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Gentrification in the context of post-earthquake reconstruction urban policies: a review of the Chilean experience

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Executive Summary

Gentrification, understood as the logical consequence of urban renewal policies and property speculation processes usually achieved through the building of new housing typologies (middle and high-rise buildings and gated communities) is rapidly changing the nature of core central areas in many cities of the Global South. These changes have also led to increased urban poverty levels and social inequalities, as well as the direct and indirect market eviction of low-income households living in inner cities. In spite of the fact that 48% of Latin America's population is living in cities of less than 500,000 inhabitants, the majority of gentrification studies have analysed this phenomenon in the large metropolitan areas of the region. Furthermore, fewer studies have been undertaken to understand gentrification in the context of reconstruction of secondary cities that have been affected by natural disasters. This paper provides a revision of some of the theoretical debates about urban redevelopment actions in the context of reconstruction strategies in intermediate cities in Latin American. Specific national and local urban policies are discussed and contrasted with the so-called *Earthquake Cycle Alerting Diagram* (ECAD), which identifies the main phases that follow after a natural disaster. The paper shows that the Chilean 2010 earthquake and tsunami, instead of being an opportunity to 'reset' the *natural cycle* with appropriate urban policies seems to be (once again) a chance 'for some' rather than 'for everyone'.

Key words: gentrification, post-disaster policies, intermediate city, Latin America

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1 Introduction

According to Mitlin and Satterthwaite (2013), 'one in seven of the world's population live in poverty in urban areas, and the vast majority of these live in the Global South – mostly in overcrowded informal settlements with inadequate water, sanitation, health care and schools provision' which frequently is '…ignored or given insufficient attention within low-income nations, many middle-income nations and globally' (p.297). Particularly, this condition seems to be more dramatic in Latin American and Caribbean contexts by considering that almost 80 per cent of the populations of these areas live in urban areas (79.9 per cent by 2015, according to United Nations, 2002) and from this population, 62 per cent are poor. Thus, Latin American cities are seen nowadays as a process of ´urbanization of poverty´ showing also enormous social polarisation and inequality (Carrión, 2012: 18).

The increase in urban poverty in Latin American is illustrated in two contemporary processes of socio-physical change. One of these is cultural and the other natural; and neither has yet been fully considered to explain the territorial disparities that exist in this region. On one hand, globalization and gentrification in Latin America have been identified not only as a socio-economic issue involving displacement or replacement of social classes (Inzulza-Contardo, 2012; Davidson and Lees, 2010: Lees *et al,* 2008), but also as a process that includes political (allocation of urban renewal subsidies by the state) and cultural (consumption, pursuit, desirability of 'trendy' lifestyles) dimensions, which have modified substantially the urban grid both physically and socially. This has provoked a rapid transformation of the urban landscape into fragmented cities, where different 'isles' of consumption and production, of high-income bracket neighbourhoods (gated communities) and of informal sectors, can be identified (Mansilla, 2011; Contreras, 2011; Lungo and Baires, 2001). On another level, the so-called 'natural' disasters also play their part in both physical and socio-economic changes in the Latin American, increasing the vulnerability of people in urban areas in the wake of floods, landslides, earthquakes or tsunamis, resulting in high numbers of new urban poor (Caldera Sanchez, 2012; Chamorro *et al.*, 2011; Letelier and Boyco, 2011; Oliver-Smith, 1994).

This working paper argues that both natural disasters and gentrification are processes that commonly increase poverty and social inequality, displace residents and change the urban landscape of inner cities, and particularly at intermediate scale in Latin America. There are two main reasons for these assumptions. Firstly, intermediate cities are clearly a tendency in Latin America and the Caribbean; almost half the urban population (48.1%) of this region live in cities fewer than 500,000 inhabitants (Bolay and Rabinovich, 2004). Secondly, Latin America and the Caribbean have the second highest rates of natural disasters such as floods, landslides, droughts and particularly, earthquakes and tsunamis (PNUD, 2009: 2). For example, since the 2010 earthquake in Chile, the number of people living in precarious conditions increased from 10 to 25 per cent (Ossandon and Gonzalez, 2013).

In only the last three decades, 160 million people have been affected by natural disasters, and more than 90% of these people are poor are living in vulnerable conditions (PNUD, 2009: 14). More specifically, Table 1 summarises the 11 largest earthquakes in Latin America during the last five decades, allowing a rough estimation of the number of people directly affected and physical damage caused by this type of natural disasters, and in some cases including the tsunamis and landslides associated with earthquakes. In total, it is estimated that 12,823,161 people have suffered directly from effects of earthquakes with 1,130,741 deaths, 20,024 missing, 614,477 injured and 11,057,919 displaced or homeless registered. In physical terms, at least 1,912,871 homes and 59,339 buildings including urban infrastructure such as schools, hospitals, airports and

state buildings have been listed for damage or even lost as a result of these major Latin American earthquakes.

Table 1: Major earthquakes in Latin American (1960 - 2010)

Year	Country (Epicentre)	Magnitude (Richter) [1]	Main damage	
			People	Physical
2010	**Chile** Cauquenes	**8.8** and Tsunami	524 deaths, 24 missing, 12,000 injured and 800,000 displaced In total, 75% of the Chilean population affected (12,800,000 inhabitants).	US$ 30,000 million estimated: 220,000 houses destroyed and 300,000 houses damaged. Also, 4,538 schools, 39 hospitals, 1,554 km of highways, 212 bridges, 9 airports, 53 seaports and 4,200 boats damaged or destroyed.
2010	**Haiti** Pto. Principe	**7.0** and Tsunami	316,000 deaths, 300,000 injured and 1,300,000 displaced.	97,294 houses destroyed and 188,383 damaged in the Port-au-Prince area and in much of southern Haiti.
2009	**Costa Rica** Chinchona	**6.1** and Landslide	34 deaths and many injured.	Several damaged buildings and blocked roads caused by landslides.
2007	**Peru** Pisco	**7.6**	519 deaths, 1,090 injured and 300,000 displaced.	More than 35,500 buildings destroyed and more than 4,200 buildings damaged.
2001	**El Salvador** Santa Tecla	**7.7** **6.6**	1,149 deaths, 8,056 injured and 1,532,919 displaced.	134,900 homes destroyed.
1986	**El Salvador** Los Planes	**7.5**	1,200 deaths, 10,000 injured and 200,000 displaced.	60,000 houses destroyed and 3,000 other buildings.
1985	**Mexico** Michoacan	**8.1** and Tsunami	10,000 deaths, 30,000 injured and more than 100,000 displaced.	Severe damage caused in Mexico City and central states, with 6,000 buildings destroyed or demolished.
1976	**Guatemala** Los Amates	**7.6**	25,000 deaths, 80,000 injured and nearly 1,500,000 displaced.	250,000 homes destroyed.
1972	**Nicaragua** Managua	**6.2**	10,000 deaths, 15,000 injured and 325,000 displaced.	n/i
1970	**Peru** Ancash	**7.8** and Landslide	80,000 deaths and 20,000 missing, 143,331 injured and 3,000,000 displaced people.	97% of Huaraz town destroyed.
1960	**Chile** Valdivia	**9.6** and Tsunami, Landslide	2,000 deaths, 3,000 injured and 2,000,000 homeless in southern Chile. In total 38% of the Chilean population affected (2,780,213 inhabitants). Also, tsunami caused 231 extra deaths: Hawaii (61), Japan (138) and the Philippines (32).	US$ 3,089 million estimated: 45,000 houses destroyed Tsunami caused indirectly $75 million damage in Hawaii; $50 million damage in Japan and $500,000 damage to the west coast of the United States.

Source: Author's elaboration based on The Regional Disaster Information Center CRID (2013), U.S. Geological Survey USGS (2013), Noji (1997), SVS (2012), Weiss Fagen (2008)

The two largest earthquakes in the world have been recorded in Chile with tsunamis in both cases (M9.6 - 1960 and M8.8 - 2010). Even though these natural disasters have five decades between

[1] The "Richter magnitude scale" or just "Richter scale" is referred to assign a single number to quantify the energy released during an earthquake (magnitude). The magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake, and a strong earthquake might be rated as magnitude 6.3 (see http://earthquake.usgs.gov).

them, both caused similar massive damage in terms of population, housing and urban infrastructure as well as displacement of the earth's surface (e.g. with 5.7 metres and 2.7 metres as subsidence from Valdivia's earthquake and tsunamis). While the 1960 Valdivia earthquake and tsunamis caused more deaths (2,000) and affected more people (3,000 injured and 2 million people left homeless) than the 2010 Cauquenes earthquake and tsunami (524 deaths and 812,000 injured and displaced people), proportionally the latter affected a greater proportion of the national population (75% or 12,800,000 inhabitants) than the 1960 earthquake (38% or 2,780,213 inhabitants).

In addition, these two Chilean earthquakes resulted in severe housing and urban infrastructure problems. While fewer houses were destroyed in the 1960 Valdivia earthquake (45,000 units) than in the recent 2010 Cauquenes earthquake (220,000 houses destroyed and at least 300,000 houses damaged), the total damage in buildings and urban infrastructure of the 1960 earthquake increased (US$ 3,089) when considering the estimated collateral damage by tsunamis caused in Hawaii (US$ 75 million), Japan (US$ 50 million) and the west coast of the United States (US$ 500,000) (USGS, 2013; CRID, 2013). However, according to the recent Chilean government report, '…the 2010 M8.8 catastrophe can be considered in terms of extension as the biggest earthquake known [rather than recorded], as it seriously affected Greater Concepcion, five cities with up to 100,000 inhabitants, 45 cities with up to 5,000 inhabitants and more than 900 towns and rural and coastal communities' (MINVU, 2011: 9). Also, the 2010 Chilean earthquake and tsunami meant

> '…an economic loss of US$ 30,000 million estimated, which have mainly affected to industry, fishing and tourism, housing and education sectors. More specifically, 71% of this economic loss corresponds to infrastructure destroyed (about US$ 21,000 million), and the rest of this amount is considered to national GIP loss calculated for the following four years (US$ 7,606 million) and also emergency costs (US$ 1,117 million)' (SVS, 2012: 14; Caldera Sanchez, 2012: 8).

Four years have passed since the 27 February 2010 Cauquenes M8.8 Earthquake and clear physical and social changes can be identified, and also linked with the waves of gentrification that Latin American cities have experienced in the last twenty years. Property speculation by private investors has been reported by scholars concerning inner-city residents (see Poblete, 2013; Letelier and Boyco 2011; Mansilla, 2011; Lawner, 2010; Fernández 2010). Real estate agencies are trying to procure cheaper urban land in historic areas such as Talca, Curicó and in some devastated seaside cities and towns such as Constitución and Dichato. This situation is increasingly concerning for practitioners and researchers who are trying to implement appropriate recovery projects designed by affected communities and the government at national and local scale.

Given this context, this working paper tries to answer the following research questions:

1. What are the physical and social changes that intermediate cities are showing as a result of a post-disaster urban development?
2. As a result of the reconstruction process, are we experiencing new patterns of gentrification, or it is just the same displacement/replacement as observed in previous earthquakes?
3. Can natural disasters be an option for reducing gentrification in contemporary urban development?

To answer these questions, a revision of theoretical debates of the three main topics is included. Firstly, an analysis of the main contemporary urban strategies using the gentrification approach

and furthermore the *latino gentrification* concept is provided. This latter concept proposed (see Inzulza-Contardo, 2012, 2012a) helps to understand how property speculation and free market policies are acting in inner cities, rapidly altering the urban fabric as expressions of *new-build gentrification* (Davidson and Lees, 2010; He 2010). Secondly, urban renewal and free market forces are normally present in contemporary reconstruction of cities, which can also generate a new type of 'disaster' to people who have lost their dwellings in the inner areas and are relocated to new urban poverty ranges. Moreover, natural disasters and urban redevelopment including *latino gentrification* are linked as a way to argue how the post-earthquake 'window' seems to be an opportunity for private investors to undertake bigger redevelopment projects in inner cities. From this approach, an emphasis on the intermediate scale of cities seems to be a significant indicator for recapturing the importance of urban and civic design. To illustrate this second section, experiences of post-earthquake strategies for intermediate cities are summarised by the *Earthquake Cycle Alerting Diagram* (ECAD) which recognises the main steps - *Responding, Rehabilitating, Reconstructing and Anticipating* - as a natural disaster cycle to confront urban development in central areas.

Thirdly, the 'learning lessons from the Chilean response' is reviewed as a way to understand how historically this country has addressed the reality of frequent earthquakes. Specific urban policies are discussed as part of the national and local government agendas and contrasted with the ECAD conceptual framework discussed in the previous section. This analysis allows us to understand how urban policies and natural disasters can be (or not) part of same agenda and thus an effective opportunity to improve intermediate cities, or once again, whether the 27/F Chilean earthquake is a chance 'for some' rather than 'for everyone'. The conclusion reflects on how such a natural disaster could be seen as an opportunity to reverse gentrification, and then to reset the natural cycle with appropriate urban policies that deliver an holistic urban planning system and action plan, including short, medium and long term strategies.

2 Contemporary gentrification in intermediate cities

Gentrification including social displacement was a key feature of the society in the 1960s described firstly in the British context (Islington, London) by Glass (1964). Since then, a number of experiences have been analysed in different inner city areas of Europe, Australia and the US, defined as first and second waves of gentrification. More recently, third (and even fourth) waves of this process have been identified (see Lees *et al*., 2008; Wyly and Hammel, 2001, Bandarin 1979). Contemporary concepts such as *new-build gentrification* by Davidson and Lees (2005, 2010) help to understand how large cities around the world are experiencing direct and/or indirect displacement and replacement of long-standing residents by new residents and/or residential typologies. Also, *latino gentrification* (see Inzulza-Contardo 2012, 2012a) explains how the construction of housing in inner Latin American cities vary when housing types are closer connected with redeveloping polices and specific urban fabric such as high-rise buildings and gated communities. Research in European inner city areas such as Thames-side neighbourhoods, in London by Davidson and Lees (2010) and widely in Leipzig, Germany; Bologna, Italy; León, Spain and Ljubljana, Slovenia by Haase *et al.* (2010) show how gentrification has multiple manifestations including both direct and/or indirect displacement…′but what they all share in common is the alteration of the class based nature of the wider neighbourhoods' (Davidson and Lees, 2010: 408).

Thus, latino gentrification is part of the consensus that new-build developments, and specifically '…new-build residential developments in city centres' (Davidson and Lees, 2005: 1165) '…*are*

part and parcel of the [contemporary] gentrification process.' (Davidson and Lees, 2010: 398). Within this process, globalization has had a clear effect on the new patterns of urban-life in many Latin American inner cities (Contreras, 2011; Souza, 2009). Even though gentrification is not included as a word in public policy discourses, master plans and urban briefs, urban renewal by national and local governments using displacement/replacement of inner city residents can be found in experiences also promoting regulatory incentives given mainly to the private sector for encouraging investment in historic neighbourhoods (Carrion 2012; Arriagada *et al*., 2007; Roberts, 2005; Rodriguez and Winchester, 2004). In such areas, considerable proportion of the new housing market includes 20-storey-buildings using materials such as glass and brick, changing the historic skyline of inner city neighbourhoods and introducing a new redeveloped landscape. This has been analysed in detail in inner and gated community neighbourhoods: some examples being São Paulo (Caldeira, 2000), Buenos Aires (Ciccolella, 1999, Herzer, 2008), Mexico City (Garcia Peralta and Lombard, 2009; Lungo and Baires, 2001) and Santiago, Chile (Borsdorf and Hidalgo 2013; Inzulza-Contardo 2012; Lopez-Morales, 2011; Sabatini *et al.,* 2010). In this sense, the Latin American context can be associated with other up to date Global South experiences such as Asia (Hogan *et al*., 2012) and in central Shangai (He, 2010; He and Wu, 2009), and also Central Cape Town, South Africa (Visser and Kotze, 2008).

2.1 New-build *intermediate* gentrification

Even though gentrification nowadays follows a similar pattern in many global and large cities around the world, I concur with Haase *et al.,* (2010) in that state-of-the-art gentrification needs to raise the discussion that its'…trends are not restricted to the largest urban centres but have also been evolving in medium-sized cities…' (p.44). Thus, more research is needed to develop the body of knowledge on contemporary Latin American gentrification emerging from secondary cities and particularly from post-disaster reconstruction. In this sense, Latin American historic areas seem to be more vulnerable than European inner cities to the effects of new housing proposals or corporate buildings that replace existing residential properties from post disaster reconstruction (Onestini, 2011; Bolay and Rabinovich, 2004). 'During the colonial era, poor planning strongly fostered the vulnerability of Latin American cities… cities were commonly sited for reasons of economic access and production rather than safety, making them cases of risk by origin' (Wamsler, C. 2007: 25). This situation can be explained from the beginning of Latin American urbanization, when:

> 'Most large Latin American cities are established in inappropriate [high-risk] sites such as near to volcanoes, flood plains, river banks and coasts, or active seismic faults… and this risk increases not only with the rapid growth of physical and human elements but also by a radical transformation of the territory. The rivers and lakes of the pre-Columbian period have been replaced nowadays by highways, houses and high-rise buildings: forests and hillsides have been replaced by precarious settlements and some high-income class communities; and lands with naturally high rainfall have been built up with pavements, shopping centres and supermarkets' (Mansilla, 2011: 20).

In recent times, the incipient label of gentrification identified by Ford (1996) in his improved model about the urban fabric of Latin American cities, has been showing increasingly obvious signs of physical and social changes. Real estate developments using property speculation are found in many inner city neighbourhoods devastated by earthquakes, which have a large number of old buildings waiting to be demolished. Clearly, reconstruction processes open the debate about how recent typologies of gentrification are being applied to rehabilitate inner cities supported by public-private partnerships under the name of urban regeneration policies and improvement of cities (Inzulza-Contardo, 2009). Historic neighbourhoods are seen as trendy

areas to promote commercial and housing projects, supplying the needs of a new Latin American middle class. Gentrification is this context is more related to the brown-field redevelopment showed by Davidson and Lees (2010) as the city centre could be seen as an expansive area of empty plots ripe for redevelopment and property speculation. Here, 'social injuries' such as risk of displacement can be seen as normal occurrence, when 'unfair' negotiations are carried out in the first-stages of post-earthquake reconstruction. For instance, the Chilean Civil Code (*Código Civil*) in its law 1.889 defines *lesión enorme* (enormous damage) in a property's sale contract when the seller receives less than half of the corresponding price of the land value property, but the opposite if this land value property price is less than half that the buyer paid for it (CIPER, 2010).

For instance, reports about the effects of the 2010 earthquake and tsunami in Chile have shown how property speculation is a reality. The interest is mainly from private investors who are trying to obtain urban land cheaply in historic areas such as Talca, Curicó (Pulgar, 2013; Letelier and Boyco, 2011; Chamorro *et al*., 2010) and some devastated coastal cities such as Constitución and Dichato (CIPER 2010; Lawner, 2010). Patterns of physical and social fabric change in devastated cities and towns must be recognised, especially when the affected residents have lost their pre-earthquake environments. The rapid response from the state, private sector, NGOs (particularly *Un Techo para Chile*), and local communities to provide housing must also be highlighted. Similarly, it was notable that following the 2010 earthquake the second main response from the Ministry of Housing and Urban Planning (MINVU) was to propose 52 master plans with the main guidelines for cities and coastal towns. Nevertheless, all these actions should be allied with a new vision of urban renewal in Chile and accompanied by thorough risk assessments, in particular when evidence shows the possibility of new earthquakes and tsunamis in seaside towns that are being reconstructed using state resources (Ossandon and Gonzalez, 2013).

Thus, the favourable conditions highlighted in intermediate cities such as their 'human scale' or dimension, seem to be changing rapidly with the invasion of new housing and office typologies in inner cities and riverside redevelopment projects. Clearly middle and high-rise buildings located in '…a city with a certain physical dimension that has all its main services and amenities within easy walking distance, [allows] …citizen[s] relatively easy and effortless access to the whole urban space' (Bellet and Llop 2002: 254). This strategy is being used as a *new-intermediate sized* gentrification in the way to reconstruct cities using property speculation. In this sense, I agree that little research is available into the problems associated with high-rise living. Kearns *et al*. (2012) mention the necessity to consider '… locations, tenure structures and management arrangements [of] these high-rise projects to avoid many of the problems that have been found to exist for high-rise in other localities [as] higher density 'renaissance'' (p.19). Even less research is available on incipient gentrification processes in intermediate cities. 'Modern cities look alike. Global economy and technology impose standardization of life-styles, cultures of behaviour and forms' (Lukić, 2011: 131). As many intermediate cities grow and become global cities, this result can only be expected unless there is a consciousness in the relationship between architecture and landscape, and how '…the height of certain objects [can be] limited to protect valuable views on natural beauties or valuable architectural works (Lukić, 2011: 145).

'The urbanism of the towns' model proposed by Poblete (2013) seems appropriate in order to promote the beneficial design of towns and cities as it is proportional, flexible and sensitive, and closely involves the civic design term. The intermediate city analysis should involve not just the population and the constructed area, but also its urban management as a dynamic process. Thus, intermediation '…represents the totality of human and institutional activities that organise exchange between a specific entity, i.e. the city with its authorities and residents, and the outside world with its various horizons: local, micro-regional, national, global' (Bolay and Rabinovich,

2004: 418). Also, intermediate cities '…offer rural populations better living conditions, jobs, a less polluted environment, and act as local markets for their products. They also provide services and a collective infrastructure, not only to the urban but also to the rural and regional population.' (Bellet and Llop 2002: 254). In Chile, the current preliminary results of Census of Population and Housing (2012) show only 29 cities have more than 50,000 inhabitants, three cities have more than 500,000 inhabitants and 13 cities have around 100,000 inhabitants. Moreover, most Chilean urban settlements (482) are considered intermediate with fewer than 2,000 inhabitants (Poblete, 2013) so the risk of new-intermediate sized gentrification is certainly possible to occur.

3 Urban policy in the context of post-earthquake strategies

Which lessons have we learned about disaster risk reduction in the last decades (Alexander, 2012)? What kind of urban planning is being applied to reconstruct intermediate cities? Which criteria are being included to redesign inner cities areas (Poblete, 2013)? The lessons learned from Western Europe give us a sense of awareness about the importance of an historic continuum, paying more attention to conservation and rehabilitation of historical towns and neighbourhoods (Grebler, 1964). However, the effects of the World War in Europe, and later, the accelerated growth of the urban population in Latin America in the 1970s made their mark on inner cities which have proved difficult to delete. For instance, in his analysis of the European context, Appleyard (1979) states that '…the brutal destruction of old city centres during World War II left people first in a state of shock and grief at the loss of a world that could never quite be returned' and also many problems of physical, economic and rural reconstruction' (in Bandarin, 1979: 192).

When it is acknowledged how natural disasters have altered many cities and towns across the world, it is evident this situation has also been part of the Global South context. In addition, the effort of recovering places and memories from catastrophes such as earthquakes, tsunamis, floods, and landslides can be harder as these are '…very destructive and disturbing for the victims. Apart from basic needs such as shelters, employment, health and education, affected people have social, cultural and psychological needs to cover including their identities and faiths…' (Oliver-Smith, 1994: 11). In this sense, post-disaster strategies should help to rebuild both physical and social fabric. Oliver-Smith (1994) reminds us that people and environments are closely joined, and that reconstruction processes should also include '…important cultural elements and images for the community involved such as churches, chapels, sanctuaries, squares, neighbourhoods and schools, but also some symbolic elements such as trees and informal meeting points' (p.12).

Nevertheless, a different history can be written by researchers focused on post-disaster reconstruction strategies. Most of them agree that since the 1990s post-disaster reconstruction is often seen as an opportunity to invest in new projects following market forces and property speculation (Ozerdem and Rufini, 2013; PNDU, 2010) rather than for implementing rehabilitation strategies to address physical, social and psychological effects (Mansilla, 2011; CEPAL 2010). In general, there is not awareness '…of disasters in regional urban planning frameworks [and] in the regulation of the territory in relation to population growth' (PNUD, 2004: 88). Wamsler (2007) points out that 'publications dealing with the adaptation of settlement development planning to disaster occurrence are an exception to this... [and] mainly focused on the purely physical/structural aspects of the formally built environment of developed countries' (p.26).

> 'Post-disaster recovery is still often conceptualised and designed to return a disaster-struck country to its pre-disaster development conditions. This too often means reconstruction without heeding the pre-existing conditions of disaster risk and thus effectively ignoring the risk of future disasters. Traditional recovery has also been predominantly limited to physical aspects of rebuilding and reconstruction, failing to foster the social and economic recovery of the affected populations. These challenges are confirmed by studies such as the Tsunami Evaluation Coalition (TEC) which identified *inter alia* a need for more comprehensive needs assessments and stressed the importance of both understanding the local context and empowering the affected communities and supporting the realization of their relief and recovery priorities' (IRP, 2007: 2).

By focusing on post-earthquake strategies as the aim of this review, reconstruction is found in different contexts that normally mean a rapid response to physical damage with housing provision (see MINVU, 2013 and 2011; PRESC, 2011) and recovering basic elements (water supply, electricity, connectivity, etc.). However, fewer cases are focused on socio-economic, cultural and psychological consequences for affected communities, strategic planning framework with short, medium and long-term strategies to confront earthquake including risk assessments (PNUD, 2004 and 2010b; Moser *et al*., 2011; Oliver-Smith, 1994). Examples of contemporary earthquakes help us to understand how governments are responding to the recovery of cities. According to Ozerdem and Rufini (2013) the reconstruction of 2009 M6.3 L'Aquila, Italy earthquake has meant 'the politicisation' of this process as well as a lack of coordination at all levels (national, regional and municipal) and local ownership, vested interests and corruption. Normally, housing provision is seen as the main action included in the government agendas. For instance, the last 2010 Chilean M8.8 earthquake and tsunami left 370,000 houses damaged as a main consequence (MINVU, 2011). Therefore, an exhaustive evaluation must be done to define how many of them can be repaired or necessarily demolished, especially when it must be considered that these transformations bring new problems such as changes in the patterns of everyday life developed by Lefebvre in the mid XX Century (1947, see Lefebvre, 1991) in describing problems of the modern world.

Some best examples of practice such as the Republic of Indonesia's report (2005) and the 'forgotten' Skopje reconstruction master plan (Lozanovksa, 2012) show how national and local governments could also include the reconstruction of community, economy, infrastructure and governance. For the Latin America and Caribbean context, The Regional Disaster Information Center (CRID) can be highlighted as an initiative sponsored by six organisations[2] that joined forces to ensure the compilation and dissemination of disaster-related information in this region (CRID, 2013). This initiative clearly can contribute to improve the earthquake record analysis in its different stages and periods of time. Mitlin and Satterthwaite (2013) remind us that one of the crucial impacts is a new urban poverty that is created as a direct effect of natural disasters, which has been significantly underestimated by most of the earthquake data analysis. In Table 1, I have showed the physical and social impacts of major earthquakes in Latin America since 1960. This information could be useful to planners in proposing urban policies, including strategies of risk reduction (Parnell *et al.,* 2009). Additionally, Mitlin and Satterthwaite (2013) highlight that important areas have previously been excluded suggesting that we need to evaluate the impact of

[2] These organisations are: (1) Organización Panamericana de la Salud - Oficina Regional de la Organización Mundial de la Salud (OPS/OMS); (2) Naciones Unidas, secretaría de la Estrategia Internacional para la Reducción de Desastres. (ONU/EIRD); (3) Comisión Nacional de Prevención de Riesgos y Atención de Emergencias de Costa Rica (CNE); (4) Federación Internacional de Sociedades Nacionales de la Cruz Roja y Media Luna Roja (FICR); (5) Centro de Coordinación para la Prevención de los Desastres Naturales en América Central (CEPREDENAC) and (6) Oficina Regional de Emergencias de Médicos sin Fronteras (MSF).

Latin American earthquakes on '…low-income groups, for instance damage to housing, injury, disruption to livelihoods and loss of assets' (p.141).

3.1 Earthquake Cycle Alerting Diagram (ECAD)

Earthquakes are effectively an 'ongoing process' when considering how often these natural disasters are registered in countries such as Chile and others within the 'Pacific Fire Belt'[3] in the global seismic context (USGS, 2013; SVS, 2012). For Chileans, earthquakes are a familiar phenomenon: for *Mapuches* (Chilean Amerindians) these natural disasters or *Trentren-Vilu* form part of their mythology (Lecturas, 2010). When considering that on average a strong earthquake is recorded each decade in some part of the country (details in CRID website), the aim of including this natural disaster in a regular urban planning framework seems to be obvious.

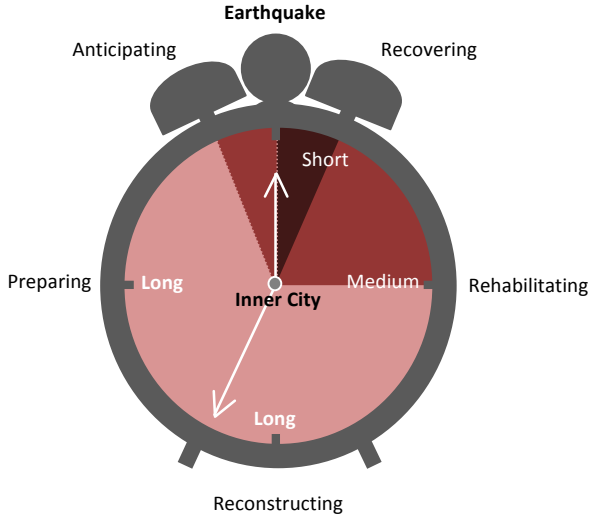
However, the reality of post-earthquake recovery is telling us that problems in confronting these disasters continue to recur. The implementation of post-earthquake strategies are inevitably drawn over time and '…where 'temporary' often becomes 'decades-long', whereas 'transitional' essentially implies a permanent modification' (Ozerdem and Rufini, 2013: 136). Therefore, it is necessary to understand that earthquakes are part of a *natural cycle,* which requires a new approach in the way to deal with them, and alternative plan urban strategies that include different steps and time periods are necessary (Caldera Sánchez, 2012; Lagos and Gutiérrez 2005). This approach could also be considered more sustainable than other discourses normally used in post-earthquakes strategies to deliver master plans and basically new aesthetic visions for damaged cities (for instance, see GRM, 2009).

Figure 1 shows an 'Earthquake Cycle Alerting Diagram' (ECAD), which includes the main stages and periods of time to be considered in any reconstruction framework, while reminding us that each city and town needs to adapt its own 'alarm clock risk' as earthquakes bring into evidence the best and the worst planning systems. In this sense, earthquakes in some way are natural events which are 'possible to predict' when data from the past records is used. For instance, The Regional Disaster Information Center (CRID) has created a comprehensive data-base to confront post-earthquakes effects more effectively. Thus, by understanding that earthquakes are part of a 'disaster cycle' (Olshansky and Chang, 2009) including appropriate stages and timetables, it is possible to plan cities and towns properly (Siembieda, 2010). As soon as a major earthquake occurs, an ongoing process is set in motion.

According to researchers of post-earthquake reconstruction, four main stages can be recognised and in this order: Recovering, Rehabilitating, Reconstructing and Preparing (Ozerdem and Rufini, 2013; PNDU 2010, 2010a; CEPAL, 2010a; EERI, 2010; Wamsler, 2007; Republic of Indonesia, 2005). Moreover, this diagram is suggested for inner city centres that normally have important architectural heritage and valued public realm. Specifically, inner city areas, which are the focus of this research, are crucial in intermediate cities because in many cases they have suffered important damage caused by earthquakes. Furthermore, *the return to the city centre* (Davidson and Lees, 2010) is a phenomenon observed nowadays in large global cities and it also occurs in intermediate cities, then it can be linked to contemporary gentrification as explained before (Inzulza-Contardo, 2012, Davidson and Lees, 2010) and documented in many Latin American cities such as Buenos Aires (Herzer, 2008), Mexico City (Lungo and Baires, 2001) and Santiago, Chile (Borsdorf and Hidalgo 2013).

[3] The 'Pacific Belt of Fire' (or 'Circum-Pacific Belt') includes the following countries: Chile, Peru, Ecuador, Colombia, Central America, Mexico, US, Canada, Aleutians Isles and isles of Russia, China, Japan, Taiwan, Philippines, Indonesia, Papua New Guinea, Australia and New Zeeland.

Figure 1: Earthquake cycle alarm diagram (ECAD)



Source: Author's elaboration

In the diagram, each stage has a period of time, which is illustrated as a way to understand both the continuity of these phases and their proportional value. Moreover, an earthquake means at least 'a decade' of working in a development planning system (12 years from this ECAD). Thus, the earthquake cycle starts by responding to the emergency and carried out during the first months as an intense agenda of *Recovering* the city, which in most cases could take less than the first year. Basically, it includes physical recovery (basic urban infrastructure) and labour of rescue, providing shelters and housing, and covering minimum life needs. The next stage, *Rehabilitating,* should then be implemented to restore the functions of public service but rather than only physical damages (mostly recovered in this first stage) and also including social and governance actions (IRP, 2007). This process that normally needs a couple of years and less than three years should be led by a clear urban framework, specific policies and master plans, underpinned by the diagnosis carried out during the recovery stage (Anderson *et al.,* 2012). However, governments facing post-earthquake reconstruction usually confuse both *Recovering* and *Rehabilitating* and focus their main actions of providing housing as fast as they can, and not necessarily within a planning strategy agenda (Ossandón and Gonzalez, 2013; CEPAL, 2010a; EERI, 2010).

Reconstructing therefore is the process that follows the two previous stages mentioned, and in most cases, a period of time of at least two to three years is required to implement this phase, i.e.'…to rebuild the public system, economic system, infrastructure, and governance functions' (Republic of Indonesia, 2005: i). According to CEPAL (2010a) natural disasters such as earthquakes ´…open the opportunity of revisiting pre urban strategy models and identifying key issues such as regional inequalities among social groups, thus finding better options to reverse negative tendencies' (p.16). As part of an evaluation done following the Chilean 2010 earthquake, it was recommended that key issues such as equality, social participation, risk reduction, territorial planning, regulatory framework and responsibilities, production, decentralisation, energetic efficiency and sustainability should be incorporated in the *Reconstructing* stage (CEPAL, 2010a; EERI, 2010). Moreover, it is necessary to highlight that as soon as we start

Reconstructing cities and towns, we need to act prospectively by *Preparing* the urban settings with appropriate planning for the future (CCHC, 2011). Therefore, urban reconstruction policies are not static regulations but specific laws and urban planning needs to anticipate future earthquakes (*Anticipating* stage).

In a wider analysis of these stages, Table 2 specifies key indicators for each stage. The complex post-earthquake process can be organised in terms of temporal, transitional and permanent actions (PNUD, 2009). Clearly, the *Reconstructing* and *Preparing* stages require more time than *Recovering* and *Rehabilitatin*g and these stages should be developed as a continuum. Also, it is crucial to include specific main actions, policies and plans as well as key actors and resources in each stage to achieve holistic and comprehensive planning. Urban policies and specific master plans to control real estate development seem to be one of the most controversial issues in reconstruction. It is common to get reports about displacement of long-standing residents and massive property speculation from the housing market using the vulnerability of the first stages - *Recovering* and *Rehabilitating* - as the perfect action plan to obtain cheaper urban land and to build new projects in inner areas (Warnken, 2013; Cartes, 2011). Protection laws for owners and tenants should be incorporated in the different stages of short, medium and long term (Allan and Bryant, 2011).

Table 2: Main stages and action time from post-earthquake plan (ECAD)

	Pre-earthquake	**Post-earthquake**		
Stage	Preparing	Recovering	Rehabilitating	Reconstructing
Time	Permanent: From previous earthquake	Temporal: Months to less than one year	Transitional: First two to three years	Permanent: More than two years to less than two decades
Main actions	Anticipating next earthquake Developing strategies such as urban planning, risk reduction, adaptation framework and earthquake storyline	Responding to emergency including demolition, shelter provision, repairing housing and assisting communities, protection laws for inner residents	Implementation , housing and public realm reparation, delivering physical and social damage inventories, discussing reconstruction actions, subsidies, and urban briefs	Master plan implementation, housing subsidies and put in practice risk corporation and committees Delivering specific budgets For community and training social and civic assets
Policies and plans	Urban renewal strategy	Reports and assessments	Housing market policy Preliminary master plan	National policy adaptation Reconstruction master plan
Main actors	Government (all levels), planners, organised community International agencies (e.g. PNUD, CRID)	National and local government, community	National and local government, planning committee, organised community	Government (all levels), reconstruction planning committees and agencies, organised community
Resources	Mainly national budget	National and international funding	National funding and regional bursaries	Mainly national budget

Source: Author's elaboration based on CEPAL (2010a), EERI (2010), Siembieda (2010), Wamsler (2007), Republic of Indonesia (2005)

In this sense, governance embodies one of the key aspects to deliver urban policies and strategies, which includes subsidies to help homeless people, incentives to investors interested in recovering

cities and opportunities to include community assets and identities (Davoudi and Porter 2012; Saez, 2012; PNUD 2010b; Moser, 2008). Clearly, the Chilean 2010 M8.8 earthquake and tsunami -as the focus of this paper- is very instructive as '…this [event that] provides an opportunity for researchers to study the role of government at all levels (local, regional, and national) in the enforcement of seismic and other natural hazard risk management policies and regulatory processes…' (EERI, 2010: 18).

At the time of the writing of this working paper, three years have passed since the Chilean 2010 earthquake. The *Reconstructing* stage is now underway and should be in turn now addressing all the factors explained in Table 2. Nevertheless, the reality seems to be different for this experience, as once again 'real estate development with [the] marks of international renaissance and regeneration strategies and policies… stand to benefit only the new urban elite' (Winkler, 2009: 33) as widely observed in many other inner cities in the Global South. The task of achieving proper urban policies with inclusion of communities and avoidance of property speculation is not straightforward. On the contrary, the context of post-earthquake reconstruction seems to be the best prospect for producing gentrification with displacement (direct and indirect) and replacement of both physical and social fabric.

4 Learning lessons from the Chilean response

The whole of the length of Chile lies along a natural fault (the point of contact of *South American plate* which is constrained by the *Nazca plate*), and is also part of 'Fire Belt' (see footnote 2). These conditions should be considered in any projects and urban development plans located within the context of this dramatic geography. The 'Earthquake Cycle Alerting Diagram' (ECAD) is of constant relevance as this country has historically been regularly exposed to natural disasters with consequences to the physical and social fabric of cities. If we take into account the largest earthquakes and tsunamis during the past 100 years, it is possible to collect a list of thirty-two seismic events over 7.1 Richter degrees that have had their epicentres along the length of Chile (USGS, 2013: SNAM, 2013). From this list, nine main earthquakes and five tsunamis have left a total of 32,166 casualties and also massive problems with housing conditions, job losses and basic urban services and infrastructure (see Table 3).

Table 3: The largest earthquakes and tsunamis in Chile over the past 100 years

Year	Magnitude (Richter degrees)	Type	Geographic area (Epicentre)	Amount of people affected
1906	8.2	Earthquake and tsunami	Valparaiso	3,000 deaths
1922	8.5	Earthquake	Vallenar	800 deaths
1928	7.6	Earthquake and tsunami	Talca	300 deaths
1939	8.3	Earthquake	Chillán	25,000 deaths
1960	9.6	Earthquake and tsunami	Valdivia	2,000 deaths
1965	7.6	Earthquake	La Ligua	280 deaths
1971	7.7	Earthquake and tsunami	Illapel	85 deaths
1985	8.0	Earthquake	Algarrobo	177 deaths
2010	8.8	Earthquake and tsunami	Cauquenes	524 deaths
				32,166 deaths

Source: Author's elaboration based on CSN-UCH (2013), USGS (2013), SNAM (2013)

As a government response after the devastating 1906 Valparaiso M7.7 earthquake and tsunami (3,000 victims), an agreement was made between the University of Chile's Chancellor and

Manuel Montt the Chilean President at that time. The National Seismological Office, a technical station located on the Santa Lucía hill is the heart of Santiago was created. Three decades later, and seven years of the 1935 Talca M8.4 earthquake, a national law and decree of building and urban planning regulations were approved in 1935 as the first national anti-seismic guidelines. However, it is argued that these institutional actions have not been enough to respond appropriately way to the reconstruction of cities. Once again, the two massive earthquakes and tsunamis Valdivia M9.5 (1960) left 2,000 new victims and more lessons to be learnt in terms of the lack of an holistic urban planning system to confront natural disasters in Chile. Moreover, tsunamis in Japan, Hawaii, the Philippines, the west coast of the US and New Zealand were reported in the 1960s as effects of the Valdivia earthquakes and tsunami with physical changes in the Nazca plate and displacement of the earth surface of 5.7 metres and 2.7 metres as subsidence (CONA, 2010; Lagos and Gutierrez, 2005).

Incredibly, this situation from five decades ago can be compared to the recent impact of Japan's M9.0 earthquake and tsunami, which affected the Chilean coast and, more widely, the length of the Pacific east-coast. Later, in March 1985 Algarrobo's M7.8 earthquake left as a result 177 dead, around 1,000 homeless extensive damage to roads and bridges. Devastation of towns and basic services was valued at US$ 1,046 million. From this century onwards, the latest 27 February 2010 Cauquenes' M8.8 earthquake (epicentre 35.909°S; 72.733°W), left 524 dead, 520,000 homes destroyed with around 800,000 homeless, as well as widespread damage in to schools, highways, bridges and other urban infrastructure. The economic impact manifested mainly in the fishing, tourism, industries, housing and education all sectors, and was valued at US$ US$ 30.000 million (SVS, 2012).

4.1 Regionalisation and main reconstruction policies

The generalised result of these natural disasters on physical landscape, building structures and social fabric can be summarised by 'profound fissures'. Are we using the 'Earthquake Cycle Alarm Diagram' (ECAD) to reconstruct cities and towns in Chile? And are natural disasters an opportunity for reducing gentrification actions in Chilean intermediate cities? Firstly, it is important to mention that the 1974 Regionalisation of Chile was in part a response to the effects suffered from the 1960 Valdivia earthquakes and tsunamis. This can be seen as the starting point for the development of strategies applied along the diverse national territory. However, the regionalisation cannot be seen as a holistic process, when practice shows that conversely, the creation of regions is not the result of balanced development (Boisier, 2000). Therefore, we are still a long way from a regional framework that considers effectively the seismic condition of our territory (MDI, 1978).

Other action plans and government responses following some of Chile´s massive earthquakes and tsunamis have been listed previously in Table 3. For this, a summary of the resulting laws, urban planning regulations and master plans is outlined in Table 4. Immediate actions, strategies, laws in force and initiatives with their varying timescales can be observed when these regulations are contrasted to the ECAD conceptual framework analysed before (see Figure 1 and Table 2). Undoubtedly, the 1928 Talca M7.6 Earthquake and Tsunami proved crucial information in developing the particular City Transformation Law and to producing a first draft of the Talca Master plan one year after the earthquake. This law and the preliminary master plan can be linked adequately to the Rehabilitation stage as a transitional phase defined in ECAD. Also, a Buildings and Urbanization Law and the First national anti-seismic guidelines were implemented in 1931 and 1935 respectively, as laws and regulations that needed a longer period of time to be delivered, following an in-depth evaluation and reports about the damage levels of this natural disaster.

Yet, these stages and periods of time seem to be different when the next major earthquake (1939 Chillan M8.3 and the largest earthquake and tsunami (1960 Valdivia M9.6) are analysed. Important agencies (National Economic Development) and regulations with incentives to resources given to seaport, roads, health, and architecture projects as well as a master plan and buildings construction reviews were produced within a year of these natural disasters. Moreover, laws such as the Building Regulation Decree to identify the subsoil by municipalities, and the Provisional Chilean Regulation (NCh) 433 regarding to anti-seismic building behaviour can be found in the same period.

Table 4: Reconstruction laws, regulations and master plans in Chile, 1928-1971

1928 Talca M7.6 Earthquake and Tsunami	▪ City Transformation Law and draft proposal of Talca Master plan (1929) ▪ Buildings and Urbanization Law (Decree DFL 345) (1931) ▪ First national anti-seismic guidelines (1935)
1939 Chillan M8.3 Earthquake	▪ Reconstruction and Assistance Corporation ▪ National Economic Development Agency (CORFO)
1960 Valdivia M9.6 Earthquake and Tsunami	▪ Resources given to seaport, roads, health, and architecture projects ▪ Master plan review ▪ Stability of buildings construction review, decree DFL 2514 (1960) ▪ Art 30 Building Regulation Decree to identify the subsoil by municipalities ▪ Provisional Chilean Regulation (NCh) 433 to anti-seismic building behaviour ▪ Building process and standard changes by the National Housing Corporative (CORVI) which promoted new notable housing projects such as Villa Olímpica (Santiago), Remodelación Paicaví (Concepción) and Población Abate Molina (Talca)
1971 Illapel M7.7 Earthquake and Tsunami	▪ Damage evaluation by the Emergency National Office and Planning National Office create din 1965 ▪ Reconstruction Law (October, 1971) ▪ Law 17564, which included changes to Law 16282 of Disasters and Catastrophes 1965 (November, 1971) to define the damage situation and the level of disasters, assistance to victims and rights to penalize property speculation. Moreover, this Law created the Emergency Communal Committee formed by key people from public sector such as Mayor, Policy Head, Health Head, First Aid, Firemen, Social Assistance Unit and Navy; and advisers from municipalities, organised communities, workers unit, farmers, youth organisations, sport organizations, housing cooperatives, wholesalers, retailers and civil defence. ▪ Urban improvement Corporation (CORMU) included legal regulations to have lands declared urgently for public use, allowing appropriate use for everyone (and not for private interest), avoiding property speculation and accelerating construction subsidy programmes by Housing Services Corporation (CORAHABIT). Also, buying houses with special loans operated by the Ministry of Housing.

Source: CSN-UCH (2013), Letelier and Boyco (2011), Lawner (2010)

Later, by analysing the main actions achieved after the 1971 Illapel M7.7 Earthquake and Tsunami, a rapid response is found in creation of two main laws: the Reconstruction Law in October and Law 17564, which included changes to Law 16282 of Disasters and Catastrophes (1965) in November, 1971. Two key aspects of this latter law and also from legal regulations of the Urban improvement Corporation (CORMU) can be highlighted as achievements: 1) The inclusion of a broad participation of urban actors in the reconstruction process from the public sector, and advisers from the organized community such as workers unit, farmers, youth

organisations, housing cooperatives, wholesalers, retailers and civil defence; and 2) Evaluation of damage and level of disaster, assistance to victims and rights to penalise property speculation.

Thus, some key urban regulations and master plans as the result of these four natural disasters (1928, 1939, 1960 and 1971) are found from the last century. However, this legal framework does not necessarily show the same stages and time periods (*Responding, Rehabilitating and Reconstructing*) for each post-earthquake period when analysing how laws in force and specific building guidelines should fit into a natural reconstruction cycle. I argue that although the reconstruction laws and regulations summarised in Table 4 are part of the ECAD model, these initiatives need to be delivered as a national plan system and sited into coordinated local agendas including short, medium and long term strategies. In this sense, the current Chilean regionalisation does not seem to recognise the geographical singularities and characteristics to be included in 'a national policy of territorial legislation': therefore, this is an important goal that remains outstanding.

On a positive note, it is possible to find some examples in this approach such as Larraín and Malina (1986) who have proposed alternatives of decentralisation for Santiago the Metropolitan Region; or Monje (2007) who debates the effectiveness of the central regions' decentralisation through the incorporated Region Los Lagos. Moreover, Reyes and Cardenas (2010) developed an interesting argument about 'seismic regionalisation' for continental Chile based on a 'neural network', which method has allowed a scenario with six seismic regions (Coastal mountains, intermediate depression, high Andean plateau, Andes mountains, ice field islands, Patagonian pampa). This result, whose hierarchy is based on the seismicity of these zones, could provide correlation together with an urban planning framework that includes the missed seismic condition of each region.

4.2 The 2010 reconstruction with the mark of gentrification?

It is widely noted that Chile underwent a major change in its national regulation in the 1970s when market forces took a central role in the urban development of the country. Even though the two National Urban Development Policies (PNDUs) of 1979 and 1985 put considerable emphasis on the social development of cities under the name of 'Social Market Economy' (MINVU, 1981), and established 'the urban land is a scarce resource' (MINVU, 1985) respectively, the last forty years has shown a clear liberalisation of the regulations governing urban land density and leading to a noticeable predominance of residential property as a real physical effect. This new State role as a 'subsidiary of the reconstruction' (Letelier and Boyco, 2011, Bresciani, 2010, Daher, 1996) has resulted in better outcomes for the market forces when in the 1985 Valparaiso M8.0 Earthquake and also 2010 Cauquenes M8.8 Earthquake and Tsunami are analysed. Lack of control and building frame inspection from the municipalities as well as fewer legal functions to professional corporations (e.g. National Architects' Association) which were transferred to the private sector (property speculation) can be identified (Letelier and Boyco, 2011).

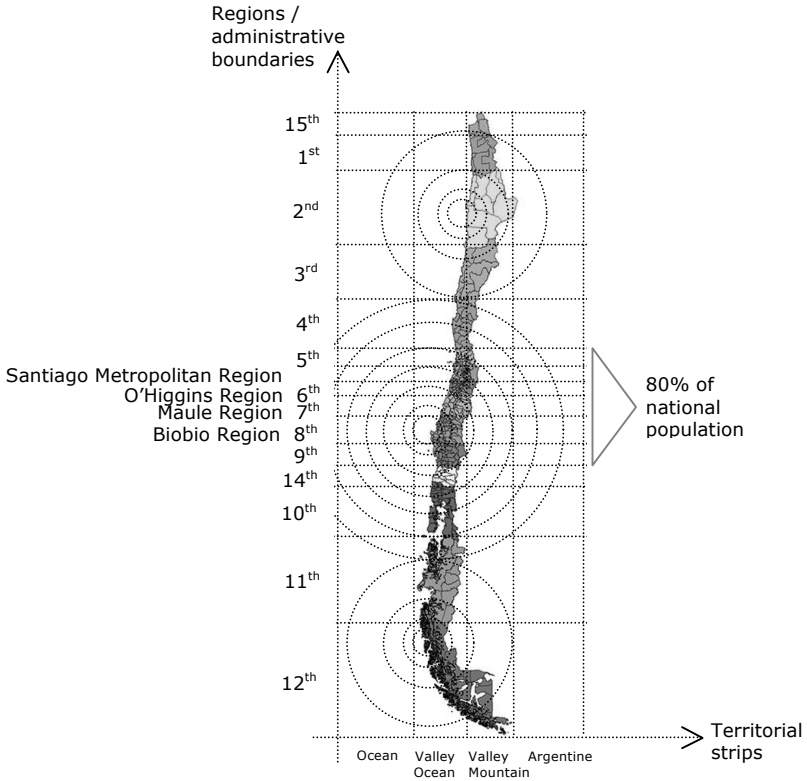
Specifically and after the 2010 Cauquenes M8.8 Earthquake and Tsunami, specific master plans have been proposed by the Ministry of Housing and Urban Planning (MINVU) to be applied in the devastated cities and towns: Coastal Cities Master plans (*PRES and PRBC, Planes Maestros de Borde Costero*); Interior Cities Master plans (*PRE, Planes Maestros de Localidades Interiores*) and Urban Regeneration Master plans (*PRU, Planes Maestros de Regeneración Urbana*). Furthermore, recent experiences of improvement of shelters developed for safety and comfort as final living solutions for an affected community in Coronel (Region of Biobío), have been proposed by a public and private partnership initiative (Cartes, 2011). Nevertheless, these urban briefs and housing initiatives are not yet enshrined in law and therefore can only be

considered as recommendations to be implemented by municipalities. Also, these master plan proposals seem not to be part of a main national strategy plan that involves urban policies and social development plans according to the territorial singularities and investment decisions for the future. This is especially concerning when considering the whole national territory is highly vulnerable to natural disasters, as evident from the 2010 earthquake which affected almost 80 per cent of the Chilean population, including O'Higgins, Maule, and Biobío Regions (see Figure 2).

The first stages of the ECAD model are missing for the 2010 M8.8 reconstruction strategy. For instance, specific housing market policies and redevelopment master plans (after preliminary versions) are main actions that should be part of the three year stage (*Rehabilitating*) as a way to properly address the next years (*Reconstructing*), including the *Preparing* and *Anticipating* stages to confront the next natural disasters. This lack of response in rehabilitation and reconstruction responses is being claimed by different urban actors such as professionals involved in urban planning disciplines (Chamorro *et al*., 2011; Letelier and Boyco 2011), civic organisations (Lawner, 2010; CIPER, 2010) and, importantly, the affected people (Fernández 2010). More alarmingly, social displacement and gentrification are key issues that are arising after 2010 earthquake three-year period. In fact, the replacement of existing low-income residents of key inner intermediate cities seems to be supported by the government in turn:

> 'There is not enough cheap urban land in inner Concepcion or inner Talca to reconstruct houses using the government subsidy. With a slightly more than 600 UF [USD 28,786] per family, it is only possible to build new houses in greenbelt areas, outside the city. People agreeing to live in these sectors [outer city] will have to forget the old benefits that they used to have when living in the centre' (Chamorro *et al*., 2011: 18).

Figure 2: Current regionalisation in Chile



Source: Author's elaboration

Likewise, more reports about displacement of residents are claimed even in neighbourhoods in the south of Chile (e.g. *Villa Futuro* and *Aurora de Chile*) where the earthquake did not have direct effects. Pulgar (2013) argues that these kind of 'false victims' of victims of housing policies and property speculation are found nowadays, because of the absence of protection laws to keep low-income people living in renewed areas. Then, *new-build gentrification* needs recognition as a process not just of large cities around the world, but also including cities of intermediate scale such as Concepcion, Talca and Curicó. In these cities, the 2010 earthquake has also been a generator of direct and indirect displacement as well as replacement of long-standing residents (Inzulza-Contardo, 2012; Davidson and Lees 2005, 2010). The Chilean three-year storyline reconstruction allows us to assume that main physical and social changes and segregation are not spontaneous processes (Sabatini *et al*., 2010). The new kinds of housing appearing since 2010 in post-earthquake intermediate cities is a product of vigorous market forces that are acting rapidly and filling empty plots that used to have mainly terraced buildings. High-rise building as one of the key contemporary housing types also can be found in central cities such Talca and Curicó. However, other gated community housing typologies such as low and middle-rise buildings can also be found in historic neighbourhoods, which deserve more attention to detail and research analysis in introducing any new construction to these areas.

The inclusion of the organised community as a key urban actor and assets (Moser and Stein, 2011) is crucial to be considered in all reconstruction stages (Cutter *et al.,* 2008). It is well established that market forces could add more 'indirect victims' from post-earthquakes who have not necessarily lost their houses but find themselves unprotected in the face of pressure from property speculation and investors to buy their properties. For instance, there are widespread reports in Talca that the day after the 27 February 2010 earthquake, anonymous investors were offering deals to residents to buy their devastated houses and land in only the half price than the original value, or to exchange them for cheaper properties in the outer city. Some of these owners accepted the deal to sell their properties in a desperate decision to have money to live (Chamorro *et al*., 2011: 18). According to Allan and Bryant (2011) 'recovery clearly has a spatial dimension, and resilience theory suggests how we might design form and space as well as a process in order to influence recovery' (p. 43). This central idea is also included in current Chilean reconstruction master plan aims such as '[2] To start reconstruction through key actions with quality and identity [and 3] To propose the appropriate institutionalisation to implement the plan and to develop mechanisms that allows us to monitor it' (PreTalca, 2010: 47). However, reality is showing a different scenario where, once again, the 2010 Chilean earthquake M8.8 is effectively a chance 'for some' (real estate development) rather than 'for everyone' (affected communities).

5 Conclusion

Although there is a wealth of experiences in post-earthquake responses around the world and especially in the Fire Belt countries (of the Pacific Ocean), we still have not learnt lessons sufficiently how to confront earthquakes and tsunamis as a recurring natural cycle. This paper argues that is common to see governments responding to the first (*Recovering*) and the second (*Rehabilitating*) stages of *Earthquake Cycle Alerting Diagram* (ECAD) framework rapidly; however they are keeping these stages longer than these should be, then also confusing these stages as the third phase (*Reconstructing*) as the long-term strategy. Thus, reconstruction cannot be considered an adequate post-earthquake response if this stage does not include a plan for the future with permanent actions for *Preparing* and *Anticipating* the next disasters. The working paper has been written after three-year stage of the Chilean 2010 M8.8 Earthquake and Tsunami.

However, the *Reconstructing* stage should include permanent actions such as a national reconstruction policy and specific master plans, risk corporations and committees, budgets for affected communities (not just social housing subsidies) and training in the community about social and civic assets. Also, these actions should be implemented through a national budget and with the participation of the government at all levels, reconstruction planning committees and agencies, and importantly the organised community itself.

Nevertheless, the reality seems to be different for this initiatives, as once again 'real estate development with [the] marks of international renaissance and regeneration strategies and policies… stand to benefit only the new urban elite' (Winkler, 2009: 33) as observed in many other inner cities in the Global South. In this sense, collateral effects of natural disasters nowadays are not just physical (as in the 1960 Valdivia M9.6 Earthquakes and Tsunamis) but political, in terms of a lack of an holistic urban planning system to tackle reconstruction process. 'Inadequate urban settlement development strongly fosters the vicious circle created by poverty, risk and disaster – by negatively influencing both risk and poverty'. Therefore, '…the limited recognition and understanding of the nexus between disasters and urban settlement development…' (Wamsler, 2007: 97) must be reversed.

The task of achieving proper urban policies with inclusion of communities and avoiding property speculation and gentrification is not easy. On the contrary, the context of post-earthquake reconstruction seems to be the best prospect for producing displacement (direct and indirect) and replacement of both physical and social fabric. Revising events following the Chilean 2010 earthquake, the lack of urban policies and reconstruction master plans with legal framework is massively facilitating physical and social change, especially in inner intermediate cities (new-build *intermediate* gentrification) without considering acts of demolition, real estate development and so on. Mansilla (2010) argues that in Latin America and as part of globalization 'intermediate cities are increasing their population faster than in large cities' (p.13). Mitlin (2001) reminds us that 'whilst globalization offers benefits through improved communication …the free movement of investment capital makes cities as vulnerable as they ever were and reduces the capacities of city managers to create more choices and listen to the views of their citizens' (p.164).

The effects of the globalization are increasingly evident not only in large cities in Latin America, but also in intermediate cities and particularly those exposed to natural disasters. In fact, Talca or Curicó as Chilean intermediate cities have begun to look like 'little Santiago' (capital city). However, high-rise buildings seem to be a type of dwelling resisted or neglected by *Talquinos or Curicanos.* Probably, it is because…"there are concerns that many developments may not include the good quality and iconic design that a few celebrated buildings can (Kearns *et al.*, 2012: 97). Therefore, it is crucial to analyse cases such as Talca and Curicó cities particularly when contemporary forms of gentrification in intermediate cities need to be covered through long term (longitudinal) research to register the main patterns of physical and social change. The opportunity to apply the ´…lessons [learnt] by evaluating [this Chilean] experience systematically' (Alexander, 2012: 1) is there for the taking.

Besides, empirical analysis in inner intermediate cities including primary and secondary data collection about real estate agency development, and following the 2010 earthquake should inform urban master plans. Furthermore, this official data should be contrasted to interviews conducted with key people of these intermediate cities, claiming a lack of social participation and displacement of long-standing residents. Only in this way it will be possible to understand how gentrification could be (or not) an inevitable phenomenon in post-earthquake reconstruction of cities and how these urban areas on an intermediate scale could avoid the same problems and complexities of larger cities. Consequently, **'**the next step might be to use this knowledge to

develop strategies based on local knowledge which responds to new opportunities as they arise, rather than imposing an all-encompassing master plan that may not recognize the vulnerabilities and opportunities that comprise the specifics of place' (Allan and Bryant, 2011: 43).

In this sense, the application of ECAD as a framework methodology allows the analysis of subsidies and acts of urban renewal that are being applied in reconstruction experiences and their relationship with the city-sizes and regions. Three main reasons can be highlighted: Firstly, by including all the ECAD stages and starting by *Recovering* is crucial especially as 'recovery provides an important window of opportunity to narrow the much-discussed gap between relief and development and transform disaster response into opportunities for sustainable development.' (IRP, 2007: 2). Secondly, *Rehabilitating* can be carried out through proper conservation plans that include a more flexible and dynamic urban regulation framework including both the physical morphology and the social environment, as basic components. And thirdly, Caldera Sanchez (2012) carried out an evaluation of the 2010 Chilean earthquake, and reminds us of good practice to reduce segregation and avoid poverty traps in reconstruction that can be included as long-term strategy (*Reconstructing* stage):

> 'The [Chilean] government [could buy] some land for subsidised housing in more central locations as a means to reduce segregation and improve the social mix…The new policy approach may contribute to more mixed neighbourhoods, but reserves of land in good locations are costly. A complementary and possibly less costly solution would be to better enforce the existing quotas for subsidised housing, as a number of OECD countries have done (*e.g.* Spain, Ireland) with good results' (Caldera Sanchez, 2012: 24).

Thus, the necessity of producing more theory-base for the analysis of post-earthquake effects including evidences of contemporary gentrification is crucial. It is hoped that the discussion provided in this working paper regarding physical and social changes in the context of post-earthquake reconstruction urban policies can serve as a starter-motor for the analysis of historic areas of intermediate cities and towns which are undergoing similar transformation. I argue that reflection on how a natural disaster could be seen as an opportunity 'to reset' the *natural cycle* with appropriate urban policies is still pending in the Chilean context. In this sense, the current national urban development policy in discussion can deliver an holistic urban planning system and provide to aim to produce master plans including short, medium and long term strategies. *Civic design* is one of the concepts that could be included as a way to promote adequate building and planning practices not only to reducing risk and disasters, but also to achieve more sustainable inner cities.

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