 2009.

Selected Countries with MI Programs, 2008		
Country	Year of origin	Sponsorship
Spain	2002	Private
Sweden	1992	Public and private
United Kingdom	pre-1970	Private
United States	1934, 1956, and 1987	Federal, private, and state
West Bank and Gaza	2000	Public

### *Homeowners Insurance*

This type of insurance covers a homeowner for property damage, replacement of contents, and sometimes additional living expenses incurred by owner during period of repair or reconstruction. Covered perils typically encompass fire and theft.

There are differences from country to country (and from region to region) in terms of what these policies cover. In general, standard homeowners insurance does not cover catastrophic perils such as hurricanes, earthquakes and floods. However in many countries cover for catastrophic events can be added as an extension to a standard policy for an additional component of premium.

The following table shows the penetration of non-life insurance coverage as a percentage of the gross national product<sup>52</sup>:

### Non-life Insurance Penetration

Country	Non-life Insurance Penetration Premiums as a % of GDP
Australia	2.8%
Chile	1.6%
Colombia	1.6%
Czech	2.1%
France	3.1%
Honduras	1.0%
India	0.7%
Indonesia	0.5%
Japan	2.1%
Malaysia	1.6%
Mexico	1.0%
Sri Lanka	0.9%
Thailand	1.7%
Turkey	1.1%
US	4.5%

<sup>52</sup> Swiss RE Sigma, 2010, AXCO 2009, Fitch Ratings

## *Catastrophe risk insurance*

Catastrophe risk cover typically comes as an extension/endorsement to a standard property damage policy although all risks policies including catastrophe risk as standard are more common for non-residential insurance.

However, it is much more prevalent in developed countries, than in developing ones. Estimates of coverage in the developed world range widely, from below 10% to higher than 95%. In developing countries, insurance covers less than one percent of losses—despite the fact that developing countries are generally more prone to disasters.<sup>53</sup>

For instance:

- In the United States, FEMA, the Federal Emergency Management Agency, provides congressionally authorized flood insurance. This is required by mortgage providers if the home is in a federally designated flood plain. It is available—though often this is not known—outside of these flood plains as well. There is no corresponding federal agency to provide earthquake coverage. Some American states, such as California, have established their own insurance programs.
- In Australia, virtually all property policies are extended to include catastrophic earthquake and wind cover. Flood cover is granted more selectively.
- In Chile, property policies are typically extended to cover windstorm although risk is perceived to be low. It is estimated that all properties with loans attached have earthquake coverage. Nationwide an estimated 24% of households have earthquake coverage, largely due to the requirement for earthquake insurance with mortgages. Almost all policies have flood coverage, except policies issued by the banks to cover mortgages.
- In Indonesia, penetration is thought to be very low. One estimate indicates that earthquake insurance penetration is less than 2%.
- In Japan, Fitch ratings estimate that 14-17% of households are covered for earthquakes.
- Prior to the Mamara Earthquake in 1999, only three percent of the country had earthquake insurance despite the fact that 96 percent of the country was in areas deemed at risk. This increased with the federally created earthquake insurance program<sup>54</sup>. By 2009, it had increased to 23 percent.<sup>55</sup>
- In Chile, while earthquake insurance was not mandatory, more than 95 percent of mortgagors held such insurance.<sup>56</sup> . Additionally, many banks offered lower interest loans to borrowers after the earthquake.

<sup>53</sup> See Gurenko, Eugene, and Rodney Lester. 2004. Rapid Onset Natural Disasters: The Role of Financing in Effective Risk Management. Washington, D.C., The World Bank, April 2004

<sup>54</sup> Earthquake Insurance in Turkey, Eugene Gurenko, Rodney Lester, Olivier Mahul, Serap Oguz Gonulal, World Bank, 2006

<sup>55</sup> Source: Swiss Re Sigma 2010, AXCO 2009, Fitch Ratings

<sup>56</sup> See BNamericas.com, June 18, 2010

([http://www.bnamericas.com/news/banking/Earthquake\\_insurance\\_in\\_mortgage\\_lending\\_could\\_see\\_40\\*\\_price\\_hike](http://www.bnamericas.com/news/banking/Earthquake_insurance_in_mortgage_lending_could_see_40*_price_hike))

### Appendix 3 Private Sector and Housing Recovery in Nepal<sup>57</sup>

“Natural hazards damage fundamental business components such as factory and supply chain, which have immediate impacts on local and national economy. As a service provider private sector actors can act as providers of advanced technologies for disaster risk reduction, for example by provision of safer construction materials and processes. As a lobby group, the business community also have significant stake in any National Disaster Risk Reduction Strategy. Finally, the private sector and public private partnerships play a critical role in protecting the livelihoods of vulnerable households, as providers of employment to community members. At this time of hour, the businesses need to demonstrate collective ability to prepare, respond and recover from disasters.”

Surendra Bir Malakar,

Nepal Private Sector: After the Disaster

<http://thehimalayantimes.com/opinion/nepali-private-sector-after-the-disaster/>

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The housing and human settlements sector was the most affected sector in the Gorkha earthquake, according to the Post Disaster Needs Assessment (PDNA) Report of the Nepal National Planning Commission<sup>1</sup>. The total damages and losses in the housing sector are valued at NPR 350,379 million. A total of 498,852 houses were categorized as fully collapsed or damaged beyond repair and 256,697 houses were partly damaged.

The PDNA estimates recovery and reconstruction needs for the housing and human settlements sector on the order of NPR 327,762 million. This includes transitional shelter, permanent housing reconstruction with structural resilience, demolition and debris clearing, repairs and retrofitting, clustering a small percentage of dwellings in safer locations, training, facilitation, and urban planning including heritage settlement planning. Based on the number of households made homeless, the PDNA estimates 609,938 housing units in need of reconstruction and another 256,697 in need of repair/retrofit.

The PDNA recommends an owner-driven reconstruction approach, through which families will receive support in rebuilding or retrofitting their home, in the form of financial assistance, technical guidance, social mobilization and skill upgrade. This model has proven successful in other post-disaster housing reconstructions when sufficient skills, funding, and incentives or enforcement are present to ensure disaster-resilient rebuilding.

The Nepal business sector alone has already contributed over NPR 300 million to the Prime Minister's Relief Fund. Beyond financial contributions, the Nepal private sector has a significant and multi-faceted role to play in the reconstruction, ranging from small-scale local artisans, including local private sector building materials producers, engineers, larger contractors and engineering firms, and related sectors such as IT and finance.

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<sup>57</sup> This material was prepared by Elizabeth Hausler Strand, much of which was taken from World Economic Forum, “Building Resilience in Nepal Through Public Private Partnerships,” World Economic Forum, 2015.

Observations are based on research and interviews with representatives from following groups: two large Nepali construction companies and one mid-size engineering consultancy, including discussions with executives and site workers; largest technical training school in Nepal; Department of Urban Development and Building Construction; NGOs present in Nepal before the earthquake; International NGOs; Shelter Cluster members.

Local builders, homeowners, women moving bricks, government engineers, concrete block producers and finished lumber producers, unskilled workers in need of employment opportunities, on several site visits, including the semi-urban community of Sankhu, rural Maneshwar.

## Building Codes and Guidelines

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### Building Code Development

Following the 1988 earthquake in Nepal which killed over 709 people and damaged over 50,000 buildings, Nepal's Ministry of Housing and Physical Planning (MHPP) requested assistance from the United Nations Development Programme (UNDP) and their executing agency, the United Nations Centre for Human Settlements (UNCHS), to develop a national building code. With the aid of various consultants, the Nepal National Building Code (NNBC) was prepared in 1993. It was primarily based on the Indian building code (Indian Standard, IS) at the time and was officially published in 1994.

The building code was approved by the government of Nepal in 2003, issued by the Department of Urban Development and Building Construction (DUDBC) within the Ministry of Urban Development (MoUD), and by 2006 it was made mandatory in all municipalities. However, a deadline for the implementation of the building code was not established, and the mandatory implementation of the building code did not extend into the smaller administrative areas defined as Village Development Committees (VDC).

For new construction, the NNBC covers the most common building types constructed in Nepal and consists of four levels of sophistication, from most to least:

*Part I* - international state-of-the-art (alternative methods);

*Part II* - professionally engineered structures, requires engineering analysis for unreinforced masonry, plain and reinforced concrete, steel, timber, and aluminium structures;

*Part III* - buildings of restricted size designed to mandatory rules-of-thumb (MRT) in lieu of engineering analysis, including more prescriptive rules for reinforced concrete frame buildings with and without infill and load-bearing masonry structures, such as specific limitations on spans, heights, member sizes, minimum reinforcing, positioning of structural elements for earthquake resistance, and so on; and

*Part IV* - remote rural buildings where expected control is limited, including MRT provisions for low-strength masonry and earthen buildings no taller than two stories plus an attic.

The PDNA indicates that 95% of the buildings categorized as fully collapsed were built of low-strength masonry. Less than 2% of the fully collapsed buildings were reinforced concrete frame. A larger percentage of RC frame buildings were damaged but can be retrofitted.



In 2009, the Government of Nepal (GON) Ministry of Physical Planning and Works issued a report identifying recommendations for updating the NNBC<sup>2</sup>. A draft of the new building code was intended to be published in July 2015, but has not yet been released. The 2009 report is broad in scope and includes recommendations for revising the NNBC and reviews effectiveness of implementation. Some priorities identified include the following:

*Priority 1:* Replacing Parts III and IV with standardized designs of typical buildings that are common in urban and rural areas. If a typical design is adopted without change, the process of building permit could be simplified.

*Priority 2:* Identifying gaps in the structural code including the building act, building bylaws, standards, specifications, manuals, directives and instructions

*Priority 3:* Adopting the International Building Code with suitable amendments wherever required,

*Priority 4:* Introducing new codes not covered by IBC and codes specific to the country or locality, covering urban planning, fire, disability accessibility, environment, plumbing, electrical, construction, and construction safety.

*Priority 5:* Prepare commentaries, guidelines, directives, illustrations, new mandatory rules-of-thumb, training manuals, and other materials to enhance the effectiveness of the updated codes.

Regarding implementation and enforcement, the 2009 report makes several additional recommendations, including establishing a National Code Council, amending the Building Act to close the loophole which allows VDCs to avoid mandatory adoption, coordinating between architectural requirements and planning/zoning guidelines, and addressing environmental pollution, high rise buildings, changes in occupancy. The report suggests to address the required qualifications for persons performing construction quality supervision, licensing of skilled construction workers, inspectors, supervisors, and to provide appropriate training.

## Permitting and Enforcement

The building permit review process varies by location and context. Responsibility for developing, adopting and enforcing the code or bylaws falls to the VDCs, Municipalities, and the District Development Committees for the implementation in their jurisdiction. The 2009 NNBC update recommendation report<sup>2</sup> describes examples of different permitting procedures in the Kathmandu Metropolitan City area and the Lalitpur Sub-Metropolitan City area. Both however, included phased permitting as a way to check progressively the construction quality.

EERI<sup>3</sup> reports that, as of 2015, twenty-six of 191 municipalities had begun building code implementation. Observed enforcement of the building code varies however. They note that public buildings and schools seem to be more compliant than private schools and buildings. Examples were found where the structure permitted did not match the structure built; such as five stories constructed on a building permitted for two, or 17 stories built instead of 12 permitted. Rural areas lag significantly behind urban in building code implementation and enforcement.

## Retrofitting

The NNBC does not include technical literature on repair and retrofit of existing structures. In practice, those who implement the NNBC often reference the Indian Standard for technical information that is not included. Although not considered a national code or



standard, the National Society for Earthquake Technology (NSET) has issued several documents addressing existing structures<sup>4,5</sup>.

## Skilled Labour for Housing Reconstruction

“If properly trained and prepared, local people can move from work in low productive sectors (such as farming) to relatively high productive sectors (such as construction, supply of raw materials, and transportation), which will build people’s skills and capacity for more resilient livelihoods.”<sup>6</sup>

The earthquake affected the livelihoods of 2.28 million households and pushed an additional 700,000 people below the poverty line. Over 600,000 houses must be built anew and 250,000 repaired or retrofit, predicted to require the labour of 20,000 skilled workers<sup>1</sup>. Engaging local people in the reconstruction is critical for economic recovery. The challenge will be to create income earning opportunities – not just sweat equity – and build skills.

## Challenges

### Migration

Nepal was facing a skilled labour shortage before the Gorkha earthquake. Every year, thousands of Nepali men and women venture abroad in search of better economic opportunities. In the 2011 national census, Nepal reported 13.1 percent of the male population absent<sup>7</sup>. This is likely an underestimate as it contains only formally reported migration, to India, the Middle East or Malaysia. The porous border between Nepal and India allows for many to leave Nepal informally. Factoring in age and informality, one-third of Nepal’s working male population has migrated abroad<sup>8</sup>. In 2011, 32 percent of households nationally had at least one member working abroad<sup>8</sup>. The vast majority of migrants are men - 92 percent in the 14 priority districts - the heart of a productive workforce<sup>9</sup>.

By the end of March this year, Nepal had sent abroad 44,712 skilled workers and an additional 282,541 semi- or unskilled workers. Many are hired by the private sector as construction labour. Due to dangerous working conditions, on average three returns in coffins to Kathmandu everyday<sup>10</sup>, nearly 400 corpses returned by mid-March this year<sup>11</sup>.

The decision to go is more complex than leaving for a better paying job. Many young Nepalese see a less than desirable future before them if they remain in Nepal, but abroad some mystery - and thus opportunity - remains. Examples exist of unskilled construction workers making *more* in Kathmandu (\$300 a month in country and only \$200 abroad) yet still deciding to migrate. Even though formal salary arrangements with other countries exist, such as a minimum monthly salary of \$330 in Qatar and \$311 in Oman for an unskilled labourer, Nepal is still battling exploitation of its workers abroad<sup>12,13</sup>. Despite this, the draws of an unknown adventure in tandem with societal pressures to leave send more migrants abroad than just money alone.

### Influx of foreign labourers

Foreign labourers from neighbouring countries often man commercial construction projects in Kathmandu. Construction companies in Kathmandu indicated that both fiscal and work ethic differences drive their decision to hire foreigners. Indians and Bangladeshis are cheaper to hire in Nepal than Nepalese and are willing to work longer hours. Project directors indicated that foreigners work harder, while Nepali workers can’t match their pace and want a shorter workday with an hour for lunch. The attitude of Nepali workers on site may reflect cultural opinions of working in the construction industry. If workers feel their

caste or class does not match their working standards of Nepali construction, they would rather work in those conditions abroad.

## Opportunities

### Remittances

In the 14 priority districts, remittances make up nearly 45 percent of household incomes<sup>14</sup>. Remittances contribute over a fourth of Nepal's GDP, and migrants send back more than a million Rupees each day<sup>11</sup>. Remittances will contribute to filling the gap between the funding provided by the government for reconstruction and the full amount needed to rebuild or retrofit a disaster-resilient home.

### Private sector-driven skills development and job creation

"It is vital that materials and human resources be sourced locally to stimulate the local economy."<sup>6</sup>

Nepali companies want to hire Nepalese. Some are eager to promote skills training. The Nepali private sector may be better positioned than the Nepal government to slow the bleeding of skilled labour by providing the right mix of skills training and incentives.

*Pumori*, an engineering consultancy, suggested housing recovery organizations partner with businesses like theirs to connect labourers trained throughout reconstruction with job opportunities after rebuilding has completed.

*CE Construction* focused their emergency relief efforts on providing help to 800 employees and 2,000 subcontractors, and assisting with debris clearing. CE Construction has a unique way of using a company system to facilitate migration abroad and skills development. The company hires and trains labourers on-the-job in Kathmandu for a time before sending them abroad for a year or two. The workers gained new skills in the international programs, then upon return, the workers continued to work for the company. Our informant said it was their way of working with the desire to go abroad, and a win-win for both the worker and the company as returnees brought home new knowledge.

*Chaudhary Group* built 1,000 transitional shelters in several districts immediately after they earthquake. They used local manpower, haven't seen a shortage of local manpower, and expect labour availability to meet demand.

## Women

Nepali engineers are required to register with the Nepal Engineering Council. As of September 2014, 24,998 engineers were registered with the NEC, of which 3,145 are women.

### Increasing Women's Role in Construction

In 2014, Nepal ranked 112 out of 142 countries on the WEF Gender Gap Index, indicating inequality in labour participation, skill level, and wages<sup>15</sup>. Housing reconstruction provides an opportunity for women to increase participation in the construction sector, build skills, and increase wages. Below are challenges and opportunities.

#### Challenges

##### Unsustainable workload

The government has noted male migration abroad already compounds the workload of women<sup>9</sup>. The PDNA warns over-engaging women in recovery and reconstruction could result in an unsustainable workload<sup>14</sup>.

##### Literacy

Women's literacy rates are lower than men throughout Nepal, a potential barrier to training and future employment in skilled positions. The average ability to read and write for women is 66% in the 14 priority districts, 56% excluding the three districts of Kathmandu Valley. However, the most effective construction vocational training programs incorporate hands-on learning and picture or sketch-based lessons, which increase the success of participants with limited ability to read.

##### Societal resistance

Women in Nepal traditionally fill domestic and agricultural roles, and some concern exists that society won't accept women working in the construction sector. In interviews however, we found most men indifferent to the inclusion of women. Resistance is most common from segments that lack economic opportunity themselves.

##### How women view income-generating work

Women who work as construction labourers may do so in a time of financial stress, rather than as a long-term career. They may not identify as unskilled labourers or skilled labourers in training. More should be done to promote this as a viable career path for some women.

##### Opportunities

##### Role models

Women in the construction sector can inspire other women to join the construction sector. Strong role models already exist in Nepal, and more should be identified and cultivated. For example, an inspiring Sankhu businesswoman offered to drum up support for women trainees; a female mason working for CE Construction, charismatic and confident, soft spoken but strong, and a clear force of knowledge on the construction site. She's trained over a dozen masons herself, men and women, family and strangers. Efforts should be made to identify and support other women to step into leadership roles to inspire the population at large to promote and implement disaster-resistant construction.

##### Physical ability

It is sometimes thought that women are not suited to the construction sector because of physical strength and ability. Given that women in Nepal are already active in the construction sector – overwhelmingly as unskilled labour which is more physically demanding than the skilled tasks – this challenge can be easily dismissed. Instead it can be used as a way to encourage women to advance from unskilled, physically demanding tasks like mixing mortar and carrying bricks which require strength, to the skilled tasks like masonry and carpentry, which require skill and finesse.

### Prioritising a safe home

Women have historically been more negatively affected by natural disasters and the Gorkha earthquake is no different; of the 8,702 people killed, 55% were women. At the same time, women have shown a higher tendency to prioritize rebuilding a disaster-resilient house and have shown to be competent decision makers and supervisors of construction.

### Construction Materials Industry

“A huge chunk of this money to be spent is expected to go to the construction industry,” Pashupati Murarka, acting president of the Federation of Nepalese Chambers of Commerce and Industry (FNCCI)<sup>16</sup>.

Though the Nepal construction materials industries suffered losses and production interruptions from the earthquake itself and the temporary return of workers to their homes during the emergency relief phase, local construction materials industries are expected to benefit in the long term because of high demand. Industrial analysts expect the market to grow by about 35-40% for the next few years and expect nearly Rs 670 billion to be required for all recovery.

### Cement

“We learnt during this earthquake that cement houses are stronger”, a 41 year old mother of two quoted in the Nepali Times<sup>17</sup>.

If used properly, cement can have a marked increase in seismic safety of buildings, particularly in the low-strength masonry with mud mortar homes which collapsed in large numbers in Nepal. Demand for cement will be high and efforts to distribute it throughout and beyond the 14 priority districts will be needed.

According to Nepal’s Cement Manufacturers Association, there are more than 40 (mainly mini) cement plants in the country. Nepal’s cement industry is moving toward self-sufficiency<sup>18</sup>, with cement imports dropping and domestic production increasing. Domestic products account for 85% of domestic consumption. The industry has recently attracted FDI, two cases reported on [globalcement.com](http://globalcement.com):

- At the end of July, GO Nepal endorsed a US\$360M FDI proposal made by China’s Hongshi Holdings to establish a cement plant in Nepal in partnership with Nepal’s Shiva Cement.
- Dangote Cement Nepal also has long-term plans for new plant construction, expecting to start production on a 6000t/day plant within 3 years. Dangote Group has provided a US\$1M contribution to the Prime Minister’s Disaster Relief Fund through the Dangote Foundation, the CSR arm of the Dangote Group.
- Additional growth in the cement industry in Nepal faces some challenges, including but not limited to the following<sup>18</sup>
- Preference for Indian cement in large projects due to quality standard

- Limited skilled labour and low productivity
- Power availability due to load shedding
- Political instability due to strikes
- High transport costs due to syndicated transport.

## Steel

Nepal is self-reliant in steel production<sup>18</sup>, though it does not produce the raw materials, but rather imports most of them from India. Iron and steel products were among the top export items during the last fiscal year. Similar challenges to the industry exist, as reported for cement production, such as low worker productivity, power shortages, and high transport costs.

## Bricks

“The international community still hides behind the veil of supply chains, but it would be very easy to ensure that there was a national mechanism set up to monitor working conditions in the kilns. It’s about having the will to do it.” Andrew Brady, BloodBricks, quoted in the Guardian, “How Nepal is trying to solve its blood brick problem”<sup>19</sup>

Fired bricks are produced throughout the Kathmandu valley using primarily high labour intensive manual mixing, moulding, and moving processes. The 1994 NNBC requires a minimum compressive strength for bricks of 35 kg/cm<sup>2</sup>, which bricks produced in Nepal generally meet. MinErgy reports that after the earthquake, 105 kilns within the valley were damaged, causing 4 casualties. MinErgy estimated that 70% of kilns need complete rebuilding. The Federation of Nepali Brick Industries reports 350/800 kilns damaged on a national scale.

Environmental, animal rights, and child and bonded labour concerns are well documented for the brick manufacturing industry in Nepal. According to Brick Clean Network<sup>20</sup>, a group of social workers, environmentalists, child rights and animal rights advocates working in brick factories in Kathmandu valley, emissions from brick factories are the largest source of air pollution in the Kathmandu valley.

Brick manufacturing consumes fertile soil. A 2012 study by the Ministry of Agriculture and Cooperative (MoA) assumed that each of the 117 kilns throughout the Kathmandu Valley would produce a million bricks per year. If each brick uses 0.001856 m<sup>3</sup> of soil, this results in 217,000 cubic meters of soil consumed per year. The Federation of Brick Industries indicates a higher annual average production of bricks, at 4.8 million units per year, which would consume nearly 5 times as much soil.

Multiple sources report that bonded labour makes up 20-30% of brickmaking industry. Discrimination in pay among female workers is reported, and BCN indicates that thousands of children, some as young as six years old, work full time in Kathmandu’s brick factories. In 2011 on the World Day Against Child Labour, a story in the Himalayan Times<sup>21</sup> reported over 3,000 child workers in Kathmandu valley brick kilns. A rapid assessment<sup>22</sup> led by World Education and performed by a collaboration of NGOs, Nepal Ministry of Labour and Employment, and other ministries in 2012 with funding from the US Dept of Labour, reports that number to be up to 28,000.

Non-profit and public sector are working together to improve the brick making industry in Nepal:

Climate and Clean Air Action (CCA) will fund work on a feasibility study to rebuild the brick industry in Nepal, increase efficiency of kilns, and reduce emissions.

*Brick Clean Network* (BCN) promotes clean and green bricks among consumers and the real estate development sector in Nepal. BCN has developed certification criteria for brick manufacturers in Nepal which considers the above factors. The quality of bricks and production is then categorized as green, orange, and red. At Nepal's first EcoFair in 2012, two manufacturers have been certified orange, Shree Satyanarayan and Bungamati Itha Udyog. None have been reported to be certified as green yet.

*Better Brick Nepal* (BBN) program of the Brick Clean Group Nepal (BCN) Global Fairness and parallel effort and aimed to change incentives in the industry by creating a market preference for better bricks, and providing technical assistance to improve working conditions, boost production efficiency, raise product quality, and provide linkages to markets. Started in 2014 with five pilot kilns.

"It's exciting to see the business community taking the initiative even before formulation of policies by the government. It's a great example of partnership between the business and nonprofit sectors to achieve common goals. We believe that Nepal's consumers, if given the choice, would rather have clean bricks free of any trace of child labour or forced labour." GFI Country Director Homraj Acharya.

### Concrete Blocks

Use of concrete blocks (CMUs) is less common than fired bricks in urban areas and stone in rural areas. Production of CMUs in the earthquake-affected zone is most common in Pokhara. Manual production methods are common. Similar to the brick industry, opportunities exist to improve production, improve quality, through a mix of technical and financial assistance.

### Stone

Stone is perhaps the most renewable construction resource present, as stone from collapsed buildings can be reused in new structures.

### Sand and Gravel

Sand and gravel are produced locally. The government announced reforms and new standards for the sand and gravel crusher industry in 2013. The regulations are motivated largely by environmental protection, requiring specified setbacks from highways, rivers, voltage lines, educational institutions, places of cultural, religions, and archaeological importance, forests, national parks, and so on. As a result of the regulations, only 25 of 700 registered sand and gravel operations chose to follow the standards and remain in operation. The enforcement of these laws on excavation of sand and aggregates has caused significant increases in the cost of these raw materials<sup>23</sup>.



## Timber

Similarly, government efforts to slow deforestation have resulted in reduction in availability and rise in prices for timber and bamboo, however, government may loosen regulations as a result of the earthquake. Implementation of regulation is done mostly by community forest groups.

## Transportation of Building Materials

A sharp rise in the transportation cost of construction materials has been reported, especially in rural communities, some reporting a doubling in transportation costs.

### Imported Materials

An earthquake which significantly damages building stock usually prompts a discussion of alternative materials, such as steel sections and prefabricated components. Nepal is no different, and such alternatives are being promoted through certain channels. The materials are not manufactured in Nepal but rather imported from China and India. The market of these materials is still unregulated and prices may vary from one manufacturer to another. However, since these materials are touted to the market as low cost alternatives to the traditional or common methods of construction, the main concern centres on material quality and their supervised usage.

## Regulation of Construction Materials

There are no regulations on construction material imports. In an interview with a materials importer, he said the government has yet to regulate or limit types of materials crossing the border. Use of the building materials is expected to comply with the NNBC. The import of different types of construction materials is thus only being dictated by the construction market. For example, the government does not ban the use of smooth-steel bar or asbestos but the market has rejected their use due to deficiencies and new better quality materials entering the construction market.

## Appendix 4 Microfinance Lending and Deposit Data<sup>58</sup>

		325.6m Loans (USD)	1.1m Borrowers	152.8m Deposits(USD)	1.6m Depositors
BAYOCA	2008	250,810	3,725	250,914	5,380
BISCOL	2012	4,721,518	5,537	5,243,832	12,332
BMSCCSL	2012	318,254	—	227,193	—
CBB	2012	27,074,138	113,963	18,244,627	147,045
Chandeshwori	2008	2,368,296	598	2,279,548	3,772
CSD	2011	7,814,566	—	3,771,967	—
DD Bank	2011	14,892,700	47,869	3,472,584	63,573
DEPROSC-Nepal	2010	11,027,538	39,710	2,369,958	51,827
FORWARD	2014-09-30	18,826,781	81,093	9,524,964	115,270
GBNB	2011	11,584	35,923	1,100	21,641
Hatemalo	2011	505,451	620	390,337	1,703
JBS	2014	33,441,105	89,010	13,818,640	125,723
JSCCS	2012	2,178,364	2,746	2,029,809	10,091
Kalyan Nair	2012	106,092	544	128,600	1,303
Kiribati SACCOS	2011	106,010	506	87,528	831
LLBS	2012	48,472	117	3,964	819
Mahila Prayash	2012	537,118	723	515,170	3,164
Mahuli	2012	2,660,589	20,203	1,493,221	29,995
Manushi	2012	1,765,833	10,740	1,051,364	25,677
MGBB	2011	10,051,307	34,366	2,823,334	63,010
MPGBB	2011	9,126,958	21,929	3,048,876	24,082
Muktinath Bikas Bank	2015	20,308,021	56,085	10,563,730	77,012
Nerude	2014-09-30	13,814,426	56,457	5,372,365	75,886
NESDO	2012	4,320,271	24,201	2,129,984	39,102
Nilkhantha SACCOS	2012	259,155	395	190,165	1,319
Nirdhan	2014	50,639,281	139,418	19,298,027	215,216
NMCSL	2008	3,622,754	4,965	3,440,971	12,150
NWCSC	2014	2,314,202	10,700	1,376,557	16,600
Padmawati	2008	1,441,710	567	1,524,826	1,463
PGBB	2012	10,534,671	40,338	3,526,307	58,324
RWDC	2011	574,048	3,858	259,430	7,711
Sahara Mahila	2012	370,603	731	325,700	2,028
Sahara Nepal SACCOS	2012	9,145,637	43,163	5,917,250	57,379
SB Bank	2014	40,467,412	124,905	16,492,601	188,925
SCDC	2011	1,821,305	10,929	444,549	45,599
SLBBL	2012	1,391,212	6,196	438,194	8,373
SOLVE	2012	1,008,093	6,683	407,215	11,129
SPGBB	2011	2,181,596	10,648	684,754	12,663
UNYC	2014	3,179,339	17,683	2,102,627	31,692
VYCCU	2012	3,396,560	2,153	3,684,574	10,536
WCS	2011	5,419,363	12,654	2,883,698	31,553
WDCN	2012	1,525,201	9,333	923,695	20,356

## Appendix 5 Rental Housing Assistance

<sup>58</sup>

MixMarket data at [www.mixmarket.org](http://www.mixmarket.org)



In Haiti, a rental housing voucher program was designed to move people out of camps. All of the units were supposed to be inspected prior to occupancy, although there were little criteria for safety, aside from the fact that the units were not supposed to be in a “red” or unsafe zone. The reviews of the program considered it a success, with the main criteria being that the families did not return to the camps. It was also considered a success in that private landlords were seen to have invested in their properties to make them more attractive to tenants.<sup>59</sup> However, neither the amounts invested nor whether they went to safety or only to cosmetic improvements were discussed in the evaluation study. Another issue was the majority of tenants left the rented housing once the one year period ended, primarily to find a unit that was less expensive.

Vouchers for rental housing is not a new concept. It has been used in developed countries for many years, primarily for low income persons and families by paying a portion of a tenant’s rent to a private landlord. In the United States, “Section 8” rental assistance, now known as housing choice vouchers, is one of the largest components of the budget of the national Department of Housing and Urban Development. These go to the tenants who pay 30 percent of their income, with the difference between that and the federally determined fair market rent for that particular area being paid for by the Government. There is an alternative, project based rental assistance, which was used heavily in the 1970s, where the landlords were the direct recipients provided that they rented to eligible tenants.<sup>60</sup>

There are a number of challenges with the program. First, while in theory the units are supposed to meet “housing quality standards,” the reality is they often do not. Tenants often felt that they had to take what they could get. This was improved somewhat with the development of the Real Estate Assessment Center (REAC) where independent inspectors were hired to assess each unit receiving rental assistance, as well as each public housing units. The protocol used by REAC is something that could be considered for Nepal.

Second, the determination of a fair market rent (FMR) was often considered neither fair nor market. The FMR standard covered such a broad geographic area that it did not take into accounts the more granular detail of the market.

Third, it is very expensive as once a family receives a voucher it may continue to keep it for an indeterminate period of time, provided that the eligibility (primarily income) is maintained. This has caused such a back-up of federal assistance that some cities shut off their waiting lists.

The example of the Philippines has a direct bearing to Nepal. The Philippines has had numerous disasters and was evaluating the potential for rental assistance for those living in unsafe areas prior to the impact of Hurricane Yolanda in the Tacloban area. It had already piloted a small program and was performing market studies in several areas to determine the availability of rental housing and the market cost of such housing. It has determined that rental housing was indeed available and that the development of a housing voucher system would be feasible.

Unfortunately, the program had to be put in place sooner than imagined when Hurricane Yolanda struck the country. It evaluated the Haitian program and made significant changes. First, as the Tacloban area was composed primarily of owners, not renters, an adjustment was made to permit them to participate in the program. Second, the period for which a

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<sup>59</sup> Condor, Juhn and Rana, “External Evaluation of The Rental Support Cash Grant Approach Applied to Return and Relocation Programs in Haiti,” The Wolf Group, 2013

<sup>60</sup> See Peppercorn, I. and Taffin, C., “Rental Housing: Lessons from International Experience and Policies for Emerging Markets, World Bank, 2013

family could receive rental assistance was lengthened to 18 months and could be extended further to two years. This made a great deal of sense as it was closer to the time period needed for the families to rebuild their dwelling.

## Appendix 6 The Turkish Catastrophic Insurance Program

While the TCIP program was created by the Government in concert with donor organizations, the program operates almost entirely through private sector entities. There are no government employees involved in the operation of the program, as its sales, reinsurance and claims management are contracted out to the private sector. More than 10,000 private insurance agents are able to issue policies. The Government's primary role is providing contingent liquidity support in the event that this excess financial capacity is needed. This is estimated to have only a half a percent chance of occurring and would only apply in the event of a once in 200 years occurring in the capital city.

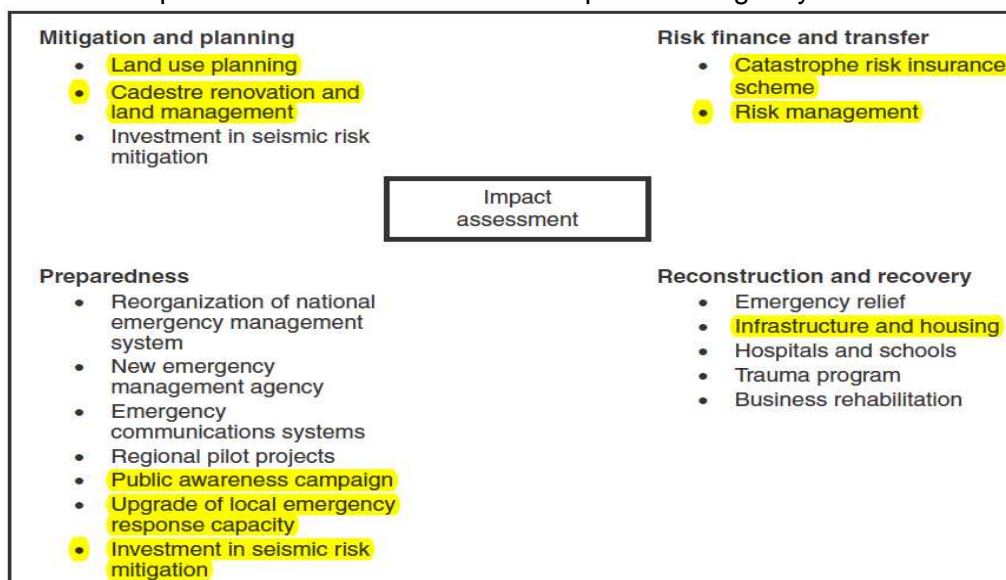
Buildings can be protected for up to \$50,000 with an estimated annual premium of less than \$50.

While Turkey has indeed had building codes, they were often ignored. One of the ways the TCIP program mitigates risk is that buildings cannot be insured unless they have both construction and occupancy permits. It is not uncommon in Turkey to see buildings not fully completed but occupied in order to avoid the costs of formally registering occupancy. These buildings, called Gece Kondu (built overnight) could not be insured, raising the risks for the owners and for the tenants, in the case of rental housing. Failure to build to the existing building codes caused significant loss of life after the Marmara earthquake.

It is often the poor that are hurt the worst in a disaster as they are more likely to be living in informally built housing and are more likely to be renters unprotected by insurance.

The TCIP grew out of the Marmara Earthquake Emergency Reconstruction Project (MEER). Rather than simply responding to the disaster, the MEER provided a broader framework to protect the country from future disasters including disaster mitigation, emergency preparedness and the transfer of risk to private reinsurers.

Map of Actions from Marmara Earthquake Emergency Reconstruction<sup>61</sup>



<sup>61</sup>

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It should be noted that there were many areas not traditionally related to disaster risk management that were included in this framework, including land use planning and improvements in the registration (cadastral) system

The TCIP can deny coverage to buildings that were built after 1999 that do not have construction permits, occupancy permits or are on land that is not legally registered.

In addition, the system put protections in place for future transfers of the properties and for occupancy. A homeowner that seeks to register a property or to legally transfer the property to another buyer must present valid proof of earthquake insurance. They must also present a valid policy if they need access to services, such as water and natural gas.

Earthquake insurance policies are sold as separate policies from homeowners insurance. In the past, one of the only options available to homeowners was to have an add-on in their fire insurance policies. TCIP changed this. The initial compensation for agents was 12.5 percent, but was later increased to 17.5 percent for areas outside of Istanbul.

The premiums are calculated using a market based, risk based pricing approach and vary depending on the type of construction, the size and the property's location. Those properties located that have a reinforced steel frame and are built with reinforced concrete are considered the lowest risk, those with amassed stone and brick are medium risk and all others are considered higher risk. The locations are ranked in zones ranging from 1, the highest risk, to 5, the lowest. The premiums range from .44 percent to 5.5 percent, with reinforced frames in the lowest risk areas having the lowest premium.

Reinsurance has been the main source of TCIP's claims paying capacity, and the program also has the resources of Turkey's Milli Re and the World Bank's contingent capital facility. Reinsurers are selected on the basis of competitive bidding. While the initial intent was not to have the Turkish Government's direct financial involvement in the facility, this was later changed to have the Government commit to providing funding in the event of a catastrophic disaster, determined by a 200 year event. In essence, it becomes the funder of last resort.

The logic for this is twofold. First, there is the question of governmental capacity in rural areas to manage building inspections. Second is that, according to TCIP's analysis, those living in rural areas are more likely to be poor and not have the financial capacity to cover insurance premiums. These are both issues that would have to be carefully examined in Nepal.

The Turkish experience also shows how important it is to have a clear communications strategy that clarifies the role of insurance, explains its value and notes that this is not another form of a tax. It is also important for people to know that how disaster reconstruction works is changing and that governments and donors cannot fund the full cost of reconstruction. Personal responsibility must be taken to make sure that homes are properly built and properties duly registered. The case of Turkey shows that disaster insurance can facilitate those efforts.

## Appendix 7 How the Public-Private Partnership Works in Colombia

- Homeowners and Community: Must be interested in retrofit, which means some disruption in their home; provide additional financial coverage if needed, make informed decisions about architecture and structural with guidance from engineer
- Public Sector:
  - National level: Seismic code commission: develops, approves building codes for retrofitting (usually private sector representatives working in a pro bono or unpaid committee context)
  - City level: Housing Secretariat of Bogota, and Caja de la Vivienda Popular; allocates budget and provides housing subsidy, screens and determines eligibility of applicants, promotes the program, partially covers technical assistance and training costs
  - Neighbourhood level: Mayor's offices, or Alcaldia; issues permits
- Private Sector:
  - Engineering industry; applies the code, by assessing buildings and designing the retrofit
  - Construction industry; small to medium scale local contractors do the retrofit
  - Construction materials industry; produce, market, sell building materials
- Social Enterprise/Technical Assistance Providers: Such as Build Change provides technical assistance and training, including developing the retrofitting manual and technical documents, working with Colombian seismic code commission to approve it, and transferring capacity to private and public sector stakeholders listed above
- Multilateral and Private Donors: partially cover technical assistance costs until government budget allocations fully cover this cost
- Finance and Insurance Industry: It is unlikely that all homes in need of retrofit will be able to complete the retrofit within the available subsidy (about US\$5,000). Access to finance and incentives through other mechanisms will be important and explored.

## Appendix 8 The Cooperative Organisations Development Institute in Thailand

CODI estimates that the number of people living in substandard housing in Thailand is significant: 8.25 million people living in 5,500 communities, 65 percent live on a rented land with no secure contract and 35 percent are squatting. Three quarters of these residents could not afford a home and approximately eight percent face the threat of eviction.

The residents are very low income people, many of whom reside in informal housing built along the banks rivers who are at risk when the river floods. They can also be displaced persons living in slums or those who are displaced when they are evicted from land on which they are squatting.

The organization of residents holds the land and the properties in common rather than having each house owned individually. When a resident would like to move, the gain on the sale does not go to the seller; it goes to the local organization. Moreover, any person moving in must meet strict eligibility requirements and is usually taken from a waiting list of nearby residents.

The Government of Thailand provides significant subsidies. Low income people are eligible for housing subsidies of 80,000 baht (\$2238) for housing. CODI also receives funds from the Government that it loans to cooperatives of residents at low interest rates. The cooperative then lends the funds to the families at approximately at interest rates approximately 2 percent higher, with the difference going to administrative costs and to social welfare housing.

CODI works with communities to gain secure title for the underlying land. It then uses a combination of its funds, governmental subsidies and resident funds to build or fix the infrastructure and, subsequently, to build the housing.

One challenge to CODI is that it must hold most of the loans since 1) financial systems often do not understand loans to cooperatives and 2) the low interest loans are below market creating barriers to a secondary market purchase.

The first barrier can be solved by loans to individuals that are then guaranteed by the group, creating an extra level of security for the lending institution. The second can be solved by using grants for down payment assistance rather than low interest loans. The effect on the borrowers should be neutral. In Nepal, this would be a way to bring in the private financial sector to purchase the loans after a period of seasoning of approximately two years. Moreover, private construction companies would benefit since the units are not built by residents, but by private contractors.

While there is no model for the use of cooperative financial solutions after a disaster, there is a model of slum upgrading that has relevance to post disaster reconstruction. Here, a cooperative organization could be developed. The recipient would be responsible for payments, but the community would be responsible in case this obligation was not met. One example of this is the Community Development Organisations Institute (CODI) in Thailand.



## Appendix 9 Slum Dweller Housing in Kenya

In Kenya, the Federation of Slum Dwellers was able to make housing affordable for slum dwellers, most of whom earn their incomes informally. This has been possible due to:

**Design:** The house has relatively short spans hence requires minimized structural support. The houses are designed in such a way that a number of units share walls, thus reducing construction cost per unit.

**Pre-fabricated components:** The use of precast slabs and beams instead of the conventional in-situ slab cuts down the construction cost substantially.

**Size and incremental build:** The size of the original units is small (approximately 22.5 square meters) in order to keep the costs down. The intention is that these units can be and have been expanded as the owners save money over time. The additional spaces are carefully monitored by the local organization.

Housing development is carried out in phases of between 20 to 50 units. All units are built to meet or exceed national and local building codes. However, these units were smaller than that required by the local code. Therefore, the development was built in what was a specially designated development zone and special permission was granted for the smaller units and permission was also granted for the use of pre-cast slabs.

This point is critical. Building codes that are intended to protect communities and residents often have exactly the opposite effect. For instance, when particular materials are specified rather than performance, technological solutions that are stronger and less expensive may not quality under the building code. This is particularly true for those countries that had been under British rule and adopted the building and planning regimens of 1946 and 1947.

Minimum size requirements are another example of how building standards when not properly thought through can hurt the poor. Those that cannot afford to build within these requirements generally fall into informality. By developing housing that is safe, but smaller than the standard previously permitted, families can be brought into formality.

What is important in thinking of how to involve the private sector in Nepal is that these are projects built for and with the community. This is more efficient for the residents than either a program tailored to individual residents, as there are cost savings and quality controls in building multiple units with shared walls. It is also more effective than large scale developments built by either a government or the private sector where the intent is to build as cheaply as possible.

The second aspect of the Muungano model is how the units are financed. All of the residents in each phase must save 20% of the cost of construction through a community wide savings scheme. In fact, having participated in a community savings plan is one of the initial determinants of eligibility. A local non-governmental organization, the Akiba Mashinani Trust originates loans to the residents on a below market basis at 6.5 percent interest rate using a blended funds from the community's savings, recycled loan payments and foundation funds.

### References

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1. Post Disaster Needs Assessment Vol. B: Sector Reports. (2015) National Planning Commission. Government of Nepal.
2. *Recommendation for Update of the Nepal National Building Code.* (2009) Ministry of Physical Planning and Works, Government of Nepal.

3. *Learning from Earthquakes Briefing for the April 25, 2015 Nepal Earthquake* (2015) Earthquake Engineering Research Institute (EERI).
4. *Seismic Vulnerability Evaluation Guideline for Private and Public Buildings Part I: Pre Disaster Vulnerability Assessment*. NSET.
5. *Seismic Vulnerability Evaluation Guideline for Private and Public Buildings, Part II: Post Disaster Damage Assessment, and Retrofitting of Common Frame Structural (Pillar System) Houses*. NSET.
6. Rasul, G. et al. (2015) "Strategic Framework for Resilient Livelihoods in Earthquake-Affected Areas of Nepal." *ICIMOD Working Paper 2015/6*.
7. National Population and Housing Census 2011. (2012) National Planning Commission Secretariat. Central Bureau of Statistics. Government of Nepal.
8. World Bank Group. (2011) "Large-scale Migration and Remittance in Nepal: Issues, Challenges, and Opportunities." Poverty Reduction and Economic Management Sector Unit. South Asia Region.
9. Labor Migration for Employment: A Status Report for Nepal. (2014) Department of Foreign Employment. Ministry of Labor and Employment. Government of Nepal.
10. Gurung, Dorje. (2014) "Costs of Leaving Home." *The Kathmandu Post*. Accessed August 13, 2015.
11. Economic Survey Fiscal Year 2014/15. (2015) Ministry of Finance. Government of Nepal.
12. Minimum Salary Details for Nepali Workers. (2013) Embassy of Nepal. Doha, State of Qatar.
13. Minimum Wages for Nepalese in Oman. (2013). Embassy of Nepal. Muscat, Sultanate of Oman.
14. Post Disaster Needs Assessment. (2015) National Planning Commission. Government of Nepal.
15. Gender Gap Index: Nepal. (2014) World Economic Forum.
16. Tripathi, Akhilesh. (2015) "Construction Industry Now." *New Business Age Magazine*.
17. A concrete future. (15-21 May, 2015) #758, *Nepali Times*.
18. Concept paper: Situational analysis of Construction Material sector and proposed intervention in the aftermath of the great earthquake (2015), SAMARTH Nepal Market Development Programme.
19. "How Nepal is trying to solve its blood brick problem," the Guardian, February 12, 2015
20. "Responsible brick makers feel encouraged by BCN certification," February 12, 2012, brickclean.net

21. "Over 3,000 child workers in Valley's brick kilns," The Himalayan Times, June 12, 2011
22. "A Rapid Assessment of Children in the Brick Industry," National Labor Academy (NLA) & School of Planning Monitoring Evaluation and Research (PMER), World Education and Plan Nepal, 2012
23. Rai, Riwanj. (2015) "Mol calls for slackening crusher industry operating guidelines." *My Republica*.