The greening of neoliberal urbanism in Santiago de Chile: urbanisation by green enclaves and the production of a new socio-nature in Chicureo

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Declaration

‘I, Martin Sanzana Calvet confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.'

Abstract

Urban enclaves -private and gated developments for elitist groups- are a worldwide spread mode of colonisation of the peri-urban and countryside of metropolitan areas, in a context of cities under capitalist globalisation and urban neoliberalisation. At the same time, environmental concerns and environmentalism are acknowledged as increasingly relevant drivers of change in urban planning and urbanism worldwide, as a myriad of public and private initiatives of urban sustainability and urban greening are reported in cities worldwide. This thesis examines the intertwining of neoliberal urbanism and urban greening in the urban enclaves that sprouted in Santiago de Chile in the late 1990s, amidst the political tensions of the period of political transition to democracy and the debates over the continuity or dismissal of Pinochet's neoliberal legacy for the urban policies. Although many studies have focused on the Chilean neoliberal experiment, the role of environmentalism and environmental discourses in the reforms to urban growth policies in Santiago in the post dictatorial period remains unexplored. And, despite the debates over social inequality triggered by their rise, the environmental transformation that the new urban enclaves have produced and their role in the production of environmental inequality have not been substantially addressed. This study analyses the linkages between neoliberal urbanism and urban greening in the making, maintaining and living of urban enclaves in Chicureo, in Santiago's metropolitan countryside. Anchored on Urban Political Ecology proposals, this research examines the role of a new urban metabolism of material flows and subjectivity driven by the urban enclaves in the production of a new socio-nature in Chicureo. The findings suggest that the assemblage of innovations in neoliberal planning, market environmentalism and elitist utopianism is generating green enclaves that reproduce social privilege and environmental inequality. Nevertheless, tensions and conflicts account for possibilities of alternative directions in Chicureo's development.

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Abbreviations and acronyms

APR: *Agua Potable Rural* - Rural Drinkable Water scheme

AUDP: *Areas Urbanas de Desarrollo Prioritario* - Urban Areas of Priority Development

BRISAGUAS: *Compañía de Aguas Condominio Las Brisas de Chicureo* - Water Company of Las Brisas de Chicureo Condominium

CBD: Central Business District

CCTV: Closed Circuit Television

CONAMA: *Comisión Nacional del Medio Ambiente* - National Environmental Agency

COREMA: *Comisión Regional del Medio Ambiente* - Regional Environmental Commission

DFL: *Decreto con Fuerza de Ley* - Decree with Force of Law

DIA: *Declaración de Impacto Ambiental* - Environmental Impact Declaration

DL: *Decreto Ley* - Decree

DS: *Decreto Supremo* - Supreme Decree

EIA: *Estudio de Impacto Ambiental* - Environmental Impact Study

EIU: *Estudio de Impacto Urbano* - Study of Urban Impact

GDP: Gross Domestic Product

INE: *Instituto Nacional de Estadística* - Statistics Office

IPCC: Intergovernmental Panel on Climate Change

KWH: Kilowatt hour

LEED: Leadership in Energy and Environmental Design

MINVU: *Ministerio de Vivienda y Urbanismo* - Ministry of Housing and Urbanism

MOP: *Ministerio de Obras Públicas* - Ministry of Public Works

NGO: Non Govermental Organization

PARCELAS: *Parcelas de Agrado* - Allotment for Enjoyment

PLADECO: *Plan de Desarollo Comunal* - Borough Development Plan

PNDU: *Política Nacional de Desarrollo Urbano* - Urban Development National Policy

PPDA: *Plan de Prevención y Descontaminación de Santiago* - Plan for Environmental Prevention and Decontamination of Santiago

PPP: Public Private Partnership

PRC: *Plan Regulador Comunal* - Borough Masterplan

PRMS: *Plan Regulador Metropolitano de Santiago* - Santiago Metropolitan Masterplan

RCA: *Resolución de Calificación Ambiental* - Resolution of Environmental Qualification

RM: *Región Metropolitana* – Santiago's Metropolitan Region

SAG: *Servicio Agricola y Ganadero* - Agricultural and Farming Agency

SEIA: *Sistema de Evaluación de Impacto Ambiental* - Environmental Impact Assessment System

UCL: University College London

UF: *Unidad de Fomento* - Finance Unit

UNEP: United Nations Environmental Program

UPE: Urban Political Ecology

USD: United States Dollars

USGBC: United States Green Building Council

ZIEDC: *Zona Industrial Exclusiva de Desarrollo Condicionado* - Industrial Zone of Conditioned Development

ZUC: *Zona Urbana Condicionada* - Conditioned Urban Zone

ZUDC: *Zones Urbanas de Desarrollo Condicionado* - Urban Zones of Conditioned Development

ZURC: *Zona Urbana de Reconversión Condicionada* - Urban Zones of Conditioned Reconversion

Chapter 1

Introduction

> This is what was so different about the founding mentality. It founded over the empytness. Over a disregarded nature, over a society to be annihilated, over a culture taken as nonexistent. The city was a European enclave in the midst of nothingness.
>
> -José Luis Romero, *Latin America: Its cities and ideas, 2001*.

> But what becomes of the attempt, inherent in urban space, to reunite the spontaneous and the artificial, nature and culture?
>
> -Henri Lefebvre, *The Urban Revolution, 2003*.

1.1 Introduction

I had to leave my country very young, holding my mother's hand as we escaped from Pinochet's annihilation campaign towards left-wing militants, after the 1973 coup d'état. Twenty years later I returned to live in Chile. I discovered the valley of Chicureo in 1993, when passing through Santiago's metropolitan region on a trip to explore the north of Chile. That valley struck me with its red coloured dryness in the Andes foothills, the symmetry of its agricultural estates crossed by water canals in the plains, and the austerity and quietude of its rural settlements. When in 2007 I returned there on a field trip, the area was barely recognisable. A new district of heavily gated and carefully gardened private neighbourhoods for high-income groups was burgeoning asymmetrically through foothills, piedmont and plains, alongside remaining crops and rural allotments. The ongoing urbanisation of Chicureo sliced the countryside with its private infrastructure, as high standard motorways that connected the area to Santiago's central districts, and premium water networks to service the new neighbourhoods. Besides the socio-demographical changes, the urbanisation disrupted the materiality of the rural environment. This change also seemed to involve a subjective dimension. To become a new market niche for Santiago's upper class, property developers' market promised the escape from the city's evils, while keeping its privileges. At the core of the identity of the new housing projects was the greenness of the local environment

presented either as a natural quality or a technological attribute achieved by the new developments. While developing this research, I have witnessed how this urbanisation has accelerated, deepening the environmental transformation of Chicureo, and consolidating the place as a novel type of metropolitan settlement with a distinctive combination of greenness, security and exclusivity.

In the background of this process of urbanisation of Santiago's countryside is the stabilisation of the post-dictatorial political regime and the many disputes over change and continuity of neoliberal policies. Intellectuals linked to the new centre-left coalition in power since 1990 -the *Concertación* -who were a very vocal group against the dictatorship's economic policies, argued that the Concertación reforms replaced the neoliberal model with a balanced social-market economy framework for the country's development. Nevertheless, policies that were presented as an unavoidable political necessity to stabilise democracy and reform neoliberalism prompted new forms of privatisation of economic activity and social life, generating an impoverished public realm governed by discourses of fear and political apathy. The initial hopes of a fresh start for a democratic regime and a non-neoliberal framework of development gradually vanished along the successive post-dictatorial administrations. By the 2010s it became clear to a significant portion of the Chilean youth that democratically elected civilian rulers had been too keen -in the name of *realpolitik*- to build a new society on the very foundations laid by the previous regime. And in 2011, under the flag of reforms to the educational system, a social movement led by a post-dictatorial born youth openly contested what they saw as the neoliberal, barely democratic, political project of Chilean bipartisan ruling class.

Studies have gathered consistent evidence that the political transition in Chile meant a long period of economic growth and decrease of political polarisation, in which new problems and discourses emerged, notably urban issues and environmentalism. Since 1990, Chilean cities were deeply restructured and transformed, and the Concertación made continuous efforts

to tackle down some of the most striking urban issues -as extreme poverty, social housing deficit and air pollution- particularly in the capital city, Santiago. At the same time, an ecologist myself, I could not fail to notice the rise of environmental discourses in Chilean society along the 1990s and 2000s. However, to many environmental activists fighting in the field of urban sustainability it became clear that those pushing the neoliberal agenda in the cities increasingly adopted green discourses. With others, I began to wonder how the wave of new green, eco or sustainable buildings and districts in Chilean cities could become instrumental to justifying social segregation, privatisation and environmental destruction.

This research sprouted in the wake of the 2011 Chilean protest movement, amidst the questions left by the contradictions of the convergence of neoliberal, post-dictatorial and green agendas in Santiago development. I aim the reflexive effort of this thesis to converge with those willing to claim back environmentalism from neoliberal and socially regressive discourses, to rethink cities as democratic, socially and environmentally fair places.

1.2 Research problem and argument

Cities are becoming arenas in which the greening of capitalism is attempted. From addressing climate change to contributing to boost the economy, initiatives to retrofit and expand cities -or create new ones- in a green or sustainable way are increasingly common. A new urban environmentalism is being offered as a promise of reconciliation of a capitalist-led urban development and nature, often through advanced technologies and complex engineering processes. Once labelled as a radical discourse of vocal minorities, environmentalism has been gaining weight in the public and private agenda, even amidst the shockwaves of neoliberal reforms that have been restructuring central and peripheral economies since the 1980s.

A milestone in the mainstreaming of the notion of integrating environmental concerns to capitalist economies has been the Brundtland report in 1987, a UN initiative that popularised the concept of sustainable development, as a response both to the rise of global environmental challenges and the spread

of a radical political environmentalism (Goldstein, 2013). Proponents of green capitalism have emphasised the win-win benefits of adopting a green economy combining the development of green markets and the setting of higher sustainability standards to address both economic recovery and environmental issues, particularly since the 2008 financial crisis (as discussed by Tienhaara, 2014). Ecological modernisation, a perspective that analyses the economic, technological and institutional reforms needed to face ecological challenges and preserve market economy and liberal democracy (Mol & Spaargaren, 2000; Spaargaren & Mol, 1992), is considered a key perspective -or mainstream environmental discourse- underpinning the proposals for the greening of capitalism (Latour, 2007; Dryzek, 1997; Hajer, 1995). Although some critics to green capitalism have denounced its pitfalls, as the resource to greenwashing as a practice of unsubstantiated or unverified claims of greenness to improve the corporate image of companies and industries (Bruno, 1997), from a radical perspective critical scholars have suggested that many problematic issues with green capitalism would be better understood as the deliberate attempt to set a neoliberal environmental governance over nature and natural resources (Goldman, 2005). Proponents of this perspective on a green neoliberalism have analysed how under claims of addressing environmental conservation and mitigate environmental problems, governments, development agencies and companies have in many cases promoted an agenda of enclosure, privatisation and commodification of natural resources. Whilst these political ecological approaches to the neoliberalisation of nature and the production of neoliberal ecologies have been increasingly focusing on the global mainstreaming of environmentalism and the production of social and environmental injustice, they have often omitted to deal with the urbanisation of nature and the ecology of cities (as in Peet, Robbins & Watts, 2011; Castree 2008; Heynen, McCarthy, Prudham & Robbins, 2007; McCarthy & Prudham, 2004). This underdevelopment in the study of an urban green neoliberalism is more acute as urban sustainability, urban greening and ecological urbanism are nowadays concepts that are fast jumping from the work of scholars, the dashboard of avant-garde architects or the agenda of radical environmental movements to the everyday reality of

planning institutions, housing industry, financial markets and public opinion leaders.

Indeed, the ongoing demographic, spatial and economic growth and restructuring of cities has turned urbanisation an even more relevant issue in current political, economical, social and environmental debates. Cities and urban areas are increasingly relevant arenas in the global restructuring of capitalism taking place since the wave of liberalisation in the 1980s, accentuated in the 1990s with the rise of the hegemony of the Washington Consensus in governments and multilateral institutions as the World Bank and the IMF (Harvey, 2005; Brenner & Theodore, 2002; Keil, 2002). The rise and spread of urban entrepreneurialism and a privatist governance of the city has led to processes of neoliberalised urban restructuring, fragmentation and reconfiguration, even after the 2009 subprime crisis in which neoliberal policies were seriously challenged in the US and Europe (Theodore, Peck & Brenner, 2011). One of the recurrent topics of this academic literature is that of the fragmentation of the cities and the sharpening of socio-spatial polarisation between an economically dynamic and globally integrated urban elite and a diversity of less-privileged and excluded social groups. Firstly reported as a phenomenon described as the fortressing of the affluent in 'gated communities' in the US, the urban enclave became a relevant concept to the study of securitisation of urban life and that of the production of new patterns of segregation and exclusion triggered by the spatial congregation of urban elites (Low, 2001; Caldeira, 2000; Marcuse, 1997; Blakely & Snyder, 1997; Davis, 1991). Converging with contributions from critical geographies, the urban enclave has also been theorised as a more general form of defensive space with a diversity of possible functions -for instance economic, productive, cultural, residential- by which economic elites are reconfiguring the cities in clusters and networks of premium spaces (Graham & Marvin, 2000; Friedmann & Wolf, 1982).

Among political ecological approaches to urbanisation, the Urban Political Ecology (UPE) perspective provides a theoretical background in which the synthesis of neoliberal urbanisation, urban greening and ecological

urbanism can be properly addressed. Scholars developing UPE have advanced the knowledge on how -in contexts of capitalist accumulation and through power disputes and environmental transformation- cities are being produced as socio-natures, the assembling of an urban metabolism -material and social flows- that set uneven and unequal relationships between human society and nature (Heynen, Kaika & Swyngedouw, 2006a; Kaika, 2005; Swyngedouw, 2004). Under this perspective, socio-environmental sustainability is considered a political issue: the materiality of the flows that constitute urban metabolism is mobilised by power-contextualised environmental relationships that benefit some whilst it may deprive others, humans and non-humans alike (Swyngedouw& Cook, 2009).

Only recently some studies on urban enclaves have been integrating political ecological considerations over environmentalism and neoliberalism, along the spread of large and well-advertised projects of eco-cities, eco-neighbourhoods and other so called 'green' developments. The academic literature on these green or ecological urban enclaves has developed around what can be described as two main concerns. One, which deepens the debates over the technical and economical efficacy and assesses the claims of urban sustainability by projects and initiatives (as by de Jong, Joss, Schraven, Zhan &Weijnen, 2015; Joss, Cowley & Tomozeiu, 2013; Ercoskun, 2008). The other one, which critically examines the eco-enclaves as outcomes from bottom-up movements and networks seeking to develop eco-communities, or as the result of top-down initiatives linking the needs of deregulated financial markets with an ecological urbanism and the needs of ecological security of elitist groups (Hodson & Marvin, 2010a). However, the study of these top-down enclaves that merge ecological urbanism in contexts of neoliberalism is still limited to few cases in the Global North and some dynamic regions in Asia (as in Caprotti, 2014; Chang & Sheppard, 2013).

In the case of Chile, considered one of the earliest laboratories in which neoliberalism was experimented, the study of the effects of greening of neoliberalism in urbanisation remains to be developed. Although Pinochet's

regime of state-led terror and shock economic reforms is considered to have deeply restructured Santiago, the Chilean capital (Valencia, 2007; Gross, 1991; Rodríguez & Icaza, 1991), the sprout of urban enclaves in Santiago's metropolitan region developed only in the late 1990s, under a democratically elected government and amidst tensions over the continuity and reform to the dictatorship urban neoliberalism (Rodriguez, Rodriguez, Saborido, Segovia & Mires, 2014). Recent studies have focused on the increasing demographic and economic weight of these growing peri-urban districts of urban enclaves and its impacts in increasing residential segregation and urban inequality (Janoshka & Hidalgo, 2015; Ruiz-Tagle & Lopez, 2014). However, very few explore the political ecology of this urbanisation by enclaves (possibly Romero, Fuentes & Smith, 2010; Romero &Vazquez, 2005), none in Chicureo, the rural area of the largest colonisation by urban enclaves in the metropolitan region. Despite the prominent adoption of green, eco, natural and sustainable concepts in the planning, building and marketing of these urban enclaves, the relationships between market environmentalism, the environmental transformation of the area and the socio-ecological consequences of this urbanisation by enclaves in Chicureo have not been scrutinised.

In this thesis I argue that the urbanisation by urban enclaves in Santiago is linked to the greening of neoliberal urbanism in the post-dictatorial context, which, by the development of greener urban enclaves is producing a new urban socio-nature of greenness and inequality in Chicureo. I present how these green urban enclaves in Chicureo originated as the result of the adoption of discourses and practices of urban sustainability and urban greening in planning policies and urbanism, in the context of disputes over the character of the post-dictatorial strategy for Santiago's urban development. These planning and market innovations meant the greening of a neoliberal urbanism that assembled greenness and sustainability with security, exclusivity and free-market action. The urbanisation of the countryside by green urban enclaves triggered a reconfiguration of social and environmental relationships by shaping the flows of materials and resources that constitute its urban metabolism. The analysis of the new

socio-nature produced by the urban enclaves in Chicureo is therefore critical to understand how this framework of green neoliberal urbanisation became materialised.

The aim of this thesis is to explain the environmental transformation unleashed by the urbanisation of Chicureo by linking the urban metabolism of the urban enclaves to the production of a new socio-nature that assembles materiality, representations of sustainability and greenness, neoliberalism and environmental inequality. I intend to contribute to fill the gap in the knowledge of how urbanisation is becoming a main arena where the greening of neoliberalism is experimented and what socio-nature is being produced in this process. I believe this work may offer an innovative interpretation of the role of politics and environmentalism in the evolution of neoliberal urbanisation in post-dictatorial Chile, and extend Urban Political Ecology to the analysis of the unexplored socio-nature produced by the green urban enclaves.

1.3 Research questions and objectives

This research interrogates the socio-nature being produced through the greening of a neoliberal urbanisation and scrutinises some of the main drivers of this process, namely political context, innovations in planning, urbanism and markets. *In a context of adoption of environmentalism in planning and urbanism in Santiago de Chile and disputes over the continuity of neoliberal policies, what urban socio-nature is produced by the urbanisation by green enclaves in Chicureo?* This broader question is operationalised through a series research questions structuring the thesis, as follows:

1. How is the planning of the green enclaves linked to the greening of neoliberal urbanism in Santiago de Chile?
2. What is the role of market-led greening in the making of the green enclaves in Chicureo?

3. How is the urban metabolism of the green enclaves involved in the production of environmental transformation and environmental inequality in Chicureo?
4. What are the main environmental discourses produced by the actors making, maintaining and living in the green enclaves?

Through these questions, this research aims to produce a coherent narrative of the historical process of urbanisation of the countryside of Chicureo by urban enclaves, by studying the greening of metropolitan planning and the enclaves' urbanism and the socio-environmental transformations driven by the production of a new socio-natural assemblage of subjectivity and materiality. The sequence of the research objectives is detailed in the following flow diagram:

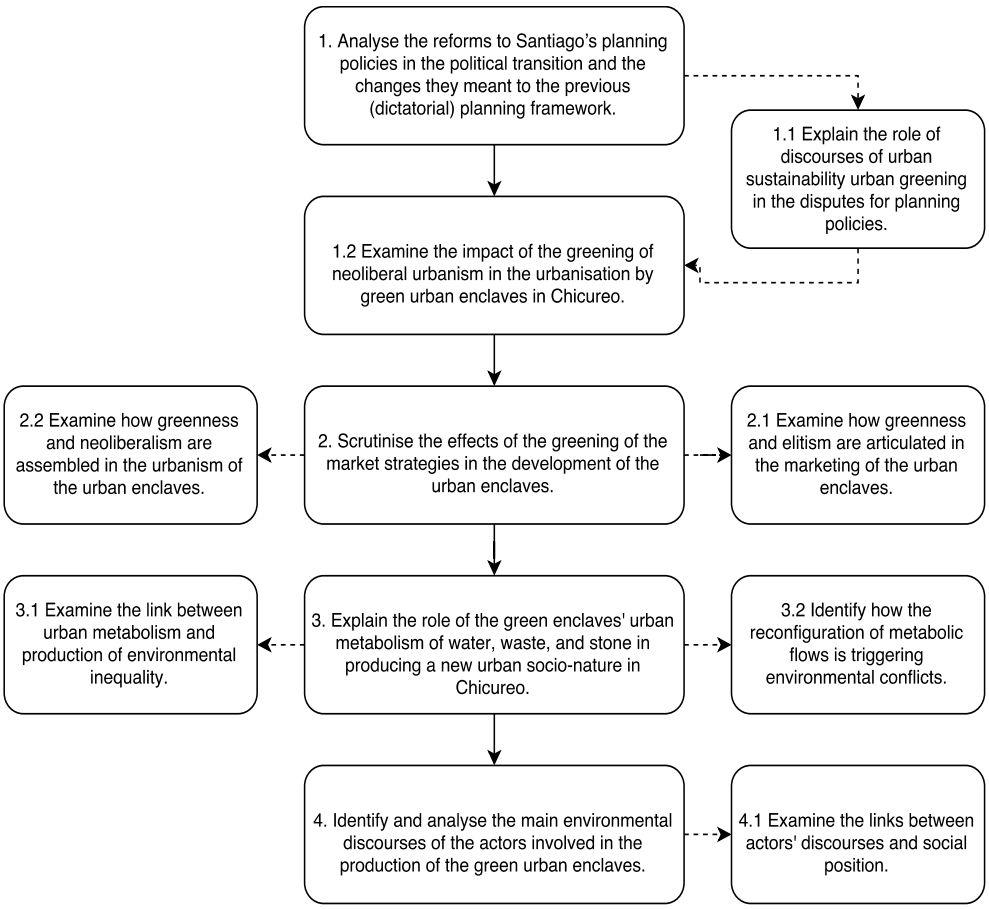

Figure 1.1 Research objectives flow diagram.

1.4 Methodology

As advanced above, I have developed a *case study* designed to research the greening of neoliberalism within the process of the urbanisation of nature by urban enclaves in Chicureo, a countryside area within Santiago's metropolitan region. I chose Chicureo because it displays some unique environmental, social and political conditions in the development of urban enclaves. Although of relatively recent urbanisation, the sector combines undeveloped areas, areas in construction and consolidated areas. There is a well-delimited geographical containment of its urbanisation, and it displays a distinctive social composition of newcomers from high-income groups. In addition, its development is related to specific changes in metropolitan planning and policies, which increases my own possibilities to scrutinise the case.

I have developed my research under an interpretivist paradigm to build a narrative of the process of urbanisation by urban enclaves in Chicureo, adopting a dialectical epistemology to address the tension and interdependence between subjectivity, politics, policies and materiality from which, under an Urban Political Ecology perspective, socio-natures are produced. Data was gathered through a combination of research methods, based on primary and secondary sources, involving both in situ and remote data collection, most of them qualitative methods: semi-structured interviews, documentary analysis, transect walks and online survey.

Semi-structured interviews were conducted among 62 key informants from the state, the private sector and civil society, directly involved in the making (conceiving, planning, designing and building), maintaining (operating, maintaining, repairing, servicing) and living (inhabiting, coexisting, contesting) the urban enclaves. Through a thematic discourse analysis I scrutinise the actors' narratives on the planning and market origins of the urban enclaves and the role of the disputes on the continuity of neoliberal policies. This analysis is also directed to understanding the actors' representations of the urban enclaves' greenness and environment in their

everyday life, and how these two aspects are related to the socio-material flows.

The documentary analysis includes different sources of data and analyses, providing contextual data and specific information on how innovation in policies, urban design, and technologies are feeding the enclaves' claims of sustainability and greenness. The analysis of official documents from the planning authorities provided an entry point to the historical background from which to understand the political context, as well as a source of data about the content of greening and neoliberalism of the metropolitan plans. Through content and visual analysis of a sample of the enclave marketing, I have refined both the description of the ecological urbanism of the enclaves and the analysis of the discourses of developers' market-led environmentalism. The review of a sample of the press provided the outline for a timeline of the enclaves' development and highlighted both relevant actors and socio-environmental conflicts that have sprouted in this period.

Through a series of transect walks in the field I gathered my own set of visual data and notes about the enclave development to contrast with other sources and feed my methodology and analysis with insights, questions and my own subjective experience in the enclaves. The transect walks also offered the possibility to introduce my own first hand perspective of the experience of the enclaves' socio-nature and expanded the scope of my reflection. An online survey among enclave residents quantitatively analysed has provided valuable information about how they organise and represent their everyday life, which turned to be helpful when contrasted with the results from the interviews in issues on consumption and waste behaviour.

1.5 Thesis outline

As displayed above, chapter 1 presents the rationale, argument and research questions, an overview of the methodology and the thesis outline.

Chapter 2 develops the theoretical framework to study the intertwining of urban greening and neoliberalism in the urbanisation of the countryside by green enclaves and the socio-ecological transformation this process is producing in Chicureo. The chapter departs from a brief contextualisation of the Chilean political transition and sets a definition of neoliberalism, exploring the conceptualisation of urban enclaves in critical studies on the changing geography of the cities under globalisation, particularly the phenomena of gated suburbanisation, residential segregation and urban fragmentation. Building on the contributions of Urban Political Ecology on politicising the study of material flows of urban metabolism and proposing cities as the result of a socio-natural assemblage of capital, nature and urbanisation, the chapter sets the theoretical approach to the environmental transformations driven by the greening of neoliberalism in the studied case. This chapter also brings together political ecological debates on green capitalism and neoliberalisation of nature with scholarship on environmental discourses.

Chapter 3 presents and explains the case study methodology selected to research the origins of the green enclaves in Santiago de Chile and the production of a new socio-nature in Chicureo. The chapter states the interpretative epistemological approach I have chosen to develop this study, which emphasises the social construction of reality and the multiplicity of narratives involved in this process. It further describes the pool of research methods, most of them qualitative, used to develop the research. Through semi-structured interviews and an online survey I gathered information on the making of policies, the process of urbanisation and the material flows in the everyday life in the enclaves, as well as the actors' environmental discourses on the greenness of the urban enclaves. The resource to transect walks allowed introducing my own field account of the green enclaves. Documentary analysis proved to be a fruitful method to gather data from different sources, as official planning regulations, printed marketing from the green enclaves, or press accounts of episodes of socio-environmental conflicts, and the actors involved. This chapter also outlines the research

phases of data collection, fieldwork and analysis, and presents the foreseen limitations as well as the ethical guidelines of the research.

Chapter 4 presents the political context of Santiago urbanisation in the 1990s and examines the role of environmental discourses in the change in metropolitan planning policies for the urbanisation of the countryside. The chapter describes the linkage between reforms in neoliberal urbanism, innovations in the metropolitan planning policies and the urbanisation of Chicureo by green enclaves, highlighting some of the main demographic and spatial changes in the area. Through the analysis of successive amendments to the metropolitan masterplan the chapter reflects on the impacts of Chicureo's experimental urban policies for more sustainable urban growth on a wider metropolitan scale.

Through the analysis of the green enclaves' marketing and urbanism, Chapter 5 scrutinises the role of a market-driven conception of greenness and sustainability in the greening of neoliberal urbanism. The chapter compares the green attributes of a sample of green enclaves in Chicureo, examining the role of ecological urbanism in the development of market strategies and the making and maintaining of the green enclaves. The chapter also examines the link between the highlighting of green attributes, the search for elitist ecological security and the reinforcing of display of discriminatory and exclusion discourses and practices.

Chapter 6 analyses the production of a new urban socio-nature in Chicureo by the analysis of the material flows enabled by the urban metabolism of the green enclaves. The chapter departs by a narrative of the main environmental transformations driven by the urbanisation of Chicureo, focusing on land use change, offering both a historical overview and a glimpse to the ongoing processes. Through the analysis of flows of water, waste and stone the chapter scrutinises how the processes of neoliberalisation of resources, infrastructures and services contribute to the enclosure, commodification and marketisation of the new urban socio-nature by the green enclaves. The chapter also explains how this new urban

metabolism is linked to the production of a new abundance and scarcity of resources, resulting in a class and power driven environmental inequality.

Chapter 7 examines the representations of greenness and sustainability and agency involved in the subjective production of Chicureo's socio-nature. The analysis of the interviews brings to light the environmental discourses of the actors involved in the making, maintaining and living the green enclaves. The chapter also analyses the convergences and divergences of the actors involved in the production of the new urban socio-nature by relating the interviewees' social position with their discursive position towards the green enclaves.

Chapter 8 presents the conclusions, through a synthesis of the findings in a narrative of how the urbanisation of Santiago's countryside by green enclaves is producing a new urban socio-nature in Chicureo. The chapter summarises the answer to the research questions and sets my remarks on the contribution of the research to knowledge on Santiago's greening of neoliberalism and the green, neoliberal and unequal character of Chicureo new urban socio-nature. A final section outlines what potential areas for future research I foresee emerging from this thesis.

Chapter 2

Investigating the socio-natural production of urban enclaves by the greening of neoliberal urbanism

2. Introduction

Through a literature review of the theorisation and scholarship on urbanisation, sustainability and neoliberalism, this chapter develops the analytical framework to research the greening of the urbanisation by enclaves in Chicureo over recent years. My inquiry is shaped by broader questions on how urban greening is taking place in cities under processes of neoliberalisation and what kind of socio-ecological reality is resulting from this.

This chapter explores the debates over the spatial reconfiguration of cities under capitalist globalisation, examining the drivers and consequences of the emergence of urban enclaves (section 2.2). A crucial factor of this process, the rise of neoliberalism, is considered as both an ideology and a set of policies influencing the shifts in urbanisation, including the development of urban enclaves (subsection 2.2.1). This section focuses on the development of theorisation on neoliberal urbanisation as a distinctive mode of reconfiguration of urban growth, scrutinising how this debate has been dealt with by scholars studying the case of Santiago de Chile from the dictatorial period onwards (subsection 2.2.2). The chapter then delves on the rise of environmentalism as both a paradigm and mainstream discourse that is transforming the representations and practices on the relationship between nature and society, ending with a close up on debates over the greening of capitalism and the emergence of green neoliberalism as a radical approach to it (section 2.3).

Once the conceptual framework for the analysis of green capitalism has been set, the chapter focuses on the theorisation on the link between urbanisation and nature (section 2.4). This section highlights critical perspectives to the environmental and social impacts of capitalist globalisation in the cities and presents the contributions from Urban Political Ecology on developing new understandings of the socio-natural character of urbanisation, including urban metabolism. The mode in which the intertwining of environmentalism, urbanism and pro-growth strategies is influencing the development of urban sustainability and approaches to urban

greening is under examination here (section 2.5). After that, the chapter specifically analyses the scholarship on the greening of urban enclaves and its linkages to the debates on transitions and sustainability experimentation (subsection 2.5.1).

The chapter closes (section 2.6) with a reflection that synthesises how the critical analysis of the literature review contributes to set my own conceptual framework for this research.

2.2 Urban enclaves and the changing geography of the city

The enclave is a concept originated in the study of phenomena of colonisation and empire, in which it denotes a generic military, political, productive or economical outpost of a metropolis in a foreign land (Graham & Marvin, 2001; Cardoso & Faletto, 1977). Since the 1980s, the concept of enclave has been used to describe an urban district in which a distinctive community often chooses to be materially and symbolically segregated from the open city, either for defensive purposes in the case of ethnic or religious discriminated groups, or to secure its domination in the case of elites (Caldeira, 2000; Marcuse, 1997; Davis, 1992). Urban enclaves have been described with a high diversity of functions, as financial centres, thematic parks, techno-poles or residential neighbourhoods; either developing within the city boundaries by gating, renewal or new projects, or in peripheral and rural areas by processes of urban growth and sprawl.

In the case of the residential enclaves, scholars have described their many typologies, from small gated villages with tens of residents (Atkinson & Flint, 2004) to large compounds of gated communities of tens of hectares and hundreds of houses (McGuirk & Dowling, 2009; Frantz, 2006). Despite the diversity of contexts in which these urban enclaves have been reported, the academic literature is rich in describing shared features among them, such as low housing density, private governance, masterplanned and landscaped design, residents from a rather homogeneous upper income, and of course gates and walls. Indeed, urban enclaves have often been identified in the literature as fortressed developments, gated communities or walled

cities (Low, 2001; Blakely & Snyder, 1997; Judd, 1995; Davis, 1992), images that reveal the primacy given by these authors to fear and the demand for security as the main driver of this kind of development. From another perspective, some authors have also emphasised the urban enclave character as a club economy, a market product where elitist groups "share the consumption of specific goods on the basis of ownership-membership arrangements" (Glasze, 2005 p.224). Either by fear or a willingness to access an elitist consumption of goods and services -or both-, scholars have described how these urban enclaves are developing not only within the city boundaries, but as secessionist colonies of upper income groups in peripheral or rural areas of lower income groups, accelerating the city socio-spatial reconfiguration and delivering substantial impacts in the city governance (McGuirk & Dowling, 2009; Janoschka & Borsdorf, 2006; Hidalgo et al., 2005; Caldeira, 2000).

Some have linked the emergence of the phenomenon of the enclaves in the US to the transition to a post-Fordist regime in American cities, describing the new urban structure defined by a continuum of residential segregation (Marcuse, 1997). While the poor and working classes were segregated into ghettos, or in the extreme cases, outcast ghettos, the wealthy classes voluntarily congregated in enclaves, "spatial concentration of a group for purposes of promoting the welfare of its members" (Marcuse, 1997 p.228), and eventually into a wider citadel from which a privileged group or elite can exert its domination (Marcuse, 2001). Other descriptions have depicted the urban enclave as "increasingly defensive, self-contained and glocally oriented [...], surrounded by social and economic spaces from which it seems increasingly disconnected" (Graham & Marvin, 2001 p.376). With the spread of the urban enclaves, less privileged social groups become increasingly insulated from the access to urban goods and services and the interaction with different social groups. New infrastructures are considered crucial for setting material boundaries between social spaces, and a carefully conceived urban design has been reported as a powerful tool for increasing the enclaves' privatism and reducing the external and internal social

interactions (McGuirk & Dowling, 2009; Graham & Marvin, 2001; Caldeira, 2000; Blakely & Snyder, 1997; Low, 2001).

In political economical and political geographical approaches to the study of the urban enclaves, these are often described as the product of urban restructuring in contexts of deregulation and linked to the worldwide acceleration of capitalist globalisation of cities since the late 1980s (Bagaen, 2010; Graham & Marvin, 2001; Davis, 1992; Friedmann & Wolff, 1982). This secessionism of urban elites is explained as occurring in contexts in which urban reconfiguration and fragmentation are changing the segregation patterns of cities, disrupting the established hierarchies of the social groups in the centre-periphery continuum and creating an urban system with new hierarchies (Graham and Marvin, 2001; Marcuse, 2001; Petti, 2007). This new urban territoriality has been also theorised as a system of urban archipelagos and enclaves controlled by an elite that is haunted by fear and obsessed by increasing its security (Petti, 2007, 2008; Bauman, 2003).

To become "private worlds for the elite" (Caldeira, 2000 p.258) urban enclaves add private services and complexes for leisure, consumption, education or health, from shopping centres to schools, urban enclaves, which is bound to sharpen social inequality and deprive local government's capabilities (Clarke & Gaile, 1998; Vesselinov, Cazessus & Falk, 2007). The rise of urban enclaves is more often considered as a threat to the public character of the city, by the development of 'anti-urban' or 'city-averse' spaces (Blakely & Snyder, 1997; Davis, 1992). In this narrative, the urban enclaves are depicted as an elitist anti-urban and privatist utopianism, a 'privatopia' (McKenzie, 1994 p.12) although critics assert that its enclosed and exclusionary character mean the abandonment of Utopia as a shared social horizon and its substitution by "widely spread mini-utopias" that can be consolidated into realities by specific groups (Bauman, 2003).

Urban enclaves and neoliberalisation

Since the late 1980s, critical scholarship on urban restructuring has been debating the role of neoliberalisation in the processes of city fragmentation

and privatisation, as well as the relevance of existing historical configurations shaping exclusion and residential segregation. The development of urban enclaves has been widely linked to contexts of neoliberalisation, particularly in the case of the changes in metropolitan areas in the US in the 1980s and more recently in the changes endured by globalisation in growing cities, particularly in the Global South. There are however strong differences in the emphases scholars assign to neoliberalism in the development of the urban enclaves in different contexts.

Some scholars highlight the role of capitalist globalisation and the spread of neoliberal reforms guiding the new economic and urban policies, which set the conditions for the development of urban enclaves as housing market products, boosted by a general liberalisation and privatisation of services and infrastructure and the rise of entrepreneurial modes of urban governance (Bénit-Gbaffou, Didier & Peyroux, 2012; Tomba, 2010; McGuirk & Dowling, 2007; Le Goix, 2006; Glasze, 2005). In these accounts of the link between neoliberalism and development of urban enclaves, the adoption of neoliberal ideology and policies is considered either to have spread a paradigm of growth, individualism and progress in the access and quality of services and goods sustained in Western modernity (as in Sardar, 2010; Foldvary, 2004) or conversely, to have reinforced exclusionary and conservative political philosophies of elitist groups aiming to skip democratisation and maintain a dominant position (as in Low, 2009; and Caldeira, 2000).

At the same time, scholarship on the enclaves' development has relativized the weight of a top-down generic neoliberalisation as a model for the city transformation, and stressed the relevance of each case's historical background and its post-colonial and post-authoritarian arrangements, which signal the political and cultural specificities that have made each urban regime unique. For instance, Rosen and Grant (2011 p.779) have emphasised the "deep historical roots" shaping the local context, where the building of a private suburb, even in cases of a direct application of a foreign urban architectural model, reveals a far more complex socio-

historical construction than the mere neoliberal replication of an American prototype. Authors as Roitman and Giglio (2010) or Sheinbaum (2010) have stressed the influence of historical models of urban domination by the Latin American elites in shaping the patterns of segregation, with or without neoliberal policies. In another context, Falzon (2004) and Bagaeen (2010) have asserted that traditional forms of community control and private governance have always existed in Middle Eastern and Indian cities, and those mechanisms are in the roots of the new local-global enclaves, even if those cities are transiting to a scenario of more economical and spatial autonomy of the elites in a globalisation process.

This tension in the debate between the weight of the global and local drivers in the explanations poses the question of how much those global securitised residential models are chosen in response to a neoliberalisation of markets and how much they rely on local power dynamics (Bénit-Gbaffou et al., 2012). The theoretical approach I take in this controversy delves on the notion of 'neoliberal urbanisation', which I believe contributes better to unveil the heterogeneous, contextually influenced and contested process of neoliberalisation in metropolitan areas. To explain this concept, neoliberalism itself has to come under scrutiny.

2.2.1 Neoliberalism and urbanisation

Although its theoretical roots can be traced to the dawn of liberal thinking, and its economical formulation to 19th century neoclassical economics, neoliberalism remains a controversial and politically loaded concept. No doubt that its linkage to radical -and in some cases violent- shock reforms in the late 20th century and its association with ideological slogans of totalitarian resemblance[1] could have contributed to this situation.

As a neoclassical economical doctrine, neoliberalism is considered to have originated in Germany in the 1930s proposing a reform to capitalism based

[1]Such as the 'There Is No Alternative' slogan in the context of Thatcher reforms in the 1980s, and the 'End of History' hypothesis spread by Rand Corporation in the 1990s, in the context of the collapse of the URSS and the rise of a global capitalist hegemony.

on the primacy of market mechanism and a state impartial regulation (Foucault, 2008). In a Keynesian era signalled by the 1929 crisis, the New Deal and the post-war reconstruction planning, neoliberalism was long considered a marginal economic and philosophical doctrine (Harvey, 2007). However, the succession of stagnation and economic crises in the central economies since the 1970s led to the decline of planned strategies of economic development and the increasing attempt of large capitalist corporations to explore modes of accumulation beyond Fordist organisation of economy and welfare state politics. A small but powerful group of intellectuals led by Frederick Hayek and Milton Friedman[2] developed a radical *laissez faire* version of neoliberalism and provided a fresh source of policies and ideology to those willing to fight socialism, economic planning and the New Deal (Anderson, 1996). At the core of this doctrine was the idea that only the self-organisation of the economic activity and a ceaseless competition, even under conditions of power and wealth asymmetries, could provide the more efficient resource distribution in society maintaining individual freedom and the realm of law (Hayek, 1944). Neoliberal propositions were used as a flagship to promote, through economic shock, market liberalisation and privatisation of economic activity, free market, the reduction of the state to a minimum, and the embracing of values of private property, private initiative and capitalist profit as the engine of economic and social life (Harvey, 2000; Friedman, 1962).

Neoliberalism became worldwide known by the diffusion of neoliberal doctrines among 1980s Thatcher's and Reagan's conservative governments in the UK and USA respectively, and mainstreamed into economic policies of privatisation, deregulation and state withdrawal in industrialised societies, post socialist regimes and developing countries (Harvey, 2007). The development of neoliberalism has been theorised as a combination of roll-back the post WWII welfare state and roll-out new institutions (Peck & Tickel, 2002), in a succession of deregulation and re-regulation -or creative destruction- that reveals the complexity of an actually existing neoliberalism

[2]At some point working at the University of Chicago, for what neoliberal doctrine was often referred as the Chicago School of Economics (Jones, 2014)

(Peck, Theodore & Brenner, 2009; Brenner & Theodore, 2002). Scholars have also identified the reforms introduced in Chile after the 1973 coup d'état as an early case of neoliberalisation (Portes & Roberts 2005; Tickell & Peck, 2003; French-Davis, 2002), a "first experiment with neoliberal state formation" (Harvey, 2007 p.7). Whilst there is consensus that Chilean neoliberalism started with Pinochet's shock reforms in the mid-1970s, the role of the centre-left coalition in government from 1990 either deepening, reforming or dismissing neoliberal policies is still contested (see Appendix 1).

By its strong political impact and its influence in reshaping national and multilateral economic policies in governmentality models by the end of the 20th century, neoliberalism became a central category in the development of a critique to capitalism by radical theorists, left wing parties and social movements fighting reforms and globalisation alike (Hardt, 2005; Callinicos, 2003). Critical analyses to neoliberalism have developed mainly among Marxian approaches stressing the functional role of neoliberalism as a dominant form of capitalist regulation -and deregulation-, and Foucauldian approaches that stress the role of neoliberalism as the enabling of governmental technologies of power (Robinson, 2011; Keil, 2002). Now, however hegemonic neoliberal ideology and policies have been considered after the fall of the socialist field, in current Marxist and post-Keynesian influenced debates neoliberalism is considered a stream among others within capitalist thinking, a particular mode of approach economic growth within a wider global capitalist economy whose decline is on debate after the 2009 crisis (Keil, 2002).

2.2.2 Strategies for neoliberal urbanisation

Urbanisation is considered a major force driving civilisation and shaping the human environment (Soja, 2000; Mumford, 1961; Geddes, 1949). Scholars developing a Marxian critique of the political economy of capitalism, particularly Henri Lefebvre (1973; 1970) and David Harvey (2012; 1987) have pointed out to the increasing relevance of space and urbanisation in the new mode of capitalist accumulation, and the latter developed an influential

work linking the new neoliberal deregulation policies with a shift in urban development. By examining the global restructuring of capitalism initiated in the 1970s by neoliberal policies challenging the Keynesian regulations and by political forces aiming to disable the welfare state in the 1980s and 1990s, critical scholars have pointed to cities as having an increasingly relevant economic and political role in the networked architecture of post-Fordist and post-Cold War order (Robinson, 2011; Castells, 2011; Keil, 2002; Sassen, 2001). According to some authors "cities have become strategically crucial geographical arenas" where neoliberal and crisis strategies have been articulated (Brenner & Theodore, 2002 p.351), thus instrumental spaces for the "reproduction, mutation, and continual reconstitution of neoliberalism itself" (Brenner & Theodore, 2002 p.375).

This Marxist influenced debate on how neoliberalisation has taken place has been swinging from the idea of a neoliberal city to the notion of a neoliberal urbanisation. In one approach, scholars have emphasised the rise of neoliberal ideology and urban entrepreneurialism as part of anti-welfare movements to restore the class power of revanchist urban elites that have polarised and re-assembled the cities into fortified fragments of a neoliberal city (Harvey, 2003; MacLeod, 2002). Urban entrepreneurialism itself has been described as a new form of deregulated governance of capitalism by which local and metropolitan governments have embraced a global competition to attract capitals and boost local economic activity, by developing increasingly flexible and pro-growth strategies (as public-private partnerships), in a framework of national budgetary restrictions and reduction of spatial barriers (Harvey, 2012). In another approach, scholars have emphasised that the urbanisation of capitalism under pressure from neoliberal forces may be better understood as a less homogeneous and more contextually defined process of neoliberalisation rather than a taken for granted top-down neoliberal hegemony (Peck & Tickell, 2002; Brenner & Theodore, 2002).

A neoliberal mode of urbanisation is considered to have spread out as the result of the combination of global, national and local scale policies and

initiatives aiming to remake the whole framework for urban development, strategically promoting privatisation of municipal facilities, urban renewal, entrepreneurialism and marketization of the urban centres, gentrification, commodification of public spaces and the emergence of a neoliberal urbanism (Peck et al., 2009; Keil, 2002).

Within this framework of neoliberal urbanisation, scholars have pointed out to the "neoliberal inflexion of urban planning" that took place in the 1990s, attempting to bypass bureaucratic bottlenecks, building a partnership between public staff and estate agents over time (Morange, Folio, Peyroux & Vivet, 2012 p.19). This neoliberalised urban planning is considered to have developed through an opportunity-led approach instead of comprehensive visions of the city, often by the development of piecemeal large-scale projects or the spread of tradable planning permits (Tasan-Kok, 2012; Sager, 2011). The privatisation of urban planning is also considered to entail the fragmentation of planning powers, by the outsourcing of functions to private consultants -including the elaboration of the planning proposals and the design of the zoning plans- the privatisation of certifiers and inspectors, and the private elaboration of the environmental impact assessments (Sager, 2011). Examples of the neoliberal urbanisation are those projects -either of urban renewal or urban expansion- built under an ad hoc logic of urban planning to develop and connect newly created neo-liberalised spaces that materialise the wider agenda of neoliberalisation (Peck et al., 2009; Swyngedouw, Moulaert & Rodriguez, 2002). Interestingly, many of those who describe the neoliberal urban planning have also emphasised its political character, involving the building up of coalitions, contested practices and a strong contextual background (Tasan-Kok, 2012; Sager, 2011; Baeten, 2011). What emerges from the scholarship on neoliberal urbanisation is the account that depicts with striking clarity the commonalities in neoliberalisation of urbanism and planning, although at the same time it stresses the role of political disputes and contextual factors.

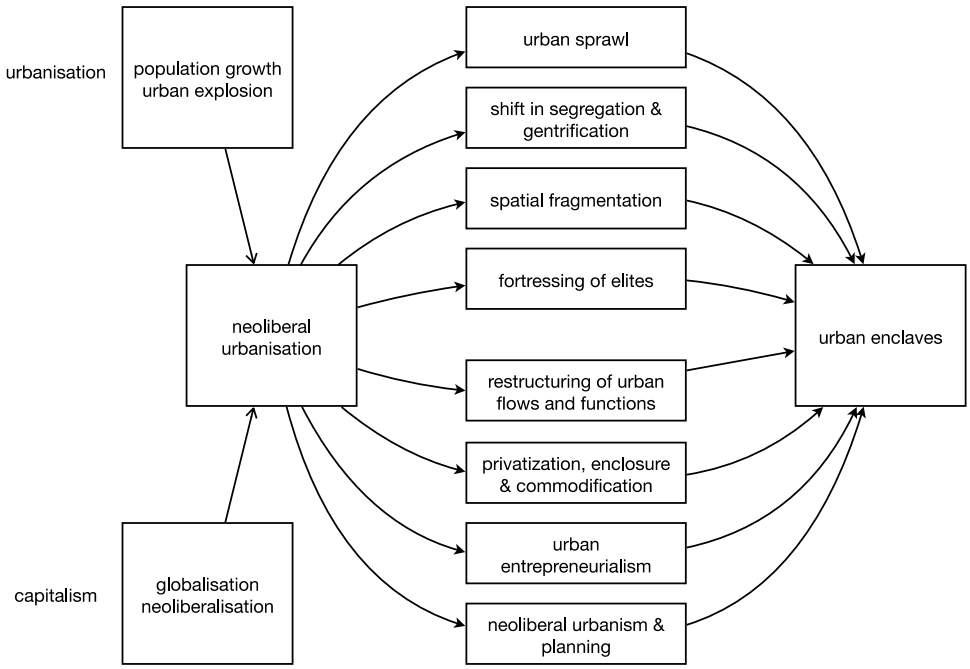

Figure 2.1 Neoliberal urbanisation and the development of urban enclaves. Source: author's own.

These theses on neoliberalisation of urban policies and governance and neoliberal urbanism have been subjected to academic and political controversies, particularly over the hegemony of neoliberalism as regulatory mode of capitalism, the much debated issue of differences in north-south contexts and the extent to which urban neoliberalism remains a major driver of urban change particularly after the 2009 sub-prime crises (Peck, Theodore & Brenner, 2013; Mayer & Künkel, 2012; Robinson, 2011). Although the 2008-2009 financial crisis is considered to have meant a revival of short-term Keynesian policies and exposed the systemic impact of neoliberal urbanism, those advocating for a central role of neoliberalisation in the understanding of the global restructuring of cities still consider neoliberalism as a very relevant -if not hegemonic- force (Peck et al., 2013). Warning against perspectives that see the Wall Street crash post-crisis scenario as a mere restoration of previous trends, authors emphasise current neoliberal urbanism as a form of "variegated neoliberalism" (Peck et al., 2013 p.1094) which would be still guiding urban policies in different worldwide contexts, even disguised under experimentation for economic recovery (Oosterlynck & Gonzalez, 2013).

Politics and pro-growth coalitions in neoliberal urbanisation

The emphasis of perspectives on the "actually existing neoliberalism" (Brenner & Theodore, 2002) in the study of urban neoliberalisation has brought more detail to local politics and the formation of growth coalitions or a new urban regime pushing the enclave agenda. The concept of growth coalitions is rooted in Molotch's (1976 p.309) propositions of the city being "the areal [spatial] expression of the interests of some land-based elite", that is, a politically and economically articulated elite pushing for growth based mainly on land values and expansion business opportunities. Another model used to understand the cooperation between public and private actors to push an agenda of enclave development is urban regime (Mossberger & Stoker, 2001), as developed by Stone (1993; 1987) who proposes to see power split among private actors and local government seeking arrangements to achieve the power to push for specific urban policies, in this case land de-regulation and private led expansion.

The rise of pro-enclave coalitions has been reported by the combination of individual, public and private interests in cases in the US and Europe (Vesselinov et al., 2007; Le Goix, 2006), but also in cities in the Global South. In a Chinese context, Zhang (2002) considers that a pro-growth coalition of developers, local bureaucracies, financial institutions and large enterprises have been pushing for new large scale developments that better suited the authorities' aims of quick housing provision. As Morange et al. (2012 p.16) have stressed, little opposition from governmental authorities has been shown over the spread of gated residential developments and its exclusionary consequences in the case of Cape Town, South Africa, suggesting a compromise between public authorities and developers, by which basic service infrastructure and roads are outsourced to the private sector "in exchange for the privatization of space".

Neoliberal urbanisation in Santiago

Prior to applying these categories of neoliberal urbanisation and neoliberal urbanism I acknowledge that, in contrast to the abundance of studies on the national-scale impacts of economical and political neoliberalisation in

Chile, urban neoliberalism has not been subjected to the same scrutiny. Until recent years, themes as the neoliberalisation of urban governance and land markets, changes in urban planning policies or the neoliberal restructuring of urban infrastructure and services have been scarcely studied, particularly in its post-dictatorial evolution. Immediately after the end of the dictatorship scholars saw in the new democratic regime a breaking point with the previous neoliberal urban policies, a new scenario in which neoliberalism is depicted as being dismissed or limited to specific aspects of urban development (Gross, 1991; De Mattos, 2002). Exception made for few critical voices; urban neoliberalism was long considered a limited dictatorial phenomenon, and the academic debate on the continuity of neoliberalism in the ongoing restructuring of Santiago only became significant with the exhaustion of the political system of the transition.

Nowadays, influenced by the advancement of critical urban theory in North American and European universities and global debates on a global or planetary urbanisation Chilean scholars are increasingly stressing the ongoing neoliberalisation of urban policies promoted by the state after the end of the dictatorship, and the consolidation of a long-term neoliberal restructuring of the city (Hildago & Janoschka, 2014; Hidalgo, 2011; Robles-Duran, 2011; Fuentes & Sierralta, 2004). Besides the continuity of the impacts and path-dependency phenomena derived from neoliberal reforms in the 1970s and 1980s, these authors emphasise the continuation and strengthening of neoliberal policies in the post-dictatorial period by democratically elected authorities. Acknowledging the persistence of neoliberal policies for urban development, some scholars are convincingly arguing that Santiago may be considered a city of neoliberalism or a neoliberal city (Pulgar, 2015; Rodriguez & Rodriguez, 2009).

At the same time that I engage with this stream of scholars challenging the hypothesis of a democratic end of urban neoliberalisation, my argument on the greening of the urban enclaves in Chicureo stresses that its neoliberalisation is a process also signalled by dis-continuity and experimentation. My objections to interpreting the urban enclaves in

Chicureo as a mere continuity of a top-down dictatorial neoliberalism are not signalled by the persistence of colonial processes of ethnic/religious fortressing, as indicated for other contexts in the Global South, but on political struggles related to the nature of the negotiated character of the political transition in Chile and the rise of pro-growth coalitions within this process. In dialoguing with the omissions and contributions in the tension between continuity and change, I develop my own analysis of urban neoliberalisation and the formation of enclaves in Santiago in Chapter 4, particularly focusing on the neoliberal changes in urban planning policies, land markets liberalisation in 1979 and 1980, and the attempts to regulate urban neoliberalism by the civilian governments between 1994 and 1997.

2.3 Environmentalism, sustainability and the greening of neoliberalism

Today's debates on urban greening and sustainability have been framed by the realisation of the unprecedented impacts of industrialisation, large-scale agriculture, urbanisation and energy/resources consumption and waste in the 20th century, either in developed societies and in the developing world, the advancements in scientific understanding of the biosphere, and the emergence of environmentalism in the 1960s as a distinctive concern for the Earth's environment (Redclift, 2010; Smith, 1998; Atkinson, 1991; Lovelock & Margulis, 1974; Meadows et al., 1972).

An unprecedented cycle of economic growth in the post World War II followed by the emergence of environmentalism (first in the developed countries) as a cultural and political force (Aldunate, 2001; Sale & Foner 1993) has shaped new technological and economical responses to address environmental problems. It was after the 1987 Brundtland's report and the 1992 Rio Conference, in the wake of a changing global political, economical and environmental scenario, when environmentalism became a worldwide-legitimised thinking. The definition of sustainable development coined by the Brundtland report, which proposes the balance between economic, social and environmental spheres to address the needs of the present without compromising those of the future generations, became a very influential concept in the debate over current environmental problems

and solutions (Satterthwaite, 1997). Since then, a wide range of actors, among them multilateral institutions, governments, private companies, the civil society and the public in general have begun to label their environmental discourses and practices as 'sustainable', 'green' or 'ecological' (Dryzek, 1997; Hajer, 1995).

This acknowledgement of the existence of biophysical limits to economic and demographic growth and the formulation of proposals for an economically, socially and environmentally sustainable development have shaped the debate on the paths for reconciling economic activity and life supporting ecosystems, and set the frame for the debates on the greening of capitalism (see Appendix 2). The environmental impacts of capitalism first, and later also the attempts to adopt sustainability as a framework for the reform of capitalism have been subjected to academic scrutiny and critique. A dominant approach to environmental studies has developed through an instrumental rationality that privileges quantitatively measurable efficiency gains and technical solutions to the environmental 'evils' of modernity, an approach akin to the framework of ecological modernisation (Mol, 1996; Habermas, 1970). However, scholars from different scientific disciplines have developed attempts to overcome the natural/social divide and integrate power conflicts and explicit references to capitalist accumulation in their analysis of environmental impacts, developing the field of political ecology (Escobar, 1996). This field of investigation for multidisciplinary research evolved in close relationship to political economy, ecology and critical geography debates, by scholars expressing high concerns both about the politics of environmental degradation and change.

From a focus on the link between environmental degradation and industrialisation and poverty, political ecology expanded to integrate the relationships "between society and nature in contexts of power" (Escobar, 1996 p.325) and the unequal access to resources and distribution of environmental inequalities/injustice and conflicts (O'Connor & Martinez-Alier, 1998; Martinez-Alier, 1995). Under the influence of Marxist political economy, some currents in political ecology have also strengthened the

analysis of the 'impact of capitalist development on the environment; (...) the social and political implications of environmental protection, conservation and management...[and] the political economy of the way new natures (species, landscapes, and ecosystems) are produced" (Peet, Robbins & Watt, 2011 p.24).

Taking account of post structuralism theoretical streams, scholars on political ecology have also displayed a renewed attention on the environmental knowledge and sustainability discourses and their production, and the forms of environmental governance or 'environmentality' (Peet, Robbins & Watts, 2011; Agrawal, 2005; Escobar, 1996; Peet & Watts, 1996). In the wake of the post-modernist and constructivist debates on the human-nature divide, Escobar (1999) has argued for an antiessentialist approach to nature from political ecological analysis, that is, one that challenges the ontologically distinctive character of nature and society, either considered as resulting from the evolution of society -as in critical theory- or an intrinsic quality of the biophysical reality -as in positivism. Political ecological critiques to green capitalism have focused on the fallacy of the decoupling strategies under the aims of always-growing markets and the sharpening of the uneven distribution of social-environmental impacts between social groups, countries and regions (Corson, MacDonald & Neimark, 2013; Magdoff, 2013; Foster & Clark, 2012; Rogers, 2010; Watts & Peet, 2004).

Green neoliberalism

Critical scholars have also pointed out that besides ecological modernisation, green capitalism is also fed by a more radical free-market environmentalism, which relies on the neoliberalisation of nature (Wanner, 2015; Castree, 2008). The link between neoliberalism and nature has been researched since the 1990s in the work of critical geographers and political ecologists exploring the environmental impacts of economical restructuring and globalisation. Inspired by Karl Marx and Karl Polyani's theorisations on capitalism and nature, this scholarship has led to the analysis of how nature is transformed by neoliberalisation, and how are neoliberal ecologies

produced (Castree, 2008). Scholars working in this field have tried to distance themselves from dogmatic and simplistic views over neoliberalism, warning of approaches that take it as a given and naturalised thing, and seeking the distinctiveness of a neoliberal environmental governance, recognising the heterogeneity of neoliberal experiences and their sometimes contradictory effects (Castree, 2007; 2008; Heynen et al., 2006a; Bakker, 2007; 2005).

Studies over the neoliberalisation of nature have put their focus on how neoliberalism developed as a mode of environmental governance by integrating discourses of environmentalism (McCarthy & Prudham, 2004), as well as in cases of privatisation, marketisation, enclosure of common resources and commodification of nature (Heynen & Robbins, 2006). In a series of works compiled in a volume on neoliberal environments edited by Heynen, McCarthy, Prudham and Robbins (2007), the authors have stressed the processes of enclosure and privatisation, commodification and marketisation, devolution and neoliberal governmentality, and resistance.

Critiques to the greening of capitalism have pointed out to the emergence of a green neoliberalism as an assemblage of policies and discourses promoting 'free-market environmentalism' and neoliberal governance of nature (Bakker, 2011; Castree, 2008; Goldman, 2005), which has been called a "neoliberal environmentalism that is friendly to capitalist development" (Harper, 2001 p.101). Green neoliberalism has been described as "a mode of resource regulation that promises a virtuous fusion of economic growth, efficiency, and environmental conservation" (Bakker 2010 p.730). The development of an ideology of a neoliberal environmentalism is considered a response both to the limits to economic growth and the risks posed by environment -and the environmentalists- to capitalism (Chang & Sheppard, 2013). According to Goldman (2005 p.6) origins of green neoliberalism as a "power/knowledge regime" are to be found in the World Bank's proposal to reconcile poverty reduction, environmental improvement and capitalist economic growth in the framework of development for countries in the South.

Debates on green neoliberalism have also registered clashing interpretations on its main characteristics and implications. Some scholars have highlighted positive aspects of green neoliberalism, as its empowerment of consumers and citizens' rights versus "oppressive state institutions" (Gautier, Benjaminsen, Gazull & Antona, 2013 p.703) and the integration of "new social and environmental dimensions" in the economic agenda (ibid). To others (as Bakker, 2010 p.715), advocates of green neoliberalism "present these developments as a welcome 'greening' of capitalism that will resolve critically urgent environmental crises, and promise a virtuous fusion of goals of economic growth, efficiency, and environmental conservation". Among critics, a central issue has been greenwashing, the resource to un-sustained claims of greenness and sustainability for marketing purposes only. This notion has been applied to the description of a mainstream corporate environmentalism (Greer & Bruno, 1997) as well as to loosely defined green policies for economic recovery after the 2009 crisis (Tienhaara, 2014). Some critics stress greenwashing as a technology of neoliberal governmentality, one that cleans and veils "the appropriation of resources and the environmental commons for private profit... [and] deepen socio-environmental inequities" (Bakker, 2010 p.715). Beyond greenwashing, critics have warned of radical free-market and moralistic solutions taking over the climate change agenda to boost ultimately vicious neoliberal responses to the environmental crisis (Parr, 2014). Critical scholars have also pointed to the limits of current scholarship on neoliberalisation of nature, arguing for incorporating contributions from dialectical perspectives on Urban Political Ecology to overcome dualistic understandings of nature/society and the theoretical fragmentation of unconnected case studies in the field (Bakker, 2010).

2.4 Critical approaches towards the urbanisation of nature

The recognition of the increasing economic, demographic and environmental role of urbanisation in shaping current scenario of a global ecological stress has facilitated the convergence of debates and studies on the greening of both capitalism and urbanisation. Under the rise of

environmental concerns related to global impacts such as growth of urban population and a dramatic increase of consumption and emissions, theorisation on the many planetary impacts of urbanisation (such as those from Harvey, 2012; Soja, 2000; Lefebvre, 1970) are giving ground to new perspectives on the link between urbanisation and nature as a defining phenomena of our era (Swyngedouw & Kaika, 2000).

The role of the "socio-material infrastructure of urbanization" in the production of current planetary-scale environmental challenges is being increasingly highlighted (Brenner, 2013 p.86), and cities are becoming arenas for the experimentation in transitions of socio-technical systems aiming to achieve urban sustainability (Bulkeley, Castan-Broto, Hodson & Marvin, 2010a). Emerging disciplines such as urban ecology and industrial ecology are fast developing in relation to the assessment of the cities' environment and the search for solutions. In the case of urban ecology, the emphasis of its studies has been shifting from an ecology *in* the cities approach that privileged the analysis of small scale ecosystems and individual species to a perspective privileging a more comprehensive analysis of the ecology *of* the city that acknowledges the ecosystemic relevance of cities and their "incredibly large impacts on Earth's ecological processes" (Marzluff et al., 2008). Industrial ecology has focused on the reduction of the environmental impacts of industrial activity and the improvement of its energy efficiency from a systemic approach that highlights the analogy of an industrial metabolism (Newell & Cousins, 2014; Ayres, 1997).

Urban Political Ecology

Rooted in Marxian and post-structuralist reflections on nature, power and capitalism, Urban Political Ecology (UPE) has developed as a critical research approach willing to link urban studies, urban and industrial ecology, and political ecology. In contrast to political ecology dominant focus on rural or non-urban environments, scholars developing UPE agenda have put their focus on the role of the "urban" as a fundamental driver of current processes of socio-ecological change (Heynen et al., 2006; Keil,

2005). Urban Political Ecology stresses the context of capitalist development and the relationships between neoliberal ideology, sustainability policies and politics (Swyngedouw, 2009), and its scholars have also developed a critique to some too narrow environmental justice approaches to distributive impacts. They claim that some approaches lack theorisation on "neoliberal capitalism in the organization of human–nature relationships" (Holifield, 2009 p.641). Scholars developing UPE analysis have aimed to challenge the current understanding of naturalised and reified everyday life ecologies (Loftus, 2012; Zimmer, 2010a), and the very existence of a pristine and external -and thus depoliticised- nature is challenged by the theorisation over the production of nature (Heynen, 2013; Swyngedouw, 2009).

The urbanisation of nature as the production of an urban socio-nature

Articulating Marxist contributions on the production of nature and human-natural metabolism, Latour's propositions on an Actor Network Theory and radical post-structuralist thinkers as Haraway's ideas on socio-technological hybridisation, UPE scholars question the mainstream theoretical divide between nature and society (Rademacher, 2015; Heynen et al., 2006; Keil, 2005; Latour, 1993).

The notion of an urban socio-nature as the product of the assemblage -or hybridisation- of human and non-human driven by urbanisation is at the core of UPE conceptual framework. Urban Political Ecology has proposed a non-anthropocentric approach that recognises the agency of non-human nature and the co-constitution of socio-natures (Cook & Swyngedouw, 2012). UPE aims to integrate the bio-chemical-physical processes with the social-cultural-economical ones into a dialectical view, using hybridization as an analogy of a process of "production of socio-nature" (Swyngedouw, 2004 p.22). One of UPE's main concerns is "the production of socio-environmental inequalities" (Swyngedouw & Cook, 2009 p.20), that is, how in the production of urban socio-natures social power benefits some while it deprives others.

Scholarship under UPE perspectives has increasingly adopted the analysis of environmental discourses to foster the understanding of the disputed arenas in which urban socio-natures are produced. In their analyses environmental discourses have been linked to the political construction of imaginaries for establishing -or contesting- neoliberalised environmental regimes, a substantial role in the subjective and political production of new urban socio-natures (Gabriel, 2014; Heynen, Perkins & Roy, 2006b). Some scholars have proposed to link the rise of those environmental discourses on nature and sustainability that emphasise ecological crisis and technological-economical fixes to a capitalist agenda that aims for a post-political moment in which a survivalist environmentalism and capitalism become the only legitimate rationality (Gabriel, 2014; Kaika & Swyngedouw, 2012; Swyngedouw, 2010).

A dialectical approach to urban metabolism

The concept of urban metabolism, an analogy of cities as organisms (Wolman, 1971), has developed under two different approaches, a functionalist one that focuses on the quantitative input and output of materials and a more dialectical analysis that links flows with power and inequality (Castan Broto, Allen & Rapoport, 2012). The former approach developed among the field of Industrial Ecology under the model of a 'ingest-digest-excrete' of matter and energy (Ayres, 1997). The methodology for knowing the metabolism is the quantitative assessment of the flows, or Material Flow Analysis (MFA), that measure flows to determine the values of consumption of resources (typically water, materials, food) and energy and waste/emission from industrial districts, cities, regions (Kennedy, Pincetl, & Bunje, 2011; Korhonen, 2004; Fischer-Kowalski & Hüttler, 1998). In this functionalist approach, sustainability is proposed both as the result of the accountability of flows and impacts (Hendriks et al., 2000), and the capacity of cities to transit from a linear metabolism where provision of resources and disposal of wastes are considered unlimited into a circular metabolism where inputs and outputs are connected and linked directly to the present and future costs, pollution and well being of the city (Girardet, 1999).

In the dialectical approach, the study of urban metabolism becomes a vehicle to understand how in the 'political dynamics of capitalist urbanization' the natural and social are hybridised, producing cities as new socio-natural assemblages (Gandy, 2004 p.374). UPE scholars criticise the 'black boxing' of the political economic drivers and socio-environmental consequences of flows under quantitative assessments of metabolism (Gandy, 2004), and rather stress the linkages between capitalism, social power and the unequal distribution of resources and impacts involved in the production of socio-material flows (Heynen, 2013; Gandy, 2002).

In the view of UPE nature becomes a constructed and disputed category, dependent both on subjective and material practices related to power and knowledge (Heynen et al., 2006). Sustainability and unsustainability disappear as naturalised categories, and in their place "urban and environmental processes that negatively affect some social group while benefiting others" remain (Swyngedouw, 2004 p.11). Dialectical approaches to urban metabolism thus also consider subjective interpretations on the relationships between material flows, networks and social relationships (Kaika, 2005; Swyngedouw, 2004).

2.5 Urban greening, urban sustainability and the enclaves

Amidst these debates on ecology, urbanisation, capitalism and environmental impacts, concepts as urban sustainability and urban greening -as well as sustainable cities and green cities- are at the core of new perspectives willing to reconcile urbanisation and environment, although conceptualised in different ways by different actors with regard to their context and interests (Satterthwaite, 1997).

Urban sustainability has been generically defined as the operationalisation of the sustainable development paradigm and the multilateral agenda in urban policies, plans and programs by the coalescence of governments, developments agencies, private sector and civil society (Pearsall & Pierce, 2010; Keivani, 2010). Urban sustainability is also proposed as a good

environmental performance of cities in chosen standards such as health and sanitation, a just distribution of environmental wellbeing, ecosystemic self-sufficiency, reduction of pollution, and progress towards a 'sustainable consumption' (Satterthwaite, 1997 p.1670). Urban greening is also being constantly redefined. More literally it may refer to the increase in the surface of vegetable coverage of an urban area, either lawn turf, trees or urban agriculture (Robbins & Sharp, 2006; Perkins, Heynen & Wilson, 2004; Girardet, 1992). Urban greening has also been conceptualised as an offer of perceived and/or measurable improvements to the city environmental qualities that affect people's behaviour and wellbeing, either through the production of aestheticized designed landscapes, the resort to socio-technological innovations or the change in the city metabolism, that is, its consumption and emission of energy, materials and waste (Bowd, McKay & Shaw, 2015; Glaeser & Kahn, 2010; Wells, 2000).

These concepts are integrated in different ways into different perspectives aiming to promote the greening of cities and improve urban sustainability. Some of the perspectives being promoted to produce green or sustainable cities have elements that can be traced back to the late 19th century proposals for Garden Cities, Garden Suburbs or Green Belts (Kargon & Molella, 2008; Hall, 2002). More often, the perspectives on urban sustainability and greening have developed over the edge of the 21th century, as New Urbanism, green urbanism, eco-cities and ecological urbanism, fostered alike by scholars, activists and practitioners. Despite their often-striking differences and crossed criticism between their promoters, these proposals usually link changes in the built environment with economic activity and ideals of social reform not deprived of utopianism (Kargon & Molella, 2008; Hall, 2002).

The 'garden city' movement emerged at the turn of the 20th century to solve the evils of the largest British and American cities and to create a new social and environmental path of urban development. At the core of this proposal was the development of new self-sufficient cities or large well serviced suburbs with what was considered a virtuous relationship of environmental

attributes (integration with a rural hinterland, large parks and house yards), social diversity (mix of income, occupations and class) and economic activity (industrial, commerce and service local jobs). Among the most iconic proposals was that of Ebenezer Howard (1902) to build new garden cities as reuniting the best of both Town and Country to relocate population from the perceived overcrowded and unbalanced city of London (Hall, 2002). By that time, Frederick Olmsted's design for the greening of the suburbs of Chicago and New York's city centre is also considered a model of the gardenification of the city (Olmsted Society 2014; Davis, 1998). These conceptions, plans and techniques set the foundations for a canon of gardenified urban design with a utopian inspiration, which was later replicated by property developers and urban planners to create the vast network of new suburbs and town that hosted an emergent middle class aiming to live in houses with yards in low density neighbourhoods, and inspired the development of new satellite and dormitory towns (Hall, 2002; War, 1992).

Eco-cities, defined as "human settlements modelled on the self-sustaining resilient structure and function of natural ecosystems" (Moore, Miller, Register & Campbell, 2014 p.1), began as the result of a proposal to reform -or rebuild- cities emphasising cultural change and the adoption of ecological urbanism, architecture and urban design (Register, 2002). Besides the influence of these proposals on the retrofitting of existing cities and districts worldwide, since the 2000s, many initiatives for building new and eco-labelled cities have been developed, often as part of economic strategies of attracting flows of capital or cluster technological poles, particularly in countries with economic surplus as the Gulf States and China (Joss, Cowley & Tomozeiu, 2013; Wong & Yuen, 2011).

New Urbanism began as the result of several initiatives for a 'smart growth' approach in the 1990s to stop urban sprawl and suburbanisation of American cities and to reinvigorate the city centres, by the proposal of urban development toolkits -the code- to guide design and planning (Duany & Talen, 2001; Burchell, Listokin & Galley, 2000). These proposals

converged in New Urbanism, a model to develop sustainable and liveable neighbourhoods that also emerged as a critique to the American suburban sprawl by architects and planners reunited in the Congress of New Urbanism (Duany, Plater-Zyberk, & Speck, 2000), who combined a vision of urban development to be achieved by the application of codes of planning and design. Some detractors to this approach have emphasised that it lays in an "individualist home ownership doctrine" (Wong & Yuen, 2011 p.5) and advocate in fact for a restoration of traditional urbanism without challenging the class homogeneity of the suburbs, lacking an ideal of justice in a city scale (Sorkin, 2009). Although widely used to refer to different perspectives on urban sustainability, sustainable urbanism has been originally defined as an approach integrating three main contributions: smart growth, new urbanism, and the movements related to green labelling and certification of buildings (Farr, 2008).

Green urbanism is defined as an integral and efficient management of urban land use patterns, transport modes, and energy/resources that first originated to contest the sprawling model of US cities, also proposed as a more systematic and ecologically conceived than the New Urbanism that spread among American architects, planners and designers (Beatley, 2000; Beatley & Manning, 1997). Environmental governance, fostering biodiversity, cultural change and the consideration to global environmental challenges has also been quoted as a fundamental part of this proposal (Beatley & Newman, 2012; Lehman, 2012). As the concept of 'green' seems to be increasingly used to sum up different aspects of urban sustainability, also green urbanism has become a generic definition used to refer to a wide range of proposals for a green or sustainable city (Beatley & Newman, 2012).

Ecological urbanism is a new and still open conceptualisation that attempts to merge urban design, ecology, and aims of global sustainability. Although diverse, scholarship on ecological urbanism can be grouped in two main categories: one that describes and develops its attributes in reconciling humanity and nature in the cities or in delivering urban sustainability, and

another one that critically describes the function of modes of ecological urbanism in the conducting of experiments on urban sustainability and the production and reproduction of environmental and social injustice. Within the first approach, one of the perspectives to consider is ecological urbanism as an expression of the integration of urban design and ecosystems into a tool for regeneration, city resilience and planning, as developed from the 1970s by authors as McHarg (1969), Spirn (1984), Hough (1984), Lyle (1996).

Also in this perspective that links city planning and nature, ecological urbanism is described as the theory and practice to integrate ecology into urban design and planning as a means to develop a sustainable city, by adding contributions from architecture, planning, design, landscape architecture, urban ecology and industrial ecology (Spirn, 2011). Cathcart 2006 p.282) considers ecological urbanism as an approach that advocates the human reconciliation with nature in a sustainable way, and is defined as the combination of sustainable architecture and a 'hypernatural' experience that results in "an environmentally responsible pattern of human settlement, which manages territorial resources, traffic flows, and infrastructural systems in a clear and visible relation to natural systems". To Mostafavi (2010) ecological urbanism is an evolution of the discourse of landscape urbanism, with ethic and aesthetic dimensions integrated in a flexible approach to retrofit and plan cities, expanded to a regional or even wider scale. In this perspective, ecological urbanism is akin to a cultural critique of modernization and environmentalism, combining both design and sustainability. To Hodson and Marvin (2010) ecological urbanism is considered as being developing in two different paths: one mainstream approach that focuses on newly-built and market and government-led developments that prioritise fragmentation, and a bottom-up or community-led approach that prioritises environmental rights and collective solutions. Considering the former, top-down perspective, eco-urbanism has been defined as a new style of urbanism "that provides the technological solutions and market frameworks to overcome what we would have conventionally understood as limits while anticipating a period of climate

change and ensuring continued reproduction under a period of resource constraint" (Hodson & Marvin, 2010a p.309).

Critical scholars researching on urban sustainability have stressed that cities are increasingly considered as strategic objects "for fulfilling the green capitalist goal of reconciling the contradictions between the environment and development that have long bedevilled capitalism" (Chang & Sheppard, 2013 p.57). Since the early 2000s scholars have argued for acknowledging the evidence that environmentalism was already exerting "a powerful influence on urban growth politics" (While, Jonas and Gibbs, 2004 p.550). Instead of conflicting, neoliberal policies and environmentalism were depicted as converging, particularly through an urban entrepreneurialism that relied on "the active remaking of urban environments and ecologies" such as former industrial areas (Ibid).

Within this market context, a green marketing is considered to have developed through labelling and certification. Generic 'ecolabels' are described as "stamp products with guarantees of sustainability, of fair trade and of worker welfare" (Eden, 2011 p.169), whilst in urban planning, building construction and property market there has been a worldwide boom of certification schemes for urban sustainability. These certifications schemes are developed to guarantee sustainability standards by setting a set of variables, indicators and parameters in the whole construction chain, from the construction materials to localisation decisions, building process and maintenance (Joss et al., 2012). In the case of houses, buildings and building compounds, the most worldwide spread market-available certification is LEED, a rating system developed by the US Green Building Council, followed by the British developed BREEAM, the Australian GREEN STAR and the Japanese CASBEE (Xiaoping, Huimin, & Qiming, 2009). Despite acknowledging their environmental benefits, critics to these certification schemes consider that they mean no real challenge to business as usual in the housing industry, and thus "capitalist development has no problem incorporating greenness as a way to increase profit", whilst

questions about collective goals on environmental change, implications and transparency remain unanswered (Cidell, 2009).

2.5.1 Urban sustainability and the greening of urban enclaves

Considering the widespread attention given to spatial fortressing, social/racial segregation and economic/policy changes in the scholarship on urban enclaves, until very recently environmentalism and the ecological transformation have not been significant themes in the urban enclaves' scholarship.

In some scholarship, descriptions of the environmental features of these developments are reported, such as localisation, closeness to nature and green facilities, particularly in studies on those urban enclaves developed in the peri-urban or rural areas. For instance, as in the case of high-income gated developments in Istanbul, these settlements have been described as built "at the fringes of the city on rural land and near the lakes and forests" (Genis, 2007 p.782). In Poland's post-socialist cities, the secessionism of the elite has been linked to the attractiveness of "green surroundings and closeness to nature" (Polanska, 2010 p.430). Sometimes, as in the case of Moscow's property market, scholars have pointed out that the environmental reputation of the urban enclaves can be "a bigger motivator than the actual quality" (Blinnikov, Shanin, Sobolev & Volkova, 2006 p.75). And in geographies where a suitable environment for green developments is not already available, developers are reported to build the degree of greenness demanded by the enclaves' market, as reported for Cairo and Dubai (Bagaeen, 2010; Mitchell, 2007a).

Only recently a political ecology of the distribution of the enclaves environmental impacts and the study of environmentalism in the making, maintain and living seem to have opened its way in the debates on urbanisation and sustainability. One of the main issues highlighted by these political ecological approaches is how the building of urban enclaves fuelled by elites' utopianism impacts on other social groups. Urban enclaves that have flourished in metropolitan Buenos Aires are proposed as private and

securitised paradises in which the garden plays a fundamental role, and for which environmental control is only a mediator to materialise an elitist utopia for the high-income groups, without considering the needs and consequences to deprived groups (Carman 2012). In Australia, urban enclaves have been conceptualized as 'planned paradises' (Gwyther, 2005), by which urban sprawl is wrapped by "idyllic discourses" that appeal to images and emotions (Smith, 2011 p.8).

Studies on the ecological impacts of the enclaves have focused on the environmental degradation caused by these developments, caused by their lack of sustainability. For instance, Davis (1998) described how the new suburban and peri-urban gated communities that spread in California's valleys and mountains, displaying a façade of green, did not necessarily meet basic standards of environmental design and ended by depleting natural resources and threatening wildlife. Among the consequences of the rise of urban enclaves in South Africa, Landman (2007 p.7) mentions "air and noise pollution […] water scarcity […] and the loss of valuable arable land". To Landman (2010) the South African enclave performance in urban sustainability not only casts a doubt on gated communities' sustainability, but it also contests its long-term viability, unless a more systemic eco-urbanism perspective is developed. In the case of Santiago de Chile, Romero and Ordenes (2004) have described the environmental impact and ecological consequences of new urban sprawl in the Andean piedmont watersheds, driven by middle and upper income groups wishing to live - some in gated communities- in a greener environment without major sustainability concerns.

Experimental eco-enclaves and ecological urbanism

Scholars advancing theorisation and research on urban sustainability have suggested that some globalised cities may be taking part in a quest to become 'autarkic' or more autonomous (Hodson & Marvin, 2010b). Through enabling new socio-technical configurations of governance and infrastructure, cities are managed to reduce their reliance on external sources and sinks, reduce their global impacts on environment and

atmosphere and adapt to climate change (Bulkeley, Castan Broto, Hodson & Marvin, 2010a). In this approach, cities are conceptualised as laboratories for experiments on sustainability by trial of new policies and reforms (Bulkeley & Castan Broto, 2013), in which ecological urbanism appears as a recurrent mode of conceiving and designing these experiments (Caprotti, 2014; Hodson & Marvin, 2010a). Bulkeley and Castan Broto (2014) have proposed the analysis of the 'making, maintaining and living' of these experiments as crucial to understand how socio-technical innovations as well as discourses and practices of ecological security are reconfiguring urban networks, urbanism and inequalities.

Critical scholarship on eco-enclaves is crucial to this research as it proposes to understand these developments as driven by a top-down ecological urbanism to answer elitist concerns on ecological resource management and capitalist search for new investment instruments (Hodson & Marvin, 2010a). The ecological urbanism applied to develop the eco-enclaves has been defined following a standardising model to be replicated in different urban scales, and 'transcendent' as it is aimed to overcome ecological constraints and limits through technological, market and design solutions (Hodson & Marvin, 2010a p.309). The rise of this ecological urbanism is seen as a response to global competition, environmental uncertainty and resource pressure displayed to achieve an ecological security, a response that seeks the functional integration and re-bundling of the infrastructure networks of the city (Hodson & Marvin, 2010a).

Ecological security, in this case "[to] guarantee ecological security for elites" has been described as a crucial function of the urban enclaves. This security is constructed through strategies combining ecological urbanism, security technologies and socio-technical reconfiguration by infrastructures and systems (Hodson & Marvin, 2010b). In this understanding, the concept of ecological security stresses the use of an ecological urbanism to overcome the ecological restrictions (and ecological crisis) creating a securitised elitist network of neighbourhoods, economic centres and consumption or recreation clusters (Hodson & Marvin, 2010a). Examples of

this ecological security can be also found scattered in the literature on urban enclaves as accounts for the enclosure of natural resources. For the case of new urban enclaves sprouting in South Africa, Landman (2007; 2006 p.6) describes a scenario of privatisation and taking over of natural resources by privileged groups, where "access to many natural amenities, for example dams, lakes, beaches, are controlled and in many cases exclusive". In another context, Zimmer (2010b) has shown how the fast rise of gated developments with golf courses in Spain led to clashes among them for the use of water.

Ecological security can be also related to Duncan and Duncan's (2001 p.401) notion of "aesthetic environmentalism", by which elites can develop politics of exclusion through their initiatives of preserving what they consider wild landscapes. This seems to apply to some urban enclaves, in which securing environmental qualities has been described as part of defensive mechanisms (Low, 2001). As Teaford (2007 p.196) states, the environmentalism of the urban enclaves' residents can be easily turned into a discriminatory mechanism, by which they discover that "a convenient wetland may be sufficient to keep unwanted neighbours at bay; a wildlife habitat can block an unwelcome habitat for humanity".

Overall, the eco-enclaves are described as a generic form of enclosed urbanisation produced by an ecological urbanism through different scales, as eco-blocks or ecologically secure gated communities to eco-towns, eco-islands, eco-cities or eco-regions (Hodson & Marvin, 2010a). Eco-enclaves are being developed under different scales and typologies, privileging the building of "entirely new 'greenfield' developments... or new standalone developments that are located adjacent to or within existing cities" (Hodson & Marvin, 2010a p.303). Based on a technological or systemic ecological urbanism, these initiatives are meant to improve the sustainability performance of the enclaves to reach specific environmental targets as well as to achieve economic goals (Joss, Tomozeiu & Cowley, 2012; Suzuki et al., 2010).

Initiatives of eco-enclaves have been labelled differently with regard to their emphases, and eco-enclaves can develop under a variety of names preceded by a green label, as ‘smart’, ‘digital’, ‘green’, ‘zero-carbon’ or ‘eco’ among others (de Jong, Joss, Schraven, Zhan & Weijnen, 2015). Eco-cities are an increasingly studied case of eco-enclaves, although there are many competing definitions of what an eco-city is, and very few of the largest standalone projects are actually in construction (Rapoport, 2014). Eco-cities would be an example of economic-environmental experiment of transition towards a ‘low carbon’ economy, in which the emphasis has been put “on the engineering of new urban environments, often along ecologically modernising and technocratic lines” (Caprotti, 2014 p.1286). As Chang and Sheppard (2013) assert for the case of the eco-cities form of eco-enclaves, their main promise is to make urban growth, both economic and in wellbeing, compatible with ecological processes. As other “utopian models for urban planning” (Rapoport, 2014 p.145) urban eco-enclaves are considered to convey ideals of social organisation (Kargon & Molella, 2008).

Although the environment is one of the top issues in the rationale of eco-enclaves projects, its appeal lies in that it is also conceived as a business in which “the problematic of industrialisation and environmental degradation can be reconciled with the imperative for sustained and rapid economic growth” (Caprotti, 2014 p.1290). With many eco-city projects developed under an entrepreneurial paradigm (Rapoport, 2014), reports depict many projects developed either as pure market or public-private partnership initiatives aimed to host high-income groups or companies (Joss et al., 2012). Scholars examining the Masdar eco-city project in the Emirates stressed the relationship between the sustainability of these eco-enclaves conceived by its urban thermal metabolism and its top down capitalist strategy of economic transition (Caprotti & Romanowicz, 2013). The ‘eco-urbanism’ of the new projects of eco-cities, as those developed in the Emirates and China, is presented as adding to their local ecological qualities the promise to serve as a model of economical, technological and governance fix to address the global ecological crisis, by an outstanding

performance in resource consumption efficiency and lowering carbon emissions (Caprotti, 2014). The link between eco-urbanism and the market, and the justification of eco-city projects through recourse to techno-socially rationalised crisis discourses is thus a crucial topic for critical analysis, and is closely linked to the deployment of ideas of crisis in justifications of green capitalism (Caprotti, 2014).

Apart from green capitalism, critical scholarship on eco-enclaves has also integrated neoliberalism as an approach to ecological challenges that omits concerns on environmental equality and resource distribution at a city scale and avoids involvement in the existing city transformation (Hodson & Marvin, 2010a). Other scholars have also emphasised the usual resort of the eco-enclave developers to commodification and place-branding by landscaping and marketization (Wu, 2010; Pow, 2009). In the market competition green branding is described as a strategy of green marketing by which green attributes of products are promoted, although this is also often considered a practice of greenwashing (Ottman, 2011).

The eco-enclaves environmental governance is considered to "incorporate neoliberal doctrines, paralleling the shift from managerialism to entrepreneurialism" (Chang & Sheppard, 2013 pp.60-61). Critics have argued that this practice of top-down experimentation often reduces cities to "an empty bounded container" to be shaped at will by those capable of transferring social and environmental costs to others (Caprotti, 2014 p.1286). Those who remain sceptic on the positive impact of ecological urbanism consider that even those most advanced cases remain "islands within the wider dynamics of capitalist urbanisation […] little more than eco-enclaves within the wider urban fabric" (Gandy, 2015 p.152). What critical analyses on ecological urbanism recognise is that although reports over the number of ecological urbanism oriented projects have increased, most of these attempts seem not to confront questions over social power and the role of capital (Gandy, 2002), and in contexts of complex technical and political challenges economic goals are considered to rise well above sustainability concerns (Cugurullo, 2013).

Beyond the predominant entrepreneurial character of the eco-enclaves, scholars have warned of the role of a top-down eco-urbanism in reproducing inequalities and leaving behind the poorer, which has already been described as those who will suffer the burden of the environmental costs of the expected environmental change (Caprotti, 2014). As Gandy (2015 p.152) asserts, the search of a "greater sustainability without equity" may be actively producing new forms of segregation as "'eco-apartheid' or 'showpiece pockets of green living'".

Some scholars assert that these new eco-enclaves could achieve a high level of self-sufficiency, by a proactive, participatory and local scaled planning to adequately address nature conservation, emission reduction, energy efficiency, renewable based energy increase, land-resource, water conservation, transport sustainability, disaster resistance and waste reduction (Ercoskun, 2008a p.76). In contrast, critical voices cast doubts on the environmental performance and degree of self-sufficiency achieved by these developments, as in most of the cases they consider that the fulfilment of their environmental promises have not been assessed (Hodson & Marvin, 2010a). Scholars have also pointed out to the limited geographical scope of the study of the enclaves' ecological urbanism, as a large portion of the experiences and their analysis has been taking place in wealthy and globalised cities in Europe, North America, the oil states in the Middle East, and China (Chang & Sheppard, 2013).

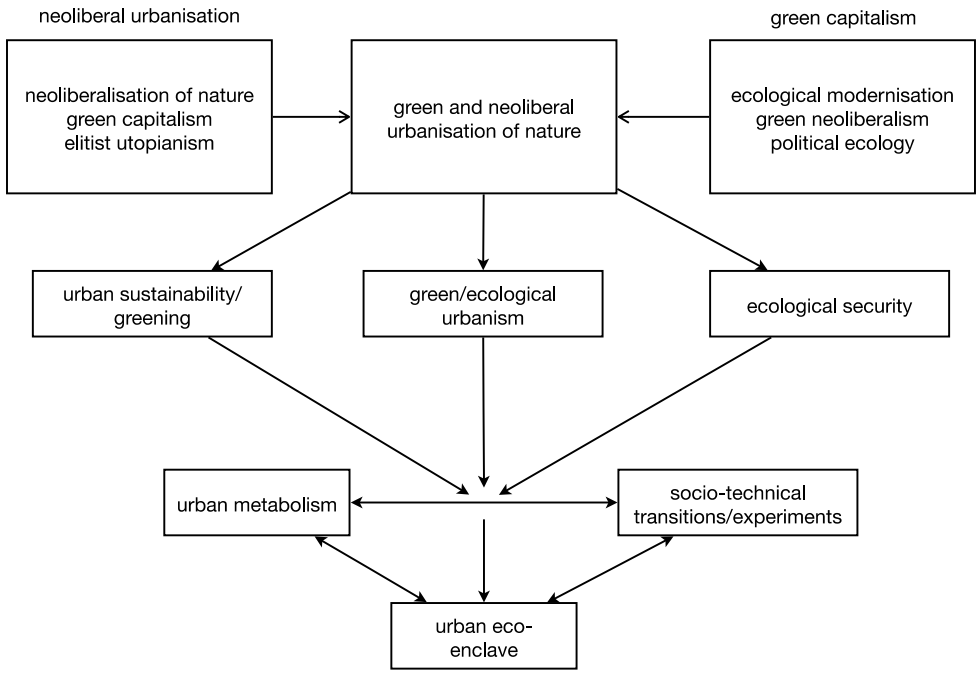

Figure 2.2 Framework of the urban enclaves greening. Source: author's own.

2.6 Chapter conclusions

Through the revision of the literature I have explored the theories underpinning my approach to the research and built a conceptual framework for the study of the greening of neoliberal urbanisation and the production of a new urban socio-nature through the development of urban enclaves in Santiago de Chile.

Urban enclaves are nowadays considered an increasingly common mode of urbanisation worldwide in metropolitan areas subjected to post-Fordist and neoliberal urban restructuring. Either associated to the survival of colonial forms of enclosure or as the striking expression of a Western-style modernisation, this fortressing of the elites in urban enclaves has been studied in a wide variety of contexts. Firmly rooted on a Marxian political economy of the restructuring of welfare/New Deal capitalism and despite the often contested character of the study of neoliberalism, a scholarship on neoliberalisation of urban policies and the city that points to the development of a 'neoliberal urbanism' operating in processes of neoliberal urbanisation has developed. Proposals for a more dynamic and context

based understanding of a variegated neoliberalism have opened the ground for studies of urban contexts in which neoliberalisation remains a strongly influential -although variegated- orientation for urbanisation, as I will argue for the case of Chicureo's urban enclaves in Santiago de Chile.

The increasing awareness of the global environmental challenges posed by the impacts of anthropic activity is considered to have permeated the ideology of modernisation of the capitalist elites and institutions, leading to new approaches to reconcile economic growth and nature. Whilst environmentalism is considered to have originated as a non-capitalist (or even anti-capitalist) critique, under the paradigm ecological modernisation and discourses of sustainable development, ongoing attempts to green capitalism are increasingly reported. The study of new neoliberal forms of governance and enclosure of nature have led to theorisation of a green neoliberalism, as a radical proposal for the greening of capitalism that shows divergences with principles of ecological modernisation. Although fruitful, debates from critical geographers on the greening of neoliberalism seem to have reproduced nature/society divides and have scarcely engaged in the study of the greening of neoliberalism in contexts of urbanisation. Whilst the weight of urbanisation as a driver of environmental transformation increases at the eyes of a wide range of actors from the academic, civil society, governments and other institutions, proposals for urban sustainability and urban greening become the centre of a debate on the limits and possibilities of urbanism and urban planning contributing to tackle environmental, social and economic problems.

Considering the proliferation of studies approaching the urban enclaves socio-spatial and socio-economic dimensions, the relationship between urban enclaves and their environment has been a much less studied issue. Some recent attempts have been made towards a political ecology of the unequal distribution of the impacts of the urban enclaves and some scholars have broadly related the environmental attributes of the urban enclaves to the utopianism of this elitist and exclusionary urban model. More significantly, under the rise of debates on green capitalism critical analyses

on urbanisation have conceptualised as eco-enclaves the growing number of urban enclaves -in the Global North and its globalised hubs- driven by a top-down (entrepreneurial and often experimental) ecological urbanism that promises to reconcile economic growth -for investors and governments- ecological security -for residents and consumers- and environmental benefits for the planet. Whilst neoliberal policies and market actors are not absent in those studies, a gap remains on how these premium eco-friendly developments relate to a green neoliberalism, and what is happening to them in the context of the urbanisation of the Global South.

At the same time, although critical scholarship on eco-enclaves highlights how these developments claim improvements in self-sufficiency and a more circular metabolism, a specific examination of how the socio-material flows of the eco-enclaves are producing environmental change remains unexplored. To engage with this issue demands to unfold Urban Political Ecology contributions to the study of the urbanisation of nature as a process of hybridisation of material-biophysical and social-subjective flows that produces cities as new socio-natural assemblages. With a dialectical approach to urban metabolism, UPE stresses the need to take into account the context of capitalism and power struggles by which those metabolic flows involved in the socio-natural production of the city are driving urbanisation and environmental inequality.

In synthesis, my research aims to fill some as of the yet unexplored gaps in the knowledge of how the reconfiguration of socio-natural flows from the urbanisation by urban enclaves driven in contexts of neoliberal urbanisation and greening of neoliberalism -in this case Chicureo in metropolitan Santiago de Chile- is producing a new socio-nature of greenness and environmental inequality.

Chapter 3

Methodology

3.1 Introduction: aim and challenges

The study of a socio-natural production of green enclaves, made of policies, representations and materiality, requires a multi-method approach. Section 3.2 justifies the choice for developing the research from a constructivist perspective, within an interpretative paradigm. To approach the complexity of the production of an urban socio-nature I decided to delimitate geographically and historically a phenomenon by a case study methodology, and approach it from different angles, combining several modes of data collection and analysis. Section 3.3 justifies the research design and describes the main research methods displayed to gather the data from primary and secondary sources, linking them with the research questions and specific objectives and, when required, presenting the study populations and sampling. This section also presents how the data collection was organised, and what analyses were established to overcome the fragmentation of the data and develop an integrated understanding of the phenomenon. Section 3.4 explains how the methodology fulfills the ethical guidelines, developing a reflection on my own social and political positioning in the process of research. The limitations and challenges of this research are debated in Section 3.5, and a final section (3.6) concludes on the implications of the methodology for the research.

3.2 Epistemological stance

I have grounded my research on constructivism, an ontological approach that considers reality not as a given realm apprehensible by an objective researcher, but a social construction in which knowledge is constantly remade by competing visions (Guba & Lincoln, 1994). The aim of constructivism is the understanding of social reality through the reconstruction of experiences, perceptions and actions (Ibid). For the constructivist epistemology, the object of study is not pure data or facts but rather the knowledge derived from the subjects' perception -often a competing perception- of the world of experience, including social and natural experience. Although authors as Bryman (2008) consider constructivism as part of an Interpretative paradigm, and not a paradigm itself, the fundamental nature of this approach remains the same. According

to Flick (2002), research under constructivism involves the reconstruction of experiences of everyday life and subjective construction of knowledge by interacting subjects, and the interpretation of more or less codified constructions, or data, by social scientists.

In this research, the knowledge about the greening of neoliberalism in the urbanisation by green enclaves is not obtained directly by the capture of data that simply *mirrors* an objective reality beyond social interpretation. In other words, the knowledge of phenomena, the data gathering and the data themselves contrive a whole that contributes to interpret the way subjects interact, perceive and conceive reality, and develop a narrative of it. I take green and sustainability as social constructions, such as discourse, policies or experiences, and not as realities independent from those who refer to them.

In my approach to the study of Chicureo's socio-nature I rely on a dialectical perspective of constructivism, tributary from contributions on the interpretation of human society as produced by a metabolism of humans and nature, and therefore socio-naturally constructed. Following critical geographers as Neil Smith, Noel Castree and Eric Swyngedouw, I consider that not only the knowledge about the 'social' and 'natural' reality is constructed, but also that both are in such way intertwined that nature itself "is intrinsically social" (Castree 2008 p.5). In particular, Urban Political Ecology, the main theoretical approach for this research, influenced by Karl Marx, Donna Haraway and Bruno Latour, considers human reality, and human beings themselves, as a socio-natural assemblage of materiality and subjectivity (Heynen et al., 2006a). In this sense, my approach to constructivism highlights the interaction of both material and subjective realms in the production of the reality subjected to research, which is assumed here not to be external to the subjects that produce, live, and know it. I consider that the construction of socio-natural assemblages by the urbanisation of nature in Chicureo and the knowledge about it are inextricably related, and my research program attempts to capture the socio-natural nexus of materiality and subjectivity.

3.3 Research design and methods

Although scholars developing Urban Political Ecology have not proposed a uniform and replicable methodology to study the urbanisation of nature, I have critically assembled some of the methodological choices displayed in by UPE scholarship on the socio-natural production of cities.

Following contributions from Bulkeley and Castan Broto (2012) I have chosen to focus on the production of the socio-nature by the urbanisation of Chicureo by green enclaves as a process that involves the making, maintaining and living. That is, a focus that involves the study of the political and policy origins, the knowledge of the socio-technical functional schemes by which the networks of flows are operated, and the representations of everyday life practices and subjectivities. I have approached urban metabolism using a principle established by Industrial Ecology, which is adopted -and to some extent subverted- by Urban Political Ecology, in following the flows of materials and resources. My selection of flows for this study -water, land, stone and waste- has both followed UPE scholarship in analysis of urban metabolism as well as an ad hoc reflection on the specific characteristics of the case study. A justification of this selection -and the absences- is presented in Chapter 6 on the role of material flows in the socio-natural production of Chicureo.

Although quantitative data on the flows is also considered as a valid source of information, the study also gathers qualitative data to politicise the analysis of circulation of material flows involved in the urbanisation of Chicureo, and its socio-ecological impacts. One main source of politicisation of the study of the flows in UPE comes from the analysis of the historical and socio-political background of the urbanisation of nature, and how these flows relate to power. My research also follows this source by taking into account the wider political context of transition between the dictatorial and the post-dictatorial period and the tensions between continuity, dismantling and projection of the dictatorial neoliberal framework. The impact of flows of capital and processes of

neoliberalisation of urban policies, which has been stressed in most of the UPE scholarship, is crucial to my research as I associate it to the study of the environmental discourses related to the claims of sustainability and urban greening. Taking into account this input I have developed a research design based on a case study -a new urban district in the making in Santiago's countryside- to approach the linkage between the urban metabolism of green enclaves and the greening of neoliberal urbanism.

To bring to light the complexity of historical context, urbanisation and subjectivities I have chosen a strategy of triangulation of methods (Flick, 2004). Based mostly on qualitative methods, this triangulation aims to produce a novel understanding of the urbanisation of Chicureo by reconstructing the process from different perspectives, not to validate a specific quantitative result. The main research methods developed to gather the data were semi-structured interviews, survey, transect walks, and documentary analysis, by which I intend to approach the history, narratives and materiality of the Chicureo enclaves.

Research questions

While in quantitative studies research questions organise variables that lead to the formulation of a hypothesis by which a theory is tested (Bryman, 2008), in qualitative research questions are most likely understood as a 'door' to the research by which processes are understood and narratives produced (Flick, 2002). Thus, instead of hypothesis I take the research questions as the guiding lines for the organisations of the methods. Table 3.1 depicts how methods were combined to address questions about the urbanisation of Chicureo and the role of neoliberal greening; to explore the greenness of the green enclaves' urbanism and its representation in the discourses of different actors; and to understand what new urban socio-nature is produced by this process of enclave development in Chicureo.

Table 3.1 Methods per specific objective. Source: author's own.

Research questions	Specific objectives	Methods	Sources
1. How is the making of the green enclaves' planning linked to greening of neoliberal urbanism in Santiago de Chile? Chapter 4	1. Analyse the reforms to Santiago's planning policies in the political transition and the changes they meant to the previous (dictatorial) planning framework.	Literature review	Academic literature
	1.1 Explain the role of discourses of urban sustainability urban greening in the disputes for planning policies.	Discourse analysis	Semi-structured interviews
	1.2 Examine the impact of the greening of neoliberal urbanism in the urbanisation by green urban enclaves in Chicureo.	Documentary analysis	Official documents
2. What is the role of market-led greening in the making of the green enclaves in Chicureo? Chapter 5	2. Scrutinise the effects of the greening of the market strategies in the development of the urban enclaves.	Discourse analysis Visual data analysis	Magazine advertisements
	2.1 Examine how greenness and elitism are articulated in the marketing of the urban enclaves.	Documentary analysis	Project files
	2.2 Examine how greenness and neoliberalism are assembled in the urbanism of the urban enclaves.	Field report	Transect walks
3. How are the metabolic flows of the green urban enclaves assembling environmental transformation and environmental inequality in the production of a new socio-nature in Chicureo? Chapter 6	3. Explain the role of the green enclaves' urban metabolism of water, waste, and stone in producing a new urban socio-nature in Chicureo.	Discourse analysis Semi-structured interviews	
	3.1 Examine the link between urban metabolism and production of environmental inequality.	Documentary analysis	Project files Press Online media
	3.2 Identify how the reconfiguration of metabolic flows is triggering environmental conflicts.	Field report	Transect walks
4. What are the main environmental discourses produced by the actors making, maintaining and living the green enclaves? Chapter 7	4. Identify and analyse the main environmental discourses of the actors involved in the production of the green urban enclaves.	Discourse analysis	Semi-structured interviews
	4.1 Examine the links between actors' discourses and social position.		

These methods were deployed in several phases of research, from the project development and upgrade to the writing of the dissertation. A detailed description of the steps can be found in Appendix 3. The fieldwork lasted four months and involved two field trips to Chile, from late November 2012 to early May 2013, with a five week break in January/February. After the fieldwork I kept gathering some secondary data and updating some contextual information. Additionally, I took advantage of a family trip to Chile in December 2014 to visit some of the enclaves in Chicureo and gather more photos of previously visited sites. Considering the diversity of methods, the phase of data processing and early analysis turned to be a complex and long phase, which involved transcription of text and data and processing it in the proper format for analysis, learning software and analysis tools and beginning to explore the data with analytical purposes. Although some parts of the analysis began right after the data processing, as the survey results and parts of the advertisement analysis, other parts were developed along with the writing, as the discourse analysis.

3.3.1 Case study

The choice of the case study in Santiago de Chile combined three main reasons, which altogether presented a good opportunity to delve on the link between neoliberal policies, urbanisation, eco-enclaves formation and socio-natural transformation. Firstly, it involved the city where one of the first experiments with neoliberalisation in the late 20th century originated, paradoxically one in which its neoliberal urbanisation has not been studied enough. Secondly, the new districts of Chicureo were of relatively recent development -still ongoing- developed by specific ad hoc policies in an area of the metropolitan countryside isolated from the city core, so it was to some extent easier to detach from other urban phenomena and policies. And thirdly, in these districts there was preliminary evidence of the formation of very large enclaves for the elites, where episodes of social discrimination had recently been reported, and where property marketing was increasingly claiming a distinctive greenness.

The selection of the case study in this research is linked to the definition of the unit of analysis, as I explain below. The literature indicates that private condominiums and residential enclaves for affluent owners have been sprouting all around Santiago countryside and peri-urban area since the late 1980s and 1990s, accelerating their development since the 2000s (Hidalgo et al., 2005). Today, several forms of residential enclaves can be found either in Santiago's Andean piedmont or in the fringe of the Valley's agricultural areas, from small and middle size condominiums for affluent house owners originated from rural allotments; very large projects suburban condominiums for middle income groups developed by large property developers, originated by changes in urbanisation policies; or small suburban private condominiums for upper income groups. Although other areas of private developments in several metropolitan boroughs could have been selected to study the process of greening of the residential enclaves of the affluent and the environmental transformation they drive, only Chicureo, in the borough of Colina, uniquely combined a set of crucial characteristics. Scale first of all, the largest concentration of both condominiums derived from rural allotments and very large condominiums built by large property developers companies; elitism, the largest concentration of residential areas for upper middle and high income outside the traditional wealthy urban districts of Santiago; policy innovation, that is, this borough was subjected to an effective experimental urban growth policy, the 1997 Plan Chacabuco that boosted the development of large enclaves by large property developers; and greenness, as both the policy innovation and the niche characteristics of these developments have explicitly emphasised in their marketing campaigns a distinctive green, sustainable or ecological character in these developments. Additionally, Chicureo provides other relevant characteristics for the study: private premium infrastructure for mobility and basic services; an ongoing demographic increase by metropolitan migration; and the existence of social and environmental conflicts related to the enclave urbanisation.

Unit of analysis

The main unit of analysis of the research are the large and elitist green labelled residential enclaves developing in Chicureo. Thus, although either data about individual enclaves or about Chicureo as a sector may also be present, the focus of the research is put on a cluster of enclaves, its development and impact.

The fact that Chicureo seemed to have a high number and diversity of enclaves was a plus, but it forced me to define a selection strategy. Instead of defining a sample of enclaves by strata or clusters, in which all the enclaves would be represented, I considered characteristics of scale, origins and elitism to be more relevant in order to understand the development of the area. The selection of the enclaves was made following the criteria of: policy origin (all the enclaves originated by the Plan Chacabuco of conditioned development were selected); scale (plot size and number of units projected), exclusivism (estimated in base of house prices or presence of elitist infrastructure -such as country club or sport clubs' facilities); and greenness (preliminarily defined as the presence or not of green attributes in a first explorative review of the projects). Occasionally, when secondary data are available and for comparison purposes only, data about other enclaves in Chicureo are integrated into the analysis. Although the characteristics of these enclaves are described and discussed in detail in the following chapters, the next table (3.2) presents the criteria of selection for the cluster of enclaves to be analysed:

Table 3.2 Urban enclaves under scope in Chicureo. Source: author's own.

Project name	Origin	Scale	Exclusivism source	Greenness in preview
Pan de Azúcar	Plan Chacabuco	+300 ha	Property and house prices/Clubs' facilities	Yes
Ciudad Chicureo	Plan Chacabuco	+300 ha	Property and house prices/Clubs' facilities	Yes
Chamisero	Plan Chacabuco	+300 ha	Property and house prices/Clubs' facilities	No
Santa Elena	Plan Chacabuco	+300 ha	Property and house prices/Clubs' facilities	Yes
Santa Filomena	Plan Chacabuco	+300 ha	n/a	n/a
Las Brisas de Chicureo	Rural allotment subdivisions	+300 ha	Property and house prices/Clubs' facilities	Yes
Hacienda Chicureo	Rural allotment subdivisions	+300 ha	Property and house prices/Clubs' facilities	Yes

The specific time scope of the research ranges from 1997, when the Plan Chacabuco for the conditioned urbanisation of Santiago countryside was enacted, to 2014, when I ended the collection of data. Nevertheless, the contextual analysis of the enclave development in Chicureo involves several time layers, including references to the hacienda system in the Spanish colonial period, the neoliberal reforms of the military dictatorship, and the new policies of the post Pinochet governments.

Although promising, this choice of case study clearly involves challenges and limitations. The number of enclaves, the scale and the time span of the study all increase the complexity of the phenomenon and the dimensions to be covered by the research, demanding continuous revisions to keep the coherence of the study and consuming resources, time and energy. Although I weighed the alternative of dismissing the historical dimension of development of the enclaves, including the innovative urban policies that boosted the large market-led enclaves, and focusing only on the present day characteristics of the enclaves, I am certain that, although simpler, it would have meant losing the dynamics of the process of greening and therefore weaken my understanding of how the socio-nature is produced.

3.3.2 Semi-structured interviews

The semi-structured interviews were the most relevant methods of data collection to approach the information, representations and experience of those who plan, develop, inhabit and contest the garden enclaves. The interviews aimed to capture the agents' narratives about the enclave development and the actors involved; to get an insight in their subjectivities and perception of everyday life experience; to obtain the agents' environmental discourses about the enclave ecology and metabolism; and to gather insight on the agents' perceptions of being political subjects.

The interviews were directed to selected key informants, defined as those who have a specific type of knowledge about the phenomena being researched, through their role in the production, reproduction or contestation of the enclaves.

Study population and sampling

I defined the study population as those active actors of the enclave production and development from the state, the private sector, and the civil society. The selection of specific groups from these three social categories considered those who conceived and planned, approved, designed, built, studied, lived and contested the eco-enclaves. There are of course many other groups that arguably take part in the making, maintaining and living the enclaves. Beyond obvious limitations of time and resources, the justification for prioritising on selecting interviewees among these groups of agents is that apart from their own role in the enclave production, they were also consistently present in my literature review and public debate (as I found in my preliminary review of the press).

Although I considered many subcategories of actors I finally grouped them to produce a sampling framework of seven broad categories described below (Table 3.3): private developers; consultants; state officials; scholars; activists, residents; and workers. The list of subcategories, institutional

affiliation (or membership) of the interviewees, gender and sampling size can be found in Appendix 4.

Table 3.3 Interviewee actors' per category. Source: author's own.

Actor	Definition
Developers	Owners, managers and sales agents of property development companies. Representatives of developers association.
Consultants	Professionals and practitioners as architects, landscape architects, urbanists, lawyers, and any other profession involved in Santiago's enclave projects planning, design, and development. Staff belonging to think tanks of the construction industry in Santiago.
National/regional/local government	Professional or directive staff from ministerial offices, regional government and municipal level departments involved in the Chicureo enclave planning, approval, governance or management.
Scholars	University based academics involved in the enclave research and debate.
Activists	Members of ecologist and urban social justice organizations involved in conflicts with Santiago's urban enclave development. Residents and workers of the enclaves' hinterland participating in community organizations and associations.
Residents	People currently inhabiting a house in a Chicureo enclave, without distinction between owners or tenants.
Workers	Manual workers. Employees or contractors of firms operating in the enclaves or enclave residents

To overcome the high heterogeneity of the groups and possible restrictions I developed a purposive or non-probabilistic sampling (Bryman, 2008) directed to represent as many of the case's facets as possible (Merkens, 2004). Following these principles I set four criteria for the sampling:

i) Represent all the defined groups of enclave agents;
ii) Maximise the variety of the sample members, getting interviewees from different categories, roles, and gender (i.e. interviewees from developers from different companies; as well as interviewees with different social roles and positions, as directives or employees, workers, students or housewives, female and male).
iii) Balance a sample number large enough to obtain enough data density and diversity for the analysis and at the same time feasible and manageable.
iv) Flexibility to select new interviewees during the fieldwork.

Within this general purposive method, I developed different sampling strategies in accordance to each group characteristic and availability. These sampling strategies can be described as personal (when a specific individual is targeted by his or her relevance); institutional (any individual playing a specific role in an institution or organization can be sampled); opportunistic snowballing (names of potential interviewees within an institution or enclave are gathered from other contacts or interviewees) and random (any person playing a specific role in a selected institution or enclave can be selected).

Throughout the development of the interviews I noticed that some of the interviewees could be classified, for the purposes of my research, in more than one social identity, as in the case of consultants that were also scholars, or scholars that had been state officials. In those cases I classified them in my data base by the first identity, that is the one for which they were firstly selected, registering their second one in another field, a knowledge that became useful to understand the links between the actors of the enclaves, as I develop in chapter 7.

Interview contents

About the questions and contents of the interviews, no questionnaire was made but a guide for the interviews was tailored based on the research questions and the preliminary revision of secondary information. As the interviews and my knowledge of the field progressed, I sought particular emphasis in each group and type of informants. Interviews had greater variation than I expected, in length, depth, and specific subjects that were dealt with. Respecting the interviewees` emphasis, an effort was made to consider a common core of themes for all group members in the above listed themes. The description of the themes is displayed below (Table 3.4), and the questions that guided the interview of each category can be found in Appendix 14.

Table 3.4 Thematic guide for interviews and analysis. Source: author's own.

Categories	Macro themes
- Urbanisation policies and processes - Urbanism and design - Sustainability policies - Environmental discourses - Ecology - Urban metabolism - Social identities - Socio-environmental conflicts	- Urbanisation policies in Santiago - Land, planning and housing policies in Chicureo - Santiago's urban sustainability policies and situation - Santiago growth, splintering and sprawl - Enclosure and commodification - Public and private convergence and divergence - Perception of the enclaves' impacts - Perception of the enclaves' greenness - Perception of own consciousness - Neoliberal urban reforms - Role of market, state and civil society in the greening of the enclaves - Life experience in the enclaves - Environmental management of the enclaves - Environmental discourses - Enclaves' planning, design, urbanism, architecture, landscaping - Urbanisation of Chicureo and enclave development - Role of actors and conflicts - Recent or current conflicts, coalitions and strategies - Governance of Chicureo enclaves and the Colina borough - Ecology of Chicureo and hinterland - Urban metabolism and flows in Chicureo

Although most of the questions I asked were contained in these themes, new themes were also raised by the interviewees during the interviews, and once in the analysis phase, the number and organization of the themes did not remain the same.

Data collection

The interviews were conducted in two periods of fieldwork, developed in Santiago de Chile, the first from November 2012 to February 2013, the second from March to May 2013. In total, I conducted 57 interviews, except

4 from a specific condominium[3]. Also in four cases there was more than one interviewee actively participating in the session, and they are counted as interviewed. In total, I had 62 individuals interviewed in 57 interviews.

Table 3.5 Interviews facts. Source: author's own.

Contacted	Interviewed	Interviews	Place of interview			Site of interview	
			Chicureo	Colina town	Santiago	Workplace	Home
130	62	57	19	3	35	37	20

In accordance with each sampling strategy, an email, webpage, telephone or face-to-face contact was established with the selected potential interviewees. It must be stated that two groups were particularly hard to contact, developers and workers. Many developers simply did not answer my e-mails, telephone calls and messages, or just refused to be interviewed. In the case of workers, it was even harder; as I had to explore several strategies to reach and contact potential interviewees, from leaving leaflets at the bus stops, search for recommendations, to direct approach. It was extremely difficult to contact workers, and most of those contacted straightforward refused any possibility of being interviewed, which limited my final sample of this group. Once I was processing the data and started the analysis some categories revealed problematic, as I found that some interviewed actors belonged to more than one category. For reasons both of data organization and the sake of the analysis I finally merged local, regional and national state officials in one category, State officials; by their role in contesting the enclaves I included Community and organization members in the category of Activists; and by their role as providers of services I included interviewees originally grouped as Think tanks members as part of Consultants (Table 3.6).

[3] This was a strategy to interview residents of a very small *parcela* enclave condominium. In the course of an interview, a resident from this *parcela* manifested her willingness to contribute with the research, and so I trained her to conduct some interviews to people of her condominium. I agreed to pay for her work as research assistant, also as a way to exert more control over the interview process. After each interview I demanded a report and her preparations for the next interview.

Table 3.6 Population study sample final categories. Source: author's own.

Category	Sample
Developers	5
Consultants	12
State officials	11
Scholars	6
Activists	7
Residents	19
Workers	2

Data processing and analysis

The transcription of the interviews was time and resource consuming, even if for about half of them I relied on a paid transcription service, which did not exempt me from doing a final edition of all the interview transcriptions. Once transcribed, the text of the interviews[4] was coded through the use of the NVivo software for qualitative data analysis (versions 7 and 10). My aim was to develop a discourse analysis through NVivo, but I ended by developing an analysis with the help of NVivo as an organiser and searcher. Although I did run analysis of the categories emerging from the coding of the text, and used them to develop basic forms of content analysis, for the discourse analyses I relied on my own interpretation of linkages among what I selected as significant chunks of text, the broader narrative of the interviewee, and the wider context about the interviewed agents on the interviewee.

Regarding the discourse analysis, along with looking for more Foucauldian representations of power, desire, fear, ideal models and control mechanisms, I tried to pay attention to the discourse audience; to the categories of context, practices, attitudes and experiences; to identify the persuasive discursive structures that unify and signify the discourses; and to take note of inconsistencies and silences (Waitt, 2010).

[4] I left the text body in Spanish and only translated those text extracts to be quoted in the dissertation. All the codes were named in English. All the quotes from the interviews in this dissertation are my translation.

With respect to the use of NVivo, I took coding as the process that allows finding both the manifest and latent meanings over a text (Dunn, 2010), which is segmented into "categorizing and qualifying data" for its interpretation (Cope 2010 p.284) and involves two main levels of codes: the descriptive and the analytical levels (Waitt, 2010). Among the process of coding I organised the codes into clusters by characteristics and relational variables, to facilitate the capture of the connections between themes, in a reflexive process of iterative reviewing of data and re-coding (Cope, 2010). My strategy was to use a sequence of coding procedures as defined by content analysis and discourse analysis. I first used an open coding to transform the data into concepts, but the results weren't satisfactory and I ended with a too fragmented and unrelated bulk of 3,737 codes, a mistake in the selection of the coding procedure, possibly more suitable for grounded theory as I realised too late. After struggling with methodologies that in my perspective focused on a too narrow, formalist, microanalysis, I shifted to a constructionist discourse thematic analysis, a more flexible and accessible method (Braun & Clarke, 2006).

Finding regularities and patterns of association between the codes allowed a much clearer and more meaningful categorisation of the interviews (Bazeley, 2007). Within this analysis I first developed 290 basic nodes organised by themes (Appendix 5), then grouping codes in trees and sets and conducting queries and relationship maps to analyse interviews more specifically, as I developed in the following chapters. As previously stated, I avoided to develop grounded theory from interpreting the coded patterns and rather tried -with different degrees of success- to use the text to develop a narrative of the process of urbanisation, the social position of the actors and their actions, and their representations and subjectivities about their environment and their own role in it.

I additionally performed some quantitative content analysis, understood as a research technique for the "quantitative description of the manifest content of communication" (Berelson 1995 cited in Bryman, 2008 p.274), to inform the frequency and distribution of some themes, concepts or keywords,

among the different categories of interviewees, as in the case of those concepts related to greenness as developed in Chapter 7. In those cases I made an effort to contrast the results with a qualitative analysis of the content context to enrich the analysis.

3.3.3 Online survey

The online survey emerged in the development of the fieldwork, as a way to complement the information about the enclave residents at a moment when I was facing difficulties to increase the number of interviews of enclave residents. Although later I overcame the difficulties I decided not to discard the survey results, and integrate the data to the analysis as a way to enhance the description of the residents' everyday life and subjectivity.

While the online survey offers clear advantages in reduced cost and speed, it presents several limitations in its representativeness. To reduce the uncertainty and increase the validity of the tool some safeguards were set as: contract a paid service with a well-reputed provider (Survey Monkey); allow only one answer per computer in the settings of the survey; set a one month term limit to gather all the possible answers; and diffuse the survey by mail to my contacts on the enclaves in the first two weeks of the survey.

The survey developed questions on: demographics, subjectivity and behaviour topics. A copy of all the questions can be found in Appendix 6, although the following table (3.7) describes the survey's main topics.

Table 3.7 Survey topics. Source: author's own.

Question category	Topic
Demographics	Age
	Sex
	Occupation
	Sector of residence
	Housing type
	Time living in
	Previous location
Subjectivity	Motivation
	Recycling perception
	Willing to pay
	Environmental valuation
	Environmental problems
	Environmental solutions
	Environmental responsibility
	Social groups
	Ecological citizenship
Behaviour	Mobility modes
	Mobility destiny
	Recycling
	Water energy consumption
	Food goods consumption

Data collection

The survey was launched during my second fieldwork, starting April15th and ending on May 15th. The number of people surveyed is 57. Most of the answers (52) were obtained between the 22th and the 27th of April (within the period of active contact to enclave resident by email), and only a few (5) between April 28th and May 15th.

Analysis

Considering the sampling limitations of this survey, no statistical representative value of the results regarding a defined population is expected. Once results were gathered and downloaded from the survey's webpage I processed the data in a spreadsheet to procure a more homogeneous sample, discarding 8 cases where the respondents manifested not to live in an enclave developed under the Plan Chacabuco policies. The

results were presented in the form of statistical percentages, and used in combination with the results of the semi-structured interviews to enrich the analysis of the residents' everyday life, their subjectivity, as well as a valid approach to some characteristics of the enclaves' urban metabolism.

3.3.4 Field observation and transect walks

By field observation I mean the exploration of the enclaves and its hinterland in the borough of Colina. This observation was developed in trips to the field to better understand the physical and human geography of the area where the enclaves are developing. Some of these trips involved a visit to an institution or organization to request information or make contact with a potential interviewee.

In the case of the enclaves, to register the social and spatial interaction of its residents I originally prepared an ethnographic non-participant observation to be conducted inside selected enclaves, by standing within the enclave and taking notes. However, my attempts to collect data through this method in my first fieldwork failed due to access issues, time, and social disruption, meaning basically that I either could not access some key points or that I wasn't even be able to stand there the time needed to perform the observation as planned. In fact, I became a factor of disruption of the people's behaviour, as standing long periods taking notes attracted the attention of both residents and security guards.

My research conditions within the urban enclaves were constrained by access restrictions to the developments. Besides the interviews to residents, when I could enter enclaves, condominiums and the houses, my access was often limited to common, service and commercial areas, main roads and in-construction condominiums. Instead of completely abandoning the idea of a non-participant observation inside the enclaves I decided to experiment with another, more flexible, method, the transect.

Transect walks is a method used widely in natural sciences, particularly in ecological studies to survey a population and describe a bio-geographical

area (Krebs, 1999). Its basic principle is to draw a line and perform research walks through it, mapping the sections' variations. It has also been adopted in the analysis of urban planning and design (Duany & Talen, 2002). In this latter form it has been called urban transect, and it lays the transition between different typologies of urbanisation and land uses in a rural-urban continuum on a map (ibid).

In my adaptation of the transect walks I registered what I surveyed regarding the presence or absence of green attributes found in the marketing analysis, particularly focusing on the green areas, parks and main roads. The transect walks cannot be considered as a representative sample of all the existent -hidden or apparent- devices, technologies, design or features that I could possible interpret as an indicator of green urbanism. Following Denzin and Lincoln (2003) reflections on qualitative fieldwork based on observational methods the transect is both an experience and data collecting method, which bears with my own subjectivity -made of my previous preconception and the in situ interactions- all the decisions of making a note or taking a picture. The data from the transects are thus a cut through the reality of the enclaves that was constructed by my own spatial and temporal experience there, reconstructed and reprocessed in the analysis. As I realised later, my own initial concerns of not being 'invisible' enough or not enough non-participant could have been processed in a different way from the beginning, as I experimented by integrating my own subjectivity to the analysis of the observation notes.

Along the transect walks I also took photos looking to capture samples of the presence or absence of green attributes as well as those striking examples of environmental transformation. These data were at the same time produced and crafted by a particular visual perspective that reflects my own identity in the field as a researcher (Flick, 2002 p.150). The photos are analysed as part of my experience in the field, expanding my observational skills to help me develop visual narratives. Following Harper (2003) I consider these images as the social construction of my own experience searching the 'eco' of the enclaves -or its absence- and therefore they are

not aimed to reflect the reality of the eco-enclaves as external to my researcher-pedestrian's eyes, nor to find the hidden behind the apparent, but rather to figure out what the apparent normality of the enclaves reveals. The photos are scrutinised through a content analysis of the green/non green content of the elements in them.

My aims with this methodology were to first-hand register the green urbanism of the enclaves to contrast with data from secondary sources, observe the interaction of people in common areas, and attempt to develop schematic maps of the land use and green areas in the enclaves and hinterland, all of which I used later to endow the case study analysis.

Data collection

The field observations in Chicureo and the borough of Colina were conducted in 19 days, 4 in my first fieldwork period, 14 in the second, and 1 in 2014. All of the selected enclaves were visited at least once, except one that I could never access. The transects were developed by walking through main roads, common areas and green areas, although exceptionally some long sections in between condominiums had to be driven through. Interviews booked in the enclaves were the best opportunities to visit most of the enclaves' interiors, but some visits were also conducted without interviews in those few enclaves that had some open common areas. Pictures were not allowed inside the inner condominiums or in front of the houses. Using a digital portable camera I took hundreds of photos from the motorways, enclave entrances points, main roads, commercial and common areas, and green areas and parks. A map of the transect walks is presented in the analysis in Chapter 5, and a detailed list of the places is on the Appendix 7.

Table 3.8 Visits for field observation. Source: author's own.

Place	Visits	Outcome
Chicureo enclaves	36	Transect walks maps, field notes, photos
Chicureo avenue	7	Transect walks maps, photos
Chicureo hinterland/surroundings	36	Photos
Colina Town	6	Photos
Colina periphery	3	Photos
Colina river	3	Photos
Local roads	6	Photos
Motorways	24	Photos
Pan de Azúcar Hill	3	Photos
TOTAL	115	4 Transect walks +400 photos Field notes

Analysis

Part of my transect experience was registered into the field notes. The longest notes were analysed as a primary source of events, to describe the enclaves' urbanism and social dynamic while the content of the shortest notes was used to guide my own research process, highlighting questions, areas for further enquiries and insights. In the notes I also registered the green attributes of the sections visited, which was a useful point of reference in the analysis of the attributes displayed by other sources. The analysis of these registered green attributes also allowed me to examine those green or sustainable technologies not reported by other sources. From the sketches made in the transect fieldnotes I developed maps of flows and activities in the Ciudad Chicureo enclave.

As the photos allowed to be re-interpreted through the research process, I re-examined them several times to focus on different themes, using these data mainly to supplement the data base on the enclave urbanism and to illustrate specific descriptions of features or phenomena.

3.3.5 Documentary analysis

Analysis of documents also plays a relevant role in the research, not only in setting the context of the case study but also illuminating specific issues on

the production of the enclave greenness in Chicureo. I have developed the documentary analysis to fulfil three main objectives: contribute to contextualise the enclave planning process, development stages and actors; enrich the description of the enclave urbanism, environment and ecology; and expand the sources and description of conflicts involving the enclave development.

Documents are standardised artefacts that occur in different formats of personal, private and public sources, and allow both quantitative and qualitative analyses (Wolff, 2004). In this research the documentary analysis consists on the data gathering, organization and analysis of public documents of different formats and sources, mainly official documents; media; advertisement and websites.

The qualitative documentary analysis, which combines coding and discourse analysis, content analysis and visual analysis, was conceived to bring specific and accurate data about the enclave projects environmental assessment process, the enclaves' urbanisation characteristics, and the enclaves' environmental impacts.

3.3.5.1 Public official documents

The files of the environmental assessments[5] of the urban enclaves -either received from state officials or downloaded from public sources of the Chilean environmental assessment agency- were among the most relevant sources of data about the projects. Although each project could include or not some of the below items (Appendix 8), many included important data to characterise the projects of urban enclaves and contrast with other sources of data. Some of the most relevant information found in these files features:

- Developers identity
- Localisation
- Scale

[5]In most cases, these documents were the Resolution of Environmental Qualification (RCA) issued by the Chilean government environmental agency, the Environmental Impact Declaration (DIA) or the Environmental Impact Study (EIA) presented by the developers companies.

- Urbanism
- Architecture
- Landscaping
- Basic infrastructure plan
- Timeline and stages
- Expected units and population
- Environmental impacts
- Ecological baseline
- Mitigation and compensation
- Project approval or refusal

Other sources of official documents were the websites of the other public institutions in charge of planning, government, and regulation of the different administrative levels (national, regional, metropolitan and municipal) of the territory where Chicureo is located.

Table 3.9 Documents and sources. Source: author's own.

Institution	Document
National Statistics Institute INE	National, regional and borough statistical data (including census)
Municipality of Colina	Social statistics Administrative information Local planning documents. Development Plan (PLADECO) and Masterplan (PRC) Municipal budget
Province/Regional government	Social programs Investment plans
Ministry of Housing and Urbanism MINVU	Metropolitan Masterplan (PRMS) 1994 PRMS amendments (1997; 2004; 2005; 2007; 2014)
Ministry of Social Planning MIDEPLAN	Poverty and income statistics
Superintendency of Water and Sanitary Services SISS	Water and sanitation utilities Population and customers Water and sanitation infrastructure Investment plans

To investigate the official documents I combined different strategies of analysis. Through their text, figures and numbers, I gathered data for an interpretation of the urbanisation of Chicureo, its recent socio-demographical changes and its planning history. These documents were also a rich source of contextual data about the borough governmental action and

geography. A discursive analysis of sections and quotes of the urban planning and environmental resolution decrees was carried out to find the discourses on urban sustainability and greening involved in the making of policies, as well as how these discourses were materialised in the planning tools and masterplans. Some information on the enclaves has been reorganised and presented (either in the text or as in tables) citing the source. Statistics and numerical data about the enclaves' population, consumption and waste, have been converted in figures or cited for illustrative and comparative purposes.

3.3.5.2 Media analysis

The analysis of the press and media was designed to bring to light contextual information about the enclaves' development, actors and conflicts. The review of news was applied first on a sample of 24 weekend printed editions of the two leading printed national newspapers, in the first fieldwork trip from November 2012 to January 2013. As a result of the relatively few news about Chicureo found in those editions I expanded the search to online editions of the same and other media sources from 2000 to 2013 (Appendix 9). Additionally, I selected 14 online blogs related to Chicureo as complementary sources of contextual and historical data, following the same query procedure (Appendix 10). Using searcher engines, I ran several queries on these online editions combining the word *Chicureo* with different series of thematic keywords, to identify five main contextual indicators of the development of the enclaves (Actor, Action, Date, Place, Source), used to identify potential interviewees, identify themes to be used in tailoring interviews, identify sources of information, identify ongoing developments to visit and research, identify possible ongoing processes and conflicts, and build a sketch of a timeline of the enclave urbanisation (Table 3.10). Articles that did not explicitly consider the topics as well as multiple versions of a same event were discarded.

Table 3.10 Themes and topics for media analysis. Source: author's own.

Themes	Keywords
Planning	Planning, ZUDC-ZODUC-Parcela, PRMS, Plan Chacabuco
Development	Construction, building, inauguration, expansion, development
Urbanisation	Chicureo localisation, urban growth history, statistics, property market trends, PPP initiatives.
Ecology	Environment, impact, nature, conservation, parks, water, land, energy, waste, sewage, energy
Sustainability	Technology, design, efficiency, saving, treatment, performance, recycling, green, ecological, sustainable
Government	Policy, regulation, control, democracy, government, social organization.
Conflict	Conflict, crisis, negotiation, rights, protest, organization, judicial.
Lifestyle	Social distinction, private, exclusion, discrimination, shop, segregation, family life, status, stigma.
Actors	Resident, dweller, scholar, developer, authority, activist, consultant
Material networks	Infrastructure, pipeline, tower, motorway, road, toll, deposit
Market	Market, housing market, neoliberal, capital, investment
Metropolitan area	Colina, Santiago, Metropolitan region, job, mobility, transport, study, car, bus
Knowledge	Study, research, report, supervision

The selected content was analysed to build a timeline of Chicureo development and the policies involved, identify the main issues, actors and social and environmental conflicts highlighted in the news, and register the characteristics of the enclave urbanism and greenness to contrast with the database and the interviewees' discourses. Selected quotes were occasionally used in the analysis. Pictures were compared with my own sources, but not placed in the dissertation.

3.3.5.3 Advertisement analysis

The revision of the advertisement of enclaves was conceived to both analyse the discourses of greenness within the marketing of the enclaves and to enrich the descriptions of the urbanism developed in the enclave projects. The sources of the marketing objects were magazines, newspapers and websites. A list of the more prominent Chilean magazines related with architecture, building and real estate were sampled to search for Chicureo's urban enclaves advertisement can be found in Appendix 11. After comparing the number and diversity of enclave advertisements in those

editions a single magazine, *VD-Vivienda y Decoración* (Housing and Decoration) was selected for both its elitist character and its comparatively greater number of advertisements of Chicureo enclaves. The other sampled magazines remained as sources of secondary data analysed as press review.

Table 3.11 Sampling of VD magazine advertisements. Source: author's own.

Examined editions	Period	Selected ads
119	3 Dec 2011 to 31 Dec 2013	84

The criteria for advertisement sampling were planning status -only the advertisements in ZUDC and large *parcelas* were to be considered, and non-repetition -only one sample of an advertisement was considered among its various issuances. The gathering of data from the advertisements combined different methods and analyses. A list of sampled advertisements was built containing the magazine edition date, page number, text corpus, commercial project name, and developer's company. The textual content of the advertisements was entered into NVivo and coded for its thematic analyses. Specific quotes of relevant phrases or characteristics were selected to exemplify situations or processes. [6] Also, both textual and visual characteristics of the enclaves, as project name, prices, house size, location, and environmental attributes, were entered into the database of enclave projects, to be analysed in comparative tables and figures. The fields of this database of project marketing are detailed in Chapter 5 (Table 5.2) as categories of green attractors. To enrich the analysis of the green imaginary displayed in the marketing, one advertisement was selected and subjected to what Collier (2001) defines as visual anthropology, a symbolic decoding (translation into words) and further interpretation.

3.3.5.4 Website revision

The revision of the enclaves' websites was conceived as a complementary source of data in the early stages of research, to understand the context of

[6] Unless otherwise indicated, all the quotes from the advertisements have been translated to English by me from the original in Spanish.

the case, select specific enclaves, and identify key actors. The webpage revision covered the main categories of actors presented in the semi-structured interview section, from the state, private sector and civil society (Appendix 12). This revision also proved valuable for the description of the enclaves' urbanism and marketing analysis, particularly in the case of one large *parcela* enclave where advertisement displayed too little information or no advertisement was found. Overall, more than 50 websites from the private sector (most of them property developers, constructors and consultants) were revised. At least 29 websites of enclave projects in Chicureo were revised at an early stage to identify the enclaves and their characteristics, and later used a source of practical information for carrying on the interviews and the transect walks (Appendix 13).

3.4 Ethics and positioning

The research followed the appropriate ethical procedures of UCL standards and the discipline literature, even if a specific ethical approval is not needed, according to the UCL Research Ethics Committee (UCL Research Committee, 2015). The research then includes ethical standards on informed consent, benefit not harm, and confidentiality (UCL Research Committee, 2012).

In the process of research the most sensitive issues on ethics arose in the fieldwork, particularly related to the interviews and transect. As a year before my fieldwork, residents in Chicureo enclaves, developers and golf clubs became involved in episodes of social discrimination exposed in the media, I decided to establish a set of clear guarantees and conditions for the interviews, which was mentioned in advance to the interviewees:

1. The general content and aims of the interview
2. Explicit consent to be interviewed
3. Explicit consent to be recorded
4. Right to end the interview at any moment
5. Right to ask for omission of parts of the interview
6. Compulsory anonymity in the reports and dissertation for both contacted and interviewed

7. Limitation of use of the interview content only for academic research purposes

Despite these guarantees in the fieldwork some of the contacted persons, particularly enclave dwellers and enclave workers, were very concerned about the consequences of the interviews for their privacy, safety and life. Their refusal to be interviewed was always respected.

The enclaves in Chicureo are partially or totally fenced, and visitors have to be always authorised if wishing to enter inner condominiums. Roads are treated as private property and subjected to restrictions in their use. In the fieldwork I complied with all requests of identification and authorisation to enter the enclaves, previously arranging the interviews by phone or email and showing proof of identity when asked. However I did not demand any special permission to perform non-participant observation from roads and pavements, as technically these are national goods of public use, and remain -theoretically- public. In the case of the transect walks, which considered photos and non-participant observation, ethical considerations were adopted. In the case of the photos that were taken in the transect walks, those were taken only from roads or common areas, avoiding personal identification characteristics as faces, house numbers and car plates. No photos were taken from experiences involving people in the green enclaves. In the case of the other sources, as official documents, news and websites, I also avoid naming people, exception made of national authorities, when drawing historical context.

Positioning

My own position from the beginning was very critical to the development of the Chicureo enclaves, which I saw as part of processes of environmental colonisation and destruction by Capital, which I opposed in several campaigns in the 2000s as an ecologist activist in my hometown, 500 km south of Santiago. Also, as a former researcher of a small critical think tank, I was aware that personal bias could interfere in any area or moment of the research, by being questioned by some of the people involved, or by my

own hand introducing my own prejudices over social groups, economic activities, or class origins into the research.

To reduce the bias I developed a scientific curiosity strategy that focused on understanding the informants' perceptions and experiences, rather than questioning their actions. My role and aims were always explicitly presented and I did not judge the interviewees' actions or discourses. This attitude allowed me to gain the confidence of most of the interviewees and listen carefully to their narratives and motivations. Most of them were also curious to be contacted and kindly willing to talk about their life and work. Without reducing my critical approach, this changed my perspective of the complexity of the enclaves and the forces involved in their production.

As personal information is now so easily available in the web, I was aware that the difficulty to access some groups of actors, particularly developers, could be increased if they ran basic checks on my internet profile, but although the rate of responses to my attempts of contact and interviews from this group were very low I cannot really indicate the reasons for it.

At some point during the fieldwork I began to use my contacts as a former master degree student in the urban studies department of the most elitist university in Santiago to access scholars and consultants, which opened many doors and facilitated my access to crucial interviewees, while guiding me to some of the most unexpected findings of this research. This, together with my own participation as a doctoral researcher from a prestigious British university in some way became my card of presentation to contact informants, as it somehow 'cleansed' my previous social identity of left wing ecologist. Nevertheless, I noticed that it also shifted a bit my position in the research, from a purely critical but external observer to one more involved in some of the actors' social and professional networks.

Some specific situations in the field made me question, but not withdraw, the curiosity strategy and the non-participant fieldwork observation in the transects. For instance, the episode of mistreatment of workers by police; in

some interviews with state officials in which they showed a rash attitude towards the potential social and environmental impacts of the enclaves; or strong assertions of some interviewees on other social groups. Although at some point I did consider the possibility to engage in a participant role, I finally kept the curiosity strategy, and dealt with those problematic episodes by integrating them into the research as part of the field, thus subject to analysis and reflection.

3.5 Limitations and challenges

I have directed my research strategy to ensure the validity of the study by collecting both primary and secondary data from different sources and by a diversity of methods. This quest did not lead to produce a more exact result, in the sense a quantitative triangulation for instance would have, but it increased the multidimensionality of the subject of study, allowing me to analyse the complex network of relationships between different actors and narratives. For instance, the emphasis of the policies of urban sustainability in the regulations that prompted the development of the enclaves was not as that perceived by the actors, nor did the different actors give the same interpretation to the same issue. Considering the methods used, I do not claim the data from the different samples represent a whole population. I do claim that sampling procedures were reliable and represent a coherent reality worth knowing. So, to take an example, the opinions of the interviewees do not represent the views of a whole social category, although the categories of actors I considered as crucial are represented in the sample (developers, consultants, etc.). The data gathered in the walking transects do not represent all the possible routes and encounters that could take place, but they entail a trustworthy knowledge on my own experience reporting the environment, urbanism and life within the urban enclaves. The construction of a coherent explanation on the evolution of Chicureo and the production of a new socio-nature demanded craftiness and respect for the data, even when they did not match the format or emphasis I expected. It demanded to be aware of my own perspective and knowledge as well. Whilst I sustain the validity of my findings and of the overall explanation about the green

enclaves in Chicureo, I am aware it cannot be extrapolated to cases in other realities. It can only provide insights and trigger hypothesis.

One of the main challenges this research faced was to capture an ongoing process of urbanisation and socio-natural transformation that spans through more than a decade, set in a large and diverse area where access is often limited by material and social boundaries, involving both social and material changes. Although I consider this thesis brings enough evidence from both realms, I acknowledge that in some cases a misbalance in the depth of the information of social and biophysical aspects can be found. Also, to define a unit of analysis and set a methodological design to capture the socio-natural assemblages, while at the same time exerting flexibility without losing focus, revealed extremely difficult. Although the methodological triangulation allowed me to build a more dense knowledge, it also involved many material difficulties in processing all the data, as well as analytical challenges in combining the results in a coherent narrative.

As exposed by scholars in the enclaves' literature, to study the residential enclaves of affluent groups involves difficulties of both social and physical access, which was confirmed by my own experience being denied access or granted a restrictive one to the enclaves' residents and spaces. Although I consider that my social distance to the world of most of the Chicureo actors was perceived by the interviewees as a sort of neutrality that facilitated the rapport, it was also an obstacle to access more sensitive groups, as developers and workers. As the fieldwork progressed, I also felt that many other social groups could have been interviewed, but weighing the complexities in the data collection, processing and analysis it entailed, I took the decision to stick to those I originally considered as most directly involved with the enclave production, reproduction and contestation. Finally, the echoes of recent polemics and conflicts about the treatment given to house maids in Chicureo were still resonant by the time of my fieldwork, and some residents specifically asked not to be interviewed about the subject, which is in itself an indicator of the relevance of the subject.

3.6 Chapter conclusions

By the development of a program of research based on a case study design in which different methods are combined I intend to present a comprehensive response to the challenges posed by the research questions and hypothesis. In practical terms, the research program also developed as an iterative process of constant return to the main methodological guidelines as well as developing flexibility and ingenuity responses to the data collection and analysis challenges.

Under a constructivist epistemology, the methodology has been developed to approach both the subjective and material production of Chicureo as a new socio-nature generated by an urbanisation by eco-enclaves. The resource to a diversity, mainly qualitative, of methods and sources of data aims to the development of a comprehensive understanding of the multiple dimensions of the unit of study: temporal (historical context and current ongoing process of urbanisation); geographical (regional, metropolitan, borough, sector and enclave scales); institutional, market and social (planning, property development industry, demand and demographic changes); political (coalitions, lobbies and resistances) and urban metabolism (flows and environmental change). The research has been organised in successive but flexible phases of data collection to reach a viable balance between the needs of an extensive and intensive process of data gathering and those of the doctoral research limitations within available time, resources and capacities. The plan of analysis was conceived both to expand the research scope by illuminating the case study from different angles as well as to provide more depth by combining different analysis of a same phenomenon. Finally, the construction of the research program and its practical development demanded to reflect on my role as a researcher and register both my positioning and the tensions involved in the research.

Chapter 4.

The greening of neoliberal planning in the origins of the urbanisation by enclaves in Chicureo

4.1 Introduction

This chapter examines the origins of the green urban enclaves in Chicureo in the post-dictatorial period in the 1990s and their relationship with processes of neoliberal urbanisation in Santiago de Chile since the 1973s coup d'état.

The inquiry developed in this chapter attempts to answer the question on how the greening of neoliberalism developed into an urbanisation of Chicureo by green urban enclaves (green enclaves for short). The main focus is on how environmental discourses are introduced as rallying calls in the dispute for the continuity of neoliberalism in Santiago's metropolitan planning policies. Whilst this chapter focuses on the greening of the urban enclaves by planning innovations to make Chicureo's urbanisation more sustainable, the next chapter analyses the role of free-market environmentalism in the making of the green enclaves.

Through the combination of the following methods I seek to reach the chapters' objectives: the review of the literature on Santiago's urban development to draw the historical context and characteristics of its metropolisation process and the context of the policy making process; the documentary analysis of urban plans and policies in both the dictatorial and post-dictatorial period to map the changes in Santiago's metropolitan urbanisation policies; the analysis of the files and environmental assessment records of the enclave projects to examine the specific content on urban sustainability introduced to the projects by the state planning; and the analysis of interviews to bring examples and references to the neoliberalisation process.

By addressing the concerns above I develop my own interpretation of the process of urbanisation by enclaves of Chicureo. In this chapter, I argue that the neoliberal restructuring of Santiago has not been a homogeneous or structurally predetermined process, but the result of a dispute on the political economy and model of urban development for Santiago in the post-dictatorial period, as the supporters of the neoliberal agenda explored new

strategies in order to survive the new context. This chapter explains how a post-dictatorial neoliberal urbanism emerged in Santiago de Chile by the confluence of local political correlations and the globalisation of environmental discourses, which I argue led to the greening of neoliberal urbanism as a centrepiece in the development of green enclaves in Chicureo.

The chapter is structured as follows. First, contextual information about Santiago and Chicureo in relation to processes of residential segregation and urban fragmentation (section 4.2). The following section (4.3) explores the process of urban neoliberalisation in Santiago at an early period of dictatorial neoliberalisation and a later period of consensual reregulation, examining their main implications in the origin of the green enclaves in Chicureo. Section 4.4 looks into the specific content of the urban policies and planning innovations that led to the development of the green enclaves, scrutinising its neoliberal character (4.4.1) and then analysing the planning and environmental conditions set by the state for the sustainability of the green enclaves (4.4.2 and 4.4.3). This section closes with a brief description of the influence of the urban planning that originated the enclaves' changes on a metropolitan scale (4.4.4). The chapter ends with a conclusions section which synthetizes the findings and their implications for the development of the thesis.

4.2 Santiago de Chile's socio-spatial segregation

Santiago de Chile is both the country's capital and its main urban area, with an estimated population of nearly 7 million, a 43% of the national total. Situated at the core of the Metropolitan Region, one of the regions created by the territorial reform of the dictatorial regime, the city spans in the plains of the valley of Santiago, bounded to the east by the foothills of the Andes mountain range, and to the west by the Coastal Cordillera. As for most of South American capitals, the history of Santiago de Chile during the 20th century is one of growth. From nearly 10% of the national population in 1900 Santiago reached a share of 40% in the 1970s, boosted by the income of rural migrants, being by far the largest city in the country (INE, 2012). Since the peak in its rate of population increase in the 1950s, Santiago's

demographic growth has been slowly decreasing to reach a sudden marginal growth (0.35%) in the period 2002-2012 (INE, 2012).

In contrast with this demographic stabilisation, the spatial expansion of the city is considered to have continued, as a result either of centralised planning policies or by processes of unregulated sprawl. The differences between the administrative boundaries of the city and the city's urban footprint have been a matter of debate between city planners and scholars, as no single administrative entity (regional, provincial, boroughs) matches the existent urban conurbation. Since the 1980s most public policies and academic studies have concentrated on what has been called the 'Gran Santiago', great Santiago, an administrative urban territory that spans over 34 out of 52 boroughs of the metropolitan region (Ortiz & Morales, 2002). Whilst this understanding of Santiago focuses on the central agglomeration around the historical boroughs, scholars have recently challenged this approach that underestimates the recent expansion of Santiago to suburban and rural territories, in which case the urban footprint would be reaching most of the boroughs of the Metropolitan Region (Ruiz-Tagle & Lopez, 2014).

Estimations of the urban footprint of Santiago in the post-dictatorial period suggest a continuous expansion, from nearly 50,000 ha in 1991 to 65,000 ha in 2000 (Ducci, 2002) and then to between 85,000 and 100,000 ha in 2013 (Trivelli, 2014; Consultancy Cox, 2013). The relationship between population distribution and space in Santiago is mediated by income and power. Despite representing an estimated of 11% of the total population, the high-income groups inhabit a large and rather homogeneous area in Santiago, creating the most significant pattern of residential segregation in the city, in contrast to the less homogeneous distribution of the rest middle, middle-low and low income groups (AIM, 2008). Even if changing tendencies in residential segregation in Santiago have been reported (see Hidalgo et al., 2007; Sabatini & Salcedo, 2007; Ruiz Tagle & López, 2014), there is a consensus in that the core of this phenomenon is still the congregation of high-income groups in a rather socially homogeneous area

in the northeast of the city -the *Barrio Alto*- whilst the low-income groups occupy other peri-central and peripheral areas in the west, south and north, as presented by the figure below.

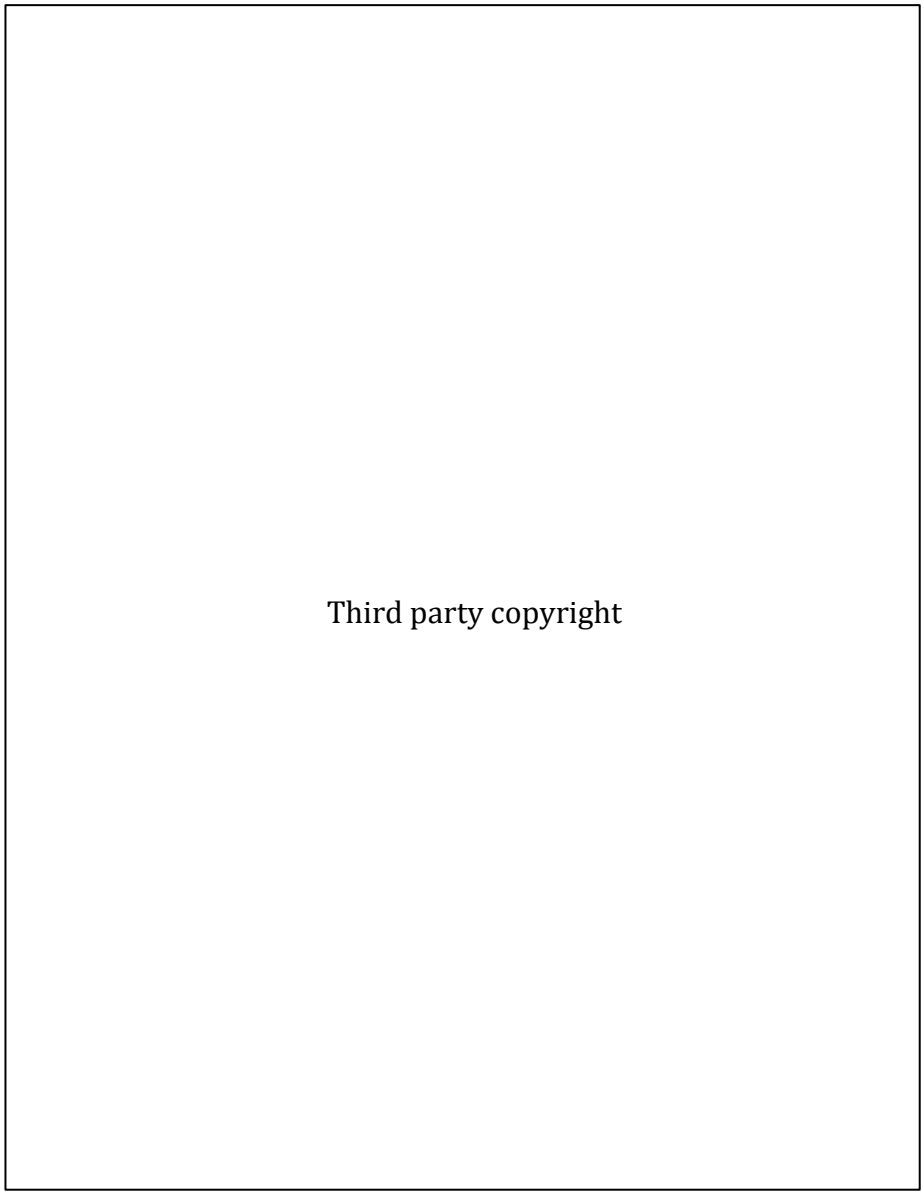

Figure 4.1 Income group localisation [high-income strata in dark blue; middle and upper-middle in aquamarine; low-middle and low in yellow tones, very low-income in red, and social housing compounds in light green]. Source: Zapata and Arias (2009 Fig. 2).

As mentioned above, although this urban divide has been confirmed by a wide range of studies about inter-borough inequalities as with income, poverty and education (CASEN, 2009; 2011; 2013) and indicators on human development (PNUD, 2005), recent scholarship on Santiago's

metropolisation has shown changes in the segregation patterns by processes of gentrification and suburbanisation, reducing in some areas while increasing in others (Agostini 2010; Ortiz & Escolano, 2013). In addition, not only the urban expansion of Santiago has taken a fragmented pattern of urban dispersion instead of a continuous and homogeneous expansion (Heinrichs et al., 2009), but it has also become differentiated by income and social origins.

This research focuses on one of the most recent and significant changes in Santiago's segregation pattern, the colonisation of the countryside of the metropolitan region by urban enclaves and gated condominiums for upper income groups, producing a fast growing and uneven peri-urban area. As Ruiz-Tagle and Lopez (2014) have shown with data from the 1992 and 2002 censuses, whilst the variation of population per income groups in the city of Santiago has been almost insignificant for all the income strata, in the same period the population of high income groups of twelve peri-urban and rural boroughs outside the province of Santiago has experienced a boom increase of over 80%, in which the sector of Chicureo has played a major role. A significant part of this spatial growth and high-income migration has been directed to new urban enclaves in the countryside of the peri-urban and rural boroughs of the metropolitan region. The figure below indicates the scale of the rural land allocated by 2008 to the development of a diversity of urban enclaves.

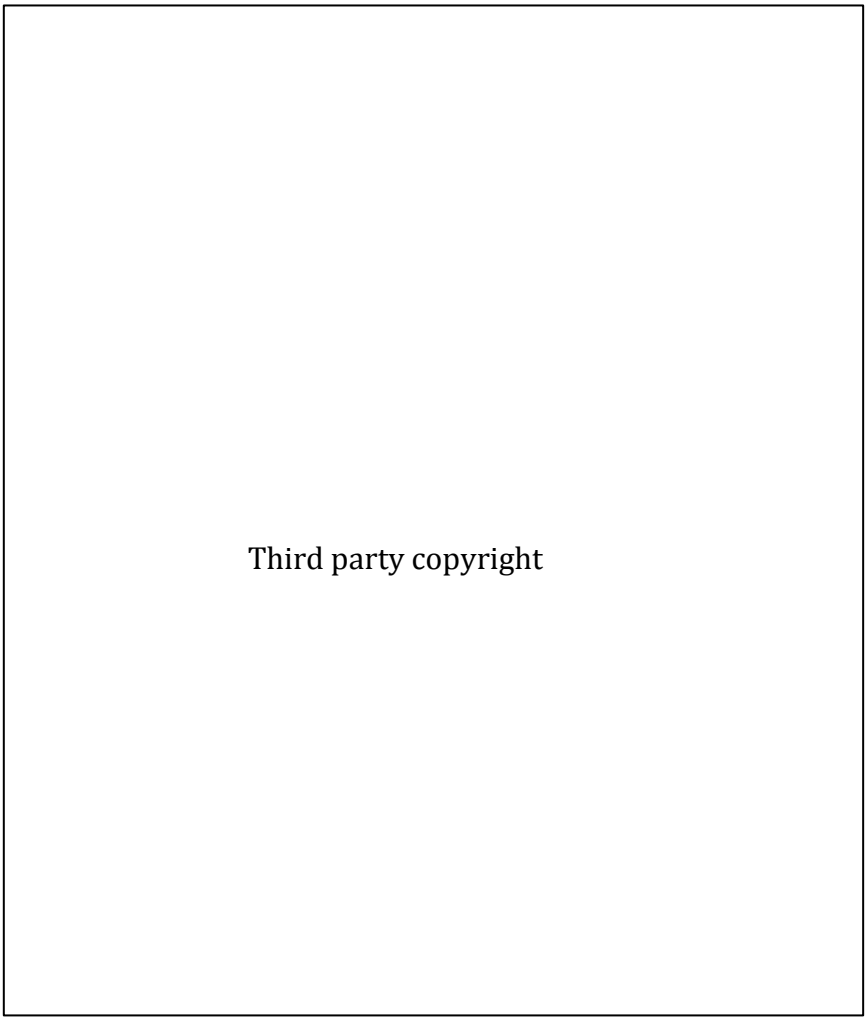

Figure 4.2 Santiago's spatial fragmentation [new areas of urban enclaves in the countryside in green tones; consolidated urban areas in grey; urban growth boundary set by the 1994 metropolitan masterplan in a blue line]. Source: MINVU (2008).

4.2.1 Chicureo and the metropolitan fragmentation

The focal point of this investigation is Chicureo, a sector of the large metropolitan borough of Colina, north of Santiago, in the province of Chacabuco (Figure 4.3). A valley of plain areas of very good quality soil, dry piedmont pastures and wild Andean foothills, its climate has an extended and dry summer season (Espinoza & Martin-Vide, 2014), classified either as Semiarid or Dry-Mediterranean, according to Paskoff and Köppen respectively (I. Municipalidad de Colina, 2009).

Figure 4.3 Localisation of Chicureo and the borough of Colina in relation to Santiago [borough boundaries in red, Colina town in red pin]. Source: Screen capture from Google Maps © 2015 Google Inav/Geosystems Mapcity.

As a result of its integration to a metropolitan dynamics, in the last decades the borough of Colina grew from about 29,000 inhabitants in 1982 to an estimated population of 116,000 in 2012 (INE, 1992; BCN, 2012). In the case of Chicureo, although until 1992 it remained a rural and rather unpopulated area, with nearly 800 inhabitants dwelling in few low-income villages (INE, 1992), by 2014 its population was estimated by municipal authorities over 30,000 urban inhabitants (Valencia, 2014). This urbanisation and population increase is related both to neoliberal regulations of urban growth set by the dictatorial government as well as to the attempts of the late civilian administration to moderate and mitigate the effects of the

original neoliberalism by introducing regulations to sustain urban growth and assuring the private sector a dominant position in the new scheme of urban development.

4.3 The neoliberalisation of Santiago since the coup d'état

In this section I examine the historical context of the development of policies of urban neoliberalisation that led to the emergence of the green enclaves in Santiago's countryside, and how these policies are involved in the urbanisation of Chicureo. The evolution of Santiago neoliberalism since the dictatorial government reforms has been interpreted by relatively fixed positions, one stressing the end of neoliberalisation by the reforms made by the new civilian administrations, a contrary one emphasising the fundamental continuity of neoliberalism in the post-dictatorial period. A third interpretation of Santiago's history of neoliberal planning is favoured in this thesis. It emphasises a more nuanced and organic interrelation between change and continuity of neoliberal policies.

This process can be explained by characterising the planning history in two main periods: one of dictatorial violence, deregulation and laissez faire in the late 1970s and early 1980s, and one of consensus based reregulation in the post-dictatorial period since 1990. In turn, this post-dictatorial period underwent a state-regulationist phase in the first half of the 1990s, followed by a market-regulationist phase from 1997 onwards, stressing the political nature of reforms. The following figure provides a general image of Chicureo's neoliberalisation timeline, departing from the crisis of the Hacienda land ownership to the transformation of Chicureo in Santiago's property market leader for high-income housing.

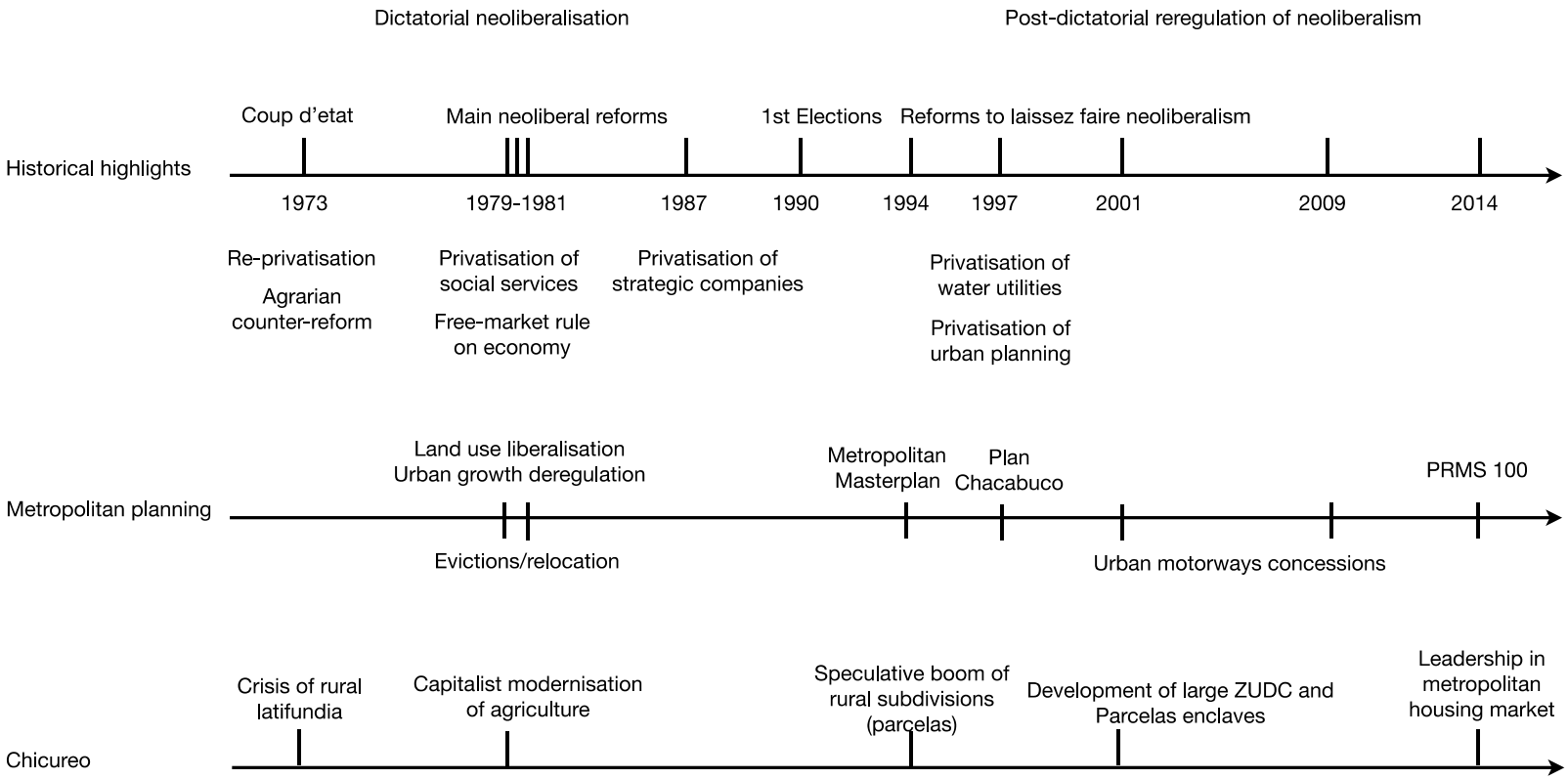

Figure 4.4 Timeline of neoliberal reforms, planning innovations and urbanisation phases in a national, metropolitan and local scale. Source: author's own.

In the next subsections I present each of these periods of urbanisation followed by the implications of each period for the development of the green enclaves in Chicureo.

4.3.1 Dictatorial urban neoliberalisation

As scholars have pointed out, military force and economic reforms was at the core of the origins of neoliberalism in Chile (Klein, 2008; Foxley, 1982). The neoliberalisation of Santiago during the dictatorial period followed this dual pattern. On one hand, violent state coercion and repression, often by the action of the armed forces, focused on disabling the socio-spatial configuration of the previous socialist regime and destroying the sources of its political power, as well as cleaning and preparing the urban grounds for the neoliberal accumulation. On the other hand a set of institutional and policy changes, designed by groups of pro-regime civilians and enacted by the military government, enabled a deep economic restructuring under a radical laissez faire orientation, which had large impact in the cities. I briefly describe this violence-market dualism in the following paragraphs.

Before the 1973 military coup, Santiago was experiencing a fast process of urbanisation by the incoming of rural migrants, most of whom came to live in informal settlements, the *campamentos*, generated by the occupation of available urban land in the interstices of the city and peri-centre. By claiming vacant plots in middle and upper districts and demanding urban policies to legitimate and consolidate their settlements, including the recognition of their collective forms of property and organization, the new urban residents not only demanded housing, but political citizenship as well (Garcés, 2002). At the same time, a powerful and politically well organised industrial working class inhabited the peri-centre and were consolidating a series of clusters of industries and working class neighbourhoods, called the *cordones industriales*, a ‘red belt’ which was considered to be at the core of President Allende’s political force. By 1973, the year of the coup d’état, these two socio-spatial configurations were at the centre of the dispute for the city and the disruption of its existing spatial and political fabric (Castells, 1973).

After the coup d'état, the dictatorial regime reverted the socialist urban policies and dismantled the socio-spatial configuration that sustained the political force of the socialists (Garcés, 2002). Whilst industries and popular neighbourhoods were immediately subjected to military control and disciplined by a state of terror, by the late 1970s the regime launched a policy of socio-spatial cleansing. Part of the policy was to evict working class beneficiaries of social housing compounds located in middle and upper classes neighbourhoods, and replace them by military families. Another part of the policy was a large-scale operation to eradicate the *campamentos* by military force and disperse its population into social housing projects built in the periphery of the city, all of which speeded the formation of a metropolitan periphery of segregated, poor and often stigmatised population (Rodriguez & Icaza, 1993). These tasks were facilitated by the development of a new paradigm of social policies, which in contrast to previous emphasis in social integration and collective rights strategically promoted the management of the urban poor by the focalisation of state aid into families and individuals and its contention and disciplining rather than social equalisation (Kast, 1980).

This policy of cleansing the central and upper class districts was driven by the wish of secure premium urban areas for deregulated financial capital investment (Rodriguez, 2004) and the aim of consolidating a district of higher income groups in the Andean piedmont, where a great deal of the affluent population -an important part of the base of support of the regime - already congregated. This district, effectively called *Barrio Alto*, the 'high neighbourhood', grew towards the Andean foothills outskirts fuelled by the undeniable but unequal bonanza produced by the growth of the Chilean neoliberal economy. Along with the social and political cleansing, the state made relevant investments in selected areas of the city to develop them as an example of the regime achievements in modernising the country, among them the *Barrio Alto*, which was seen as the crown jewel (De Ramón, 2000). These areas benefited from public investments in roads, water and sanitation networks and other public infrastructure by the military

authorities. Most of them were financed by long-term loans from the World Bank and Inter-American Development Bank. One of their aims was the development of a modern Central Business District (World Bank, 2013; IDB, 2013a, 2013b).

With respect to the neoliberal policies, in the 1979-1981 period the dictatorial regime simultaneously launched the set of reforms that were to be the basis of the new neoliberal economic model and a process of institutionalisation of the new politics and economics in a new Constitution (advised among others by neoliberal intellectual Friedrich Hayek himself, see Fisher, 2009). Among those economic and institutional reforms, private property was elevated to a privileged constitutional status, and economic growth was set as the ruling principle of governmental policies (along with political control). Many of these reforms had a significant impact in boosting the development of a neoliberal urbanism in Santiago, as the liberalisation of urban growth, the deregulation of land markets and the privatisation of Santiago's public transport, whilst private cars were given a central role in the planning and conception of the city and everyday life (Gross, 1991). Along with the liberalisation of economic activity in general came that of the private provision of educational, health and financial services in particular (Figueroa, 1990). Also of relevance, a territorial reform created new boroughs in Santiago, and a process of municipalisation transferred the responsibilities of management of the provision of public health and education to the borough councils (by that time led by designated mayors), without strengthening its financial and technical capacities (Rodriguez & Winchester, 1997).

4.3.2 Environmental impacts of the dictatorial neoliberalisation in Chicureo

During the dictatorial period and the first years of the Concertación government the main impacts in the area of this research were the fragmentation of rural land (and the changes in agricultural activity), and the shift of Colina from a rural town to an impoverished and segregated metropolitan periphery. However, in the long term the reforms in urban

policies, planning regulations and land markets developed under the dictatorial urban neoliberalism set the framework for a private led and deregulated urban sprawl of high income groups towards Chicureo countryside.

The decay of the Hacienda and the rise of a neoliberal agriculture

Although a process still largely unexplored by urban scholarship, evidence suggests a large impact of the neoliberalisation in Chicureo's productive agricultural structure during the dictatorial period. In the case of Chicureo, from the Spanish Conquest to the late 20th century, the area was part of three main *haciendas* or latifundia: Chacabuco, Chicureo, and Guay-Guay. Although the Chilean *haciendas* became increasingly under pressure of social and productive changes driven by industrialisation, democratisation and urbanisation since the late 19th century, it is considered that the end of this model in Chile only occurred in the 1960s with the Agrarian Reform instituted by the Christian Democratic government and radicalised during President Allende's socialist government (Mellafe, 1981). Although the agrarian reform granted land in the area to settle families of farmers and develop small-scale agriculture in cooperatives, most of this process was reverted by the military regime (Garrido, Guerrero & Valdes, 1988). What seems to have had a more significant impact in Chicureo was the modernisation of agriculture promoted by export-oriented neoliberal policies that allowed the introduction of imported technology, the transition from family run business to private company ownership and management with the proletarisation of the work force instead of the traditional modalities of land vassals, promoting a reduction in the area effectively used and accelerating the rotation in crops and land use change by the foreign market cycles of boom and crises (Kay, 1991). This was the liquidation of the Hacienda remains, as land was turned into part of the new capitalist machinery of commodity exports, in the pursuit of maximising the rural land revenue, and the rural landowners started a reconversion of traditional crops to new species to fulfil international demand. For instance, as Aravena and Kusevic (2005) describe, the traditional vineyards in Colina were destroyed to set place to kiwi plantation, which was a valuable product

in the early 1980s, but when its market value suddenly fell, the land was either recycled to other crops, left unproductive or sold away.

The production of a segregated metropolitan periphery

Overall, from 1979 to 1985 the evictions in Santiago are estimated to have dismantled hundreds of *campamentos* located in central and affluent areas, directly affecting 150,000 to 175,000 inhabitants of informal and poor settlements (Labbé & Llévenes 1986; Morales, 1990). The dwellers were relocated in new compounds of social housing in peripheral or even peri urban boroughs, dispersing the conflictive settlements and opening new spaces for the growth of the neoliberal city (Rodriguez & Rodriguez, 2009).

In the case of Colina, since the early 1980s the main town received several waves of relocated poor families, some of them expelled from Santiago by the military government urban forced eradications. It has been reported that families from *campamentos* in the Santiago and La Pintana boroughs were relocated in newly built social housing compounds in newly created urban districts adjacent to the existing (and smaller) town of Colina (Labbé & Llévenes, 1986; Municipalidad de Colina, 2009). Overall the military regime built nearly 1,000 social housing units in Colina between 1978 and 1989 (Hidalgo, 2007).

Not all this incoming population was displaced by force: some were beneficiary of the new housing policies of the military regime, a strategy that combined the spatial containment of the poor, and the rewarding of low-income groups loyal to Pinochet, with the institutionalisation of a new social policy that promoted targeting the extreme poverty groups. This was to be achieved first of all by developing a new set of tools, as maps and surveys, to identify and manage the groups, and secondly by promoting reforms aiming to eliminate the indirect subsidies and the state universal welfare policies and replace them by direct subsidies and vouchers to the poor, combined by a local government management of the policies, in addition to subsidies to the market (Kast, 1980). As Morales (1990 p.3) describes, the new focalisation paradigm applied a ‘social homogeneity’

principle to better manage the poor settlements and families. By expelling the poor from the richest and better serviced boroughs, and relocating them in deprived boroughs with a high rate of poor population, the process increased the social distances and polarisation between the Barrio Alto and the rest of the city (Morales, 1990).

It seems these newcomers, either eradicated or benefiting from social housing programs, were not welcomed by the existing population of Colina, and a stigma of criminality developed over them (Carolina, 2010). In 1981, along with the new housing policies of eradication and focused housing subsidies, the military government inaugurated a new prison for the Metropolitan Region in the town of Colina, in an effort to fit the increasing population of prisoners (Figure 4.5).

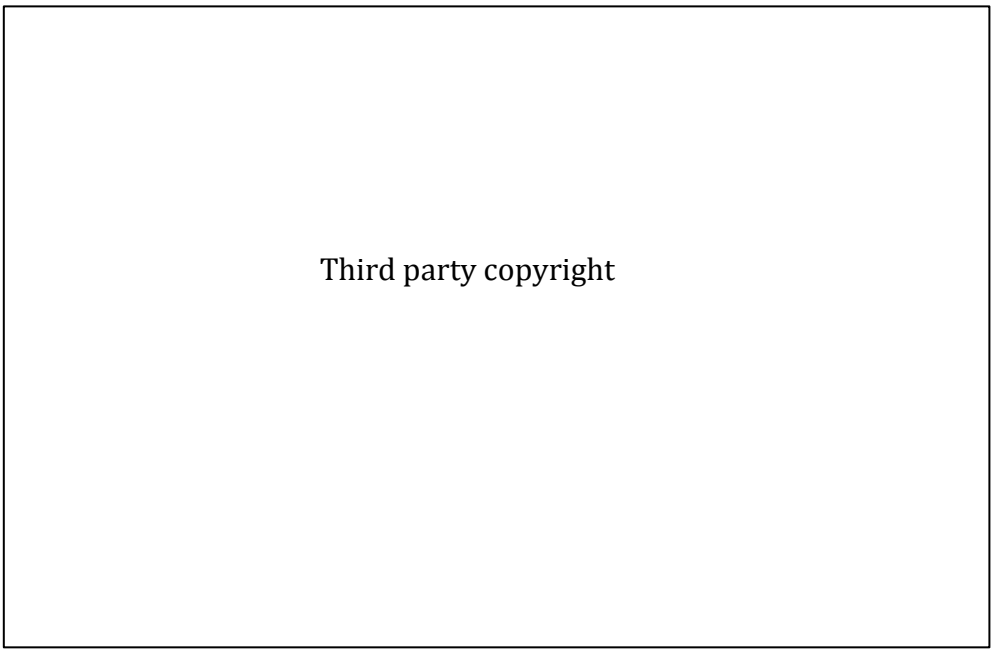

Figure 4.5 Prison in Colina [new prison compound (front) and the new social housing district (back) in 1981]. Source: Archivo Fotografico Direccion de Arquitectura (1981).

The prison compound soon became a new source of stigmatisation, as it is believed to stimulate the settlement of relatives of the prisoners associated by the town to criminal activity. As a resident in Colina explains, “because

of the prisons, there is also more crime, because the people who come to visit their prisoners prefer to settle here, it's closer... This comes from 1979-1980" (Carolina, 2010[7]). As I explain in the following chapters, this production of a poor and stigmatised periphery had an impact in the making of the planning policies that led to the development of urban enclaves and to the new social character of the peri-urban produced by the urbanisation of Chicureo.

The origins of Santiago's neoliberal planning

With regard to urban planning policies, in 1979 the military regime launched reforms with the enactment of the Urban Development National Policy (PNDU), a policy framework that guided the development of urban policies until 1994. This policy synthesised the neoliberal ideology on liberalisation, deregulation and a subsidiary state in five principles (MINVU, 1979 pp.5-7):

> 1) Urban land is not a scarce resource;
>
> 2) Land use is defined by its highest profitability;
>
> 3) The spatial concentration of the population generates comparative advantages for the development of economic and social activities;
>
> 4) Urban land use must follow flexible regulations, defined by the market requirements;
>
> 5) The State's responsibility is to protect the common good.[8]

Basically, this new urban policy dismissed previous attempts to plan and control the city expansion and assigned the tasks of urban development to the private sector, saving a subsidiary role for the state. Along with this policy the regime abandoned the central planning tradition developed in the 1960s and the tools of metropolitan masterplans, relying on borough scale and ad hoc plans (Gross, 1991). Also, immediately after this policy a series of decrees and administrative measures were taken by the military sectional authorities, some of them of high relevance to the further urbanisation by enclaves in Chicureo, as the decrees DS 420 and DFL 3,516, both in 1980. The decree DS 420 extended the urban growth boundary of Santiago to

[7] My translation from the Spanish.
[8] My translation from the Spanish.

100,000 ha, a huge expansion considering that the Santiago urban footprint estimated for that year was not bigger than 31,841 ha (Galetovic & Poduje, 2006). In practical terms that meant the elimination of the urban limit that restricted the urban expansion to the peripheral rural areas, for the sake of the property market. For many reasons this decree had a very limited effect in Santiago's growth and peri-urbanisation (Petermann, 2006), in part because of the sharp 1982 economic crisis caused by the explosion of a private debt bubble of both upper class families and the financial sector (Silva, 1995), and partly because the investors had both economic and political reasons to focus their investments on the renewal and expansion of the well serviced and protected Barrio Alto rather than exploring uncertain zones dominated by belts of low income *poblaciones* (Rodriguez & Rodriguez, 2009).

In the case of the DFL 3,516 decree, it was declaredly enacted to promote the colonisation of the Chilean far south regions and solve the inheritance problems of small farmers, allowing the division of rural land -that is, beyond the cities urban growth boundary- up to plots of a half hectare, allowing a small residential density on it, up to 10 inhabitants per hectare. The subdivided plot kept its rural legal status, which meant the state had no legal mandate to provide connection to urban infrastructure as paved roads, water and sanitation and electricity networks, or waste removal services. The owners had to manage to connect with infrastructure and services by themselves, and as counterbalance they were entitled to exemptions in land tributes and taxes (Naranjo, 2009). Nevertheless, as I explain in the next section, until the end of the dictatorial period this decree had little impact in the urbanisation of Chicureo.

4.3.3 Attempts of consensual reregulation

As presented in the literature review chapter, the notion of a consensual political transition does not imply that these reforms to the metropolitan planning tools were achieved without political conflict, but rather that the struggle was limited by a general acceptance of the Concertación leaders to the realpolitik rules of the political transition: acceptance of market

economy, respect of the country's Constitution and renouncing political violence and class ideologies (Garretón, 1994). As part of its gradual reformist strategy of regulating the markets and fighting the evil effects of the previous neoliberalisation, the new civilian government launched new urban policies in the 1990s to mitigate some of the sharpest and negative social and environmental impacts of previous urban neoliberalism in Santiago. The new authorities prioritised to fight poverty and unemployment, housing deficit, air pollution and urban sprawl towards the foothills and agricultural areas in the metropolitan region (Rodriguez & Winchester, 2001; Ducci, 1998; Figueroa, 1990).

The Concertación reproduced some of the social policies of the previous regime. For instance, policies on prison infrastructure and social housing were continued by the Concertación governments, which directly affected the borough of Colina. In the first issue, to renew the already degraded prison infrastructure in the metropolitan region the Concertación government built in the early 1990s a whole new compound besides the existing prison in the town of Colina, doubling its capacity to over 4,000 male inmates (Gendarmería, 2013). At the same time, to help tackling down the severe lack of social housing of Santiago's poorest population, between 1990 and 2000 the Concertación government pursued a strategy of quantitative goals, and house building more than doubled the amount of social houses built by the military regime, with the same typology of construction and localisation (Tokman, 2006). In Colina alone the government built 4,534 units of social houses or flats from 1990 to 2002, at least 4 times more than during the military regime, keeping the same urban parameters of construction (Hidalgo, 2007). Not only did the civilian authorities increase the building rate of social housing, but also the percentage of these houses located in the rural and peri-urban boroughs of the Metropolitan region increased. Considering the whole 1978-2002 period, the town of Colina was the leading borough in the building of social housing, accounting for nearly 21% of the total of social houses built in the metropolitan periphery, saving better located urban land for renewal and gentrification policies (Hidalgo, 2007; 2011).

In the early 1990s the new authorities in the Ministry of Housing had a critical diagnosis of the effects of Santiago deregulated growth in land speculation, availability of public services and infrastructure, and residential segregation. As a centrepiece of a strategy to regulate urban growth and set a new path of development, they enacted a metropolitan masterplan in 1994, the 'Plan Regulador Metropolitano de Santiago' (PRMS). The PRMS was conceived as a return to the functionalist planning tradition, by which a city was conceived as a system to be managed by a technocratic state bureaucracy rather than left to the unruly forces of the market. This plan explicitly intended to promote the city densification by the urban renewal of the city centre by high rise developments and the development of sub-centres within the city boundaries, preventing the city sprawl, making public investment more efficient and thus protecting the rural and agricultural environment in the metropolitan surroundings (Contreras, 2011; MINVU, 1994). Although the PRMS did not abolish the rural subdivision decree, it did establish a relatively restricted framework to urban growth. Its main tools were a detailed zoning and planning of public infrastructure, and a conservative urban growth boundary. In contrast to the military generous urban land allocation, this boundary constrained and reduced the amount of land available for expansion, setting a green belt of agricultural and natural protection zones around the city (MINVU, 1994). By setting new limits to the city spatial growth, the regulators intended to "discourage urbanization by prohibiting the extension of public service trunk infrastructure to developments outside the UGB [urban growth boundaries]" (Zegras & Gakenheimer, 2000 p.60). The plan repositioned the ideas for a green belt to establish clear boundaries between the urban and rural and protect the countryside as presented in the original metropolitan masterplan of 1964 (Honold & Poblete, 1966). In accordance, the PRMS zoning defined a large greenbelt around Santiago, mainly of agricultural areas in the south and west, wetlands areas at risk in the west and northwest, and protected Andean foothills in the north and east (MINVU, 1994).

Detached from any wider legal and economical reform, the PRMS encountered serious obstacles to some of its flagship policies. It is not devoid of irony that, by attempting to limit the city growth, the 1994 Metropolitan Masterplan drew the housing market's attention to the potentialities of urbanisation of the large rural areas outside the greenbelt, particularly in the north sector of the Metropolitan Region, and the new affluent classes benefiting from the economic boom increased their search of a rural property just beyond the urban limits established by the plan (Naranjo, 2009).

The emergence of parcela enclaves in Chicureo

By that time, rural landowners and affluent buyers found in the DFL 3,516 decree, and its framework for the generation of rural allotments, a suitable tool to proceed in subdivision and trade of rural land and its de facto shift to residential use. Since the 1980s the market of these rural allotments was of a small scale and scattered in the Metropolitan Region, oriented to the subdivision of small rural property into individual plots for second or leisure homes, without common areas or services, which were known as leisure allotments, *parcelas de agrado* (Hidalgo et al., 2005). The boom of rural subdivisions in the metropolitan region for the development of *parcelas* in the mid 1990s attracted the interest of property developers, who started to sell the allotments as part of residential condominiums of *parcelas* rather than separated properties. This increased the scale and speed of urbanisation of the allotments and its heterogeneity, with developers offering some new features as gates, small scale water provision arrangements, road lights, children's playgrounds and sport facilities, to make them more attractive (Hidalgo, 2007). Instead of rural allotments for enjoyment this urbanisation of the *parcelas* into fenced and walled condominiums produced a first wave of green urban enclaves, the *parcela* enclaves.

The DFL 3,516 turned into a speculative mechanism by which landowners increased the rent of rural land, selling urban-like plots in a rural environment, without having to pay the costs of urbanisation and skipping all the bureaucratic regulations for urban development (Zegras &

Gakenheimer, 2000; Hidalgo, 2007). The *parcelas* were a well suited speculative product both for small and medium size landowners, for developers and buyers as well: it allowed living in a better and more natural environment; it offered a better price-product relationship, by which larger plots were cheaper than in the city`s Barrio Alto; and the *parcelas* entailed the expectation of a future profit, in the form of a rise of the land price caused either by the incorporation of the rural land to the local urban masterplans, or by the expectation of the building of the already advertised projects of motorways that were to connect the sector with the city Central Business District (CBD) and Barrio Alto (Poduje & Yañez, 2000). This new market of *parcela* allotments and condominiums boosted an "extra-official" urbanisation of countryside style houses for upper income classes, in practical terms eliminating its agricultural role (Naranjo, 2009 p.214).

Under the new conditions of PRMS regulation and dynamic land markets the rural subdivisions began to concentrate in few boroughs, particularly in those in the countryside north and south of Santiago. By 2002 [9] the accumulated number of subdivisions of rural land into *parcelas* made under the rule of the DFL 3,516 decree in the Metropolitan Region reached 378,000 ha, about four times the estimated size of Santiago's urban footprint (Hidalgo et al., 2005; Poduje, 2006), whilst the borough of Colina alone already accounted for nearly 25% of the total of *parcela* subdivisions (Hidalgo et al. 2005). It has been estimated that from 1994 to 2002, the peak period of *parcela* subdivision, the subdivided area in the Colina borough reached 77,738 ha, while the number of those subdivisions effectively consolidated (with some materialisation of the urbanisation as plot fencing, road connecting, servicing by water and electricity or house building) was of 48,641 which means nearly 25,000 ha (Naranjo, 2009). These figures point out to the scale of the changes and highlight the leading role of the countryside of Colina (Chicureo) as a preferred market localisation for these operations. As figure 4.6 below indicates, the borough of Colina had the

[9] Although restrictions to new subdivisions were set in 1997, already approved subdivisions could still turn the site into a parcela.

highest share in both number of rural subdivisions and surface involved in these.

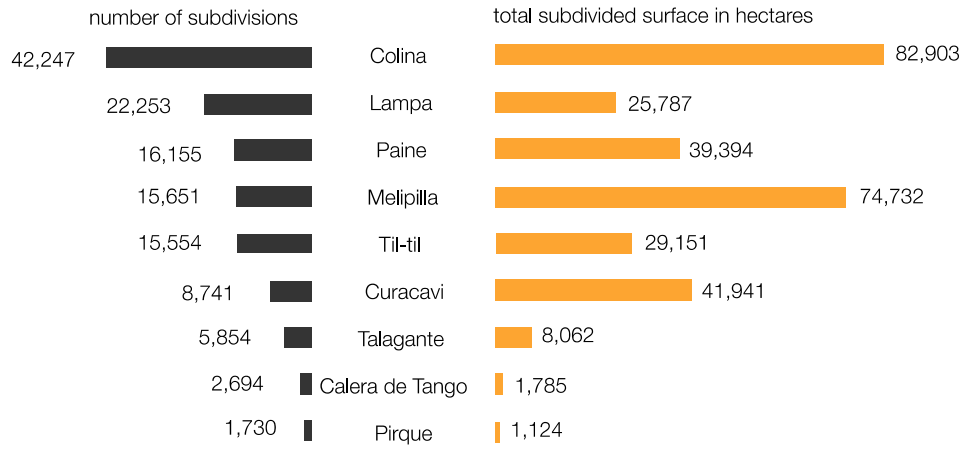

Figure 4.6 Number of rural subdivisions and surface per metropolitan boroughs (1994 to 2002). Source: author's own with data from Hidalgo et al. (2005).

The development of this urbanisation by *parcela* enclaves was heterogeneous. The earliest form was the subdivision of rural land in single plots, sometimes sharing basic infrastructure as a road or time slots from a water channel with other *parcelas*, fenced by their owners (Naranjo, 2009). In the mid 1990s a boom of small to middle size *parcela* condominiums occurred, with common arrangements for drinking water and electricity (Hidalgo et al., 2005), and from the late 1990s a new type of very large and premium serviced exclusive *parcela* enclaves appeared, with common arrangements for drinking water provided by private utilities, security services, internal roads, sport clubs and golf courses, among others, with external fences provided by the developer (Hidalgo, 2007). By 2004, a considerable part of the central area of Chicureo was subdivided *parcela* enclaves, although not all these subvisions were materialised, as the figure below suggests.

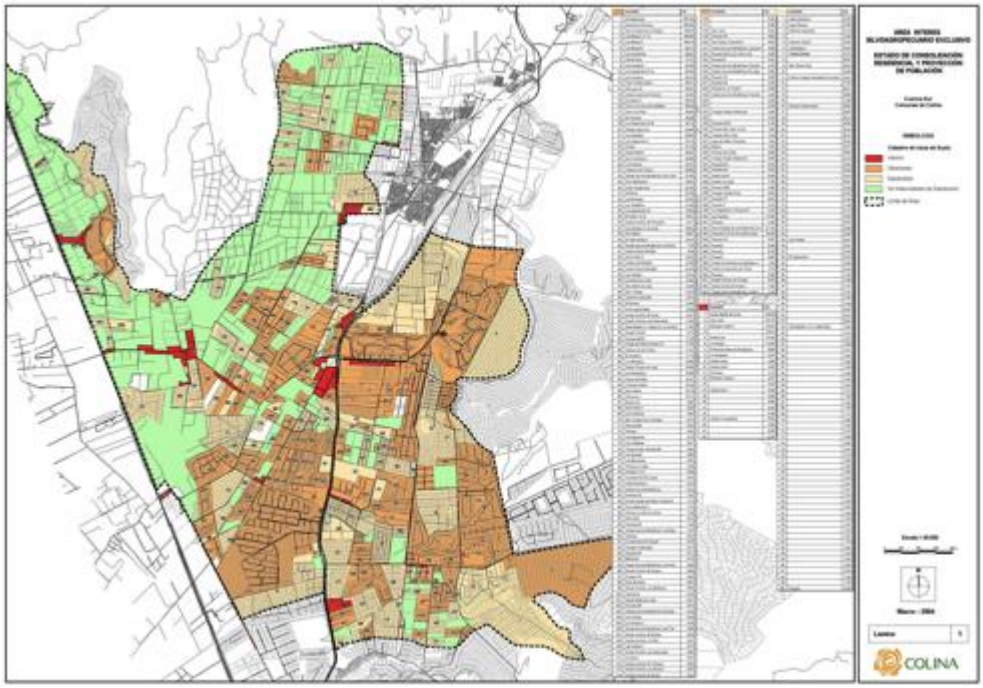

Figure 4.7 Consolidation of land subdivision in Chicureo. [Agricultural land in green; consolidated (urbanised) *parcela* enclaves in organge; non consolidated (non-urbanised) subdivisions in light yellow; equipment buildings in red; areas of ZUDC enclaves in White]. Source: Municipalidad de Colina (2004).

4.3.4 Green strategies of reregulation of neoliberal urbanisation

The changes promoted by the PRMS provoked tensions between the state and private actors of urban development. To revert part of the regulations of the plan and fight the rise of an unruly urbanisation of the countryside, a modification to the PRMS was presented, focusing on a new state and market driven urban sustainability.

The PRMS received harsh criticism from pro-growth and pro-market actors who rejected the restrictions it imposed, arguing that it was contrary to a proper business climate, it froze property market investment and reduced the income of municipalities (Beyer, 1997). A coalition of mayors, the national building chamber, and technocratic fractions inside the Ministry of Housing lobbied against the plan (Poduje, 2006). At the same time the PRMS also received criticism from ecologist groups who saw in some of its regulations, as the permits to build up to the 1,000 m contour line of

elevation in Santiago Andean foothills, a renewed attack from private speculative capitals to the city environmental commons (Interview 35, Activist, Santiago, April 2013).

Under the technocratic and pro-business government of president Frei (1994-2000) the pro-growth coalition efficiently argued that limiting the urban land would increase the land cost and stop the city development, which basically meant a defence of the neoliberal principles of Gen. Pinochet's 1979 urban reform. At the same time, by 1996 the *parcelas* were reported consuming no less than 1/3 of the best soils in the boroughs of the Chacabuco province, and particularly in Colina, and the Ministry of Housing and Urbanism considered these fragmented settlements were promoting an anarchic demand for infrastructures and services, which represented a burden to the already deprived peripheral boroughs (MINVU, 1997).

A total dismissal of the PRMS and some of its densification policies was politically not viable nor desirable for the pro-growth agents, as an important part of the plan converged with ongoing initiatives of private urban renewal in the city centre for middle income groups with generous state subsidies. These initiatives were welcomed by the construction and banking industry (Contreras, 2011). Thus, the proponents of changes focused in a change limited to a single rural province of the Metropolitan Region, Chacabuco, to develop an innovative and more flexible approach to simultaneously tackle the loss of rural land and increase the availability of urban soil (Zegras & Gakenheimer, 2000). In 1996 the Ministry of Housing and Urbanism passed a new amendment of the PRMS, which although presented as a compromising solution between the pro-densification and pro-growth groups became a U-turn in the urban growth policies. This administrative act, enacted in 1997, became also known as the Plan Chacabuco, extended the rule of the metropolitan masterplan to the whole rural province of Chacabuco in the north of the Metropolitan Region, establishing original ad hoc regulations to guide the urban development in

the newly integrated metropolitan territories (MINVU, 1997). In the words of the Plan Chacabuco proponents:

> The plan includes the province of Chacabuco with its districts [boroughs] of Colina, Lampa and Til-Til in the Metropolitan Regulating Plan [Masterplan], establishing a unitary and comprehensive urban system that cautiously manages potential urban areas, while avoiding present scattered, accelerated, and inconsistent settlement. (SEREMI Metropolitana, 1998 p.44).

Although it was one among many of the objectives of the plan, environmental sustainability became a central piece of the public discourse, and to stop the rural subdivisions of the *parcelas* became the flagship motive of the plan. As the proponents of the plan argued, the growth of the urban centres in the region "has been permanently made at the expense of agricultural land" (González et al., 1998 p.44). The directives of the Plan Chacabuco stated that it was a necessary part of a strategy to protect the natural and rural soil and regulate the city sprawl, which was to be achieved by opening controlled urban growth reserves of low-density residential use, where the private urbanisation and development could flourish. Instead of laissez-faire the plan proposed a public- private association based on regulated concessions of infrastructure and land use rights. The core objective was to "achieve a harmonious, balanced and environmentally sustainable urban development" in the new metropolitan territories (MINVU, 1997 p.6), and the mechanisms proposed by the plan were expected to simultaneously tackle the environmental degradation of the area, mainly caused by the urbanisation of soils of good or very good agricultural quality, stop the urban sprawl and develop self contained, economically dynamic and interconnected urban centres. The boroughs involved in the Plan Chacabuco were thus subjected to an urban planning by conditioned development, a mechanism of urbanisation inspired by the anglo-saxon exactions, by which private developers could build on land previously stated as rural, but had to find themselves the infrastructure and services, and mitigate the impacts to achieve urbanisation rights.

The expectations stated by the plan were huge and apparently contradictory: to allow the offer of rural land for low density use and at the same time save agricultural land (MINVU 1997), to increase the urban land availability in

Santiago for private initiative, decreasing the urban land price, but regulate the sprawl. By adopting concepts from a sustainable development discourse, this greener framework aimed to skip constraints to the property and land markets and boost market solutions to environmental problems. To fight the evils of the violent and deregulated neoliberal urbanisation of the dictatorship the reformers created a set of planning tools for urban development based on the coordination of public-private action. Either a naïf or Machiavellian move, the Concertación set in motion neoliberal urbanism tools to fix the very problems urban neoliberalism was considered to have caused in the previous regime.

To stop the speculative growth of the *parcelas de agrado*, the Plan Chacabuco set restrictions to restrain the rural subdivisions of *parcelas*, increasing the minimum subdivision area of the rural allotments from 0.5 ha to 4 ha and limiting the consolidation for existing subdivisions to those that were effectively registered in public documents (MINVU, 1997). Whether or not intentional, the decision to apply these administrative restrictions was filtered to the public, and a boom of new subdivisions permits arose just before the new regulation enactment, increasing the potential fragmentation of rural land (Naranjo, 2009; Poduje, 2006).

At the same time, a significant part of the province surface was put under a restrictive planning regulation to preserve natural areas and zones at risk from urbanisation: in the case of the borough of Colina, 78.2% of its surface fell under some category of preservation. In total, 75,600 ha were declared restricted or protected, from which more than 2/3 were "natural land", a euphemism to name the arid Andean hills, and 1/3 were fertile irrigated land (MINVU, 1997 p.39-40).

Planning the self sufficient cities in Chicureo

The crucial point of the Plan Chacabuco strategy was the idea to "favour the creation of new cities... differentiated and separated from the current cities and the Metropolis, avoiding the conurbation and the sprawl beyond the established limits" (MINVU, 1997 p.38). In a language inspired by the New

Towns experience in the UK, although under a market framework, the project envisaged developing completely privately and self-contained cities which were expected to attract a diversity of economic activity, located beyond the traditional city limit but connected by private road infrastructures to the metropolitan urban system.

Through a framework of urban and environmental planning conditions to the private sector (mainly property developers and utilities), the Plan Chacabuco aimed to boost the new cities' sustainability. This was to be achieved through economic means, as the localisation of clean jobs there; social integration, by setting a share of social housing to the new upper income developments to achieve a social mix in the until then homogenous low income borough; and environmental initiatives, as the preservation of rural land, the promotion of larger green areas in the plans, the establishment of higher standard water and sanitation systems, or the mitigation of air pollution.

In accordance, the Plan Chacabuco defined new areas where the demand for low-density and suburban districts could flourish with virtuous effects, areas "where low-density settlement could be promoted, in accordance with the planning system, and promoting the creation of self-contained urban entities" (MINVU, 1997 p.8). Thus, nearly 50,000 hectares of former rural land were declared apt to be potentially urbanised in the Chacabuco province. Also, although the plan did stop new subdivisions, it omitted to regulate those subdivisions that were legally made but not materially consolidated, either by lack of competencies or just by convenience, de facto allowing the process of conversion of agricultural land.

The plan opponents found it difficult to argue against a plan conceived to improve the relationships "between the cities and their environment" (MINVU, 1997 p.7), and had to cope with the fact that it was an administrative act to be decided by a designed regional governmental authority, not subjected to public debate, in which its content was scarcely publicised before its approval (Marquez, 1996). Despite this, the plan

triggered a fierce opposition from inside the government. The anti-growth groups inside the government were led by the Ministry of Agriculture, who felt the Plan Chacabuco would be a coup de grace to the agricultural activity of the region, and represented a severe loss of jurisdictional powers in favour the pro-growth Ministry of Housing authorities (Poduje, 2006). As a result of the political skirmish between the ministries of the centre-left coalition in government, the final amount of urban land had to be reduced to 20,000 hectares in the province, and 6,045 ha in the borough of Colina. This fight caused retaliations within the state, as one interviewee from the Ministry of Agriculture recalled:

> Yes, I know this story... I'll tell you that in 1997 even the National Director of the Agricultural Service (SAG) was fired for opposing the ZUDCs development, because of the expected impact of those in the agricultural world and rural zones of the Chacabuco province. (Interview 36, State official, Santiago, April 2013).

From the approximately 20,000 hectares of urban land broadly defined by the Plan Chacabuco, nearly 60% were subjected to a conditioned zoning modality. From this total, the Plan Chacabuco allocated 3,249 ha of land to specific housing conditioned development areas in Colina. The Plan Chacabuco displayed three main planning tools to achieve its goals: one, the Zones of Urban Conditioned Development (ZUDC), directed to the development of new self-contained cities in rural territories; two, a mode of urban extension of existing urban areas called Areas of Urban Priority Development (AUDP), destined to transform (under conditions) the land use of the closest land ring of the towns; and three, a zone of conditioned industrial use or ZIEDC area.

In the case of the Colina borough, the image-objective resulting from the planning regulations is to have the southern half of its territory being composed by several urban centres, envisaged as small cities or towns, totally detached one from another but well connected to Santiago's metropolitan centre, one of them being the Colina town, the others the conditioned planning areas, in a medium of exclusive agricultural land and environmentally protected areas, as the figure below suggests.

Figure 4.8 Image objective of the province of Chacabuco urban system by the Plan Chacabuco [Hills in brown lines; agricultural areas in white; planned ZUDC in yellow; planned AUDP in orange; existent urban areas in dark red; planned and existent roads in black lines]. Source: González et al. (1998 p.44 Fig.1).

The green enclaves in Chicureo

The focus of my analysis is placed on the ZUDC areas to host the sustainable self-sufficient cities. Under proposal of developers declaredly interested in the scheme, the Plan Chacabuco set eleven ZUDCs for the whole province, from which six are currently in ongoing development. Undeveloped ZUDCs can be developed or traded at any moment, should their owners consider the market conditions appropriate. Five of the ZUDC areas are located in the borough of Colina, in Chicureo, and four of them are in ongoing development. As I explain in the next sections and chapters, both

by the planning conditions and the market dynamics, these ZUDC areas developed as large green enclaves in Chicureo since its beginnings, each one a walled mega-project of private condominiums for upper income groups with a suburban or country club typology of urbanism rather than a diverse and public city.

The spatial and social scale of the residential enclaves projects in ongoing development in the ZUDC areas were large even for the scale of metropolitan Santiago. As detailed in the table below (4.1), the projects of private and gated condominiums currently in development in the ZUDC areas involve the planning, building, selling and operating of over 35,000 houses. If fully developed as planned, in a time horizon of two or three decades the ZUDC enclaves alone will have added no less than 315,000 new inhabitants to Colina, potentially placing the borough of Colina among Santiago's top ten most populated (CChC, 2014). At the same time, the total area considered by the five ZUDC enclaves in Chicureo represent alone nearly 7% of the urban land (developed and undeveloped) of the whole Metropolitan Region (PRMS, 2014; Trivelli, 2014).

Table 4.1 Urban Enclaves in ZUDC areas in Chicureo.[10] Source: author's own with data from COREMA (1999, 2000a, 2000b, 2003a, 2003b).

Planning name	Urban area (ha)	Total area (ha)	Planned units	Planned population
Ciudad Chicureo	1,062	4,095	12,473	110,814
Pan de Azúcar	474	794	5,203	32,104
Valle Santa Elena	1,950	1,950	10,760	85,000
El Chamisero	542	1,597	7,819	62,764
Santa Filomena	335	1,000	unspecified	24,888
TOTAL	4,363	9.372	36,255	315,570

[10] As each enclave project in ZUDC areas may contain different condominiums, for clarity reasons I privilege here the use of the planning name of the original project. However, to develop some descriptions and comparisons in further chapters I bring both the planning and commercial name, properly indicated.

4.4 Making neoliberal urbanism and planning

The analysis of the new policies and regulations that set the framework for the development of the green enclaves in Chicureo points out to the presence of characteristics of neoliberal urbanism involved in the conception and planning of these developments. The planning conditions set by the metropolitan masterplan (Table 4.2) reveal a process designed to maximise opaque and fast-track planning and administrative procedures, delegating the planning of the service and infrastructure provisions, as well as the planning of the masterplans and zoning into the developers' planning of the project management and economic development.

Table 4.2 Planning conditions to development of ZUDC enclaves. Source: author's own from Plan Chacabuco (MINVU, 1997).

	Attributes	Description	Goal
Approval process	Restricted	Subjected to the approval of the regional council (non elected body)	Achieve legality and legitimacy
Modification process	Executive	After positive report of Regional housing authority	Skip bureaucracy and political/social interference
Project Planning	Outsourced	Developers hire consultant firms of urban design, landscape architecture and architecture.	Flexible planning, differentiation and market standards.
Service provision	Private services	Developers had to secure interest of private utilities in managing the provision of electricity, water and sanitation services.	Private sector building infrastructure and running the services
Mobility	High standard private infrastructure	Developers had to build inner roads and accesses. Private sector provision of paid motorways and highways. Transport services left to the market.	Achieve high standards of private mobility without affecting state budget
Economy	Local economic activity	Dedicate at least 5% of the land to economic activities (non-pollutant).	Boost self sufficiency by jobs provision and a local and clean economy
Residential densities	Low suburban and peri-urban densities	All the residential areas in the plan except those to have social housing densities	Save agricultural land from random low density urbanisation
Social housing densities	Justify the social character of the project	Include in the masterplan 5% of high density areas for social housing as defined in the Plan Chacabuco	Fight residential segregation

Comparing the main motivations of urban development in neoliberal urbanism with the characteristics of the urban enclaves in both ZUDC and *parcelas* in Chicureo brings to light some of the similarities and differences between the modes of neoliberal urbanisation driving these two categories.

Although in both types of enclaves the motivations of urban development fit well in a modality of neoliberal urbanism, in the green enclaves in ZUDC areas the market component has been expanded and exacerbated (Table 4.3).

Table 4.3 Neoliberal urbanism by category of enclave in Chicureo. Source: author's own based on criteria from Tasan-Kok (2010 pp.4-6 Table 1.1).

Main motivation of urban development	ZUDC	Parcelas
Entrepreneurialism	Urban development left to market forces to build efficient and sustainable new cities.	Individuals interest to make profit and live in the countryside.
Competition	Enclave developers compete in metropolitan housing market to attract investment and house buyers. Investment competition between suburban sprawl and urban renewal.	Rural landowners and house landlords compete in housing market.
Consumerism	Residential unit presented as a premium good, associated by marketing with consumerist lifestyle.	Property as an investment and a lifestyle good.
Profit maximisation	Yes. Developers attempt to maximise both their land rent by land use change and the housing products by marketing. Consumers attempt to maximise their investment by seeking high status neighbourhood at cheaper cost than in traditional wealthy neighbourhoods. Financial institutions are associated with developers to finance construction and provide credit to consumers.	Yes. Landowners attempt to maximise their land rent by land use change. Consumers attempt to maximise their investment by seeking high status neighbourhood at cheaper cost than in traditional wealthy neighbourhoods. Financial institutions may lend credit for buyers.
Globalisation	Participation of foreign capital and internationalised companies in both housing market and infrastructure and services provision.	Some developments serviced by private utilities owned by foreign capital.
Glocalisation	Planning power scale shift at the same time from local governments to regional technocrats and to project developers and managers.	Planning power diffused by national law, subjected to interpretation from landowners.
Piecemeal large-scale project-led development	All projects.	Only some projects.

The outsourcing of urban design operates in the following mode. Once the ZUDCs localisation and total surface were established, the conception of the masterplan remained recourse of the developers, who hired private consultancy firms of urban design and architects to develop the masterplans. As the main lines and zoning conditions were already drawn by the MINVU and the PRMS, the role of the local planning authorities was more to control

than to plan, basically reduced to the check list of the legality of the submitted proposal but not its planning merits (MINVU, 1992). Finally, the material construction of the enclaves has been carried not directly by the developers but by hired construction companies, which in some cases (Ciudad Chicureo for instance) belong to the same economic group as the developers (Interview 16, Consultant, Santiago, January 2012). Comparing the content of planning in the green enclaves in Chicureo by category (Table 4.4), it seems that despite the many differences between the origins and context of both categories of green enclaves, they do not differ substantially in what scholars have considered a neoliberal planning (Sager, 2011).

Table 4.4 Chicureo enclaves' neoliberal urbanism. Source: author's own using criteria from Sager (2011 p.152).

Sphere of influence	Policy	ZUDC enclaves	Parcelas enclaves
Urban economic development	City marketing	Property developers marketing of neighbourhood brand "Chicureo"	Landlords market use of neighbourhood brand "Chicureo"
	Urban development by attracting the 'creative class'	Not observed	Not observed
	Economic development incentives	Indirect subsidy to urban development by ad hoc change of land use increasing the land rent	Not observed
	Competitive bidding	Not observed	Not observed
Infrastructure provision	Public–private partnerships	Motorway concessions	Motorway concessions
	Private sector involvement in financing and operating transport infrastructure	Motorway concessions	Motorway concessions
	Private sector involvement in procuring water	Large private utilities for water and sanitation system	Medium/small private utilities for water and sanitation system
Management of commercial areas	Business-friendly zones and flexible zoning	In areas inside the enclaves	Not observed
	Property-led urban regeneration	Not observed	Not observed
	Privatisation of public space and sales-boosting exclusion	Not observed	Not observed
Housing and neighbourhood renewal [or development]	Liberalisation of housing markets	Yes	Yes
	Gentrification	Upper income groups rural colonisation	Upper income groups rural colonisation
	Privately governed and secured neighbourhoods	Yes	Yes
	Quangos organising market-oriented urban development	Not observed	Not observed

4.4.1 State-led greening of neoliberal urbanism by planning innovation

The Plan Chacabuco aimed to guide Santiago's urban development onto a path of metropolitan sustainability by setting a framework that combined restrictions and incentives to the market actors in charge to materialise this vision. Instead of the restrictive planning of the 1994 PRMS, the Plan Chacabuco was conceived as the kick-off of a win-win mechanism, by which sustainable development would be profitable.

Table 4.5 Conditions for ZUDC development and responsibilities set by Plan Chacabuco. Source: author's own from the 1997 metropolitan masterplan (MINVU, 1997).

Condition	Planning	Building/Provision
Concentration of land, at least 300 ha per project	Public (MINVU)	Private (Developers)
Spatial detachment and enclosure of future urban areas	Public (MINVU)	Private (Developers)
Public-private metropolitan connectivity	Public (MINVU/MOP) - Private (Developers/Private sector)	Private (Private sector)
Use of existent public infrastructure to be mitigated (defined by an urban impact assessment)	Public (MOP) - Private (Developers)	Private (Developers)
Environmental impacts to be mitigated (defined by an environmental impact assessment)	Public (SEIA) - Private (Developers)	Private (Developers)
Private provision of water, sanitation, electricity and communications services	Private (Developers/Utilities)	Private (Utilities)
Risk mitigation by management of land/water systems	Public (MOP)	Private (Developers)
Zoning of 83% for suburban land densities 10-85 pp/ha	Private (Developers)	Private (Developers)
Zoning of 7% for green areas	Private (Developers)	Private (Developers)
Zoning of 5% for social housing densities (3% 300 pp/ha and 2% 500 pp/ha)	Private (Developers)	Private (Developers)
Zoning of 5% for commercial/productive non pollutant activities	Private (Developers)	Private (Developers)
Commercial activity left to market initiative	Private (Developers/Private sector)	Private (Developers/Private sector)
Transport activity left to market initiative	Private (unspecified)	Private (Private sector)

To achieve its social, economic and environmental goals, the Plan Chacabuco set a list of conditions to be followed by those private actors

willing to develop residential projects in the ZUDCs. These conditions were mainly referred to the process of planning and approval of the projects, by the assessment of urban and environmental impacts; to the market provision of services and infrastructure to the new developments; and to the characteristics of urban design set by land use and construction specifications, as detailed in the table below.

Now, as the Plan Chacabuco was a regional planning tool and not a national law or an integral urban development regulation, and could not interfere with the broad neoliberalised sector of service provisions, the problem that arose for the state was its lack of competencies to define -and enforce- the conditions and the mitigations. Following private talks between the Ministry of Housing and Urbanism and large rural landowners, the Plan Chacabuco discretionally selected the specific areas to be urbanised with special conditions matching the interest declared by developers to build developments under the new scheme. After the Plan Chacabuco was enacted, the Ministry of Public Works (MOP) developed an ad hoc methodology to assess the urban impact of the projects presented by eleven developers who manifested their interest in the scheme. The MINVU proposed the private developers to pay for the impact mitigation, according to each project size, a mitigation that would take the form of infrastructure projects, motorways and public transport projects (Zegras & Gakenheimer, 2000). Confronted to the bill, the developers refused to pay what they considered was a problem not theirs, but of the whole city. As the Plan Chacabuco did not establish any institutional mechanism either for agreements or for dispute solving, the majority of the developers simply withdrew from the negotiations (Poduje, 2006). From the developers' point of view, the obstacles in the negotiations with the government were the "lack of a clear institutional authority...; the fact that some of the tools... are being developed, essentially, on the fly; and a rigidity and lack of reality in the norms" (Zegras & Gakenheimer, 2000 p.105).

However, the authorities managed to keep three of the developers on the negotiation table, until they could reach an agreement with the MINVU and

the Ministry of Public Works on just one large infrastructure project, a high standard motorway concession that would directly benefit their developments, and other minor scale and local works, worth of US$ 110 million, 36% of them financed by the state (Poduje, 2006 p.264). Once the motorway project was approved, an agreement was finally achieved with nine developers, and two of them later also agreed to finance a private road between Chicureo and the Barrio Alto to improve the developments' connectivity.

In the long term, the discretional nature of the procedures proved insufficient to address the issues arising from the complexities of the development of the ZUDCs, and the state had to be continuously pressing the developers to comply with needed mitigations, as for instance in the 2010 disputes over of the rainwater infrastructure bill (Gutierrez, 2010). As all the contributions from the private sector lay exclusively on the authorities' political will and negotiation skills, the mechanism opened serious considerations over the relationship between state and market interests. To an ecologist leader, who opposed the ZUDC expansion, this lack of institutional procedures only confirmed their suspicions of an under-the-table public-private arrangement: "we were then able to clearly perceive the policies of the Ministry of Housing, completely co-opted, captured, by the property industry" (Interview 19, Activist, Santiago, March 2013).

The lack of transparency of Plan Chacabuco also emerged as a major critique in public debate, as emphasised by a former authority of the Ministry of Housing: "[it] is an issue of governmentality and participation; I mean, the guy [developer] was given a top bottom regulation, he made his own plan, and approved it only by using administrative procedures" (Interview 26, Scholar, Santiago, March 2013). To an NGO leader, this was not a coincidence, nor a public policy failure, but a deliberate situation designed by powerful pro-growth interest groups. In his words:

> And also, with these lies, to state nice things on paper, they hired good lawyers... Well, the same lawyers that had made the regulations, mind you, and they set windows, and through these windows those very regulations can be violated (Interview 28, Activist, Santiago, March 2013).

The conception of the PRMS modification was made by a technical department in the Santiago metropolitan regional branch of the MINVU, and subjected to the approval to the regional council. Despite its scale, the approval of this modification did not require any kind of public consultation, a privilege not granted to minor modifications to the municipal masterplan, although the MINVU authorities did work in close ties with the municipalities of the Chacabuco province to gain their support (MINVU, 1997). No public debate was established to scrutinise the impact of such scale of privatisation of urban development and rural urbanisation, or to ask the opinion of those potentially affected, as local residents and farmers in Chicureo. At the same time, the authorities promoting the plan held private conversations with developers to find those interested in participating in the new scheme, in a similar way to what Morange et al. (2012) describe as informal partnerships between public staff and estate agents to bypass bureaucratic bottlenecks.

4.4.2 Greening of neoliberal urbanism by planning innovations

Along with the conditions set by the metropolitan masterplan, the projects of condominiums in the ZUDC had to comply with the newly enacted System of Environmental Impact Assessment (SEIA). As a response to increasing concerns about pollution and sustainability, in the mid 1990s the Chilean government launched several initiatives and regulations to create a path for sustainable development, which directly affected the urbanisation of Chicureo. In 1997 the SEIA was launched, whose main goal was to make projects environmentally viable (CONAMA, 1997). The first main concern of this regulation was to make Chilean economic growth -mainly based in extractivism and primary industrialisation- compatible with a socially acceptable environmental quality (Campos-Medina & Salas, 2012), while the second was to elevate the country's environmental standards in the context of its 1990s negotiations of free trade agreements with the US, the European Union and Canada (Garín, 2011). To avoid affecting the viability of the economic projects, a major concern of the economic actors and associations, the SEIA relied much more on the responsibility of the project

proponent rather than in a bureaucratic state enforcement, combining a general framework with flexibility and an ad hoc resolution process (CONAMA, 1998).

To illustrate this later assertion: the proponents of a property development project had to decide themselves the modality of this assessment: either a shortened and simpler procedure of environmental statement (DIA) if they considered the impacts would be minor, or a more complete study of environmental impact (EIA) if they considered the impacts were to be of a major scale. [11] Once the project entered the system, the proponents themselves had to choose, hire and pay a consultancy firm to develop the assessment, the same for any service and study involved in the assessment, a procedure often criticised by the plausible lack of independence of the environmental consultancy. In the case of the very large-scale ZUDC projects, once a project was environmentally approved, all the smaller developments inside were exempted of developing their own assessments, except in case of major changes, again left to the criterion of the developer to decide. Finally, a regional council (by that time still designated by the political authority), issued the environmental resolution, following few requirements of transparency or social participation, what left several opaque areas for illegitimate lobby or ad hoc resolution criteria (Sierra, 2008).

In relation to urban development and environmental degradation, a specific decree was set in 1998, the Plan for Environmental Prevention and Decontamination of Santiago (PPDA), which was designed to tackle down the severe air pollution of Santiago caused by particle and pollutant emissions. Although air pollution in Santiago was a problem inherited from the dictatorial period, it became aggravated by the increase of the motorisation rate and industrial activity, and the deregulated private bus transport system during the post-dictatorial period (CONAMA, 1998). Both

[11] The EIA demands a baseline study for the environmental and social situation, plus a technical study of the expected impacts and mitigations, including a process of information and participation of the presumably affected communities.

regulations were associated, as the SEIA's environmental resolution of a project localised in the Metropolitan Region had to consider the compliance of the PPDA restrictions (as well as those of all other environmental-related agencies as forestry, agricultural, sanitation, etc.).

By their scale[12], the projects of urbanisation in ZUDC areas in Chicureo became some of the first to enter the SEIA in the metropolitan region, a process in which additional conditions and restrictions were added to those of the Plan Chacabuco, and where environmental compensations and mitigations were established (SEGPRES, 1997; 2001; MMA, 2013).

Since the enactment of the Plan Chacabuco and the SEIA in 1997, eleven projects of residential enclaves have been environmentally assessed in Chicureo, among them the four ZUDC projects in development. Comparing the environmentally assessed surface of the *parcela* enclaves (of projects larger than 100 ha)[13] with that of the ZUDC projects, it seems that at least from a planning perspective it represents an important shift, from a nearly inexistent assessment in the former to a 100% of surface assessed in the latter (Table 4.6).

Table 4.6 Estimation of environmentally assessed surface (in hectares) of enclave projects by category (1997-2014). Source: author's own with data from COREMA (1999; 2000a; 2000b; 2003a; 2003b), Hidalgo et al. (2005) and Naranjo (2009).

Category	Assessed	Not assessed
Parcelas enclaves	60	2,268
ZUDC enclaves	3,021	0

In spite of that, the assessment system could not question one of the most relevant decisions involving environmental planning, which is the

[12] Residential projects with 80 units or more had to enter the SEIA. In the case of zones declared as pollution latent or saturated (as Santiago) the residential projects had to enter the system if they were developed in surfaces over 7 ha or of more than 300 units, or if they were considered to build their own water and sewage system (BCN 2014).
[13] The surface occupied by non-assessed *parcelas* enclaves is certainly higher but the share of the smaller *parcelas* has not been yet been quantified.

localisation of the ZUDC areas in the rural piedmont of the Chicureo valley, to spare the agricultural activity from urbanisation, by creating huge land reserves for urban expansion in natural areas previously declared by the planning authority of 'low ecological value' (MINVU 1997), without mentioning studies backing this assertion.

Comparing the content of the environmental statements of the four enclaves in ZUDC areas in Chicureo it is clear that, despite their large scale and time length, all these projects entered the system as environmental statements (DIA), not presenting an environmental baseline neither any process of public consultation or participation. Also, following the environmental regulation guidelines (SEGPRES, 1997; MMA, 2013), each project was assessed in its own merit, that is, the institution in charge of assessment never considered the cumulative impacts of these or any other projects in the territory. This dissociated mechanism of environmental assessment did not prevent different projects from overlapping in their use of the same ecosystemic resources, thus omitting possible synergies of the impacts.

The environmental statements of the ZUDC projects in Chicureo are strong in analysing the expected impacts in the construction phase, and detailing a plan of management and mitigation for this phase, particularly in relation to pollution by particle emission, noise, liquid effluents and solid waste. With regard to the phase of operation of the project, these DIAs consider two main parts. In one part, presented in all the projects, the developers present those basic environmental characteristics the urban projects are expected to comply by law, as water and sanitation arrangements, waste collection, management of risk areas, building of rainwater collectors, compliance with the green areas surface, and a plan for the management of the estimated impacts in air pollution in accordance to the PPDA. In another part of the DIA, developers have presented their expected environmental impacts of the projects concerning the local hydrological systems, ecosystems and archaeological sites. As the table below suggests (4.7), this crucial section of the DIAs seems to be the most poorly developed and less consensual between the projects.

Table 4.7 Comparison of environmental assessment content in ZUDC projects. Source: author's own from RCA's COREMA (1999; 2000a; 2000b; 2003a; 2003b)

Environmental Assessment	Ciudad Chicureo	Pan de Azúcar	Valle Santa Elena	Chamisero
Construction impacts (pollution)	Yes	Yes	Yes	Yes
Construction management plan	Yes	Yes	Yes	Yes
Operation water and sanitation	Yes	Yes	Yes	Yes
Operation solid waste	Yes	Yes	Yes	Yes
Management of risk areas	Yes	Yes	Yes	Yes
Build rainwater collectors	Yes	Yes	Yes	Yes
Green areas (7%)	Yes	Yes	Yes	Yes
Operation air pollution (PPDA)	Yes	Yes	Yes	Yes
Protect ravines	No	Yes	Yes	Yes
Manage creeks and riverbed	Yes	No	No	No
Protect specific sites	No	Yes	Yes	No
Archaeological relocation	Yes	No	No	No
Native fauna relocation	Yes	No	No	No
Native flora relocation	No	No	Yes	No
Native flora conservation	No	Yes	No	No
Survey protected species	No	No	No	Yes

In the case of the expected impacts in air pollution, to comply with the PPDA metropolitan decontamination plan the DIAs proposed a series of measures of mitigation and compensation directed to deal with the impacts of the emission of gases and particles (CO, NOx and PM10) derived from the projects' estimated future fleet of private cars. These measures, often increased in the final environmental resolution that approved the projects, referred to road fees, removal of pollutant cars, extra green and forested areas, and financing of ecological education. The analysis of the measures (shown in table 4.8 below) suggests the lack of clear criterion in their application, particularly if considering the total expected population for each project. Crucially, although justified by basic calculations of emissions, these measures failed to indicate a correlation between the scale of the projects' lifetime impacts and the mitigations established, with no reference either to expected increase in motorisation rates or current environmental challenges as local droughts or global climate change.

Table 4.8 Enclaves environmental mitigations to comply with Santiago's PPDA. Source: author's own from the projects DIAs and their environmental impact resolutions (COREMA, 1999; 2000a; 2000b, 2003a)

ZUDC project	Planned population	Road use mitigation fee (in thousands USD)	Taxi removed from use in Santiago	Diesel to gas bus replacement in Santiago	Locally plant extra green areas with trees (ha)	Metropolitan Park ecological centre funding (in thousands USD)	Reforest extra tree areas in Santiago's Metropolitan Park (ha)
Ciudad Chicureo	110,814	-	140	114	72	-	-
Pan de Azúcar	32,104	-	93	-	36	-	-
Chamisero	62,764	-	50	40	15	154	63
Valle Santa Elena	85,000	5,700	-	-	27	-	-

As developers found some of these measures of environmental mitigation and compensation, as the removal of taxis, difficult to apply in practical terms, these were changed for economical measures proposed by the same developers, as funding contributions for municipal plans for roads or school buildings (Interview 52, State Official, Santiago, April 2013; Interview 14, ZUDC Developer, Chicureo January 2013). Although some of the measures to comply with the PPDA were arguably environmentally beneficial to the metropolitan environment as a whole, only those grouped as the planting and foresting of green areas over the urban planning standard directly considered the local environment of Chicureo and the borough of Colina.

These environmental mitigations of the ZUDC projects set by the environmental assessment had a relevant impact on both the market image of the developments and their ecology, as I present in the following chapters. A significant implication of these environmental conditions, explained in the next chapter, is that property developers took these state conditions for sustainability -in urban planning and environmental assessment- as the starting point for their own green market strategy, developing the green enclaves under a form of ecological urbanism.

4.4.3 From experiment to mainstream?

To end the chapter I develop this contextual section to follow the evolution of the urban planning policies originated by the Plan Chacabuco until its adoption on a wider metropolitan scale.

The original mechanism of neoliberalisation of land of 1979, the end of urban growth boundaries and in a more general sense the end of limits to growth, was changed by a more pragmatic mechanism in 1985 after an economic and environmental crisis. And although the following civilian authorities of Concertación explicitly rejected the neoliberal principle that the ‘scarcity’ of urban land restricted urban development, the post-dictatorial policy makers and urban planners proved very sensitive to continue the spatial expansion of the city, even if large areas within the urban growth boundaries were still undeveloped. As scholars and activists

have recently argued, all the modifications to the PRMS since its enactment in 1994 have been made to answer the continuous claim of the private sector of the end of the urban land and impacts of this to the economic growth and the increase of the cost of social housing (Trivelli, 2014; Herman, 2013). At the same time, as I explain below, what had started in 1997 as an experiment resultant of a compromise solution between pro-growth and pro-densification coalitions, was revised and expanded to reach a metropolitan scale.

Once the enclaves in ZUDC areas started to develop in the 2000s, scholars pointed out the failures of the Plan Chacabuco in delivering its promises of social mix, internalisation of mitigating costs by the private developers, and sustainability (Romero et al., 2003; Fuentes & Sierralta 2004; Palacios, 2008). Despite criticism, the Ministry of Housing authorities did not set-back the policies of conditioned urban development, but instead enacted new modifications of the Metropolitan Masterplan in 2003 and then in 2014, when the mechanisms of conditioned planning were simultaneously reformed and extended in scale. These changes did not affect the already established conditioned areas of ZUDCs and AUDPs in Chicureo, but created new and more complex conditioned planning regulations and exaction tools to be applied now to the whole Metropolitan Region.

In 2003 the modifications introduced a new scheme for conditioned urban developed in the PRMS metropolitan masterplan, the Project of Conditioned Urban Development (PDUC). The PDUC scheme inherited many of the conditions defined to the ZUDC: minimal area of 300 ha; densities of 85 (+-15) inhabitants per hectare; 5% area destined to productive activities; and a quota of land destined to social interest housing (MINVU 2003). At the same time, the PDUC meant several innovations in relation to the ZUDCs. Instead of fixed designated areas, PDUCs projects could be developed in any part of the Metropolitan Region, even if previously classified as areas of forestry or agricultural and farming interest, which meant almost anywhere outside the urban limits of Santiago. Also, instead of being granted to few developers, the PDUCs were now available to anyone willing to pay for the

access to overcome the limiting rules of urban development in the existing city. Another innovation of the PDUCs was that at least 30% of the total residential units had to be sold under a social subsidies scheme, under densities of 400 inhabitants per hectare, to allow a social class mix. The third innovation was an explicit definition of the areas of equipment to be provided by the developers, which included health, education, security, green areas and services. The projects also had to pass a more closely defined transport requirement, which included both road infrastructure building and a public transport connection plan. A final innovation was a set of requirements that established a minimal size for a stage development, and the need to fulfil a basic standard and mitigation requirements before opening a new building stage (MINVU, 2003). This combination of higher spatial flexibility with a lower building flexibility resulted in only one residential enclave being currently developed, while another is stuck by disagreements between authorities and developers in the timing of the agreed mitigations (Pflieger, 2011; Isla, 2012).

In 2014, after not less than three years of debate, a new and contested modification to the Metropolitan Masterplan -the PRMS 100- was passed, expanding the urban growth boundary of Santiago in an additional 10,000 ha towards the west of the current limits, and in compensation declared additional zones of natural areas and metropolitan parks (Trivelli, 2014). This new modification added new dimensions of flexible planning and fragmented urban governance, but followed the same matrix established by the Plan Chacabuco. In terms of conditioned planning, the PRMS 100 innovations were the establishment of two new schemes, for which new concessions and more flexible conditions were set: the potentially urban conditioned zones (ZUC), that is, areas of urban extension within the urban growth boundary; and the potentially urban zones of conditioned reconversion (ZURC), those deprived urban areas assigned for priority renewals (MINVU, 2014). But despite its final approval, the PRMS 100 emerged in a context of serious critiques to the practices of speculation over rural land triggered by a corruption scandal in February 2015 that involved the son of President Bachelet in trading rural land and asking for planning

changes to allow its urbanisation (Salaberry, 2015). A public climate of discontent with the political class and the neoliberal model emerged after the massive students' uprising in 2011, and the political crisis triggered by a scandal of corruption of politicians by a private company owned by Pinochet's son-in-law in 2015. The credibility of public-private association that was at the core of the Plan Chacabuco in conceiving and developing the enclaves was severely damaged (Romero S., 2015). As a result, the government presented a series of reforms to stop speculation (Romero M., 2015) and illegitimate public-private connivance (Alvarez, 2015) that so far makes the urban governance of new large projects as those of Chicureo, much more complex, even with the new PRMS 100.

What emerged in 1997 as an ad-hoc innovation to direct a balanced and sustainable growth of Santiago consolidated in 2014 as a mainstream liberalised policy for urban development, in which the planning powers are very much shared by two main actors: the regional council and regional branch of the MINVU, that sets these policies, and the private sector, that develops the projects, whilst local government and social actors are limited to secondary or null roles. Although traditional urban planning was not abandoned, the long-term impact of all that variety and fragmentation of planning forms is still to be assessed. At the same time, despite sound critiques to its failures and impacts, the formula of the ZUDC enclaves in Chicureo proved to be feasible, whilst most of the mega projects of enclaves conceived under the modifications to the PRMS extending the conditioned planning to a metropolitan scale have faced serious obstacles to be developed in the complexity of the metropolitan governance and in relation to the increase of gentrification and urban renewal processes that reduced the potential for new large scale projects for high and upper middle income in undeveloped countryside areas (Contrucci, 2011).

4.5 Chapter conclusions

The analyses displayed in this chapter show that the emergence and development of the green enclaves in Chicureo is a solid case supporting the notion of ongoing processes of neoliberal urbanisation in metropolitan

Santiago, as proposed among others by Hidalgo (2011). However, this process is signalled by changes and innovations in neoliberalism, not by the continuity of the dictatorial urbanism. Indeed, the introduction of successive reforms on urban growth and urbanisation policies by the centre-left coalition dismantled the dictatorial laissez-faire urbanism, setting the bases for a neoliberal urbanism made by new free-market, privatised and pro-growth mechanisms of urban development. These reforms express power struggles between pro-growth and anti-growth coalitions that put environmental concerns in the front of their strategies to shape the new policies for urban development in Santiago.

Through my findings on the crucial legitimatory role of the discourses of urban sustainability in the debate over urban policy reform and its relevance in shaping new planning directives for the urbanisation of the metropolitan countryside, I conclude that the greening of neoliberal urbanism was decisive in setting the framework for the development of the green enclaves in Chicureo. These reforms were developed firstly to fight the environmental evils of the dictatorial laissez faire policies of urban growth, through the enactment of a metropolitan masterplan (PRMS), and later to correct the unexpected effects on the countryside of the more restrictive regulations to urban growth, through an amendment to the PRMS (Plan Chacabuco).

The dismissal of the dictatorial project of a neoliberalised city was replaced in the case of the Plan Chacabuco by a model of simultaneously fragmented and overlapped governance, in which the municipal and regional government kept the management of some basic public services, as education, health, social housing, green areas and local roads maintenance, whilst new monopolist concessions and PPP schemes regulated the private provision of urban water, electricity, waste management, motorways infrastructure. In addition, these public and private regulated areas coexisted with a larger domain of pure laissez-faire as for the private services of education, health, commerce, construction, industry and services in general.

The Plan Chacabuco meant the introduction of the concession model to the urban development, by assigning areas for low-density development under social and environmental conditions for its totally private urban development. And the evidence points out the relevance assigned by the Plan Chacabuco to promote environmental sustainability, by stopping degradation of rural land, mitigating atmospheric pollution, and increasing green and protected areas. This plan was presented as a win-win strategy that would reconcile urban growth, property market development and urban sustainability, saving the state resources and limiting its action to a subsidiary role in urban development. However, as elaborated in this and the next chapters, instead of new self-sufficient and sustainable cities the plan led to the development of urban enclaves highly dependent from Santiago most dynamic areas, that split the borough in low income stigmatised urban areas, an elitist cluster of green enclaves in the countryside, and scattered patches of countryside in between.

Although the Plan Chacabuco was a delimited amendment to the metropolitan masterplan, perceived as controversial mainly because of its disputed origins and later by its effects in residential segregation, the evolution of the following amendments to the metropolitan masterplan suggests that the guiding principles of the green neoliberal urbanism set by that plan were replicated in new policies for conditioned urban growth in the metropolitan area. As I unfold in the next chapter, in the case of Chicureo this adoption of green strategies for urban development by the action of the state in reregulating policies and planning was actively reinforced by the action of private developers integrating greenness as a core issue in their market strategies, by adopting green discourses and green/ecological urbanism in the making of the urban enclaves, ultimately producing green enclaves in Chicureo.

Chapter 5.

Market strategies in the production of green enclaves

5.1 Introduction

The previous chapter explained why planning innovations and regulatory changes in the context of the political transition were crucial to the development of Santiago's green neoliberal urbanism. Although substantial, these state-driven changes in the regulatory framework for urban growth are but a part of what it takes to turn a neoliberal urbanism green. The adoption of environmentalism by entrepreneurial strategies for urban growth has also been fundamental in the production of the green enclaves in Chicureo.

The research question that organises this chapter concerns the market participation in the making of green and neoliberalised urban enclaves in Chicureo. This can be broken down into some specific questions. One, how has the adoption of environmentalism in market discourses and practices in the urbanisation of Chicureo -under Plan Chacabuco's guidelines for self-sufficient, sustainable and socially integrated cities- contributed to the development of a green neoliberal urbanism in the making and maintaining of the urban enclaves? What are the implications of the greening of neoliberalised market strategies and urbanism for the development of urban enclaves in Chicureo? And how has this greening in a new framework for Santiago urban growth converged with processes of marketisation, enclosure and securitisation of nature?

Through the analysis of the urban enclaves marketing and transect walks I first examine the claims of greenness displayed by the enclaves' marketing, and how this is materialised in the green enclaves' urbanism and urban design. I interrogate the relationship of the type of urbanism predominant in each urban enclave and the kind of resulting enclave. Taking into account the concerns over segregation and privatisation presented in the scholarship on urban enclaves and eco-enclaves, I explore how the making of the greenness of the enclaves is interwoven with the production and reproduction of social discrimination and ecological securitisation.

The chapter is structured as follows. The first section (5.2) examines the role of greenness in the property developers' market strategies in Chicureo

by examining the presence of green attributes in the marketing of the urban enclaves. Besides reporting the existence and characteristics these green attributes I intend to produce a more comprehensive notion of the socio-environmental character of the urban enclaves, by analysing the relationship between the enclaves' greenness and what has been widely considered in the scholarship on this type of walled developments: socio-economic elitism and socio-spatial segregation.

In this chapter I also enquire into the recent evolution of the Chicureo enclaves' marketing in order to analyse to what extent it is possible to speak of a shift towards eco-urbanism in it, contrasting the attributes of ecological urbanism in the enclaves with what has been defined in the academic literature as eco-enclave, including here use of green certification schemes in Santiago and Chicureo housing market (subsection 5.2.1). In the following subsection (5.2.2) I study the symbolic complexity of the advertisements, exploring the way in which the green attributes are organised in messages that combine environmental and social stereotypes and ideals that reinforce social exclusionary and discriminating trends of the enclaves. I later contrast these findings on the marketing with my own report of the materialisation of the green attributes in the urban enclaves (section 5.3) stressing both the similarities and discrepancies among the promise of greenness and its material construction. Subsection 5.3.1 specifically highlights the scope of the innovations in sustainability introduced by the enclave developers in their ecological central parks, and the tensions that arise from the conception of public space that is applied in the enclaves' green areas.

In the following section (5.4) I examine the relationship between the urban enclave urbanism and the materialisation of an agenda of ecological security, both through the spatial and geographical enclosure of the developments (subsection 5.4.1) and the ecological functions of resource control of the enclaves' urban design (subsection 5.4.2). The chapter ends with a section of conclusions (5.5) in which I explore the implications of the linkages between the development of green niche market strategies through

green urbanisms, and the production of social exclusion and ecological security in the neoliberal green enclaves.

5.2 Marketing strategies and the production of green enclaves

The greening of cities to increase urban sustainability is considered to have become a relevant trend in the current making of urban policies by governments, NGOs and multilateral institutions (Cheker, 2011; Birch, 2008). This urban greening has also been increasingly reported in the development of free-market environmentalism and the spread of urban neoliberalism and entrepreneurialism by which cities and places compete for flows of capital, immaterial networks and status (Wu, 2010; Bowd et al., 2004). Marketisation of property developments, place-marketing and branding has been reported as a central characteristic of market competition under neoliberal urbanism framework, including the development of urban enclaves and urban mega-projects (Wu, 2009; Peck et al. 2009; Swyngedouw et al., 2002). I examine here what green is offered by the property developers' marketing and what this marketing indicates in relation to the strategies of market greening involved in the production of Chicureo as a place of green enclaves.

Scholarship in private developments emphasises how marketing practices that include references to greenness and environmentalism are a central value in the idealised imaginary of the private residential developments and have become a core feature in the making of green capitalism (Irarrazaval, 2012; Greer & Bruno, 1997). In the last decade scholars have described how marketing practices have increasingly introduced environmentalism as a core theme in the production of an image of exclusive and enclosed private led developments, either in the eco-enclaves in general (Hodson & Marvin, 2010a) or, specifically, in some eco-cities (Caprotti, 2014). In studies related to contexts of neoliberalisation, the practices of green marketing have been linked to mechanisms of greenwashing, by which developers' claims of increased sustainability and environmentalism of their projects are considered just a marketing strategy without provable improvements in efficiency (Bakker, 2010; Tienhaara, 2014). Critical scholars have also

stressed the relevant role that marketing plays in those market dynamics related to urban neoliberalisation, either as a crucial practice of the making of city competitiveness by attracting targeted wealthy or 'creative' social groups (Sager, 2011), as a means of reproduction of class and race segregation (Ruiz-Tagle & Lopez, 2014), or as a tool for the promotion of idealised stereotypes of social life (Carman, 2012). Using the analysis of the green enclaves' marketing I scrutinise the claims of greenness and innovations in the display of a more 'ecological' urbanism, as well as its underlying discourses of class, race and environmental relationships.

The green attributes in the marketing of the urban enclaves

My analysis of the marketing focuses on the green attributes of the projects, that is, the environmental qualities displayed by the marketing makers, ultimately the property developers behind each enclave project. These green attributes range from ecological urban and landscape design, to green architecture and the operation and management of more sustainable systems. The concept of attributes itself has been widely used to describe the positive characteristics of environmentally oriented developments, from Howard's (1902) model of the Garden City to current Eco-city movement (Register, 2002). In the case of Chicureo these attributes have been displayed in different modalities of advertisements, mainly banner ads on television, advertisements in printed media, Internet websites, or billboards in roads. Advertisements are not treated here as accurate reports of the projects. They are a blend of information and idealisation destined to frame the developments within a market niche and make them attractive to a targeted customer group. I therefore do not expect the presence or absence of an attribute in the marketing to *necessarily* match the actual material development of the project.

I develop the analysis of the green attributes displayed by the marketing of the four ZUDC enclaves plus two very exclusive and large *parcela* enclaves, all localised in Chicureo (Figure 5.1).

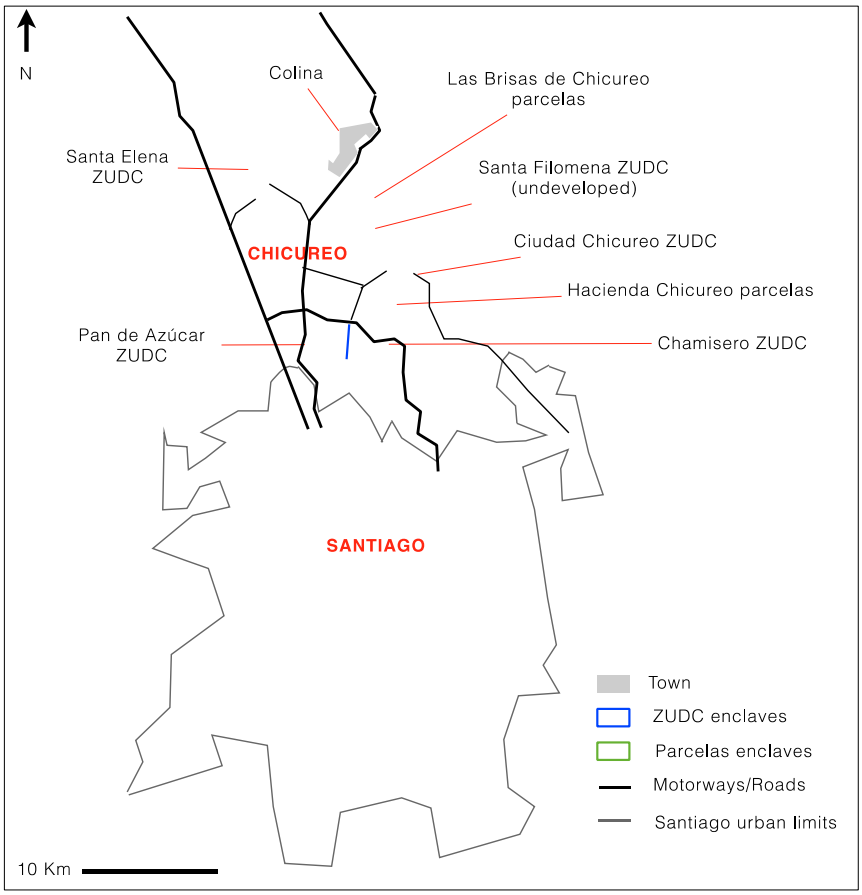

Figure 5.1 Localisation of selected large urban enclaves in Chicureo and Santiago. Source: author's own from Plan Chacabuco (MINVU, 1997).

As a singular assemblage of geographical and social attributes, localisation is a unique variable in the property market. It is also the cornerstone over which a complex market niche is developed, and for the case of Chicureo I propose to consider exclusivism and greenness as the other relevant variables assembled in the making of the enclaves in Chicureo. To weigh on how elitism, segregation and greenness are assembled in the marketing I build the variable of green exclusivism.

Firstly, based on property market reports of house size and prices I explore the concept of price exclusivism in the marketing as a variable that combines socio-economic status and socio-spatial segregation. The offer of status is displayed by an elitist lifestyle, meaning the access to large and premium priced houses while the offer of market segregation is defined by price barriers that ensure socio-economic homogeneity, particularly for the

highest income groups. The results of this exercise are presented below (Table 5.1).

Table 5.1 Exclusivism and price range for residential units by green enclave. Source: author's own from property market review.

Planning	Project name	Property price range (USD)	Income group homogeneity	Plot size range (m2)	House size range (m2)	Price range for built m2 (USD)	Exclusivism continuum
Parcelas	Las Brisas de Chicureo	1,600,000 700,000	Very high and high	5,000 2,200	600 360	2,667 1,944	+
Parcelas	Hacienda Chicureo	1,500,000 770,000	Very high and high	5,400 2,500	1,000 450	1,711 1,500	
ZUDC	Ciudad Chicureo	850,000 387,000	High and upper middle	1,300 600	460 140	2,764 1,848	
ZUDC	La Reserva	800,000 387,000	High and upper middle	5,600 640	580 150	2,580 1,379	
ZUDC	Chamisero	387,000 258,000	Upper middle and middle	850 400	300 130	1,985 1,290	-
ZUDC	Santa Elena	258,000 130,000	Middle	800 340	175 120	1,474 1,083	

The exercise reveals that differences in the range of both prices and space were as valuable as absolute prices to assess price exclusivism.[14] Overall, the property market displays a total exclusion of offers for middle low and other lower income groups in these urban enclaves, what speaks of a general scenario of the production of a new pattern of residential segregation by the urbanisation of this portion of Santiago's countryside. However, the analysis of the market data also suggests a scenario of segmentation and segregation between the urban enclaves (and as it is presented later, also within each ZUDC enclave), which develop as market niches for specific income groups. Although the very high income groups can undoubtedly be considered rich, even the more expensive houses in walled condominiums with guarded entrances do not seem to fit the standard of the super rich -say mansions in very large individual estates with its own entrance- and it is unlikely that these enclaves host any of those Chilean families whose fortune is ranked in Forbes, what speaks of the differentiation of status and exclusivism strategies within in the elite.

[14] Also, prices of entire properties revelaed a better indicator than prices per built square meter in approaching exclusivism in Chicureo, as plot size barriers seem to also play a role in the making of elitist market niches.

In terms of exclusivism, rather than an exact ranking I produced an approximation to what can be seen as a continuum of property market exclusivism, in which the large parcelas display very high levels of elitist homogeneity, followed by two ZUDC enclaves, whilst the two other ZUDC enclaves show lower exclusivism, in a context of general segregation of lower income groups. Now, as I suggest here, in the context of the urban enclaves in Chicureo this first approach to exclusivism needs to take in account the attributes of greenness displayed by the marketing. Thus, I present below what are these attributes of greenness as displayed in the marketing, and later confront the exclusivism of the enclaves with these attributes.

Based on the references to the urbanism of the green enclaves in the literature I have classified the green attributes found in the marketing into the following main ideal types (Table 5.2). Firstly, a rather standard *suburban urbanism* developed under the model of American urban sprawl and influenced by references to the Garden City ideals, made of low density neighbourhoods with semi-detached houses with car garages, backyards and front gardens (Low, 2001; Duany et al., 2000; Blakely & Snyder, 1997). Secondly, a *country club urbanism* in which rather large house sites coexist with sports and leisure features in highly exclusive large rural estates (Roitman & Giglio, 2010; Caldeira, 2000). And thirdly, an *ecological urbanism* in which the emphasis may be either in the conservation of ecosystems, or in the development of a rather circular urban metabolism, by recycling, ecological designed parks or else, in the development of systems for resource and energy efficiency (Caprotti, 2014; Spirn, 2011; Hodson & Marvin, 2010a). Overall, the most frequent green attributes found were those of suburban and country club urbanism whilst attributes of ecological urbanism had a lower performance.

Table 5.2 Marketing green attributes per category of urbanism in Chicureo green enclaves. Source: author's own.

Suburban design	Country club	Ecological urbanism
48 mentions	47 mentions	26 mentions
House's architecture (semi detached/garage)	Controlled access/fenced perimeter	Central Park
House gardens (front/back/rear yard)	Agricultural surroundings	Cycle Lane
Playground	Rural/peri urban localisation	Sustainable design
Walkways/Pavement/Paths	Lagoon	Ecological landscape design
Gardens	Pool in club	Ecological reservation area
Green Areas	Sports field	Energy efficiency
Green Plazas	Horse riding	Gas/heating/energy savings
Parks	Nautical club	Intelligent/Smart home
Trees in roads	Golf course	Domotics/Automatic/Techno innovation
Landscaping/Landscape architecture	Gardening equipment	Green certified system/material
	Nature/Natural landscape	Passive heat diffusion
	Sightseeing/Views/Environment beauty	Architectural design for energy saving
	Wildlife/Animals/Farm	Thermal insulation (other than windows)
	Outdoor nature activities/circuit	Thermal insulation windows (double glaze)
	Outdoor life	Sunlight oriented design/construction
	Breezes/Wind/Ventilation/Open skies	Environmental care
	Mountain bike ways	Recycling point
		Recycling system/program
		Water availability/rights

In the marketing of the green enclaves in Chicureo, the ideal categories of green attributes are blended in different proportions, giving each enclave a distinctive market identity, in a pattern that indicates the presence of market strategies of differentiation and segmentation. The figure below (Figure 5.2), in which the green enclaves (listed following a scale of more to less exclusivism) suggest the development of a market niche strategy in which some enclaves' marketing focus remarkably more on ecological urbanism attributes whilst others focus on more traditional country club and suburban urbanism. This figure also shows how these green attributes are distributed with regard to socio-economical and socio-spatial exclusivism, producing a first approach to the degrees of green exclusivism displayed by each enclave in Chicureo.

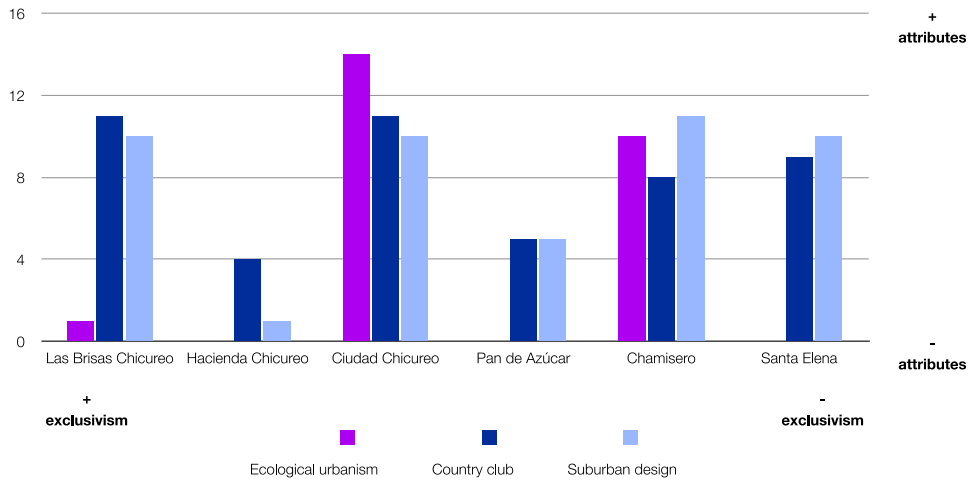

Figure 5.2 Marketing diversity of green attributes: per green enclave and per category of urbanism [enclaves organised from left to right according to the exclusivism continuum]. Source: author's own.

A first finding is that enclaves listed in the highest section of the price exclusivism continuum display a higher relevance of country club attributes over ecological and suburban attributes. This means that for the top-of-the-line enclaves, green exclusivism does not look like any very eco/sustainable exclusivism. Significantly, those enclaves where marketing presents higher diversity of ecological urbanism are not at the absolute highest section of the exclusivism continuum, but on the highest section of its income group, the high-income in the case of Ciudad Chicureo ZUDC and upper-middle income for the Chamisero ZUDC. In that case, the green exclusivism of the enclaves in Chicureo would be segmented in market niches that display specific green configurations according to degree of elitism each consumer can afford. A plausible hypothesis is that ecological urbanism attributes come in this case as a distinctive premium mark for those 'wannabe' groups in a bid to achieve higher socio-economical status. The analysis presented here reinforces the idea of eco-enclaves as elitist havens (Caprotti, 2014; Hodson & Marvin, 2010a). However, it also brings light to the more specificic way elitism became interwoven with greenness in the context of a neoliberalised property market.

All consumers are offered a configuration of greenness and ecological security, but the emphases vary. In the most price exclusive green enclaves, the Hacienda Chicureo and Las Brisas de Chicureo *parcelas*, the emphasis is put on achieving exclusivity in the access to exclusive status-giving green amenities, such as country clubs, golf clubs and polo clubs. In other words, effiency and sustainability seem to be less valued than socio-econimic status. In the case of the top of the high-income prices -Ciudad Chicureo ZUDC- and the top of the upper middle and middle-income -Chamisero ZUDC-, green exclusivism combines country club and suburban attributes with significant number of attributes rated as ecological urbanism. In these more green enclaves the offer of 'eco' standards and technologies are presented as combining economic savings with concerns for the local environment. In those less exclusive green enclaves in each price/income group, the marketing strategy focuses on the benefits to access a better environmentally placed suburb, as in the case of the Santa Elena ZUDC. The marketing emphasises the belonging to Chicureo and its green environment rather than top exclusivity or investment in efficiency and sustainability.

To deepen in the character of exclusivism and its relationship with the green attributes per green enclave, I examine a series of indicators in the advertisements of selected condominiums from the six enclaves. The main character of the urban enclaves as presented by developers' marketing can be approached based on the exclusivism of the enclaves and the text of the advertisements (Table 5.3).

Table 5.3 Character of the relationship between exclusivism and green attributes per green enclave. Source: author's own.

Enclave	Las Brisas de Chicureo parcelas	Hacienda Chicureo parcelas	Ciudad Chicureo ZUDC	Pan de Azúcar ZUDC	Chamisero ZUDC	Santa Elena ZUDC
Price exclusivism continuum	+	-	-	-	-	-
Green exclusivism	Golf club	Golf club	Sailing club	Ecological reservation	None	None
Condominium	Las Brisas de Chicureo	Hacienda Chicureo	Montepiedra	La Reserva	Valle Norte	Ecourbe
Selected text	*Neighbourhood of countryside and golf.*	*If there is a place for each person, this is the best.*	*High quality finishing and energy efficiency*	*Unique sensation of freedom in Chicureo.*	*Neighbourhood life, nature, schools, sport and much more only 7 minutes far from Vitacura by the Nororiente motorway.*	*Ecourban, modernity and nature in equilibrium*
Character	Elitist lifestyle country club haven	Status segregation	Exclusivism ecological modernisation	Anti-urbanism	Barrio Alto secessionism	Suburban green utopianism

This comparison offers another perspective to how a green exclusivism develops in each green enclave following different marketing strategies, what shapes new and different niches within a broad property market niche for urban enclaves. The marketing of the *parcela* enclaves stresses the exclusivism associated to a countryside elitist lifestyle (Las Brisas de Chicureo), or simply to social status segregation (Hacienda Chicureo). The marketing of the ZUDC enclaves includes a higher variation of the character of the exclusivism. In that condominium in the Ciudad Chicureo the marketing stresses the association of exclusivism and ecological modernisation attributes. In a different tone, the La Reserva condominium in the Pan de Azúcar enclave promotes an anti-urbanism approach to the life in Chicureo without the restrictions of the city. By the contrary, the Valle Norte condominium in the Chamisero enclave emphasises a suburban secessionism that allow residents to keep an urban elitist lifestyle as well as a fast and direct connection to the Barrio Alto. Finally, at the bottom of the price exclusivism continuum in Chicureo, the Ecourbe condominium in the Santa Elena enclave offers a Garden City ideal in the form of a suburban life in nature.

Ecological urbanism in the marketing of the green urban enclaves

The development of premium green enclaves conceived and designed with modalities of ecological urbanism is considered a fundamental feature in the making of eco-enclaves, premium enclosed settlements aimed to overcome the environmental limits and uncertainty set either by the scarcity of natural resources or the negative impacts of the anthropic action, as pollution or climate change for instance. The scrutiny of the diversity and distribution of green attributes in the marketing of the green enclaves shows attempts to present the greenness of the developments as more ecological and sustainable, and not just aesthetically appealing green areas of ‘natural’ landscapes and well designed gardens. Through the analysis of the marketing and its evolution I found examples of how developers also present developments with a higher profile in attributes and innovations in sustainability, and claim a specific ‘eco’ character for some of the green enclaves.

With regard to specific emphasis in ecological urbanism promoted in the marketing, most emphasis seems to refer to the promise of improvement of the environmental performance of the enclaves either by urban, landscape or house design or by the adoption of technologies and systems embedded in houses or development claimed to be more efficient, particularly with regard to energy use (Table 5.4).

Table 5.4 Marketing attributes of ecological urbanism in the enclaves of Chicureo. Source: author's own.

Attribute	Las Brisas de Chicureo	Hacienda Chicureo	Ciudad Chicureo	Pan de Azúcar	Chamisero	Santa Elena
Central Park			Yes		Yes	
Cycle Lane	Yes		Yes		Yes	Yes
Sustainable design					Yes	
Ecological landscape design	Yes		Yes			
Ecological reservation area				Yes		
Energy efficiency			Yes		Yes	
Gas/heating/energy savings			Yes		Yes	
Intelligent/Smart home			Yes			
Domotics/Automatic/Techno innovation			Yes		Yes	
Green certified system/material			Yes		Yes	
Passive heat diffusion			Yes			
Architectural design for energy saving					Yes	
Thermal insulation (other than windows)			Yes		Yes	
Thermal insulation windows (double glaze)			Yes		Yes	
Sunlight oriented design/construction					Yes	
Environmental care			Yes			
Recycling point			Yes			
Recycling system/program			Yes			
Water availability/rights			Yes			

However, few of these attributes relate to some degree of engagement of residents in an ecological action, an invitation perhaps only suggested in this sample by the Cycle lane and the Recycling program. At the same time, it is worth highlighting the omissions of the marketing in mentioning other key ecological attributes, either for lack of them in the enclave projects or on account of strategy. Attributes that one could expect to find would be systems for improving water efficiency and recycling (crucial for a semi-arid zone as Chicureo), systems of energy production to contribute to increasing the enclaves' self-sufficiency in energy production, or systems for reducing the carbon footprint of the developments operation.

This concentration and diversity of attributes of ecological urbanism in some of the urban enclaves in Chicureo, particularly the Ciudad Chicureo, has to be balanced with the fact that the enclaves are not internally homogeneous. Although both ZUDC and *parcela* enclaves constitute a spatial unit with well delimited boundaries with common areas, dependent on a main developer and a main commercial identity, in the case of the ZUDC enclaves their internal distribution is often made out of different condominiums, in some cases with distinctive characteristics.

This means that also within a ZUDC enclave, different strategies of differentiation are in course, and the overall performance of an enclave with respect to the green attributes can be made out by a highly uneven combination of different individual performances of the inner condominiums. In the case of the Ciudad Chicureo ZUDC enclave for instance, among its eight condominiums surveyed in the marketing sample, some display most of their attributes as belonging to ecological urbanism (as Canquén Norte or Casas de los Bosques), whilst others show very few or none. In this case, all the condominiums with attributes of ecological urbanism have been inaugurated after 2011. To provide an image of this inner differentiation in the enclaves, I examine the diversity of green attributes in each condominium per ZUDC enclave, where more inner condominiums are found. The pattern of green attributes distribution in the

sample shows that even in those enclaves with presence of attributes of ecological urbanism, this follows a niche strategy, in this case adopted by some of the most recent condominiums.

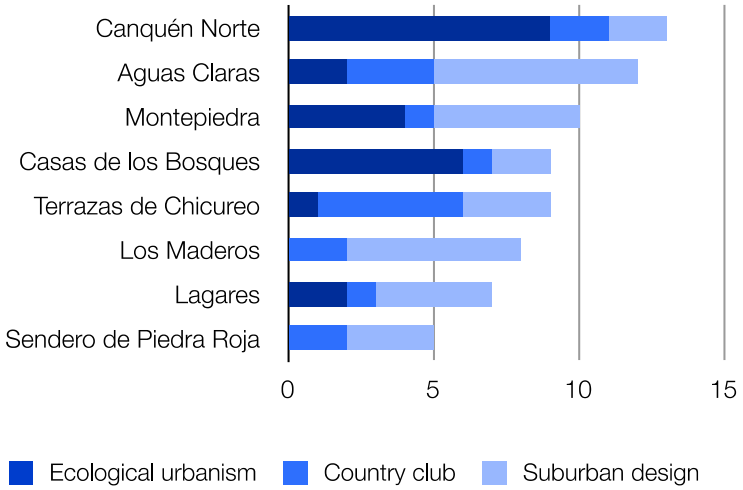

Figure 5.3 Green attributes per condominium per category of urbanism. Source: author's own.

These results show that, although some urban enclaves -and particularly some inner condominiums- are closer to the definition of eco-enclaves in the literature, a more generic definition that will encompass the diversity of outcomes of the green neoliberal urbanism and the market niche strategies in Chicureo is that of green urban enclaves.

5.2.1 The role of certification schemes in the marketing of green enclaves

These green enclaves are part of a more general tendency of Santiago's premium property market to adopt sustainability discourses and innovations, although their development in Chicureo does not reproduce the same standards for the claim of being 'green', 'sustainable' or 'eco', as debated in the next section.

To back their claims about the greenness of the urban enclaves in a context in which their environmental concern is often depicted as greenwashing by

other actors (see Chapter 6), developers have very slowly begun to apply 'eco-labels' to their products (Eden, 2011). Eco-labels are part of a marketing-led strategy of green branding which is considered fundamental of current services and goods (Ottman, 2011; Hartmann et al., 2005) These eco-labels take two main forms in Chicureo. They are either coined by the developers in the form of names or marketing labels, for instance the 'Ecourbe' neighbourhood in the Santa Elena ZUDC or the 'eco-smart' house in the Ciudad Chicureo ZUDC, or issued from certification bodies to materials and systems used in the enclaves. From 2011 onwards property developers in Chicureo cautiously started to adopt some degrees of certification that supported their claims of a shift to sustainability (Table 5.6), although in all the projects, certification is limited to the performance of construction materials and appliances, avoiding the certification of sustainability systems, buildings and neighbourhoods.

Table 5.5 Green certification per project in Chicureo ZUDCs enclaves. Source: author's own from Siena (2012); Besalco (2013); EE Chile (2013) and Efizity (2015)

Project	ZUDC	Certification	Year	Certifier
Canquén Norte	Ciudad Chicureo	Insulation system	2011	DECON - Catholic University of Chile
Canquén Norte	Ciudad Chicureo	Energy Efficiency	2012	Ministry of Housing
Canquén Norte	Ciudad Chicureo	Insulation Windows	2012	University of Chile
Canquén Norte	Ciudad Chicureo	Design's assessment on energy	2012	EFIZITY consultants
Lomas de Chamisero	Chamisero	Insulation materials and systems	2012	EIFS
Terralta	Chamisero	Insulation Windows	2012	IDIEM - University of Chile
Valle Norte	Chamisero	Energy assessment	2012	EFIZITY consultants
Jardín del Canto	Chamisero	Energy Efficiency	2013	EE Chile
Santa Elena	Santa Elena	Design's energy efficiency	2014	EFIZITY consultants
Terralta	Chamisero	Energy assessment	2014	EFIZITY consultants

The disregard of broader certification schemes on urban sustainability has drawn my attention, particularly considering the explicit image of greenness promoted in the enclaves' marketing and the momentum these schemes are gaining also in Santiago property market, as I gathered from the field and from the interviewees' discourses. From the late 2000s Santiago's

construction and property development industry has been experiencing a boom in green building certification, mainly by adopting LEED scheme as the market standard for green labelling[15]. The LEED growth rate in Chile has been very fast, and in 2012, only four years after its first certification, the country was rated among the top 10 countries in number of projects (Rojas, 2012). By February 2015 the USGBC reported 225 projects in Santiago, 66 of them already awarded the LEED certificate (USGBC, 2015). Although the bulk of the projects are office and corporate buildings, there are 37 residential projects in process of certification in Santiago, and since 2013, 5 of them are already certified (USGBC, 2015). At the same time, in the borough of Colina two buildings have recently been certified by LEED, and a newly built storage centre is going through certification (Table 5.6). None of these LEED certified projects being *inside* a green enclave.

Table 5.6 LEED projects in Colina borough. Source: author's own from project files (USGBC 2015).

Project	Type	Year	LEED Standard	Green Attributes
Santa Carmen de Chicureo	Office building	In construction	Certified	Bicycle parking Arid adapted flora in garden Green wall Photovoltaic cells in roof Efficient insulation systems by materials and natural ventilation Efficient lightning by T5 and LED technologies
Information Centre Parque Quilapilún	House	2012	Gold	Water efficient landscape and gardening Energy efficient systems Local materials Use of natural illumination Innovation in Design
Megaflex Storage Centre Algarrobal	Industrial storage	In construction	In certification	-

This complete omission in Chicureo of what is today *the* market standard in building certification in Chile is indeed remarkable. Even those developers

[15] There are LEED versions to qualify new constructions, core and shell of existent constructions, retail, schools, healthcare, data centres, among others. In each version, points are assigned according to the performance of the project in many categories, being some of the most relevant those of Sustainable Sites, Water Efficiency, Energy & Atmosphere, Material & Resources, Indoor Environmental Quality Innovation and Regional Priority Credits. There are four levels of LEED certification, from the lowest to the highest: Certified, Silver, Gold and Platinum (USGBC 2015).

with residential buildings already in certification by LEED in Santiago, are not certifying their houses or condominiums in enclave developments in Chicureo. Paraphrasing Cidell (2009 p.621), who challenges the vision of green city being produced with LEED, the question here would be what vision is being produced *without* the standard, and why so, if as Cidell (2009) suggests, LEED represents a flexible commitment 'to be greener' already being promoted under discourses of green capitalism?

There is no straightforward answer to these questions, which are scrutinised in the next two chapters (Chapters 6 and 7) in relation to the environmental discourses of the actors on Chicureo and the hybrid socio-nature produced by the green enclaves. What can be concluded in this point is that the absence of LEED in Chicureo -in the context of Santiago certification boom- adds to the notion of Chicureo as a product of a green neoliberal urbanism that omits more complex discourses and practices of ecological modernisation proposed by green capitalism.

5.2.2 Assembling green subjectivity and narratives of exclusivism in the urban enclaves

I consider the marketing of the enclaves as a complex and subjective form of communication that cannot be reduced to the count of green attributes. The analysis of symbolic dimensions of the green marketing may contribute to enrich the understanding of the strategies of market greening, by linking the product with a more general framework of social aspirations and representations.

The green marketing of the enclaves involves the production of an attractive and idealised image of the product in offer to a targeted group. In this case, the green appeal of the enclaves is interwoven with other symbolic attributes that explicitly and implicitly create a promise of a specific place, environment, and social relations. This subsection focuses on the symbolic character of the green attributes displayed in the advertisements, by scrutinising the textual and visual content of their discourses, the main message that emerges from a specific composition of green attributes in the

advertisements and the linkages between the coded content of the marketing.

The distribution of green attributes among the advertisements' visual and textual elements is displayed in a highly subjective composition in which at least one dominant message can be interpreted. To illustrate this, I take a sample of three advertisements belonging to different enclaves. In the case of the Terralta condominium in the Ciudad Chicureo enclave, I consider an advertisement at the early stages of the project marketing in 2013. The main message of the text and image of this advertisement invokes Chicureo's countryside environment and its fast connectivity to the Barrio Alto. One of the main visual elements of the message is the woman running on the hill, along the message of "from the bottleneck to the trainers in 8 minutes", promising a fast switch between the city busy lifestyle and the safe, peaceful green lifestyle of the enclave. The advertisement's main slogan "Chicureo is closer" is open to multiple and simultaneous interpretations: although it explicitly indicates that Chicureo can be reached faster by car, it also may imply that it is more affordable than before, as houses in this enclave are not at the top of the prices, and the photo shows the woman reaching for something just around the corner.

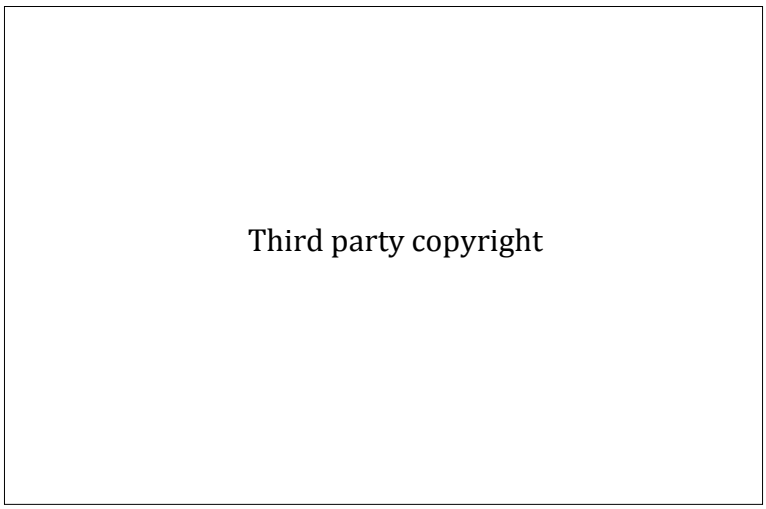

Figure 5.4 Terralta advertisement. "Chicureo closer: from the traffic jam to the trainers in 8 minutes". Source: screen capture from www.terralta.cl [12-02-2014]

In the case of the Hacienda Chicureo *parcela* enclave, the dominant message is one of exclusivity, safety and a green country club lifestyle for families. There are no references to the city in this advertisement, only an image of some of the green attributes of the enclave. The slogan on the top is a statement that "we [project developers] dream the same as you", followed by a central image of a man and a boy -presumably representing a father and son- playing in the very green golf course. There is a powerful conservative symbolism in this photo, the green enclave as space for reproduction of generational (father and son transmission of practices and values) and gender roles (guys go play golf, women... stay at home?).

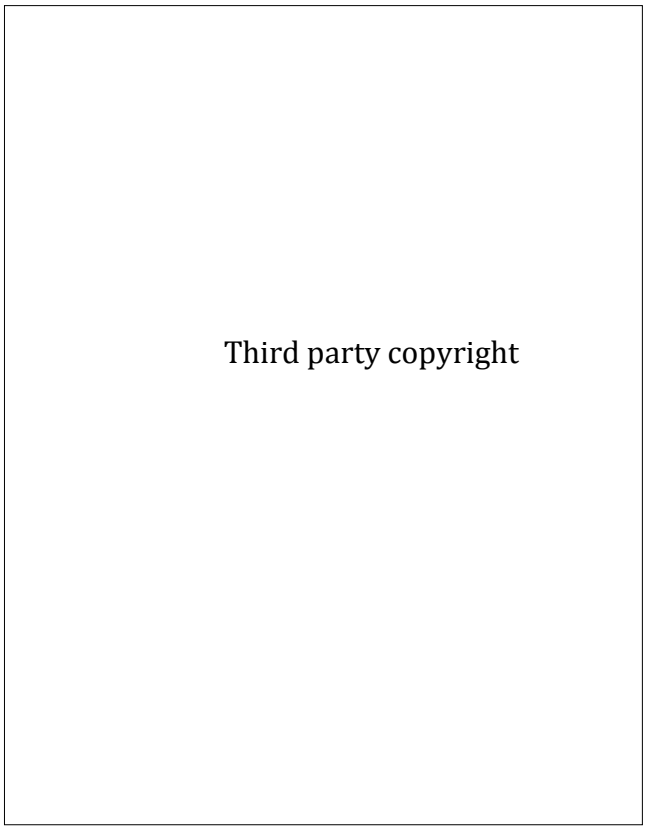

Figure 5.5 Hacienda Chicureo advertisement. "New phase launch: last 22 houses". Source: VD magazine 14-04-2012.

In the case of those advertisements with high diversity of ecological urbanism attributes, I have divided these in two main strategies, based on the literature. I consider that one strategy emphasises the elements of

landscape and urban design that attempt to mitigate the impacts of the settlements in the local ecosystems, and thus adapt to the environmental limits (as presented by Spirn, 2011). I see another strategy emphasising a technologically led response, influenced by ecological modernisation to extend and overcome the ecological limits put by climate or resource restrictions (as presented by Hodson & Marvin, 2010a).

An example of the former can be found in what might be the main green message of the Aguas Claras project in the Ciudad Chicureo enclave, which stresses an ecosystemic park that adapts to the surrounding ecology and contributes to the project self-sufficiency (Figure 5.6).

"The Park. The design of this Ecosystemic park of a surface of almost 11,000 m2 was conceived to host different zones: Sectors with children's playground, shadowed places, sports areas and a large cycle lane. Nature itself adapts and develops in a self-sufficient way, as the Park considers species that feed different birds and insects."

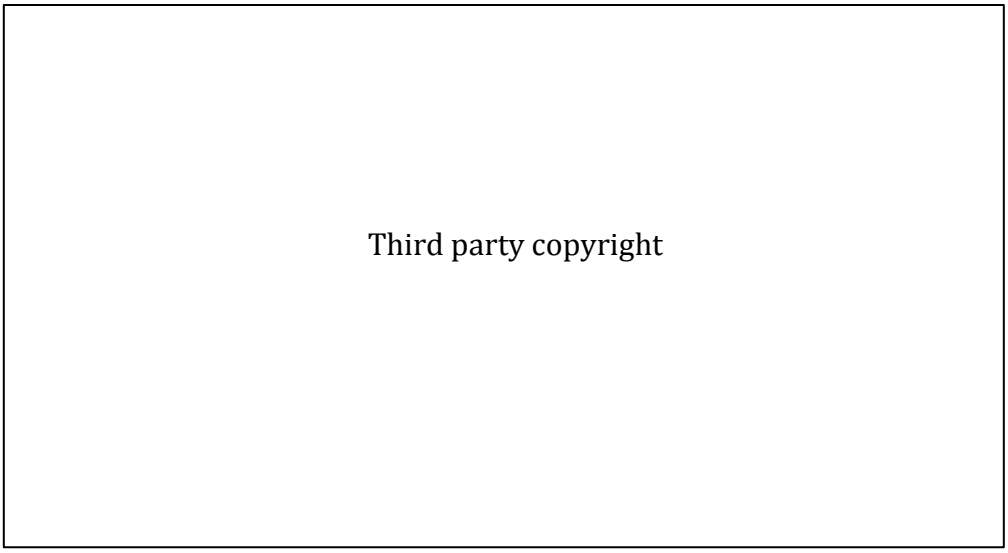

Figure 5.6 Advertisement image of ecosystemic park in the Ciudad Chicureo ZUDC. Source: Inmobiliaria Manquehue (2014b)

This piece of advertisement is extremely interesting as the image chosen to show the ecosystemic qualities of the park simultaneously combines elements of ecological landscaping, as cycle lanes, dry climate grasses and

trees, with extensive lawns and an intensive use of water, which is telling of the contradictions of the green marketing of the enclaves.

Examples of marketing based on discourses of urban sustainability can be found in the advertisements of the Casas de los Bosques condominium and the Canquén Norte condominium. In the case of the Casas de los Bosques condominium in the Ciudad Chicureo enclave, the advertisement below stresses a new concept of house, the Eco-Smart, a reference to Smart cities. The concept of smartness would be encapsulated in an individual site, and it refers to featuring energy efficiency driven by new insulation materials and systems; house automation (domotics) and remote control of the house systems; premium architectural design and quality; and environmental care, in the form of both recycling bins and compost in the house site (Figure 5.7). In this case, the image is set in a night scenario, in which the electricity powered house lighting stresses the attributes of the built environment. The main slogan states that "an Eco-Smart house is a house that thinks as you do", which not only promises a house with intelligent systems for the efficient management of energy, and technology and design for environmental care, but offers an alternative lifestyle for those potential customers who consider themselves as having an 'eco' way of thinking. The other example of an ecological modernisation style of eco-urbanism is the advertisement of the Canquén Norte condominium. In this case, the marketing offers households with significant savings in winter energy consumption, generated by the use of energy efficiency systems achieved by innovation and certified by the Chilean government. Although limited to specific condominiums -and not representative of a whole enclave- the advertisements below display a technological approach to ecological urbanism that is closer to the cases of eco-enclaves in the literature.

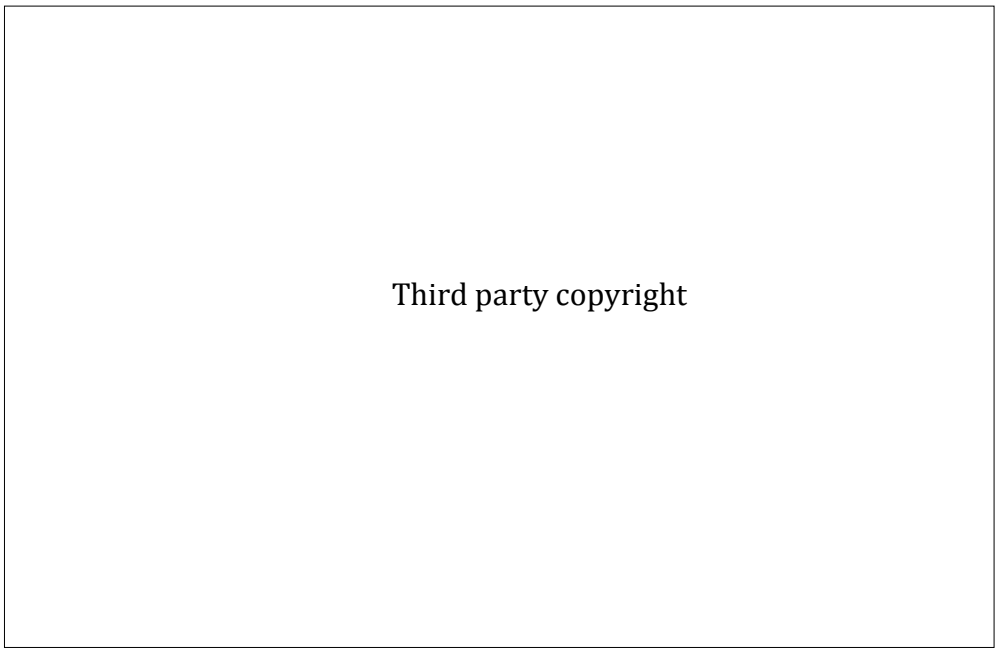

Figure 5.7 Advertisement of eco condominiums in the Ciudad Chicureo enclave. Source: VD magazine (06-04-2013 and 8-08-2012).

In order to further explore the linkages between the offer of greenness and a specific social order in the enclaves' marketing I ran in the NVivo 10 software a function[16] to associate by similarity the content of the codes related to ecological urbanism/architecture, exclusivity and lifestyle of twenty advertisements. The result is a very suggestive figure in terms of the underlying narratives of social hierarchy that are marketed. The figure shows the organization of the codes in a node tree with two main branches and three secondary branches, which I call 'code families' (Figure 5.8). It suggests that the content of ecological urbanism in the marketing is deeply interwoven with that of exclusivism (and exclusion) and lifestyle, and the market package of the enclaves is simultaneously assembling these elements in one single product: the green enclave.

[16] The software correlates the similarity in the codes content (text) by using r (Pearson) and draws the linkages, whilst the name of the code families is my interpretation.

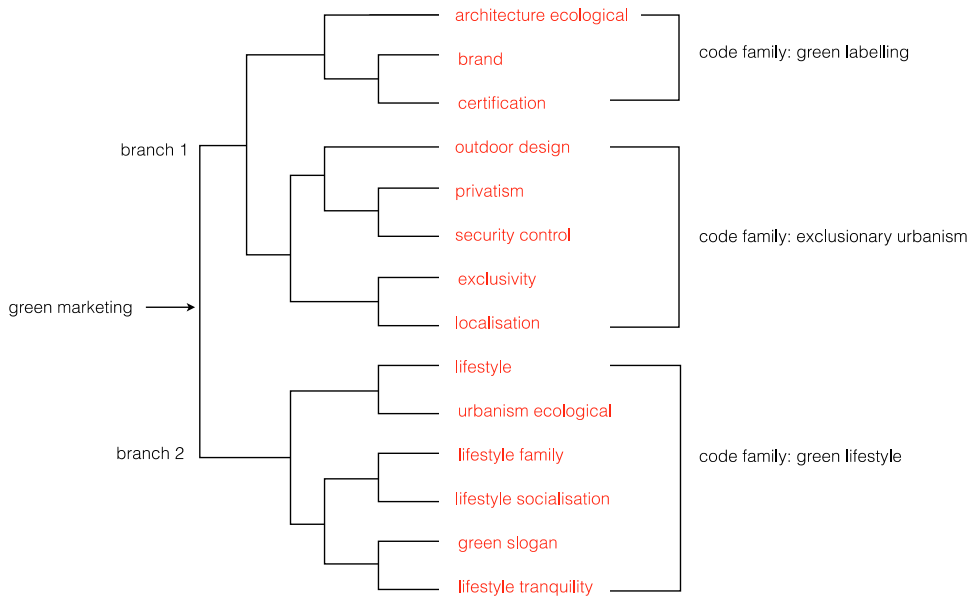

Figure 5.8 Advertisements clustered by coded similarity. Source: author's own using NVivo 10.

Both the analysis of images and text performed in this section raises questions on the implication of the convergence of market environmentalism with social exclusion and inequality. I continue to interrogate this issue in the following chapters, examining first how the socio-nature is produced by the green enclave neoliberalisation linked to the production of environmental injustice, and then how socio-ecological and power asymmetries are discursively framed. I now examine the greenness of the enclaves by contrasting the presence of green attributes in the marketing with my own experience in the field, as reported in the transect walks.

5.3 Materialising green attributes in the urban enclaves

My own experience in the field, and in particular a series of transect walks through the enclaves[17] (Figure 5.9) are a source of data to understand how the promoted green attributes are being built and materialised. Although the main goal of the transect walks is to contrast -and enrich- the data gathered from the marketing analysis and other documentary sources with my own experience, the marketing is also observable inside the urban enclaves.

[17] In the case of the Hacienda Chicureo, which I could not enter, my report was limited to the attributes spotted from the enclave's entrance and through its fences.

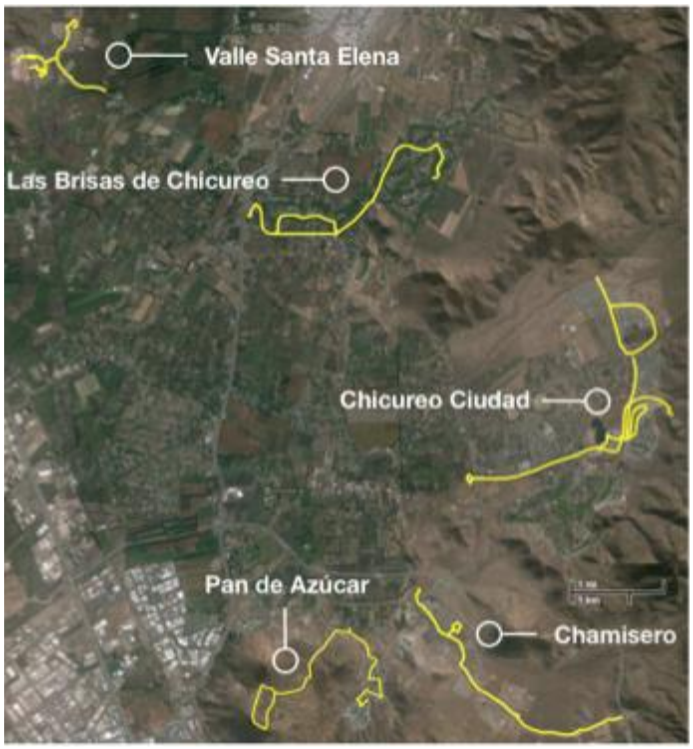

Figure 5.9 Transects route (yellow lines) in Chicureo large enclaves. Source: author's own from fieldwork notes data, plotted on screen capture from Google Earth, Image © DigitalGlobe 2014.

The urban enclaves in Chicureo are long-term projects and condominiums or infrastructure for private services are often being constructed or sold inside the enclaves. In my walking transect I consistently found different forms of advertisement -among them the billboards (Figure 5.10)- of the green character of the enclaves being built in an arid environment. This finding matches reports on what is depicted as an aggressive marketing in the literature of eco-enclaves and eco-cities (Caprotti, 2015; Joss & Molella, 2013).

Figure 5.10 "Here, houses with big private park": billboard in the Chamisero ZUDC enclave. Source: photo M. Sanzana Calvet 2013.

In my register of green attributes during the transect walks I found a decrease of these in comparison to those found in the advertisements, largely due to the reduction of visible attributes of Ecological Urbanism (Table 5.7). Please be aware that, as the transect walks are not representative of all the inner condominiums of the enclaves, a green attribute not reported in the transect walks not necessarily is absent from the whole enclave[18]. This divergence does not challenge the green character of the urban enclaves, although it triggers questions about the level of engagement of developers with strategies of ecological modernisation.

[18] As the interview reveal (more detail in Chapter 7) this dissonance may occur by development strategies, in which an area is left to be built in a later stage, by change of plan agreed with the authorities, or simpli by an unilateral market decision to omit a specific feature. The fieldwork confirmed that in the case of very large scale green attributes promoted in the marketing, such as central parks and lagoons, these are not being omitted by developers, and it is unlikely that would pass unnoticed to my register.

Table 5.7 Comparison of diversity of green attributes found in marketing and in the transect walks. Source: author's own.

Urbanism	Source		Urbanism	Source		Urbanism	Source	
Ecological urbanism	Marketing	Transect	Country club	Marketing	Transect	Suburban design	Marketing	Transect
Central Park	Yes	Yes	Controlled access/fenced perimeter	Yes	Yes	House architecture (semi detached/garage)	Yes	Yes
Ecological landscape design	Yes	Yes	Agricultural surroundings	Yes	Yes	House gardens (front/back/rear yard)	Yes	Yes
Ecological reservation area	Yes	Yes	Rural/peri urban localisation	Yes	Yes	Playground	Yes	Yes
Domotics/Automatic/Techno innovation	Yes	Yes	Lagoon	Yes	Yes	Walkways/Pavement/Paths	Yes	Yes
Sunlight oriented design/construction	Yes	Yes	Pool in club	Yes	Yes	Gardens	Yes	Yes
Recycling point	Yes	Yes	Sports field	Yes	Yes	Green Areas	Yes	Yes
Sustainable design	Yes	-	Horse riding	Yes	Yes	Green Plazas	Yes	Yes
Energy efficiency	Yes	-	Nautical club	Yes	Yes	Parks	Yes	Yes
Gas/heating/energy savings	Yes	-	Golf course	Yes	Yes	Trees in roads	Yes	Yes
Intelligent/Smart home	Yes	-	Gardening equipment	Yes	Yes	Landscaping/Landscape architecture	Yes	Yes
Green certified system/material	Yes	-	Nature/Natural landscape	Yes	Yes	Cycle lane	Yes	Yes
Passive heat diffusion	Yes	-	Sightseeing/Views/ Environment beauty	Yes	Yes	-	-	-
Architectural design for energy saving	Yes	-	Wildlife/Animals/Farm	Yes	Yes	-	-	-
Thermal insulation (other than windows)	Yes	-	Outdoor nature activities/circuit	Yes	Yes	-	-	-
Thermal insulation windows (double glaze)	Yes	-	Outdoor life	Yes	Yes	-	-	-
Environmental care	Yes	-	Breezes/Wind/Ventilation/Open skies	Yes	Yes	-	-	-
Recycling system/program	Yes	-	Mountain bike ways	Yes	-	-	-	-
Water availability/rights	Yes	-	-	-	-	-	-	-

This reduction reported in the transect walks is remarkable in those enclaves that performed high in attributes of Ecological Urbanism in the marketing analysis, as Ciudad Chicureo and Chamisero ZUDCs, whilst from the perspective of the walking transect all enclaves seem to perform better in attributes of Suburban and Country Club urbanism (Figure 5.11).

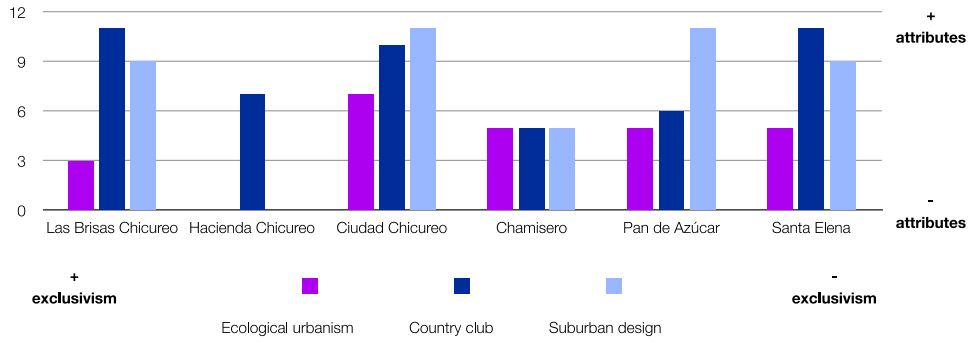

Figure 5.11 Green attributes per enclave in transect walks. Source: author's own.

These results show the presence of green attributes in the enclaves from the point of view of the street, and may be particularly missing those 'house-embedded' ones (as construction materials, systems and appliances). To develop an approximation to these 'missed' attributes I compared the unreported green attributes in the transect walks with data from my notes on the visits to enclave houses while doing the interviews, and also run a query in the interviews content (in NVivo 10) for references to these unreported attributes. The results plotted below (Table 5.8) suggest that although some of green attributes originally displayed in the marketing may have been omitted in my observation in the transect walks (for instance as part of the houses interior or hidden infrastructures and appliances), others may be temporarily or definitively absent.

Table 5.8 Presence of ecological urbanism attributes (unreported in the transects) in house visits and house interviews. Source: author's own.

Ecological Urbanism	Las Brisas de Chicureo parcelas	Ciudad Chicureo ZUDC	Chamisero ZUDC	Pan de Azúcar ZUDC	Santa Elena ZUDC
Sustainable design				Yes	
Energy efficiency					Yes
Gas/ heating/ energy savings		Yes	Yes		
Intelligent/ Smart home					
Domotics/ Automatic/ Techno innovation	Yes				
Green certified system/ material	Yes				
Passive heat diffusion					
Architectural design for energy saving				Yes	
Thermal insulation (other than windows)					Yes
Thermal insulation windows (double glaze)	Yes	Yes		Yes	Yes
Environmental care		Yes	Yes		Yes
Recycling system/program					Yes

The belief that what is promised as green in the marketing is not delivered or is just a facade of green -a greenwashing operation of the developers- is indeed widely present in the discourses of some of the enclave actors, as presented in Chapter 7 on environmental discourses. However, apart from this apparent absence of green attributes related to qualities embedded in the houses, a significant finding of the transect walks is the presence of new green attributes, that is, features not reported in the marketing sample (Table 5.9). In the case of the new green attributes classified as ecological urbanism, their presence reinforces the idea of a recent spread of 'eco' innovations related to efficiency in the consumption of resources. Now, what are these new green attributes? And why aren't they advertised with the other attributes?

Table 5.9 New green attributes found in the transect walks. Source: author's own.

Ecological urbanism attractors	Country club	Suburban design
Water efficiency (irrigation)		
Water solar heating system		Shopping area with
Solar photovoltaic cells for bus stop lights	-	terraces
Solar photovoltaic cells in houses		Benches in green areas
Eco-friendly rainwater management systems		

In the walking transect I realised that appliances for a more efficient watering of gardens and green areas garden -as by drop irrigation in green lanes and automatic lawn sprinklers- were an extended feature in condominiums and enclaves in Chicureo. What I found somehow surprising was that some green areas of the Ciudad Chicureo enclave had the combined presence of more sophisticated system by drop irrigation with a gardening landscaping that privileged stone gardens and arid land vegetation, and this was particularly remarkable in new neighbourhoods under construction. The combination of these attributes is an indicator of the spread of a more ecological landscaping and gardening that begins to take into account not only geography and garden models but also the typology of the local ecosystem of a *matorrales* -dry bushes- biome. As it is presented in the next section, this more ecologically aware design was also found in some parks in the enclaves.

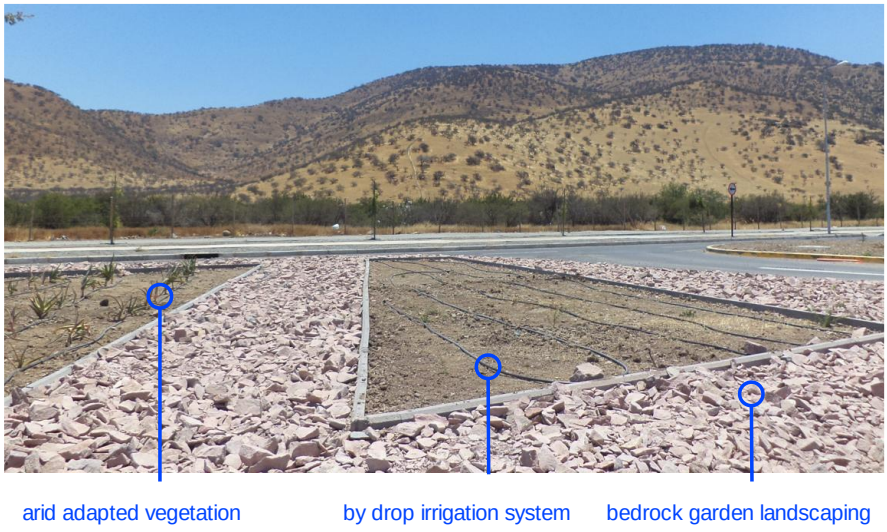

Figure 5.12 Ecological urbanism attributes in landscaping and gardening. Source: author's own from photo M. Sanzana Calvet (2013).

Although rainwater management in the enclaves resembles very much that of any suburban development, in some areas I found 'eco-friendly' rainwater management systems, designed to integrate the rainwater from the ravines and creeks into urban parks with vegetation and flooding absorption areas, rather than channelling it in an underground network. As highlighted

by Fernandez (2004) in his design of park in a condominium in the Pan de Azúcar ZUDC enclave, this concept contributes both to create aestheticized landscapes and to reduce the volume and speed of rainwater flowing downwards the valley.

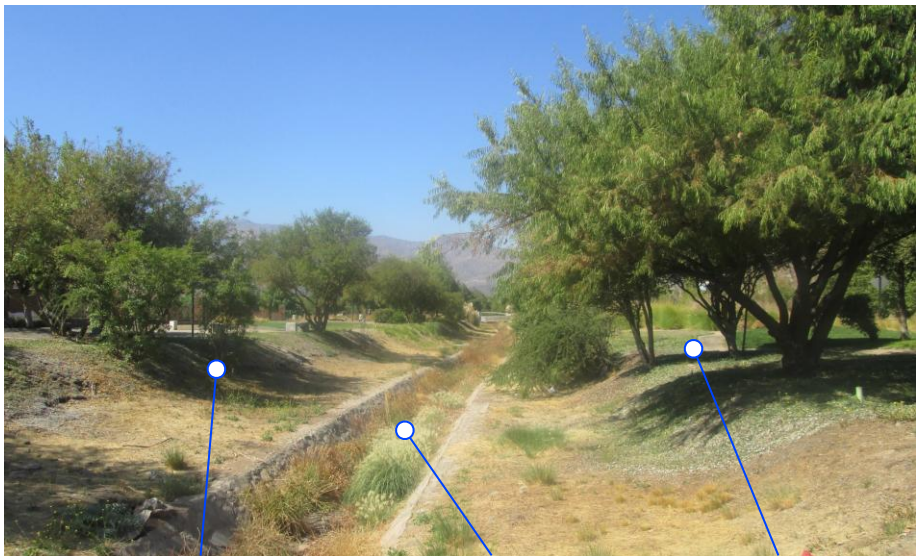

Figure 5.13 Example of eco-friendly rainwater management in Chamisero ZUDC enclave. Source: author's own from photo M. Sanzana Calvet (2013).

As all these green attributes regarding water efficiency are related to the management of green areas by the developers, I hypothesise that they do not consider it the most representative greenness sought by potential consumers (something suggested by the developers' perception of what house consumers want), a topic to developed in Chapter 7 on discourses.

The other new green attributes spotted in the transect walks related to the use of solar energy. Although not a feature displayed in most houses, in the walking transect I noticed several houses with panels in the roof for water heating by direct solar energy irradiation in the Santa Elena and Ciudad Chicureo ZUDCs. In addition to this basic form of solar energy capture, I also reported two modes of use of photovoltaic panels to the generation of electricity from solar energy (Figure 5.14). One mode was by small photovoltaic panels in the top of lights placed at the bus stops of the main

avenue of the Ciudad Chicureo ZUDC enclave, whilst the other -and very scarce mode- was the use of large photovoltaic panels in the roof of houses in the Las Brisas de Chicureo *parcela*s and La Reserva ZUDC enclave.

Figure 5.14 Uses of solar photovoltaic cells in the enclaves. Source: author's own from photo M. Sanzana Calvet (2013).

In these cases reported in the walking transect, the use of solar energy technologies reflects different market approaches, that combine house owner's choices with developer`s initiative, as suggested by the table below, made from information from field interviews, review of press and developers' website. What is interesting in this configuration of the market decision scheme is that property developers of eco-enclave do not offer solar technologies as part of the houses basic set up. The decision is always entrusted to the house owner/buyers, who in some cases have to manage the selection and installation of the technology themselves as well. The result is that even when the developer offers the technology, solar powered houses are still scarce, as happens in the Santa Elena ZUDC.

Table 5.10 Solar technologies by market decision. Source: author's own from interviews, press review and enclave developers websites.

Decision	Set up	Water solar heating in house	Photovoltaic cells in houses	Photovoltaic cells in common areas
By house owner/buyer	By developer	Santa Elena ZUDC	-	-
By house owner/buyer	By house owner/buyer	Ciudad Chicureo ZUDC	Pan de Azúcar ZUDC Las Brisas de Chicureo parcelas	-
By developer	By developer	-	-	Ciudad Chicureo ZUDC

Besides the photovoltaic cells in common areas -particularly near bus stops- the rest is left to the decision, payment and often construction by house owners, as developers consider, from their own experience and studies, that even if a potential saving in the long run, compulsory solar technologies would mean an increase in the house price and therefore would reduce the housing product sustainability, as it is highlighted from some developers' discourses in the analysis presented in the next chapter. Rather than simply taking these answers as a definitive reason for the omission of green attributes in the marketing, I consider that they point to the development of niche market strategies, by which, over a basic greenness, more sophisticated attributes are offered to a premium green consumer, exclusively.

5.3.1 Making 'eco' parks and green areas as spaces for social discrimination

A major issue in the literature of the enclaves is its impacts towards the public character of the city. Some of these impacts are related to how the enclaves mean an impoverishment and degradation of the urban space outside these developments, either by reducing the public and private urban funding to the city or by cutting off deprived areas from the use of parks and other communal infrastructure (Le Goix, 2006). Scholars have also examined how the production and use of public spaces are lived within the enclaves (Low, 2009; 2001). In this section I enquire how the green areas for public use -as parks, plazas, and green walkways- are conceived,

developed and used in the green enclaves, and how this informs the debates on the public character of the city.

The access to public green areas is widely considered by scholars and public agencies as a significant indicator of a healthy and sociable quality of urban life (UNDP, 1999; Halpern, 1995). In the scholarship of Santiago's segregation, the estimation of an average of green areas per inhabitant is the main indicator used to contrast the access to a 'public green', as parks and plazas, by inhabitants of the poorest and wealthiest districts and boroughs (OCDE, 2013). Although the green areas in the enclaves are not considered public -at least in their ownership- they are conceived and promoted as having a public function among the enclave residents -as expressed in the marketing- and even for the city -as manifested by the Plan Chacabuco planning directions.

The relevance of the analysis of how green areas are conceived and used in the enclaves is illuminated by the existence of previous episodes of discrimination related to the use of public and green spaces in the enclaves in Chicureo in the southern summer of 2011/2012. In December 2011 a letter from the Golf Club in Las Brisas de Chicureo *parcela* enclave triggered a series of disputes about the enclaves' rights to discriminate workers and non-owners. In that letter the club reminded its members of the strict regulation about the presence of 'Nanas' (housemaids) in the facilities, who had to wear their uniforms to be identified by their role and status (as servants, differentiated from the enclave members), and who were prevented access to the pool sector (Qué Pasa, 2011). Controversy broke out and authorities and civil society organization protested against the regulation, and a Santiago based housemaids' union presented a judicial resource, which led to a court sentence forcing the Club to withdraw the regulation (Diario U Chile, 2012). Few weeks later, in January 2012, it also became public that in a condominium in a *parcela* enclave the housemaids and the enclave workers were forbidden by the enclave regulations to walk in the streets, and had to be transported from the gates to the houses either by the resident or a shuttle, often facing severe mistreatment by the guards and

some residents, whilst other enclave residents justified the fact with highly discriminatory remarks about these workers. The dispute caused a national outrage and accusations of social apartheid in Chicureo spread, to the extent the condominium softened the control of the regulation, but did nothing about the regulations themselves (Publimetro, 2012; Castillo, 2012).

I specifically focus here on how large parks are presented in the enclaves' marketing, in contrast to how they are conceived in the enclaves' urban design, and finally -through the transect walks- how these green areas are experienced in the enclaves' everyday life.

Central parks as a sample of green neoliberal urbanism's socio-natural relationship

Along with the offer of small and scattered green areas, large enclave projects include what developers have highlighted as 'Central Parks', which are a distinctive green feature from other forms of enclaves in Chicureo. These parks, and some of the largest green areas in the enclaves, are often presented as designed under ecological principles, and have the signature of prestigious Chilean landscape architects. The reference of these parks in the elitist enclaves as 'Central Parks', in analogy to one of the most iconic forms of green areas in large northern metropolis should not be ignored. First of all, 'central parks' are not part of the traditional Chilean urbanism. Indeed, Chilean towns feature the Plaza as a central square organising the institutional life of cities designed by a grid of regular squares, as inherited from the Spanish colonial tradition (Lemoine, 1977). However, as I present below, if Frederick Olmsted's most iconic work, Central Park in New York, was aimed to introduce attributes of the green belt in the very core of the city and improve social life of the urbanites -as did Hyde Park in London or the Bois de Boulogne in Paris- the central parks in the Chicureo enclaves appear to follow a different conception.

Among the ZUDC enclaves' marketing and project profiles I registered twelve 'Central Parks' as offered by the projects developers from 2012 to 2014. In the case of the large and most elitist *parcela* enclaves I found no

central parks advertised, but a central green area in the form of golf courses and polo grounds. In the ZUDC enclaves there are two main categories of central parks, one placed in common areas and another one placed in the inner condominiums. Now, with respect to how these parks are designed, there are several characteristics that differentiate them from the canon of urban Central Parks. One of them is scale. Although conceived within projects of at least 300 hectares (some ranging over 1,000 ha), these parks seem small: most of the central parks in Chicureo barely reach 1 ha, whilst the largest one does not exceed 20 ha (Table 5.11), not comparable to Central Park in New York, with 341 hectares (Central Park NYC, 2014) or, in a Latin American context, to Ibirapuera Park in Sao Paulo, with 158 hectares (Parque Ibirapuera, 2015).

Table 5.11 Central parks declared in ZUDC enclave projects. Source: author's own.

ZUDC Enclave	Category of park	Area (ha)	Developers' description
Valle Santa Elena	In condominium	0.2	Central park
Ciudad Chicureo	In condominium	0.3	Thematic central park
Ciudad Chicureo	In condominium	0.5	Large central park
Santa Elena	In enclave	0.8	Park around lagoon
Ciudad Chicureo	In condominium	0.7	Central park: with walk paths
Ciudad Chicureo	In condominium	1.1	Ecosystemic park
Chamisero	In enclave	8	Central park: backbone of the project
Ciudad Chicureo	In enclave	8	Ecological path: lagoon park
Ciudad Chicureo	In enclave	14	Central park: avenue park
Pan de Azúcar	In enclave	20	Central park
Ciudad Chicureo	In condominium	Unspecified	Central park: with walk paths
Ciudad Chicureo	In condominium	Unspecified	Central park: what articulates condominium

In terms of their localisation within the enclaves, most of them are designed to spread along main avenues, roundabouts or lagoons, and these can be better described as linear gardened parks in avenues, and in some cases waterfront parks (Figure 5.15).

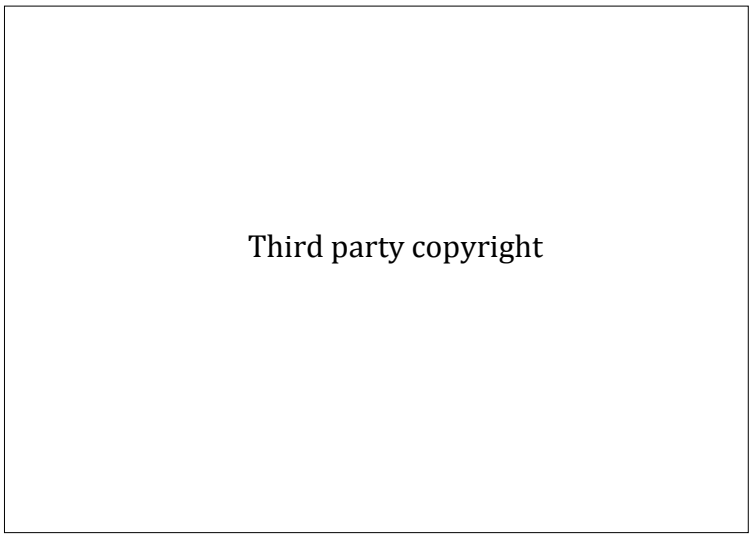

Figure 5.15 Design of central parks in ZUDC enclaves: Ciudad Chicureo (left) and Pan de Azúcar (right). Source: author's own from photo by M. Sanzana Calvet (2013) and La Reserva (2013).

Although many of the green areas in Chicureo are still dominated by large lawns, exotic trees and low-efficient irrigation systems, a new paradigm in landscaping and gardening seems to have emerged in some of the enclaves' central parks. A crucial feature of some of these large parks in the ZUDC enclaves is that they are often presented by those who conceive and develop them as examples of the introduction of ecological principles to the urban and landscape design of public spaces and, to some extent, of the greening of the property industry. Some of the consultants regard the design of these 'eco' parks as an innovation that aligns the projects with global trends in ecological urbanism, as the designer of the central park in the Aguas Claras inner condominium describes:

> We developed a park that has sustainability concepts that have not been built until now, from our perspective, in the public spaces... [The developer] is taking a trend that is happening in the whole world, in which landscaping is not only doing a green garden that somehow would produce an aesthetic sensation, but at the same time, a landscaping integrates ecosystemic variables or environmental ones in a very responsible and powerful way. That is, Aguas Claras was conceived as an ecosystem as well as a park (Inmobiliaria Manquehue, 2014a nd).

The main ecosystemic innovation claimed by these central parks relate to the mitigation of impacts to the local hydrological system and efficiency achievements in water use. Their hydrological design of the parks aims to reduce the impacts of interventions over the rainwater drainage system,

using less invasive techniques: for instance, in one of these parks, in the La Reserva enclave, the designer (Fernandez, 2004) describes how an engineering project of concrete funnelling the main creek in the central area of an enclave gave place to the development of a central park with a more ecological treatment of the water drainage (Figure 5.16), promoting the local infiltration, the water speed reduction, the integration of the system to the urban design and its use by the residents as a central park.

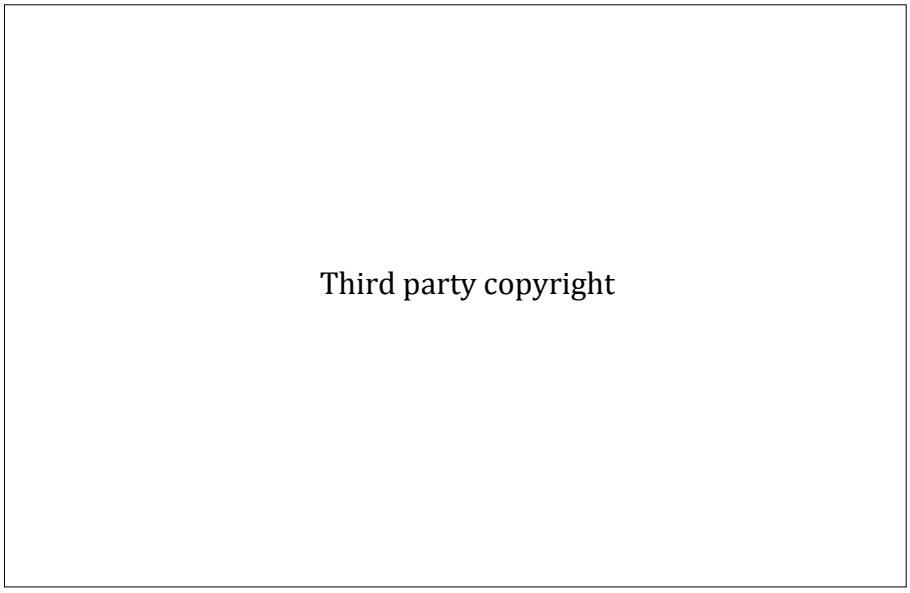

Figure 5.16 Sections of the ecological design of a water stream in the central park of La Reserva condominium, Pan de Azúcar ZUDC. Source: Fernandez (2004 pp.47-48)

The integration of water efficiency principles in the design of the central parks is also a tendency implemented by the landscape architects, and is based on acknowledging that water is increasingly scarce in Chicureo and that local sources must be preserved. That is why, for instance, the landscape architect who designed the central parks and waterfront park in Chicureo stated “design must be made with this [water efficiency] in mind” (Paisajismo Chileno, 2014). A characteristic of this water efficiency design is the building of mixed land covertures that combine hard surfaces with patches or corridors of semi-arid vegetal species that can adapt easily to the area climate and demand low watering and management. Along with design

and species selection, there is an effort in these parks to install modern systems of irrigation by automatically controlled drop.

In these new ecological gardens, whole sections of the garden traditionally covered by plants are also replaced by pebbled surfaces and plants that emulate the low height and density of the local semi-arid vegetation. As the landscape architect of the La Reserva project explains, the concept used by him was the parterre, a technique that "does not imitate nature but works with it to create an artifice that mixes geometry, plants and minerals, in replacement of the continuous lawn cover" (Fernandez, 2004 p.48).

Figure 5.17 Water efficiency landscaping (left to right): Piedra Roja lagoon park; Montepiedra central park; Valle Norte park avenue. Source: author's own from photo by M. Sanzana Calvet (2013); Harries e Illanes arquitectos ltda. (2014); photo by M. Sanzana Calvet (2013).

The consultants involved in the design of these parks consider them a breakthrough in the development of enclaves in Chicureo, particularly in contrast with previous models of landscaping based on imitation of northern gardens not appropriated for the local biota. As the designer of the Montepiedra park states:

> Landscaping with irrigation efficiency criteria, low watering, zero watering, has been very successful, and... for good reasons. I mean, we felt that we used to live in a country, in a city, that seemed to position itself in the surroundings of London, when, actually, we are beside a desert... I mean, the desert starts in Colina. (Interview 34, Consultant, Santiago, April 2013).

Despite 'Central Park' seeming a deceptive concept to describe these parks, many of these parks do entail substantial ecological innovations in the way they are conceived and designed. What is crucial in order to further assess their public or private character is to analyse the role these new and more

ecological green areas play in attracting and facilitating social interactions in the enclaves.

Greenness as a function of socio-spatial demarcation

If in Chilean cities parks are public spaces owned by the state, in the enclaves the green areas are by definition private, although there are references in the discourses of developers, planners and residents to these spaces as public or common areas, definitions that leave a lot to the interpretation of the enclave rulers and therefore to ambiguity and conflict. In the transects I gathered evidence on how the greenness of the spaces designed as common green areas in the enclaves does not necessarily favour social interaction, as it entails discriminative social rules. I specifically bring in this section the analysis of my transect walks in the Ciudad Chicureo green urban enclave (Figure 5.18), where I could witness conflicts and tensions in the use of parks.

Figure 5.18 Walking transect route in Ciudad Chicureo ZUDC. Source: author's own from fieldwork notes and Google Earth: Image © DigitalGlobe 2014.

The first issue that arose from my transect observation in parks and green areas was the unequal standard for the walkability. There is a remarkable lack of pavement and walkways, particularly in the inner condominiums of the enclaves. The streets are designed for car use, and there are no walkways to reach the green areas, whilst in some cases, the green areas themselves

have no paths and walking on the grass is restricted (Figure 5.19). As Caldeira (2000) reflected for the case of Sao Paulo enclaves in Brazil, this strategy for discouraging pedestrian use might be a deliberate attempt to ban strangers and any non-regulated use of an urban space otherwise considered as public and free.

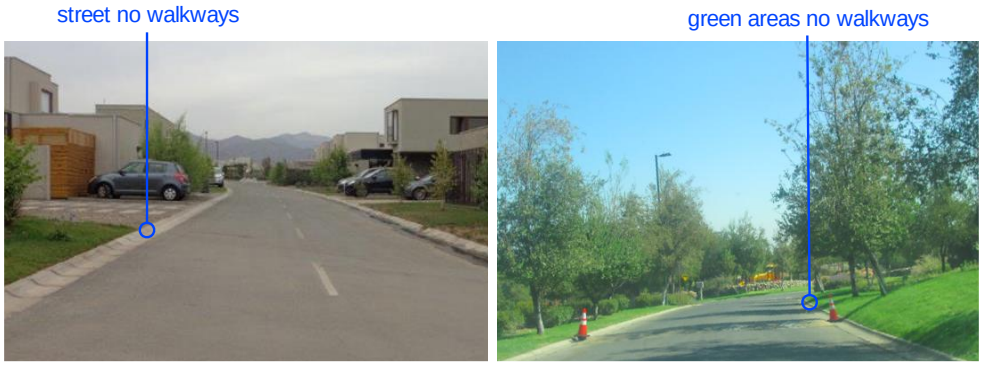

Figure 5.19 No walkways in roads or green areas of the Casas de los Bosques condominium. Source: author's own from photos M. Sanzana Calvet (2013).

Contrastingly to what happens in condominiums' roads and small green areas, in the central parks of the enclave there are walkways and pavement, in some cases with good standard of walkability with lights and benches. In these cases, the issue seems not to be the absence of walkways, but the scarcity of their use. Along all the transect walks in the Ciudad Chicureo enclave in March and April 2013 the walkways were almost always empty, and only in the afternoon did I spot a few people running, or walking adults, presumably workers heading towards the bus stops.

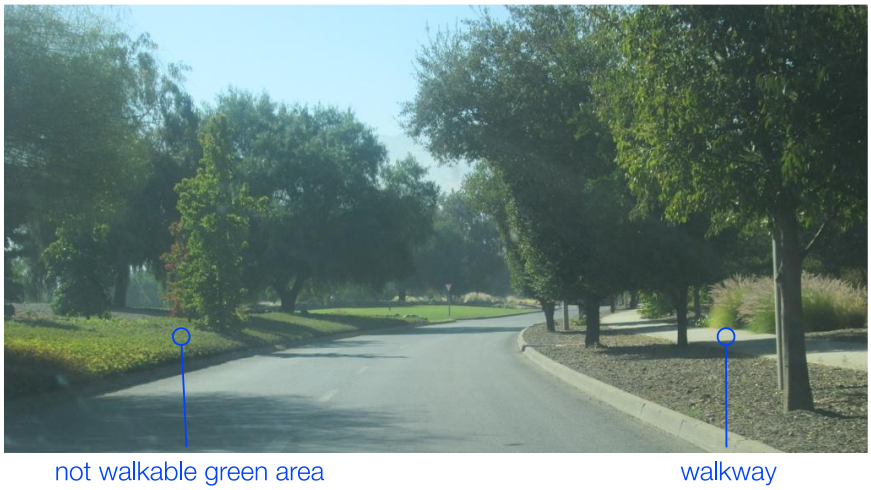

Figure 5.20 Avenue park and walkways. Source: author's own from photo M. Sanzana Calvet (2013).

A crucial issue in the enclaves is the restricted access to green areas, a privatism organised in layers, each enclave showing different number of layers in accordance to its scale and exclusivism. Taking the case of the Ciudad Chicureo enclave, once inside the ZUDC enclaves visitors can access the linear parks along the avenues, but to access the inner condominiums' parks one must be a resident or be authorised by a resident, in all the enclaves. The Ciudad Chicureo central park is centrally placed, walk-friendly and ecologically designed; surrounded by brownfields, it is only accessible from two small gated entrances near the commercial areas, which can only be trespassed by a magnetic card only granted to residents that pay for it. The notion of a hierarchy of entitlements by membership is not limited to the enclaves' golf and nautical clubs, but used to regulate the use of a wider diversity of green areas.

The enclaves are by definition an aggregation of private spaces, owned and co-owned by developers and householders. What is remarkable in the enclave space is the continuous segmentation of space and entitlements: the access to the enclave does not provide automatic access to the other spaces within the enclaves, neither does it provide equal rights of use. Not only is the use of common areas within the enclaves, as green areas and parks, roads, commercial areas, or clubs, strictly regulated, but there is a clear

social hierarchy that defines the entitlements, as I was able to observe in the transect (Text Box 5.1).

Text Box 5.1 Transect note C: workers restraining themselves from the use of common spaces. Ciudad Chicureo shop terrace. April 4 2013 (6.20 pm).

> A group of five men, presumably workers, arrive to the terrace in the waterfront of the lagoon, an area of food shops, restaurants and cafes with tables on the terrace. These tables are not identified with a specific shop, and I have sat there to observe and take notes, without buying from any shop. Less than 1/4 of the tables are occupied. From here the view covers all the lagoon and lagoon park. I can hear what these men talk about. One of them, the youngest, asks the others in the group if they can sit on the chairs. Another man answers that the space "is public, but we cannot sit there".

It is unclear whether in this case a written regulation supported the idea that these men could not sit in the terrace, but they seemed to have internalised clear social rules that prevented them from doing so. Interestingly, as spaces supposed to have a public function are privatised, private commercial spaces are used as substitutes of a public area, as described below.

Text Box 5.2 Transect note A: public functions of private space? Petrol station at the entrance of Ciudad Chicureo ZUDC. April 8 2013 (12.20 pm).

> Arriving from Santiago by car, I enter the COPEC petrol station in the main entrance of the [Ciudad Chicureo] enclave to refill the tank. It's noon, the sunlight is too strong and the day is already extremely hot, above 30^{o} C according to the local radio station. The petrol station is a fully paved area with the pumps in the centre, where the station workers busily fill the customers' tanks. A strong smell of oil fills the atmosphere. No sign of benches, chairs, pavement, parks, grass or restaurant, only a small kiosk where a woman sells cold beverages and ice cream. As I enter the kiosk to buy an ice cream I realise that this very impersonal spot is more that it seems. After refilling their tanks, customers of different social backgrounds park their cars and smoke a cigarette in the small parking (even if forbidden), often speaking by mobile phone. Expensive cars with elegant drivers park beside service vans and small commerce trucks where young uniformed drivers listen to the radio. Although people do not seem to speak to each other,

they share the same space without difficulty, as if this were a neutral point in which an apparently egalitarian market temporarily suspends social hierarchy. It surprises me how the interaction that cannot take place in the beautifully designed waterfront somehow occurs in this unfriendly spot.

I witnessed another episode days later, while continuing the transect walks in the same enclave. This new experience made me think that the attitude of the workers reported in note 'A' was justified by the existence of a code of unwritten rules governing the use of green spaces in the enclaves, by which workers should not attempt to subvert a rigid hierarchy in the use of the space, which could lead of confusing their role as workers (Text Box 5.3).

Text Box 5.3 Transect note B: police harassing workers in 'public' space. Ciudad Chicureo ZUDC main park avenue. April 12 2013 (6.26 pm).

In one of the accesses to the Piedra Roja [Ciudad Chicureo] shopping centre, in the exit from the Shell petrol station, almost in front of a bus stop, there are some green patches and decorative rocks surrounding a small concrete platform that supports a large billboard advertising the shops inside the commercial centre. There is a group of seven men, presumably construction workers by their appearance and clothes. They are sitting on the platform, consuming fizzy drinks, and as I see them I start to cross the street to contact them for a possible interview. Before I can reach them, a police car stops by them, turning on its emergency lights, and two police officers exit the car. They head towards the group, asking for their identification documents in loud voices. One of the workers in a good mood answers they are not doing anything wrong, just waiting for the bus. The policeman who had talked first now hardens his tone of voice, reaffirming the command to be shown their identifications, which the men comply reluctantly. The policeman begins a speech reprimanding and explaining about why they should not be there "in that way", ordering them to wait for the bus at the bus stop shelter, which is already crowded; he goes on to say they should not sit either on the concrete platform nor on the lawns, consuming food or drink, as they "know that it is not a place for a picnic". After registering the information about the workers' identification, and asking for the name and address of their hiring company, the policemen wait until the next bus passes and the men board it. Once workers and policemen are gone, I approach some women at the bus stop, presumably housemaids by their appearance, and explain to them my

interest in interviewing them. They all reject that possibility, some of them so afraid that they refuse to talk and move away.

This event was shocking and unexpected, and this was the only time during the fieldwork when I could spot a police vehicle inside the enclave, instead of the usual private patrol vehicles. But it was more shocking precisely because it was the police, a public body, and not a private guard corps, that treated these men as second class citizens, and considered their duty to apply such drastic crime prevention measures, or supervise the respect of such hard-line, probably unwritten, restrictions about the use of the few "open" green areas in the enclaves. It is also of concern, as this episode happened not that long after a bitter polemic involved the Chicureo enclaves in 2011 and 2012. To those who witnessed that event in April, and -as my self- did not intervene in defence of the workers, that patch of garden probably took a bitter tone of green, as a culture of social discrimination displayed against the workers kept looming large.

In the next section I delve into the linkages between the 'eco' urbanism and design of the green enclaves and its privatism, from the analysis of specific green areas to the scale of the enclaves, to investigate the characteristics that the search of ecological security is taking in these developments.

5.4 Urban design and ecological security in the green enclaves

Scholars have suggested that premium ecological enclaves are globally sprouting as a response to increasing needs of urban ecological security by privileged groups and global economic dynamics (Hodson & Marvin, 2010a). The agenda of urban ecological security means the attempt to control ecological flows and resources to reproduce the city dynamics and economic growth, which in a context of urban neoliberalisation entails competition, privatisation, enclosures and exclusions (Hodson & Marvin, 2009). A core issue to be examined in this chapter is how does the urban design of the green enclaves in Chicureo -made by the combination of green attributes- may also be contributing to achieve this ecological security of

control and exclusion. This section analyses two aspects in the relationship of urban design with the green enclaves' ecological security. First, it focuses in the use of green attributes of urban design to enhance the enclaves' spatial enclosure and defensiveness; and secondly, it examines how the green attributes are related to the availability of ecological resources.

5.4.1 Ecological security by enclosure

As presented earlier in this chapter, once the Plan Chacabuco conceived by a neoliberal urban planning was approved, a new set of developments entered the market dynamics, not as self-sufficient and socially integrated cities but as green enclaves, spatially enclosed and highly segregated niches for upper income groups, with high standard urban infrastructure and services in the countryside.

The enclosure of a distinctive settlement by barriers and gates is a defining element in the notion of the green enclaves, by a combination of material and symbolic elements as walls, gates and warnings that have been part of a defensive and securitised urbanism (Graham, 2011). Scholars have extensively examined how the urban enclaves are fortressed to respond to fear -of crime or other social groups- or needs of status differentiation (as Low, 2009; Caldeira, 2000; Blakely & Snyder, 1997; Davis 1992). The green enclaves in Chicureo organise their defence in many security layers, with some enclaves displaying complex defensive systems, made of several defence lines, from the exterior walls, the main gate, the CCTV and communal alarm networks, the private patrol circuits, the inner condominiums checkpoints, the house perimeter, house alarms, as extensively found in the ZUDC enclaves (Table 5.12).

Table 5.12 Security urbanism in Chicureo green enclaves. Source: author's own from transect walks.

Enclave	Outer membrane guarded gates	Inner neighbourhoods gated checkpoints	Private guard patrol	Police patrol	CCTV	House alarm
Las Brisas de Chicureo parcelas	2	No	Yes	No	Yes	Yes
Hacienda Chicureo parcelas	2	N/A	Yes	N/A	N/A	N/A
Ciudad Chicureo ZUDC	0	Yes	Yes	Yes	Yes	Yes
Pan de Azúcar ZUDC	2	Yes	Yes	No	Yes	Yes
Chamisero ZUDC	2	Yes	No	No	Yes	Yes
Santa Elena ZUDC	1	Yes	Yes	No	Yes	Yes

I suggest that in the case of Chicureo green enclaves, these defensive elements of security, worldwide spread according to the scholarship on the enclaves, have been enhanced by the addition of green attributes of urban design. In particular in the ZUDC enclaves resultant from the planning innovation of the Plan Chacabuco, attributes of rural localisation and agricultural surroundings converge to enhance the enclaves' defensiveness and privatism. As explained in Chapter 4, the Ministry of Housing set the localisation and shape of the ZUDC areas under proposal of property developers interested in participating in the new scheme for extending private urban development in rural areas of Santiago's Metropolitan Region. As displayed in the maps below (Figure 5.21), these ZUDC areas share a localisation in the piedmont of sub-watersheds of the Andean foothills.

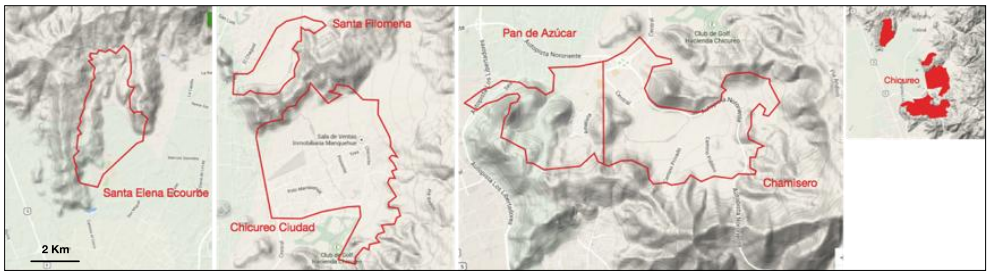

Figure 5.21 ZUDC enclaves' perimeter and topographical localisation. Source: author's own from PRMS 1997 and Google Maps: © 2014 Google.

Although the declared reason for the choice in these localisations was occupying larger estates in areas of less fertile soils, their positions have

provided additional layers of defence to the green enclaves, as geographical enclosure, buffer areas and clustering strategies. By geographical enclosure I mean the ZUDC enclaves have always a significant part if their perimeter flanked by foothills, leaving less area 'exposed' to the openness of the countryside. Whether willingly or not, this localisation provides the green enclaves with the control of the main ravines of the sub watersheds hydrological system. This use of the geomorphology of the Chicureo Valley constitutes a stable and natural defensive position that maximises the project enclosure and often provides a dominant view over the surrounding hinterland (Figure 5.22). Arguably, this geographical enclosure does not prevent crime by itself, but it clearly contributes to increase the exclusive character of the green enclaves and to deter the access of those without the means or authorisation to sort the defensive layers.

Figure 5.22 View from La Reserva condominium in Pan de Azúcar ZUDC. Source: Inmobiliaria La Reserva (2012).

Not only the agricultural land in the Chicureo Valley offered larger plots, a 'natural' scenario, lower prices and a speculative land rent premium given to the developers by the change in land use-, but the remaining agricultural and wild areas around and within the green enclaves worked as a buffer zone or green belt that added a spatial distance from the nearest settlements and eased the surveillance tasks. In the long run, these buffer zones remain possible areas for urban expansion if the planning authorities could be persuaded to change -once more- the existent regulations. Although some of these buffers have already disappeared, others continue to coexist with the green enclaves, and within those some are most likely to remain, as the zones of risk and ecological protection set by the same Plan Chacabuco. Additionally, the fast urbanisation of the area by green enclaves has

developed as an extra form of spatial defensiveness by clustering. Although in their planning the ZUDC enclaves appear as totally detached from other urban areas and surrounded only by rural areas, in practice most of them are sided by *parcela* enclaves, forming clusters of green enclaves.

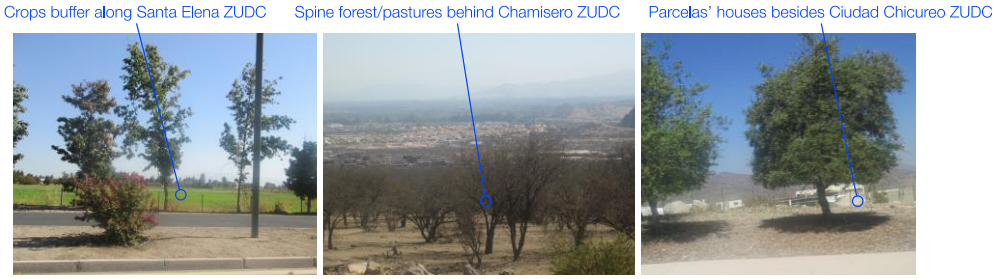

Figure 5.23 Examples of buffer zones involving the ZUDC enclaves. Source: photos M. Sanzana Calvet (2013, 2014).

Once the enclave begins to be built and developed, a defensive perimeter is established to delimitate the interior and the exterior of the enclave, what Alaily-Mattar (2008) calls a 'membrane', a set of material and symbolic boundaries that regulate social and material flows such as people, vehicles, fauna or water. As also reported in the literature, in the urban enclaves this membrane is also walled, fenced and gated, and tends to be rather opaque from the exterior, blocking the view from outside, although in many cases this opacity is also 'green' thanks to arborisation and the use of wood (Figure 5.24).

Figure 5.24 Section of exterior walls of the Las Brisas de Chicureo *parcela* enclave. Source: author's own from photo M. Sanzana Calvet (2013)

Apart from this external membrane I found many layers of inner membranes differentiating the internal segments of the green enclaves. Omitted in most of the descriptions of the urban enclaves in the literature, this feature in Chicureo means the presence of different types of green separations, green areas, wood panels and hedges. As these images suggest, the greenness of the walled membranes does not seem to reduce its defensive functionality.

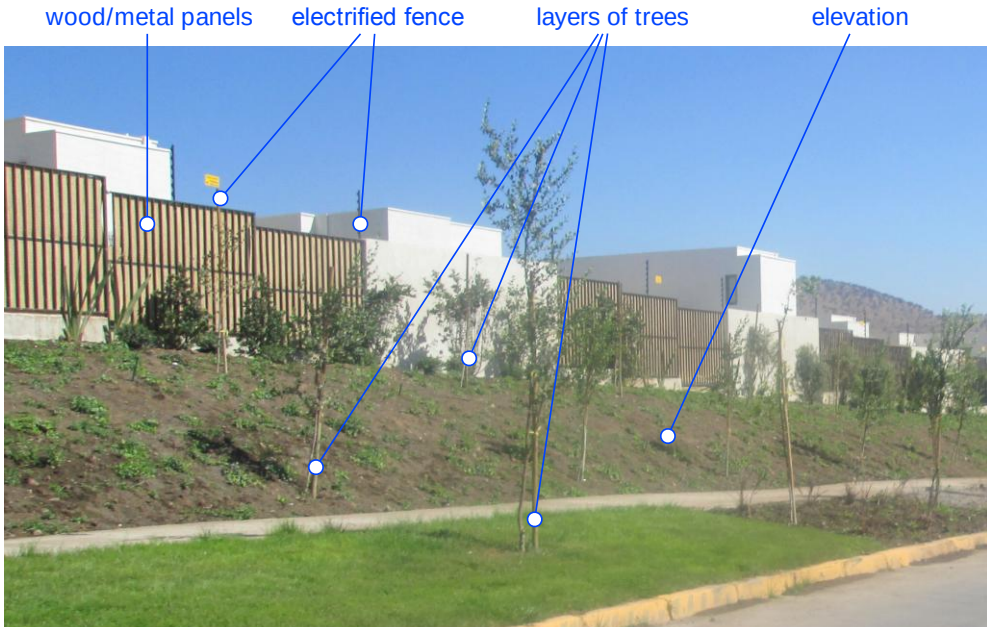

Figure 5.25 Walled section of a condominium inside the Chamisero ZUDC. Source: author's own from photo M. Sanzana Calvet (2013)

Overall, the different layers of combined security and greenness in the green enclaves clearly contribute to produce the spatial seclusion and enclosure of these developments, as systematised below (Table 5.13).

Table 5.13 Security, enclosure and greenness in the green enclaves. Source: author's own from fieldwork transects.

Enclave	Geographical enclosure (enclave perimeter partially flanked by hills)	Buffer rural areas (land use)	Buffer clustering (number of enclaves in contact)	Buffer connectivity (motorway or avenue flanking enclave)	Materiality of enclaves' membrane	Materiality of enclaves' inner membrane	Materiality of house/site subdivision
Las Brisas de Chicureo parcelas	Yes	Agricultural, pastures	3	Motorway	Brick gate with metal barriers. Wood fence panels, concrete panels	Green areas, hedges, short wood fences or wired mesh panels	Hedges, wood panels or brick walls
Hacienda Chicureo parcelas	Yes	Pastures	1	Avenue	Brick gate with metal barriers. Brick walls, concrete panels, electric fence	N/A	N/A
Ciudad Chicureo ZUDC	Yes	Agricultural, pastures	2	Motorway; Avenue	Wired mesh panels, barbed wire	Green lanes, automatic metal gates. Concrete fence panels	Hedges, brick walls
Pan de Azúcar ZUDC	Yes	Pastures, mining	1	Avenue	Brick gates with metal barriers. Brick walls, concrete panels, barbed wire.	Green plazas, concrete fence panels, wired mesh panels	Hedges, brick walls, wire fence
Chamisero ZUDC	Yes	Pastures	1	Motorway	Brick gates with metal barriers. Concrete fence panels, wired mesh panels, barbed wire	Green lanes, brick gates with plastic barriers. Concrete fence panels, wired mesh panels	Hedges, brick walls
Santa Elena ZUDC	Yes	Agricultural, pastures	2	None	Brick gates with metal barriers. Barbed wire.	Green plazas, automatic metal gates. Concrete fence panels, wired mesh panels.	Hedges, brick walls, wire fence

5.4.2 Ecological security by urban design

Besides localisation strategies and walling practices, urban ecological security in Chicureo is also enhanced by the development of green attributes. This section examines how urban ecological security develops from the relationship between those green attributes found in the enclaves -as registered in the transect walks- and the capture, enclosure and consumption of ecological resources.

The process of producing a degree of ecological securitisation, which means in this case the control of resources to the benefit of the making, maintenance and living of the green enclaves and its elitist population, is mediated by the development of green attributes. As it was developed early in this chapter, green attributes can perform different functions, from enhancing market-niche attractiveness to produce gardenified urban environments. And the same attributes meant to turn the enclaves greener mean the development of ecological functions that have an impact in the capture, control and consumption of resources. This can be easily explained by the analysis of the scheme below (Figure 5.26), a diagram that links main resources, green attributes and functions in the production of urban ecological security in the green enclaves. Working on a sample of green attributes[19], the diagram displays how the development of green attributes to perform an ecological function for the green enclaves involves the use of a locally available raw resources, for what these green attributes are also fulfilling a function as attributes of ecological security.

Overall, the diagram shows how local energy, water, land, ecosystemic services and atmosphere are converted into resources that allow material and subjective production and operation of the private neighbourhoods in Chicureo as green

[19] I have selected for this analysis those green attributes more evidently playing a function in ecological security. The development of a full diagram, considering all the green attributes, also adding other geogrpahical scales -i.e. metropolitan, national and global- plus the mode of enclosure and the complete analysis of its implications, may provide the basis for advancing the concept of ecological security in the scholarshiup of eco-enclaves, but it is a task better suited for an article exclusively focusing on this issue rather than a subsection of this chapter.

enclaves. Although most part of the energy brought to Chicureo comes through long supply lines -by electrical lines, gas pipes and fuel tankers- increasingly some local energy is harvested in the form of solar photovoltaic cells and solar water-heating panels. This can be indeed seen as the private capture -by enclave managers and residents- of a common resource, sunlight. As an iconic symbol of sustainability, solar energy relevance today is put on the construction of an imaginary of a relative autarky of the enclaves rather than an effective use as an alternative energy source to fossil fuels and large impact hydropower electricity. In this case, the display of some solar energy devices can be taken as greenwashing, for instance, the use of photovoltaic cells in the bus stop. These cells are a symbolic improvement that does not challenge the dependence of fossil-fuelled private cars as the main transport mode of residents nor the lack of an efficient and public transport system. Disconnected from wider policies of energy efficiency and environmental justice, solar energy appears veiling the green enclaves' dependence of unsustainable or contested energy sources, as fossil fuel and shale gas imported from worldwide sources and hydropower energy imported from the large dams in the Chilean south (see Appendix 15).

Being a crucial resource to 'green' the enclaves in a dry environment, green attributes referred to water availability and management play an active role in the privatisation, capture and enclosure of this resource. By holding water rights from the local aquifer originated in deregulated water markets allow the enclaves to provide water both to residents, facilities and services, keeping the attractiveness of the green enclaves for potential new consumers. Large artificial lagoons provide simultaneously storage capacity, scenic/environmental beauty, recreational/sport spaces and heat mitigation, whilst efficient systems of garden irrigation enhance the perception of greenness and potentially allow for better resource management (something contested by my findings on irrigation practices presented in chapter 6). Being a very obvious enclosure, the securitisation of land by the spatial enclosure of large rural and wild territories in Chicureo valley and foothills allows the development of relatively large

green areas -sometimes bombastically sold as ecological central parks or ecological reservations- that provide for some biodiversity to take shelter in the in the wake of the continuous urbanisation of the area. The enclosure of land by each enclave is maximised by the overall enclosure by the clustering of enclaves, which produce a dependent or captured hinterland from where more resources can be extracted, from water from the aquifer to stone from the hills, (not always exempted of conflict as I develop in chapter 6).

Whilst existent ecosystems in Chicureo are increasingly and systematically put under pressure of the urbanisation by enclaves, some of the green attributes of these developments create an environmental assemblage in which residential districts co-exist with countryside-like activities and natural-like landscape in a scale not reproducible in Santiago's Barrio Alto consolidated urban districts. Finally, the atmosphere unexpectedly revealed to be one of the most common resources to be captured by the green enclaves. In this case, not by any attempt of climate experiment neither by any systematic policy of zero carbon developments, but simply and more effectively by the capture of a relatively enclosed valley with less polluted than Santiago, to which the development are connected by very high standard private infrastructure. To escape the city -and its pollution- revealed to be a relevant motivation to move to and live in an enclave in Chicureo, as it is presented in the analysis of the actors' discourses in Chapter 7. Clean -or less polluted air- is a high demanded commodity in Santiago's high-polluted urban atmosphere. Not surprisingly has the Barrio Alto developed as a constant run of upper income groups to colonise Santiago's Andean foothills, as they found there cheaper space, enclosed areas, few urban poor and working class population, and clean air, or at least lower pollution levels than in the city plains and low areas, not surprisingly populated by lower income groups. However, the scale of this leap-frog jump of upper-middle and high income groups from the city to Chicureo surpasses any precedent, considering the phenomenon short period of time, large scale of areas and population, and the extent the control of space, population, resources and

territory has developed. Thus, it is not to assert that born as a planning experiment seeking urban sustainability the green enclaves in Chicureo have developed more as an experiment of neoliberal social and environmental governance in which exclusivism, greenness and ecological security are merged.

Figure 5.26 Green attributes classified as urban ecological security in the enclaves. Source: author's own.

As the diagram of urban ecological security above draws a general system of relationship between attributes, resources and functions for all Chicureo enclaves, the distribution of attributes of ecological security is not necessarily similar in each green enclave. As with green attributes in general, green

enclaves does not display the same diversity of attributes ecological security, neither the same rate between these (Figure 5.27). It is also relevant to notice that, in contrast with the general distribution of attributes per type of urbanism (those classified as country club, ecological urbanism and suburban design), less exclusive green enclaves display relatively high diversity of attributes of ecological security.

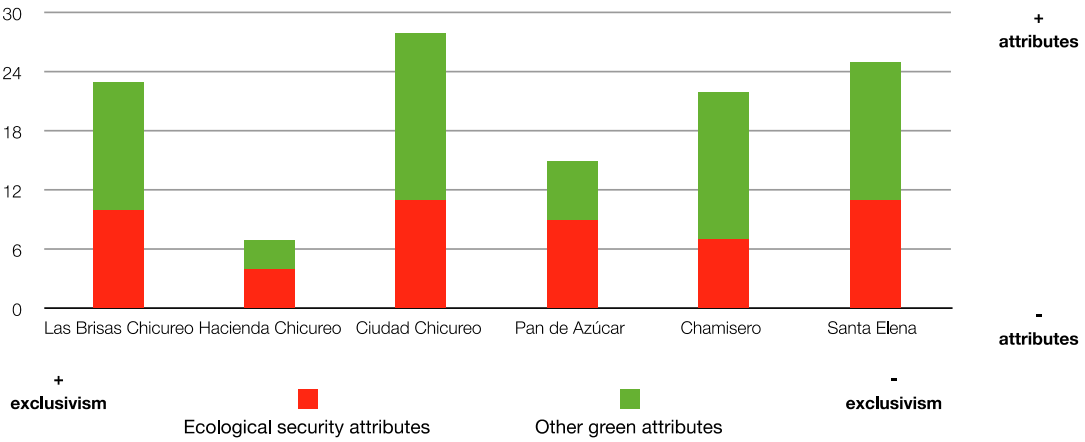

Figure 5.27 Diversity of attributes of ecological security by enclave.

This finding suggests that in the configuration of the market-niche of the green enclaves in Chicureo ecological security area also playing a role in shaping the character of these green exclusive products. This line of reasoning is reinforced by the following analysis. All the developments share those attributes that relate to a general availability and enclosure of resources, and that of water availability or water rights (except for the unreported Hacienda Chicureo, as displayed in the table 5.14 below), whilst the rest of the attributes have a more uneven distribution among the green enclaves. This distribution means that, although the basic attributes of Ecological Security related to spatial and resource control are a must in the green enclaves, more exclusive and sophisticated attributes may be obtained in a segmented and to some extent thematic market of residential ecological security.

Table 5.14 Ecological Security attributes of the green enclaves found in the fieldwork data. Source: author's own.

Ecological Security attributes	Las Brisas de Chicureo parcelas	Hacienda Chicureo parcelas	Ciudad Chicureo ZUDC	Pan de Azúcar ZUDC	Chamisero ZUDC	Santa Elena ZUDC
Controlled access/fenced perimeter	Yes	Yes	Yes	Yes	Yes	Yes
Rural/peri urban localisation	Yes	Yes	Yes	Yes	Yes	Yes
Nature/Natural landscape	Yes	Yes	Yes	Yes	Yes	Yes
Sightseeing/Views/Environment beauty	Yes	Yes	Yes	Yes	Yes	Yes
Breezes/Wind/Ventilation/Open skies	Yes	Yes	Yes	Yes	Yes	Yes
Water availability/rights	Yes		Yes	Yes	Yes	Yes
Eco-friendly rainwater management system			Yes	Yes	Yes	Yes
Wildlife/Animals/Farm	Yes		Yes			Yes
Lagoon	Yes		Yes			Yes
Central Parks			Yes		Yes	
Water solar heating system			Yes			Yes
Solar photovoltaic cells in houses	Yes			Yes		
Agricultural surroundings	Yes					Yes
Solar photovoltaic cells for bus stop lights			Yes			
Ecological reservation area				Yes		

5.5 Chapter conclusions

The market action of property developers has been crucial to greening the enclave developments built in Chicureo, by adding new green attributes to the conditions for sustainability and self-sufficiency set by the planning innovations of the Plan Chacabuco. In particular, the analysis of the marketing displayed by the green enclaves' projects points out how developers are assembling green discourses and innovations in ecological urbanism to offer a novel housing product that reunites claims of greening and elitism. Neoliberal urbanism can be greener not only because of the shift of the city planning to a model of concessions and conditioned development that sets greener standards, but by the market stakeholders embracing urban greening as an entrepreneurial mechanism for competition, differentiation, as well as a value-increase tool.

Using the flexibility of the framework for conditioned development set by the planning innovations, property developers targeted high-income groups by offering them premium enclaves that merged greenness, exclusivity, security and connectivity, displaying a green and elitist niche strategy. The findings in the analysis of the marketing of the enclaves show that greenness is a key attribute in structuring both a message to attract potential clients and a profile to establish a specific green imaginary in the housing market. The success of these strategies in effectively attracting investors, buyers and inhabitants in a new mode of urbanisation of the countryside means the consolidation of a green neoliberal urbanism that combines state reregulation and market initiative. This has distorted the Plan Chacabuco, omitting some of its most relevant *declared* objectives as metropolitan sustainability and social integration, leading to the production of green urban enclaves instead of self-sufficient cities.

Developers' niche strategies have led to the development of a differentiated range of green urbanisms, for the making of more aesthetic landscapes (as suggested by Wu, 2010 and Pow, 2009; Duncan and Duncan, 2001) or more functionally efficient developments (as suggested by Hodson and Marvin, 2010

and Caprotti, 2014). Each of the ZUDC and *parcela* type of green enclaves studied displays a unique identity, either combining or excluding these typologies of green urbanism, namely a very elitist country club urbanism, an elitist ecological urbanism and a 'wannabe' suburban design. Whilst critical urban studies have long established that the enclaves reinforce segregation through socio-spatial exclusion, recent scholarship in eco-enclaves has shown that elitism and exclusion can coexist with green discourses and practices. My approach to green exclusivism in the enclaves in Chicureo depths in how this linkage is developed, showing a continuous of differentiation processes through a diversity of market, planning and symbolic tools. Further development of the concept of green exclusivism may contribute to integrate in apprehensible ways the mode in which the explicit but elusive offer of exclusion is not only tempered but reinforced by the resource to an increasing shift to urban discourses and practices of making, maintaining and living green.

What seems remarkable in the case of the green enclaves in Chicureo is that the content of 'eco' attributes is levelled by developers to the target segment of consumers, displaying features just above the average standard of Santiago's housing market, avoiding globalised certification schemes in urban sustainability, as for instance LEED. My own field reports show that the materialisation of the green attributes in the green enclaves seems to respect what is being offered in the marketing, exception made for the attributes of ecological urbanism. Although allegations of deceptive and greenwashing practices by property developers initially seem to prove rightly confirmed, this shortcoming has to be balanced with the finding of non-advertised attributes of ecological urbanism, set either by developers or the residents themselves.

The findings indicate that neoliberal urbanism can converge with greener discourses and practices. This is particularly remarkable in those green enclaves with a higher profile of ecological urbanism attributes, but also in the market idealisation of nature and rural life promoted by a country club urbanism, and

to some extent even in the more suburban style green enclaves where the marketing offers a revival of a suburban utopia.

The marketing discourses of the green enclaves represent attributes of greenness, eco-ness, nature or sustainability deeply assembled with idealised socio-natural relationships that display class dominance, consumerist lifestyles, environmental transformation, social exclusion and racism. In this sense, the analysis of the symbolic content of the advertisement corroborates the exclusionary character of the enclaves as presented in the literature, either in the US (see Low, 2001) or Latin American context (Ruiz-Tagle & Lopez, 2014; Caldeira, 2000). One of the cases that I present as an example of this intertwining of greenness, neoliberalisation and social discrimination is the development of ecologically designed central parks in the green enclaves. These parks display advanced landscape architecture in their conception and sustainability technologies for their maintenance, although following marketing objectives to flagship the greenness of the enclaves and a green lifestyle rather than environmental integration of local ecosystems or conservation of habitats. And crucially, the everyday use of these 'central parks' demands the active exclusion and discrimination of those not entitled to live the green lifestyle.

The analysis of the green enclaves' urbanism and design suggests that beyond the aesthetic enrapturing and search of energy and water savings by more efficient technical systems, these developments have also been conceived to achieve ecological security. Through strategic geographical and topographical localisation, green forms of gating, and the control of local resources through buffer zones and restriction zones, the system of green enclaves and infrastructures transforms and dominates Chicureo's environment. The next chapter (6) delves in the questions opened by ecological security, examining how the material flows of the green enclaves' urban metabolism is producing a new urban socio-nature through environmental transformation, social discrimination and socio-environmental conflicts.

Chapter 6.

Material flows in the production of a green neoliberal socio-nature in Chicureo

6. 1 Introduction

Since the 1990s critical geographers have been examining how market environmentalism is developing as a capitalist answer to environmental concerns, producing neoliberal ecologies of privatisation, enclosure and commodification of nature, a green neoliberalism (Bakker, 2010; Castree, 2008; Heynen & Robbins, 2005). Scholarship on eco-enclaves has increasingly engaged in the debate regarding strategies of neoliberal accumulation (Caprotti, 2014), experiments in urban sustainability to be made, maintained and lived (Bulkeley & Castan Broto, 2012), and the ways top-down elitist developments aim to overcome the environmental limits by achieving an ecological security (Hodson & Marvin, 2010a). This scholarship has highlighted the innovative 'eco' features offered and built by these elitist developments and their linkage to the making of market exclusivity and the progression of a green subjectivity. However, the analysis of the metabolic flows driven by this new 'eco' or 'greenness' and the study of the environmental transformation it triggers is still underdeveloped.

This chapter aims to address this gap by exploring the relationship between the urban metabolism of the green enclaves and the production of a new socio-nature in Chicureo, in other words, to develop an Urban Political Ecology of the urbanisation by green enclaves (Heynen et al., 2006; Swyngedouw, 2004). The specific research question that expresses these concerns about the production of a neoliberal new socio-nature is: how are the material flows driven by the green neoliberal urbanisation by green enclaves producing environmental change and reproducing environmental inequality?

Besides their planning and marketing, the making, maintaining and living of the green enclaves involve the construction of buildings, infrastructures and systems, whole new socio-technical systems by which the metabolic flows are produced and circulated. I have set my methodology by following the material flows and examining how through their production, consumption, discharging

and disposing, a new metabolism is produced and contested. To gain depth, I chose not to attempt a description of all the material flows involved in the production of the socio-nature of Chicureo, but rather to focus on those that seemed both more relevant and more apprehensible I develop the analysis of these metabolic flows by organising them in several case studies that aim to explore a specific dimension of the linkage between green neoliberalism, environmental change, inequality and conflict. In each case the analysis combines different sources of data, most of them qualitative, from primary and secondary sources, aimed to highlight a specific angle of the issue. I do consider the use of some quantitative data also, mostly to exemplify inequality in the access to resources and distribution of impacts, but a systematic quantification of all the flows (as Material Flow Analysis) is neither part of the methodology nor a research objective.

Considering both the relevance given in the academic debates -and my preliminary approach to Chicureo's historical development and its geographical configuration, I decided to focus in those most relevant flows involved in the socio-natural production of Chicureo, such as water, land, domestic solid waste and energy. However, as it is justified in the next paragraph, the analysis of energy was finally omitted in the later versions of this study.

Water is possibly the flow that has received the most attention in the analyses of urban metabolism developed under a UPE perspective (Cousin & Newells, 2015; Kaika, 2005; Swyngedouw, 2004), but it also has a long history as one of the highlighted elements of the Wolman's (1971) seminal study of urban metabolism. In the case of land, although often crucially involved in the analysis of the urban metabolism, it is often not taken as a flow but as geographical space or land use (Keil, 2005; Heynen, 2013) and therefore it seemed challenging to introduce the analysis of land's materiality into the environmental transformation led by the metabolism of the urbanisation by enclaves.

The study of solid waste has been largely developed under more quantitative approaches to urban metabolism. Although absent from the first wave of critical studies on urban metabolism, the analysis of governance of the flows of solid waste is developing fast in recent years (Sadoff, 2015; Demaria & Schidler, 2015; Lund, 2014). Energy flows have been given significant attention to metabolic studies, particularly from Industrial Ecology contributions on systemic improvements in efficiency gains in urbanised districts and more recently by its impact in reducing carbon emissions and therefore mitigating climate change (Newell & Cousins, 2014; Castan Broto & Bulkeley, 2013; Korhonen, 2004).[20]

The chapter is structured as follows. Section 6.2 analyses the link between the materialisation of land-use changes in Chicureo driven by the ongoing urbanisation by green enclaves and the environmental transformation of the area. This section focuses on the spread of ZUDC planned green enclaves through the foothill pastures and the deregulated urbanisation at the centre of the Chicureo valley by *parcela* enclaves. Section 6.3 examines the case of the production of water in Chicureo, firstly by understanding the background of privatisation processes that have produced the Chilean water system, and secondly by scrutinising the sources of water and the socio-technical systems

[20] Energy flows were part of the research fieldwork, and a preliminary section on electrical power circulation was even produced looking to integrate a broader analysis of Chicureo's metabolism. However, as the work developed, it became clear that because of its relevance and complexity, energy flows demanded as substantial work as those of water, in studying the regulatory framework and the industry as well as carefully examining its distribution and provision. Electrical power was relevant in many ways for the understanding of Chicureo's socio-nature: as water, it circulated through a system based on large scale infrastructure and networks that shaped and in many ways supported the operations of other functions of the green enclaves; also as water, it worked over a neoliberalised regulatory framework and a privatised industry, and it involved scales much beyond Chicureo, in this case a national grid of energy production and distribution along the Southern Andes; and finally, again also as water, energy was involved in triggering local socio-environmental conflcts in Chicureo, but also involved in conflicts by large dams in the Chilean Patagonia, what would in a very interesting but time consuming way extend the analysis of metabolism to scales beyond my possibilities in the thesis. It became clear that a strategic decision needed to take place, choosing between water and energy, and I finally chose water, as it seemed more primarily linked to the making, maintaining and living the enclaves' green. As I interrupted its development, the section on energy never reached a satisfactory degree of accuracy and depth, but as it shows my progress in the issue I have attached it as Appendix 15 in the post Viva version.

developed to service the green enclaves with water. This section also emphasises the relevance of processes of neoliberal grab and commodification of the resources of the water table by developers and utilities to secure the green enclave development.

Section 6.4 examines the process by which the greenness of the enclaves is produced and reproduced through the consumption of water. The analysis of cases of water consumption (management of green areas, artificial lagoons and sport fields) displays evidence of how the maintenance of enclaves' greenness demands the neoliberal securitisation of the resource. Deepening on the consumption of water, section 6.5 examines the link between domestic consumption and the production of water abundance for some and scarcity for others. The analysis of the rates of individual consumption by households depicts a scenario of extreme inequality within boroughs and indicates signs of depletion of the resource.

Section 6.6 examines the case of a dispute for the flows of stone between developers and a community of quarrymen, and how this became a focal point of resistance to the urbanisation by green enclaves in Chicureo. The enclosure of hills to develop both a condominium and a private ecological reserve for the condominium residents exemplifies some of the symbolic and material violence involved in the production of the enclaves and contributes to unveil the contradictions of a green neoliberalised ecological security. The flows and trajectories of domestic solid waste produced in Chicureo are analysed in this case (Section 6.7) in relation to the wider waste management system of the Santiago Metropolitan Region, highlighting the economic and ecological implication of the system of neoliberal governance. Then I focus on how the developers' claims of an extraordinary recycling performance in the green enclaves show deep inconsistencies, challenging both the efficacy and transparency of the green-neoliberal inspired recycling system.

In the last section (6.8) I conclude that the urbanisation of Chicureo under the hegemony of green neoliberal discourses and policies have produced a distinctive socio-nature, in which social and environmental power is embedded in the material flows. The urban metabolism of Chicureo is contributing to the production of environmental inequality in the access to resources and disturbing the reproduction of local identities, triggering conflicts between those who favour the green enclaves and those who don't.

6.2 Urbanisation by green enclaves and environmental transformation in Chicureo

In nearly four decades of neoliberal rule, from the original reforms to de-regulate land market and urban policies to the current situation of a 'regulated' neoliberal urbanism, Chicureo has undergone a process of significant socio-environmental change. As shown in Chapter 4, Chicureo has developed from a scarcely populated agricultural valley to an increasingly urbanised area, colonised by upper-middle and high-income residents. The valley of agricultural plains and pasture foothills areas has transited to be a mosaic of urban green enclaves amidst residual agricultural plots and pastures, temporary brownfields and interstitial rural settlements.

Contrasting the observed land use in 1985 and 2015 the figure below (6.1) summarises some of the most striking changes in the area's landscape. These changes reveal how the urbanisation of Chicureo by green enclaves has disrupted the process of production of the borough as a metropolitan periphery made of industrial zones in Santiago's outskirts and social housing in the town of Colina to host the metropolitan poor evicted or displaced from the main city. Boosted by the development of motorways concessions, the green enclaves are colonising both the centre of the valley and the Andean foothills. The urbanisation by green enclaves has filled the centre of the valley, replacing agricultural estates by a myriad of country club style *parcela* condominiums, from very large-scale enclaves to the clustering of individual plots, leaving

residual areas of crops and rural villages in the borders and interstices of the enclaves. Pastures and Andean foothills are being transformed by the growth of green enclaves, most of these in the ZUDC areas established by the Plan Chacabuco in 1997. The resulting image suggests the production of a splintered urbanisation, which at the same that it fragments and erases the rural character of the countryside enables a new metropolitan connectivity.

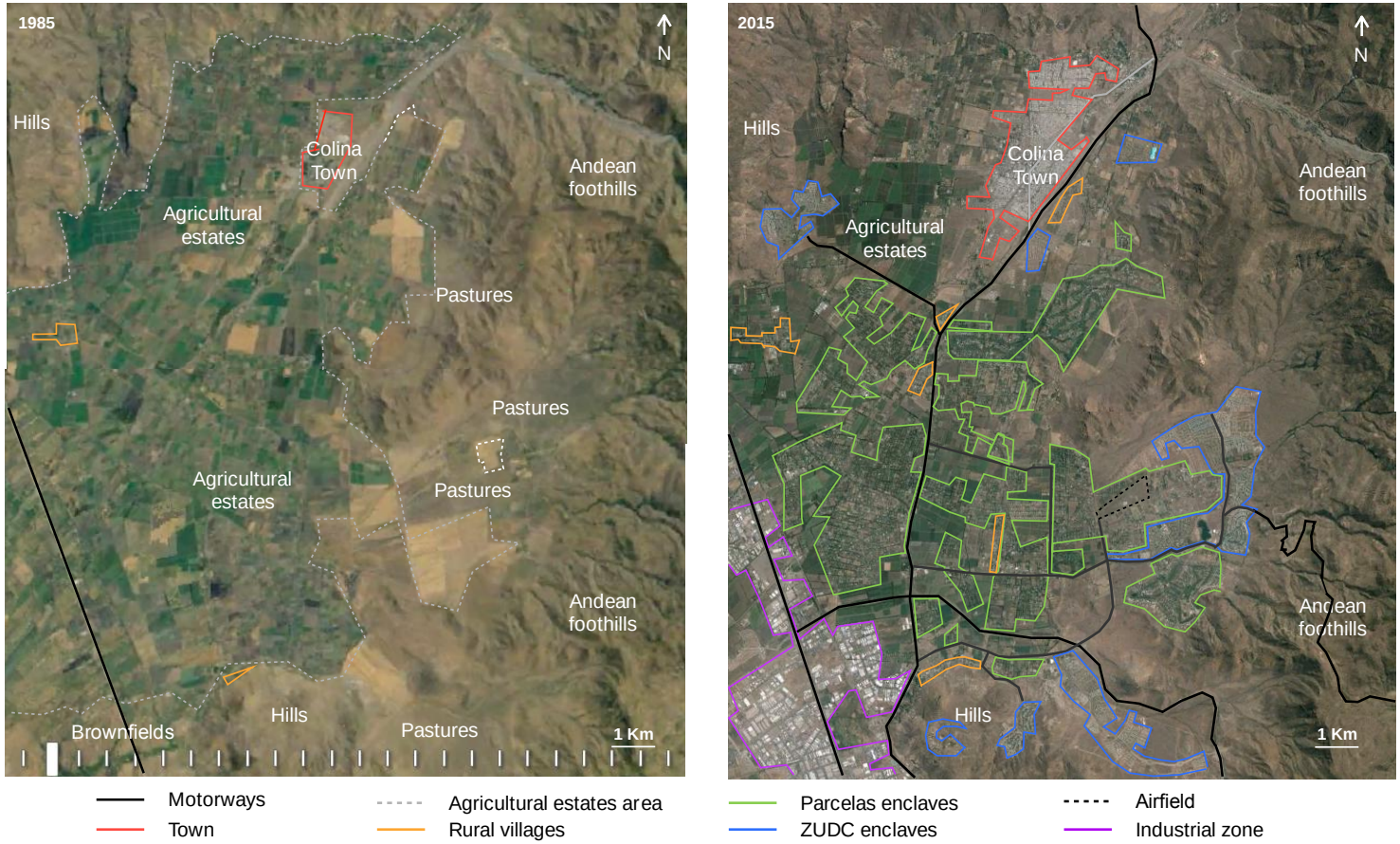

Figure 6.1 The urbanisation of the Valley of Chicureo through the changes in land use: 1985 and 2015. Source: Author's own using data from transect walks, interviews information plotted in Landsat satellite images (Google Timelapse: Earth Engine 2015).

This combination of processes has meant a significant socio-ecological transformation by which a new and urban Chicureo is being produced. At the core of this dynamism are the large scale green enclaves, converting crops into gardened private residential allotments, turning large pieces of the countryside into premium country club enclaves with golf and polo courses, and greening the dry pastures of the foothills into suburban gardened districts covered with lawns, parks and suffused with claims of eco-friendship. Planned as long-term projects, the success of the green enclaves is already attracting new and unplanned investments. As the population of green enclave residents increase and Chicureo consolidates its brand in the property market, new services and trade are being attracted both to the ZUDC enclaves and to the interstices between urban enclaves and crops.

Altogether the environmental changes in Chicureo are producing a peri-urban land use mosaic (Allen, 2003), in which many of the existing pieces are also subjected to transformation. The rural-urban continuum (as proposed by Duany & Talen, 2002), with well defined boundaries, stable land-use, and softened spatial transitions, is not taking place in Chicureo; instead, it is developing as a still-on-the-making imbricated dis-continuum mix of wild, rural, peri-urban, suburban, and urban districts and corridors.

This section focuses on the main processes of urbanisation by green enclaves described in the figure above (6.1), emphasising the link between the consumption of land and the environmental transformation. Land is a complex issue to study: often considered in urban studies as a socio-spatial and spatial-economical resource in which human activities can be planned and developed, it can also be treated -mostly in ecological studies- as a material resource that entails a specific biophysical environment. My approach to land-use change attempts to stress the link between both dimensions, by relating the planned consumption of land by the property market for the making of the green enclaves to the material production of a new urban environment, a crucial step in the production of a neoliberal socio-nature in Chicureo.

The urbanisation of the foothills by green enclaves

The foothills of Chicureo, previously occupied by pastures, low crops and wild vegetation have been progressively turned into green enclaves, with some of the largest in planned ZUDCs. Prior to developing its specific greenery of gardens, parks, lagoons, fields with water and energy efficient systems, the making of the green enclaves departs from the raze of the existent land and landscape, destroying the semi-arid biome and levelling the topography of the area, either by landfills or land removals. Arguably, this practice is not new in the process of urbanisation, and does not constitute an exclusively neoliberal treatment to the existent environment of a development site. However, it is significant that this tabula rasa approach is applied to the development of urban enclaves that, even though to different degrees, are all making claims on being green, eco, sustainable or nature-friendly.

It is a shared opinion among many of the consultants interviewed in this research that developers work out from a tabula rasa approach onto their projects (Interview 44, Scholar, Santiago, March 2013; Interview 16, Consultant, Santiago, March 2013). In Chicureo native bushes of *espinos* or hawthorns (*Acacia Cavens*), forming low density forests which dominate the local landscape of pastures and foothills, are cut down, as developers do not value them either aesthetically or economically, "they [developers] say it's ugly, that it has a *poblacion* look", as sentenced a scholar and architect with previous experience working for the developers in Chicureo (Interview 44, Scholar, Santiago, March 2013). The figure below (6.2) portrays an example of the transformation of the area by land raze and houses and condominium construction in Chicureo.

Figure 6.2 Foothills landscape with a native species forest (hawthorn) and its replacement by condominiums in the Chamisero ZUDC [yellow arrow=visual reference point]. Source: author's own from photos by M. Sanzana Calvet (2012; 2014).

In the condominium built in this site, each house has a front and a rear garden, a standard feature in all condominiums, whereas the size of the garden depends on the income and lifestyle niche the housing product is aimed at. Besides the houses, infrastructure networks occupy the green enclave surface: paved roads, water pipes and sewage tunnels built along with power stations and underground wires. New green areas beautify the surrounding environment and in some cases water bodies are developed. The photos below depict the same condominium in the Chamisero ZUDC enclave, signalling the scale of transformation and the exotic typology of the new green areas.

Figure 6.3 Tabula rasa environmental approach in a condominium in Chamisero ZUDC [yellow arrow=visual reference point]. Source: author's own from photos by M. Sanzana Calvet (2012; 2014).

Not only the sites of the neighbourhoods become subjected to a policy of land raze, but the building of the roads also becomes a process of landscape transformation. In the case of one of the entrances of the La Reserva condominium in the Pan de Azúcar enclave (Figure 6.4), its construction entails not only a symbolic impact by the naming and delimitation of a private territory by a stone landmark, but also direct material impacts, as the paved road reduces and disturbs the water infiltration, the fences block the movement of fauna and people, and the large cut of the hill slope contributes to enclose it and establish controlled access.

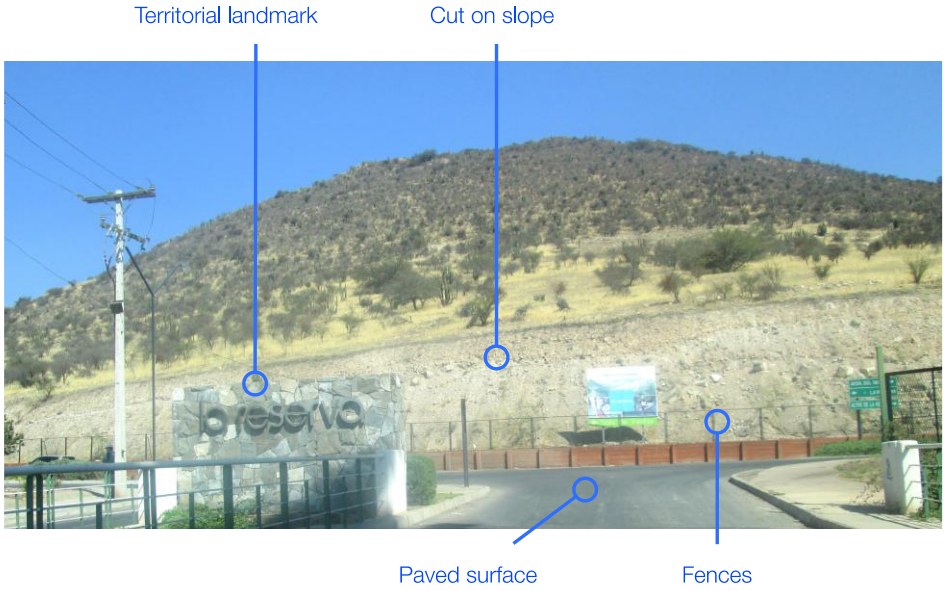

Figure 6.4 The socio-material transformation of landscape. Source: author's own from photo by M. Sanzana Calvet (2013).

Overall, the green enclaves in ZUDC areas sampled in this study display a high variety of these tabula rasa interventions on the land (Table 6.1). The consumption of land involves an intensive previous process of environmental transformation by which the land use can be materialised under the guidelines set by the specific niche market strategy for each enclave.

Table 6.1 Tabula rasa practices in the construction of ZUDCs green enclaves. Source: author's own from transects walks, marketing analysis and interviews.

Landscaping	Ciudad Chicureo ZUDC	Chamisero ZUDC	Pan de Azúcar ZUDC	Santa Elena ZUDC
Site levelling	Yes	Yes	Yes	Yes
Slope cut	Yes	Yes	Yes	-
Slope making	-	-	-	-
Inner avenues	Yes	Yes	Yes	Yes
Lagoon making	Yes	-	-	Yes
Pool making	Yes	-	Yes	-
Deforestation	Yes	Yes	Yes	-
Tree planting	Yes	-	Yes	Yes
Parks	Yes	Yes	Yes	Yes
Garden areas	Yes	Yes	Yes	Yes

The neoliberal urbanisation of the central areas of Chicureo

As mentioned above, once filled with crops, the centre of the valley of Chicureo has developed into a changing patchwork of remaining crops, growing low income villages, brownfields of speculative nature, and *parcela* enclaves -most of them small and medium condominiums, although there are a few over 100 ha.

Figure 6.5 Example of middle-size *parcela* enclave (left) in front of pastures and brownfield (right) in central Chicureo. Source: photo by M. Sanzana Calvet (April 2013)

Although the urbanisation in this part of Chicureo has meant a significant loss of agricultural land and estate fragmentation, the area has kept a

vegetation cover, although transiting from large areas of seasonal crops to patched gardens, orchards and lawns inside the plots and condominiums. Urbanised plots in *parcela* enclaves often contain a swimming pool and sport facilities along the house, and house owners usually have green lawns, fruit trees and sometimes even small orchards (Interview 42, *Parcela* Resident, Chicureo, April 2013; Interview 55, *Parcela* Residents, Chicureo, May 2013.

Figure 6.6 Sectors in Chicureo. Source: author's own writing on a Google Earth's screen capture: Image © DigitalGlobe 2015.

Building *parcela* enclaves on previous agricultural estates seems to mean a less intense intervention on the land surface, as these sites are already levelled -are located on a plain- and cleared from trees. Although these *parcela* enclaves are more often smaller than the ZUDC ones, with smaller condominiums, and smaller green areas -gardens and lawns- the vegetal coverage appears to be denser by the effect of more trees planted for the urbanisation, either by landowners or house owners.

Table 6.2 Tabula rasa practices in the construction of *parcela* enclaves in central Chicureo. Source: author's own from transect walks, marketing analysis and interviews.

CHANGE?	Santa Cecilia	Lo Arcaya	Algarrobal	Chicureo central	Avenida Chicureo
Site levelling	-	-	-	Yes	-
Slope cut	-	-	-	-	-
Slope making	-	-	-	-	-
Inner avenues	-	-	Yes	-	-
Lagoon making	-	Yes	-	-	-
Pool Making	Yes	Yes	Yes	Yes	Yes
Deforestation	-	-	-	-	-
Tree planting	Yes	Yes	Yes	Yes	Yes
Parks	-	-	-	-	-
Green areas	Yes	Yes	Yes	-	-

Besides the slow but noticeable growth of the rural villages along some local roads, the most acute change that is taking place is the fast development of a flourishing commercial strip in Avenida Chicureo that services all the population of the area. A local offer of goods and services is growing to service the increasing population in Chicureo. Developers and large companies have responded by building supermarkets in the ZUDC enclaves, but a myriad of small and middle size shops have also sprouted along the most populated areas of Chicureo geographical centre. These rural areas cannot be turned into commercial ones without a major change in the borough's masterplan; thus, the sprout of shops alongside this area in both unplanned and 'technically illegal', although the municipal government has no interest in conflicting with the population of Chicureo, as long as they keep paying the municipal taxes as land contributions and car permit fees (Interview 22, State official, Colina, March 2013).

In the case of the old pre-existing rural road in the area, now named Chicureo Avenue, almost all the properties in front of the avenue turned to commercial use with shops, restaurants, real estate offices, decoration and furniture stores, and service stations, among others. As a response to this sprouting small commerce, large companies began to lobby the town hall to

establish large commercial areas in the masterplan, eventually succeeding in 2012. Instead of planning the commercial zones for all Chicureo and normalise the existent ones, the municipal government, advised by the regional office of the Ministry of Housing, enacted a new masterplan in which only a couple of very large properties were legally transformed into commercial equipment. One of these estates, examined during my fieldwork, was a large brownfield located in the intersection of a regional motorway and the Chicureo Avenue. On my last trip to the area, the estate already hosted a shopping centre, Puertas de Chicureo ('Gates of Chicureo'), with a supermarket, and plans of building offices were on their way (Figure 6.7).

Figure 6.7 Land use transformation in central Chicureo: from brownfield to shopping centre. [yellow arrow=visual reference point] Source: author's own from photos by M. Sanzana Calvet (2012, 2014).

The many patches of brownfields that are part of the landscape of central Chicureo indicate a transitional and dormant speculative state, waiting for investments and land use changes that expectedly will pay the gamble. This example of commerce in Chicureo Avenue suggests how far the economic interests and the neoliberal rationale are imbricated in urban development and planning.

6.3 Case 1: water privatisation and the green enclaves metabolism

To understand the development of the green enclaves' water metabolism, I am introducing a brief summary of the neoliberalisation of the Chilean water system. The whole cycle of water production, consumption, and disposal is regulated by a series of national laws, in which the cornerstone

principles have been set by the neoliberal reforms initiated by the dictatorial regime in the early 1980s, that established a market-oriented water code which transformed all the supply of water resources (estimated by the water authority) into tradable water rights[21], and then by the privatisation of the water and sanitation system by the civilian regime in 1998 (Borzutzky & Madden, 2013; Bauer, 1998).

The 1998 regulation added a new system of provision of water and sanitation that basically meant the de facto division of the industry in three: a small remaining public sector of municipal and cooperative owned water utilities; a large regulated sector of private (privatised) utilities, which received concessions to both producing water and managing and treating sewage servicing defined urban areas; and growing a non-regulated sector of private water and sanitation companies that freely respond to market demand outside the regulated areas to provide solutions of water provision, disposal and treatment to rural, peri-urban and industrial customers (SISS, 2015). In 2014, the regulated and non-regulated utilities accounted altogether for more than 95% of the water consumers in number of clients and 99% in volume of water provided (SISS, 2015).

In the case of the borough of Colina -where the sector of Chicureo is located- while in the 1980s there was one water and sanitation utility -Servicomunal- servicing the town (by piped water) and the rural villages (by water tanks and trucks), nowadays there are no less than eleven private utilities of very diverse sizes serving differently various segments by population, area and income. This diversification of companies does not prevent the concentration and globalisation of the industry (Table 6.3). Along with the largest water and sanitation regulated utilities that provide water for the ZUDC enclaves and some areas with *parcela* enclaves, there is a dynamic market of medium and small private water and sanitation

[21] Water rights are available for free to anyone that asks for its usage, limited to the maximum ecological capacity estimated by the water authority to the specific water source. This ecological capacity is indeed limited to estimate the minimum hydrological capacity to keep the resource, not an ecosystemic assessment. Once the water right is given, it can only be taken back by the state if after a reasonable period -and after sound warnings and fees- it is not used.

providers, offering construction and maintenance of boreholes, wells, and pit latrines, mainly for medium and small *parcela* enclaves, in which case the condominiums have hired non-regulated private utilities to develop and manage small systems of drinkable water reservoirs and residential connections (Interview 42, *Parcela* Resident, Chicureo, April 2013). About these private contractors, although there is no public register of them either in the water authority or in the Town Hall, in at least one case there is a commercial branch of a water utility already operating in Chicureo (Sembcorp Utilities S.A.), which services thirteen condominiums in *parcela* enclaves (Sembcorp, 2014). In another case, the large *parcela* enclave of Brisas de Chicureo first hired the services of a private company (Brisaguas) to manage their water, sewage and sanitation provision, and ended by buying it to secure the quality of the service, control the bills and add value to the properties (Interview 43, *Parcela* Resident, Chicureo, April 2013).

Table 6.3 Large and medium water utilities in Colina. Source: author's own with data from SISS (2013); Sembcorp (2014) and Las Brisas de Chicureo (2011).

Type	Company	Owner	Servicing Area	Borough Sector
Regulated	Aguas Manquehue	AGBAR-SUEZ (France/Spain)	ZUDC enclaves	Chicureo
	Aguas Manquehue	AGBAR-SUEZ (France/Spain)	ZUDC enclaves	El Chamisero
	Aguas Colina	Mr Abalos (Santa Elena enclave owner) (Chile)	ZUDC enclaves	Santa Elena
	SEMBCORP Aguas Santiago	SEMBCORP (Singapore)	ZUDC enclaves	Pan de Azúcar
	SEMBCORP Aguas Chacabuco	SEMBCORP (Singapore)	AUDP enclaves	Ayres de Chicureo
	SEMBCORP Aguas Santiago	SEMBCORP (Singapore)	Parcelas enclaves	Los Alamos de Colina
	SEMBCORP Aguas Chacabuco	SEMBCORP (Singapore)	Parcelas enclaves	Colina-Esmeralda
	Aguas San Pedro RM	Mr Galilea family (Chile)	AUDP enclaves	San Luis-Brisas Norte
Non regulated (largest)	SEMBCORP UTILITIES	SEMBCORP (Singapore)	Parcelas enclaves	Algarrobal-Los Ingleses
	BRISAGUAS	Brisas de Chicureo condominium (Chile)	Parcelas enclaves	Brisas de Chicureo
	ECORILES	AGBAR-SUEZ (France/Spain)	Industrial-Industrial Farm Animal	Rural-Industrial areas

These utilities cover a wide range of urban and peri-urban areas and diverse planning status of the enclaves, exception made for two types of settlements. Firstly, the rural villages, which are subjected to rural drinkable water programs (APR) led by the Ministry of Public Works in alliance with the local government that allow rural dwellers to build and manage a water tank connected to the houses. In the case of extremely water vulnerable communities, the local and province government periodically supply free water by trucks. Secondly, residents and developers of smaller *parcela* condominiums that are not under zones of water concessions have developed other private solutions to cope with water provision. As I found in the fieldwork, the solution adopted by these is often the extraction of groundwater directly from a well in the site or condominium, or in some cases the extraction of groundwater from a central point in Colina, "a groundwater well from which all Colina takes its water, it is the same aquifer for everyone" (Interview 45, *Parcela* Resident, Chicureo, April 2013) In this case water is just added chlorine and distributed.

The production of water

Within this framework of private water provision, green enclaves in Chicureo demand water in large quantities and various qualities, leading to the transformation of the previous cycle of water of the rather depopulated agricultural valley into an urban metabolism of water. The enclaves resort to water from different sources for their making, maintaining and living, which can be raw (directly extracted from a reservoir or water table); treated non-drinkable (water with a basic filtering or chemical cleansing); and drinkable water (treated water that fulfils drinkable standards) from a diversity of local and metropolitan sources. As the table below suggests (6.4), for most of the processes the water used in the enclaves is either raw or drinkable water.

Table 6.4 Source, function and quality of water used in the sampled green enclaves. Source: author's own from COREMA (1999; 2000a; 2000b, 2003a); Las Brisas de Chicureo (2011).

	Raw		Treated non-drinkable			Drinkable		
	Water trucks	Boreholes and wells	Water trucks	Local treatment	Lagoons	Networks from local aquifer	Networks from Andean streams	Bottled water
Construction	X		X			X		
Landscaping	X		X					
Maintenance		X	X	X	X	X	X	
Gardening	X	X	X	X	X	X	X	
Domestic		X				X	X	
Drink						X	X	X

The production of water for the enclaves involves many stages, mainly its collection (or extraction), treatment and transport to the consumption points either by infrastructure, vehicles or both. The water produced for the enclaves is collected from several sources, but mostly extracted from Chicureo aquifer and local streams and treated in plants in the enclaves. In the case of the medium and small *parcela* enclaves, these usually have individual wells in the plots, by which households obtain water for gardening or even drinking (Interview 45, *Parcela* Resident, Chicureo, April 2013). Surface water is used by utilities to complete a provision that relies heavily on the aquifer contributions, and new projects of water plants that combine the collection of water from local canals with the extraction from the water table have been recently approved (SISS, 2015; SEA, 2011).

Some enclaves serviced by large utilities have even developed a provision of water from other metropolitan sources, transported from Santiago to Chicureo by long pipelines through the Andean foothills (Aguas Andinas, 2010). I also noticed in the interviews that it is quite an extended practice among enclave residents to periodically buy bottled drinking water from other than local sources (Interview 48, ZUDC Resident, Chicureo, April 2013). And in the transect walks I witnessed the use of water trucks -of undefined origin- in construction and maintenance tasks. The figure below (6.8) presents a diagram of the production of water for Chicureo, which involves mainly local sources and local production; secondarily water from both metropolitan sources and production; and finally a minor but unspecified share of sources and production presumably from outside of Santiago watershed (at least for the case of bottled mineral water sourced in southern regions).

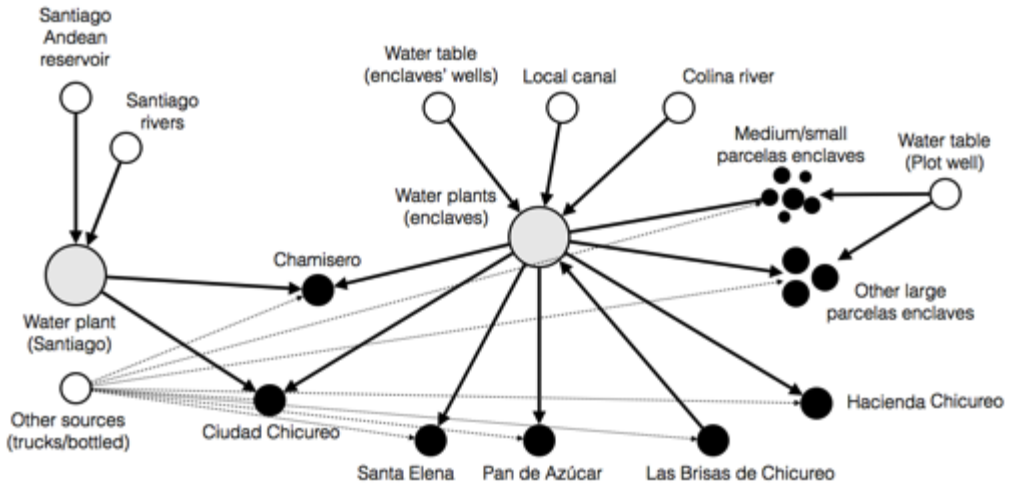

Figure 6.8 Sources of water and production sites in large enclaves in Chicureo. Source: author's own from SISS (2014); SEA (2011).

The use of local water is already a contested issue. Either in reports from public agencies and the actors' interviews, water in Chicureo is considered a scarce resource. However, this scarcity is not even for all the actors, nor is its production a process separated from the urbanisation of the area.

Chicureo's semi-arid climate is defined by a long dry/hot season (Municipalidad de Colina, 2009). Besides, since 2008 the borough of Colina is officially under drought, by a water authority decree declaring the area as a water scarcity zone (ONEMI, 2008). This has meant that the already short yearly period for water extraction from the streams in the borough -rivers and creeks- is becoming shorter, and thus, the volumes of available water are becoming lower than the water authority estimation based on a normal average range. This increases the stress on the Chicureo aquifer, from where the bulk of the water resource originates. According to the water authority, from the total water rights conceded in Colina, that is, water to be locally extracted either from the water table or surface streams, water rights for the Chicureo aquifer amounted to a yearly average of 15,771 litres per second, while in comparison water rights for superficial water meant a yearly average of only 374 litres per second (DGA, 2013; 2002).

In 2001, after a series of legal disputes with developers aiming to increase their volume of water rights, the local water table was officially declared exhausted by the water authority (DGA, 2005), meaning no new groundwater rights were assigned, and they could be acquired only in the water market. The paradox is that since then the enclaves have not ceased growing and greening. Then, how is the water scarcity being overcome? There is of course the resource to water sources from metropolitan origin, but this is limited to some green enclaves and only as a complementary mode. There are grand plans launched in 2011 by the largest metropolitan association of owners of water rights to build a large-scale infrastructure system to pump water gathered from another watershed to the Chicureo aquifer, but these are still in a stage of feasibility studies (Sociedad de Canalistas del Maipo, 2011). Thus, the answer may be found in the development of a market of water rights.

As mentioned, producing water for its consumption -under any form- demands the possession of water rights to extract it from surface or underground sources. The property structure of the water rights shows how the control of groundwater is crucial to Chicureo urbanisation by green enclaves. Land owners are the first category in quantity of water assigned, but this can be misleading: as a former research director of the water authority warned, for strategic or speculative market reasons companies are known to buy rights using a private owner as a front man (Interview 20, Consultant, Santiago, March 2013). What is clear is that these private speculators, the agricultural companies, the green enclave developers, and the water utilities account for 3/4 of all the water rights assigned in the borough of Colina, while residents in rural villages and even residents in green enclave condominiums own very few water rights (Figure 6.9).

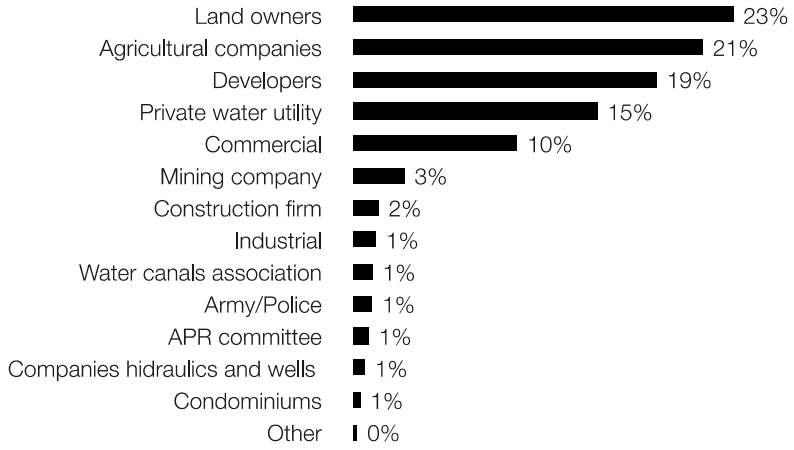

Figure 6.9 Water rights ownership per category in Colina to 2013. Source: author's own from DGA (2013)

What water utilities and developers have done is buy water rights from other owners, most of them local farmers or agricultural companies. This has concentrated the water rights in few hands, raising the price and worsening the scarcity for less affluent local actors, mostly small farmers and local communities who cannot compete in the bid for water rights. The largest water right owners, those with over 200 litres per second (99% of it being of groundwater) account alone for more than 40% of the water rights in the borough and, unsurprisingly, green enclave developers and water utilities servicing the green enclaves are at the top (Figure 6.10).

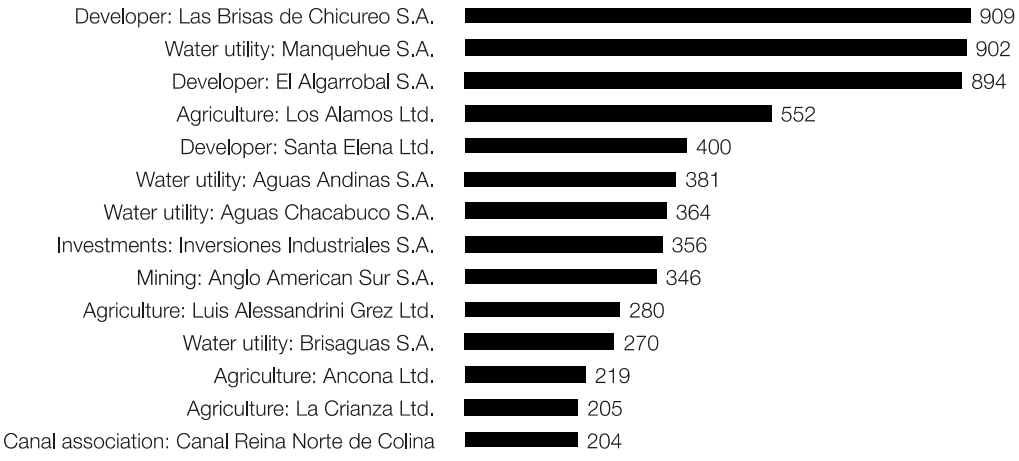

Figure 6.10 Top water rights entitlements in Colina per volume (annual average of litres per second). Source: author's own from DGA (2013)

To produce water for the green enclaves the utilities have been developing complex infrastructures and networks to extract, collect, treat and circulate large volumes of water. The joint efforts of private developers and water utilities have shown an impressive record of achievements in building and managing water infrastructure, either building tanks and production and treatment plants in situ, or connecting the large and far located developments with the metropolitan networks of water and sanitation infrastructure (as seen below in Figure 6.11), that is producing a new landscape and a new asymmetric network of water flows. Indeed, the coverage of water treatment -which according to the water superintendence reaches 100% (SISS, 2015)- is the main environmental achievement in the green enclaves, as mentioned by the head of the property developers association (Interview 2, Developer, Santiago, December 2012).

Figure 6.11 Uneven standards of water infrastructure. Private utility water tank for ZUDC enclaves (left) and public rural water tank for rural community. Source: EBCO (2014) and photo by M. Sanzana Calvet (2013)

This has produced some impacts in the foothills, as water leaks, visual impact and enclosure of former communal areas for pastures. In one case, a large water tank built by a private utility for a green enclave located just above a rural community (with which they are already in dispute for other reasons) meant, for the community, a risk and the intrusion of the green enclaves into their territory, who felt it rode roughshod over them.

> Aguas Santiago made that big tank here in the hill, it's huge... And we have a complication now with two of our families, we thought it was an issue with the canal, that it was leaking and filtering water, but it happens that, beyond the issues with the canal, it is the water tank from Aguas Santiago [that is leaking], because ours has a thin pipe, while theirs has a large pipe. And you know, it's filtering downhill, water is appearing between some stones downhill, and...it's filtering behind the houses. So it is a water jet, no, rather than a jet, many little jets going like this [hands gesture], and we are complicated about what can happen, because they go from the alley downstairs, and they have broken it 2 or 3 times, they break, destroy, they cross the plaza, they come as if it were their own house, they do what they want because they are big companies, they have money. (Interview 35, Activist, Chicureo, April 2013).

Another issue reported in relation to water infrastructure relates to the source of the water. One of the threats to the communities' water supply is the vulnerability of their rural system in face of nearby green enclaves grabbing their water from the same source. The high demand for water from the water table seems to be compromising the capacity of the aquifer to refill. Larger and deeper systems for extraction of water from the water table can have a negative impact in nearby weaker and more superficial systems, as when working the powerful extraction of underground water may cause a depletion of the watershed, which can affect nearby pumps in the radium (Interview 20, Consultant, Santiago, March 2013). It is not clear to what extent developers and utilities are entitled to such practices, which rely on a grey area of the law. All of this is a source of concern among the neighbouring communities:

> [What] we don't know is where Aguas Santiago [a water utility] have their well... In front of that, inside the condominium, there is a borehole, a large hole, and I don't know, if they extract water from there, to pump it uphill, or if they store it... We are worried about it because if they extract water our well can dry, because there, also in that direction, they also did a water exploration, and I denounced and they stopped it for a while, but then they resumed the exploration. (Interview 35, Activist, Chicureo, April 2013).

Another impact to rural communities by the extraction of water from developers is directly caused by illegal practices. Of course, the illegal extraction of water has repercussions on all those who depend on the Chicureo aquifer, as it reduces the water availability and distorts the official estimations. But some practices directly affect the rural communities, as when developers bribe a community leader in charge of the management of the local rural water system (APR) to install an illegal pipe in the

community area, reducing the water availability for the locals (Interview 35, Activist, Chicureo, April 2013).

In short, the analysis of the water flows shows how the production of urban water is tied to privatisation processes that first, in the dictatorial period, commodified the element into a resource to be legally grabbed and traded, and later in the post-dictatorial period privatised the services of drinkable water production, distribution and sanitation. In a context of restriction to the availability of water in Chicureo posed both by climate conditions and the competition for its use, developers and private utilities have managed to secure the resource by dominating the market of water rights, allowing them to exploit the water sources -mostly the water table- to produce both raw and drinkable water. To materialise these rights, developers and utilities have developed modern socio-technical solutions that accomplish the environmental and social standards demanded by the regulator, although following the economic rationality of the market resource-allocation the water systems of the green enclaves do not connect with the needs of the population outside the enclaves.

6.4 Case 2: maintaining the enclaves' greenness through water enclosure

Once produced as consumption good, water in Chicureo is usually sold to the final consumer, either a green enclave (for maintenance), a company within an enclave (for construction, maintenance or service provision), or a resident (for domestic consumption). In this and the next cases I explore this consumption linking it to the production of greenness and environmental inequality.

In the maintenance of the green enclaves as I witnessed in the walking transects, a large share of the water consumption is destined to the reproduction of the environment, that I group under the maintenance of green areas, lagoons and sports fields. An unknown share of water is also used for cleaning and other purposes, although due to the lack of data and for the sake of clarity I omit this consumption in the following analysis.

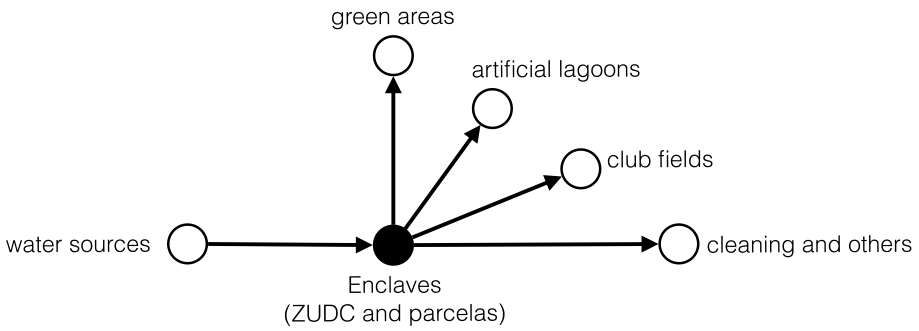

Figure 6.12 Diagram of destination of water by green areas maintenance in green enclaves. Source: author's own.

As examined in Chapter 5, the presence of green areas either as gardens or parks is one of the most relevant market attributes of the green enclaves, presented as an example of the green environment of the enclaves and in some cases even explicitly labelled as 'ecologic' or 'sustainable'. These areas are often designed by highly recognised Chilean landscape architects who develop concepts of water and energy efficiency, native vegetation, and ecological design.

However, as my transect experience shows, beyond those flagship 'eco' gardens a significant share of the green areas in the enclaves still includes large portions of highly water-demanding green surfaces. In my fieldwork visits, both in summer and autumn, I witnessed the watering of the green areas, systematically done with a complete disregard for any principle of water efficiency, as reported in the pair of photographs below (Figure 6.13).

Figure 6. 13 Lawn irrigation in Piedra Roja main avenue and Ecourbe Santa Elena entrance. Source: photos by M. Sanzana Calvet (2013)

In the image on the left, a green area in the Ciudad Chicureo ZUDC enclave, with dry climate adapted species and drip water irrigation, is completely misused, not only by the wrong time of irrigation (nearly 2 pm at the heat peak) but in a way that causes the loss of the element to the road, where it will evaporate or be transferred to the rainwater collection system. The image on the right, at the very entrance of the Santa Elena ZUDC -by that time still named 'Ecourbe'- exemplifies another common decorative and inefficient feature of the scenic green of the enclaves: large portions of highly water demanding lawns, irrigated -again- by noon by very powerful water streams and inefficiently used water sprinklers, which suggests a very intensive water consumption. In the centre of the lawn area, an impressive fountain that, as I inspected, has no connection with the irrigation of any green area, and thus its function seems to be purely decorative, showing off the abundance of water in the green enclave.

As I found this behaviour repeated again and again in all the green enclaves, at first it seemed to me an expression of pure ignorance and economic/ecologic irrationality. However, landscape architects with experience of work for developers in Chicureo offered alternative explanations for this behaviour. One of them was that keeping the enclaves green is extremely relevant because it ensures the market value of the properties and it attracts people to the always-expanding green enclaves, by fitting the aesthetic parameters of the average house buyers. So it turns out that any economic loss by the misuse of water is compensated (Interview 16, Consultant, Santiago, January 2013).

Another explanation, given by another landscape architect was that other and more "perverse economical incentives" were in place (Interview 27, Consultant, Santiago, March 2013). To her, these incentives related to the ownership of the water utility by some developers:

> If the water utility is yours, the water bill for the maintenance cost is also paid to you, so you have a captive market in both the individual consumers and the enclave administration... I mean, as the accounts are not separated, many times garden maintenance is paid as common expenses of the condominium, so there is no point in using less water, so they put more lawns.

I also noticed again that the use of the water table could also consider water grabs, by which either *parcela* residents with wells or the green enclave developers may use water above their water rights quota, or even with no rights, as was admitted by some residents (Interview 45, *Parcela* Resident, Chicureo, April 2013), in a context of lack of supervision from the water authority (Interview 20, Consultant, Santiago, March 2013).

Whilst the neoliberalisation of water facilitates its production and consumption by the green enclaves, water is reported as an extremely scarce resource for low-income areas of the borough. The following image shows the brown landscape of the public areas of deprived urban neighbourhoods in the nearby town of Colina, as the reverse of the private green environment of Chicureo.

Figure 6.14 Open playground in a low-income neighbourhood of Colina town. Source: photo by M. Sanzana Calvet (2013).

Water consumption for sports fields and lagoons

Sports and recreation facilities, either fields or lagoons, also play a core role as green attractors of the green enclaves, as presented in the analysis of the marketing in Chapter 5. Keeping them green and filled is a key task of the maintenance in the enclaves. The lawns of the sports facilities are not limited to the interior of the green enclaves, but are also a core part of the

private schools and clubs that have sprouted in Chicureo, as golf courses, tennis courts, football fields, rugby pitches and polo grounds. These clubs and their fields occupy large fenced areas in Chicureo, as exemplified in the figure below (6.15), depicting a very exclusive sports club placed besides an agricultural and low-income village.

Figure 6.15 Sports club lawns in the Las Canteras area. Source: author's own from photo M. Sanzana Calvet (2013)

These lawns demand frequent and abundant water consumption in the dry season, when they are used the most. In the fieldwork I counted as many as 20 lawn fields, courts and courses, but the number is likely to be even higher. The figure below (6.16) shows the seven largest sports lawns reported by me, grouped by surface and water consumption.

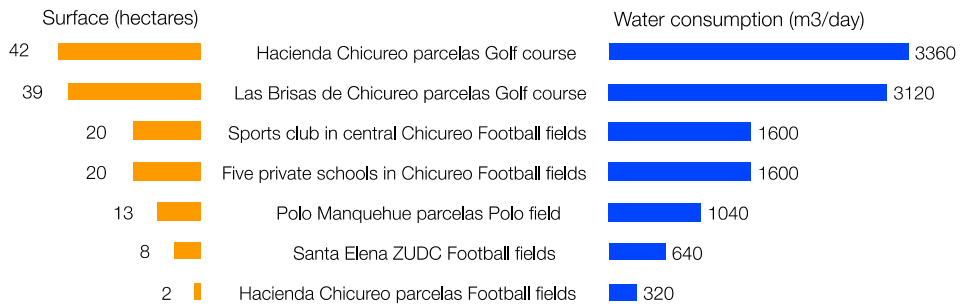

Figure 6.16 Estimated daily water consumption in summer for lawn surface per sports club (in m3). Source: author's own from developers' websites and Google Earth (2014).

Altogether, the daily water consumption[22] of these lawns[23] would be of 14,600 m3, which would equal the daily consumption of water data for all the population in the town of Colina (14,637 m3), according to data from the water authority (SISS, 2014). These figures evidence a situation of inequality in the access to water in which the production of abundance for some co-exists with the water scarcity of others.

Other relevant facilities of the green enclaves that demand to be filled and maintained are the artificial lagoons of the enclaves, as they play a crucial role in the production of the greenness of the enclaves: not only do they have green surroundings, often parks or lawns, but they are also used for recreation and socialising (Interview 39, *Parcela* Resident, Santiago, April 2013). Only considering the green enclaves of the sample, I reported the existence of at least ten artificial lagoons, with an overall estimated surface of 13.3 hectares (Figure 6.17).

[22] Estimated in a scenario of 10 litres per m2 in summer, which is the average estimated by the water superintendence (SISS, 2011; Ubilla and Oliva, 2011).
[23] Area estimated: 146 hectares.

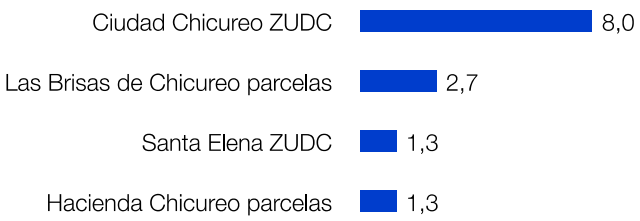

Figure 6.17 Surface of artificial lagoons per green enclave (in hectares). Source: author's own from enclave projects files and estimations using Google Earth (2014).

Among these lagoons, the most iconic -and largest- of all the artificial lagoons is that of Ciudad Chicureo, surrounded by a park, a boat club and a commercial area as described in Chapter 5. The volume of water of this lagoon alone has been estimated in 320,000 m3 (Defendamos la Ciudad, 2005), which represents 20 days of the water consumption of the inhabitants of the Colina town in summer.

The lagoon is not refilled every day, although it does need a constant refilling and circulation -with groundwater- for its cleaning, oxygenation, algae treatment, and evaporation compensation. The continuous abundance of water in the lagoon and its green and beautified environment make a stark contrast with the arid landscape of Colina in summer, when its river and green areas dry (Figure 6.18).

Figure 6.18 Main water bodies in summer: Colina river in the town of Colina (left) and lagoon in Ciudad Chicureo enclave (right). Source: photos by M. Sanzana Calvet (April 2013)

Whilst in summer residents of the green enclave have access to the lagoon, people in low income urban neighbourhoods of Colina use the irrigation canals to play (Interview 50, Activist, Colina, April 2013) or open the fire hydrants on the roads to recreate, causing shortages of water (Colina CTV, 2014a). Omitted in the environmental impact assessment and not subjected to the scrutiny of public bodies, the lack of information and accountability of the lagoon management represents itself a challenge to more consistent assessment of water efficiency and sustainability of the green enclaves.

Water flows generously to the green enclaves, allowing both developers and residents to make and maintain the greenness of the enclaves. The consumption of the green enclaves that keeps the water flowing is a centrepiece for maintaining the market attractiveness of these developments by the presence of large and well maintained green areas, lagoons and sports fields. Following the flows of water to its consumption by the green enclaves to service the 'common' areas of the private developments also reveals the striking contrast of these with the rather dry public areas of the low-income neighbourhoods in the borough.

6.5 Case 3: unequal access and uneven consumption of domestic water

The modes of domestic consumption of water by households in Chicureo differ in accordance to where do they live, if in ZUDC enclaves, *parcela*

enclaves or rural communities (Figure 6.19). The main difference in the mode of consumption between the ZUDC and *parcela* enclaves is the use of water for the maintenance of orchard in the latter.

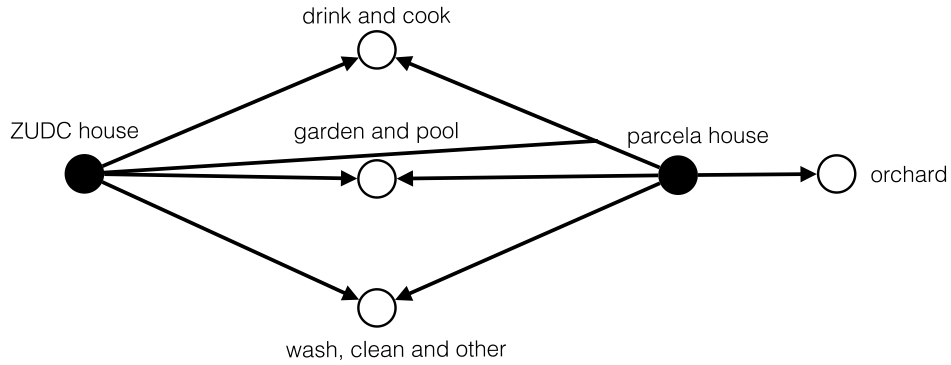

Figure 6.19 Modes of domestic water consumption in the green enclaves. Source: author's own.

Water consumption is considered a crucial issue in urban sustainability. But what may be considered too high or too low in relation to domestic consumption in the green enclaves? Is it really different from other urban or peri-urban areas in Chile or elsewhere? I analyse here the data on water consumption in the enclaves, including my own data, comparing them with data and estimations from other areas of Chicureo and the borough of Colina.

In the only public study comparing domestic water consumption by the Chilean water authority, some of the green enclaves in Chicureo were placed at the top 1st, 3rd and 8th of the national ranking on the per capita consumption average per neighbourhoods (Rivera, 2011). In the following table, I compare the per capita consumption of these green enclaves with data of other neighbourhoods in the borough of Colina. The results (Figure 6.20) represent a summer peak, precisely when the differences between the need for water and its availability can be crucial in the dryness of Chicureo biome. This figure indicates the scale of the surplus domestic consumption of water in the green enclaves in comparison to other urban and rural areas of the borough. Although the figure does not challenge the efficiency in the

use of water, it shows the huge gap between the consumption of the water haves and the water have nots in the borough of Colina.

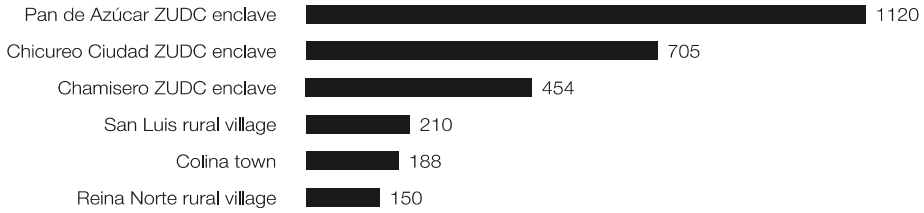

Figure 6.20 Summer water consumption per selected sectors in Colina (in litres per capita per day). Source: author's own from SISS (2014) Rivera (2011) and Interview 38 (State Official, Santiago, 2013).

As high as these averages may seem, my own estimation with data from domestic consumption provided by the residents in interviews and the survey suggests an even higher peak consumption rate. A resident from a *parcela* condominium stated that his domestic consumption was of 600m3 per month in the summer (Interview 42, *Parcela* Resident, Chicureo, April 2013), which means 20,000 litres per day (in that case for 2 adults and 3 children), which makes an average of 4,000 litres per capita per day. In this case, this includes the drinkable water provided by a utility and groundwater taped in situ directly from the water table, which remains unaccounted in official statistics of domestic consumption.

As this number exceeds by many times the highest rate of water consumption found in official reports, I searched for other sources of information to set estimations for those who do not tap directly from the water table. Comments from ZUDC resident interviewees about the high water bills in the summer provided new data: in three interviews the figure of $ 100,000 Chilean pesos emerged as a reference of the usual monthly water bill (Interview 30, ZUDC Resident, Chicureo, March 2013; Interview 25, ZUDC Resident, Chicureo, March 2013) while $ 250,000 Chilean pesos was mentioned as an expensive summer month bill in the Ecourbe

enclave[24]. Using these figures I worked out a new estimation for the residential water consumption[25] focusing on the case of the Santa Elena ZUDC enclave. The result indicates a non-peak average of daily consumption of 1,462 litres per capita, and a peak of 2,591 litres per capita.

The consumption of the ZUDC enclaves seems to be in some cases much lower than the *parcela* enclaves, which as mentioned in Chapter 4, were depicted as the most unsustainable form of urbanisation of Santiago's countryside, and justified the development of the ZUDCs as a more sustainable alternative of low-density urbanisation. The ZUDC developments not only were claimed to be sustainable by the state planners, but also as seen in Chapter 5, often depicted in the property marketing as 'green', 'ecological' or 'nature-friendly' (Table 6.5). However, the numbers in some cases are so much above the average that they do not compare with the reality of the average urban consumption in Chile.

Table 6.5 Rate of water consumption per capita and labels in green marketing. Source: author's own.

Enclave	Difference with national per capita urban water consumption average	Labels in green marketing
Parcela enclave (Santa Cecilia)	+2,128%	-
Santa Elena ZUDC	+1,378%	Ecourban, modernity and nature in equilibrium
Pan de Azúcar ZUDC	+596%	Ecological reserve; nature
Ciudad Chicureo ZUDC	+375%	Energy efficiency, Eco-smart
Chamisero ZUDC	+241%	Neighbourhood life, nature

The reason for such high rates of residential water consumption, as suggested by interviewees, seems to be the demands of lawn irrigation and

[24] These figures are consistent with the fieldwork survey, when 65% of the respondents estimated their water domestic consumption in summer between $ 50,000 and $125,000, while a 27% described it as of above $ 125,000.

[25] In 2013 the regulated price cost for 1 m3 of water in the Ecourbe was of $ 402 (peak overconsumption) and $ 285 (no peak-no overconsumption), according to the water authority price decree (SISS, 2008). For this estimation, I corrected the result by supposing a conservative scenario, in which half of the bill was to be paid for other services than water, as new water and sanitation infrastructure costs being transferred to the customer, sewage and treatment fees, and other administrative charges. The per capita daily consumption was estimated for a house with a family of four.

pool refilling, and not the consumption inside the house, although the use of washing machines, several toilets flushing, and high number of bathrooms may contribute to it, (Interview 30, ZUDC Resident, Chicureo, March 2013; Interview 43, *Parcela* Resident, Chicureo, April 2013). As in the *parcela* enclaves, particularly during the summer, residents have to constantly refill the pool and water the lawns and garden, although in this case, in most of the ZUDC enclaves, residents are not allowed to extract groundwater, as the developer owns all the rights, and all the water use has to be made using the expensive drinkable water.

Figure 6.21 Private pool and lawn in Santa Elena ZUDC enclave (left) and satellite image of Ciudad Chicureo enclave depicting density of house pools and lawns (right). Source: Mercado Casas (2013) and screen capture on Google Maps (17-08-2014).

Are these results of domestic consumption high only for Chilean standards? What if compared with other high-income settlements in semi-arid or arid areas worldwide? Some green enclaves in Chicureo ranged around the average litres per capita per day as those of Perth in Australia, or Sacramento in California (Cahill & Lund, 2012), that is between 248 and 455 lpcd. However, for the higher consumption rates found in Chicureo the best comparison pair turned to be the average litres per capita per day values of villas in the extremely arid and wealthy environment of Abu Dhabi in the United Arab Emirates, where the highest range reached 1,760 lpcd (Environment Agency Abu Dhabi, 2009). Even considering the limits of this exercise, the results are astonishing and highly disquieting in the light of both the rate of consumption of a limited resource and the model of lifestyle

that is being developed in a country as Chile, still facing severe challenges in poverty and inequality.

These results add to an already existent inequality in the provision of water for domestic consumption between the different types of settlements in the borough of Colina. In this borough, just above 100,000 inhabitants are serviced by regulated water utilities; 20,000 are serviced by other private arrangements (SISS, 2013); whilst an estimated 20,000 inhabitants are serviced by rural water services and emergency water truck assistance (Gobernacion, 2012).

How big is the share of consumption of water from the inhabitants of the green enclaves if compared to the population of other areas of the borough? Below is my estimation of the daily average consumption of drinkable water of the population of Chicureo in summer, taking into consideration only sources accounted by the water superintendence, that is, excluding in situ wells and boreholes.[26]

The results (in figure 6.22 below), indicate that the water consumption of the population inhabiting the green enclaves in Chicureo represents nearly 40% of the borough's total water consumption, which means one-fifth of the population consumes two-fifths of the drinkable water, an estimate that would arguably grow if grabs from the water table were taken into account.

[26] The estimation is made by multipliying the per capita water daily consumption average in each sector by its population, converting the results in a percentual share of population and water consumption. The population in each sector was estimated using municipal data (Valencia, 2014; Municipalidad de Colina, 2009). For the water consumption rates in Colina urban and Colina rural I used averages provided by the interview of officials from the Direction of Hydraulic Works (Interview 38, State officials, Santiago, April 2013); for Chicureo's consumption I used that of the Chamisero enclave in ZUDC area, found in a 2011 study of the water superintendency (Rivera, 2011).

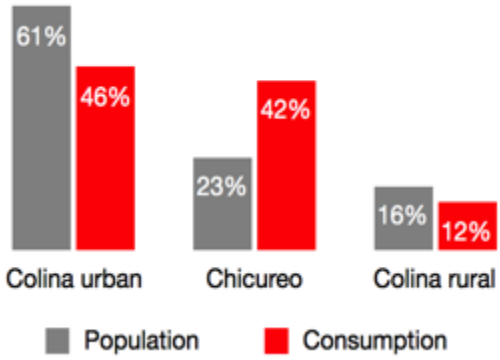

Figure 6.22 Population and drinkable water consumption in the borough of Colina. Source: author's own from SISS (2011; 2013) and Gobernación (2012).

Besides their water consumption rates, residents of rural areas in the borough -including those in Chicureo- are not serviced by the high standard socio-technical systems developed by large private utilities. A myriad of small rural villages and communities are still serviced by precarious rural water systems (APR) and emergency provision schemes (Table 6.6). Also, in the borough of Colina, 644 inhabitants, from 27 small villages, have their water provided by a municipal hired water truck (Gobernación, 2012).

Table 6.6 Rural water provision in the borough of Colina. Source: author's own using data from Gobernación (2012 Table 1).

Serviced sector	Serviced population	Electrical generator (power backup)
Chacabuco	1,920	Yes
Ejemplo Campesino	288	No
El Colorado	1,440	Yes
Hermanos Carrera	2,000	No
Las Canteras	3,378	No
Los Diecisiete	390	No
Manuel Rodriguez	3,900	No
Quilapilún	300	Yes
Reina Norte	630	No
Santa Filomena	1,350	No
Santa Luisa	750	No
Santa Marta de Liray	3,000	No

The APR system basically means a subsidised service to be managed by rural communities, which allows them to install a small water pump and dig water from the aquifer, build a small water tank where chlorine is added, and extend artisanal connections to the sites. The service depends on the availability of groundwater and the provision of electricity for its extraction, both of which cannot be taken for granted in those communities, hence the unreliability of the service.

Water scarcity in these villages is already triggering tensions between communities and the green enclaves. As already mentioned, in the case of the Las Canteras quarrymen's village, the community blames the action of nearby green enclave developers and residents as the cause of worsening their access to water (Interview 35, Activist, Chicureo, April 2013). In the Santa Filomena sector (where an approved ZUDC enclave waits to be developed), in August 2014 the rural community protested against months of severe water shortage because of the well exhaustion and the abandonment of works by the company who was building them a new well and water tower (Colina CTV, 2014b).

Other rural communities with water shortage are conflicting with a nearby copper mining company. As an official from the water authority states, in the borough of Colina there are APR rural water services known by their continuous lack of water, one of them the Quilapilún Alto community, where "long ago… their well dried and they have no water. They blame the mining companies, ok?" (Interview 38, State Official, Santiago, April 2013). In this case the company mentioned is the largest private mining company in Chile, that owns an industrial plant in Colina to concentrate the minerals and a very large industrial water reservoir (capacity of 1.9 million tons minerals) to wash the minerals. This reservoir is fed with water from a local stream where it also disposes them[27] (Anglo American, 2013). Despite these claims, the same state officials interviewed make these villages co-

[27]Tens of episodes of pollution of the water table, local streams and environment have been reported annually by the company, who claim to develop expensive prevention, monitoring, and mitigation programs (Anglo American, 2013).

responsible for the worsening of situation because of their population increase, naturalising the water scarcity and omitting linkages to other local or global anthropic action "so, as they also have increased the number of residents, unfortunately they don't have a way to integrate them to the service provision" (Interview 38, State Official, Santiago, April 2013). In this case, the Ministry of Works made a first drilling but it failed to find the water table, and since then, water provision has relied on hired water trucks, until a new exploration drilling is set (ibid).

This section has shown how some of the green enclaves in Chicureo have been already indicated as those with the highest national per capita water consumption rate, pushed by the high consumption for the maintenance of the domestic green (house lawns and pools). These data and my own estimations suggest, for some of the green enclaves marketed as green, eco or sustainable, a scale of consumption comparable to those of the green enclaves in the arid and very wealthy areas in California, Australia and the Emirates. By showing the gap between the residents of the enclaves in Chicureo and the other inhabitants of the borough, particularly those of rural villages critically lacking a reliable provision of water, this chapter shows how the neoliberalised management of the water flows is linked to the production and reproduction of environmental inequality. The new water metabolism of the enclaves produces abundance for some without attempting to reduce the scarcity of others, and rather enclosing the resource by several means. At the same time, this ecological securitisation of water raises several questions on the long-term viability of this mode of consumption, as neither the future challenges of the ongoing depletion of the resource or the existing and increasing climate constraints seem to be taken in account.

6.6 Case 4: flows of stone in the dispute of the green enclaves metabolism

In the production of a new socio-nature, the green enclaves in Chicureo have not only reclaimed from previous uses the land directly involved for the construction of the new urban neighbourhoods, but also larger areas

defined as at risk, natural or productive that constitute buffers, source of resources and potential zones for future growth. The analysis of the conflict between a traditional small-scale mining activity and the new planned ZUDC enclaves further exemplifies the rationality of enclosures driven by the neoliberal urbanisation of Chicureo.

In the southern corner of Chicureo there is a small mountain range formed by the Pan de Azucar, the La Campana and the La Pedregosa hills. For nearly a century quarrymen and stone masons have mined these hills and crafted the stone, backed by social recognition to their activity and mining rights[28] over 300 ha large areas of the hills. There, they have built their settlement, Las Canteras, meaning 'the quarries', a rural village that, nowadays, has an estimated population of 600 families. It basically unfurls along a lengthy road on the fringe of the Pan de Azúcar hill, where generations of quarrymen have built their houses (Municipalidad de Colina, 2009; Interview 34, Activist, Chicureo, April 2013). The stonemasons keep their work and peddle in street workshops in the village main road (Figure 6.23), performing an informal trading activity.

Figure 6.23 Stone mason workshops in Las Canteras main road. Source: photo M. Sanzana Calvet (2013)

[28] According to the Chilean mining code, established in 1983 to boost the private mining exploitation, the mining rights for the exploitation of the underground minerals are separated from the ownership of the land (Ministerio de Justicia,1983).

The main products of the Colina quarrymen are handmade masonry, cobblestone and ornaments for construction, from stone extracted in the hills' quarries by non-industrial methods (Figure 6.24). As emerged from the interviews and fieldwork visits, quarrymen and stonemasons are a craftsmen's community rather than a mining working class, whose activity is both their main economic activity and the pillar of their social identity.

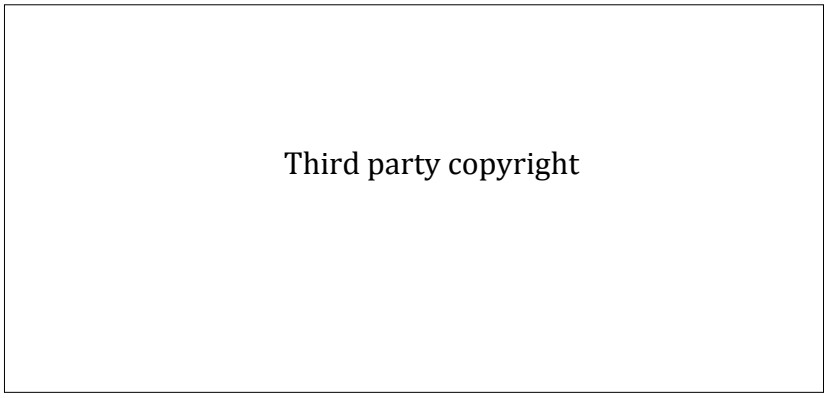

Figure 6.24 In situ stone extraction and cobblestone making in Las Canteras quarries. Source: photos by A Perez Guerra (2012).

The conflict involving the development of green enclave developments and the quarrymen began in the 1990s when a Chilean economic group who owned large part of the hills, and had it as a site for explosives tests, decided to expand their business from explosives and luxury hotels to property developments. As one of the developers who declared interest in the new scheme of the urbanisation by conditions, the planning authorities of the Ministry of Housing granted them an area for residential developments, included in the Plan Chacabuco in 1997 and known as the Pan de Azúcar ZUDC (MINVU, 1997). In association with the American company Cargill, the landowners began to develop their residential project in the 2000s, but soon clashed with the quarrymen's activity. Backed by their mining rights and their tradition, the quarrymen rejected the enclosure of the hills and demanded access to their quarries, which was denied by developers who wanted exclusivity for residential use of the area (Ramirez & Fossa, 2011).

In the mid 2000s developers initiated legal actions against the quarrymen's association. The association had to hire a lawyer, who was given the mandate to establish negotiations with the developer. However, in 2007 this lawyer swindled the quarrymen's association, and produced an agreement highly damaging to the quarrymen's interests. By this contract the quarrymen's association sold 210 ha of their mining rights to the owners of the Pan de Azúcar ZUDC for the symbolic amount of one Chilean peso (less than a penny), and leased another part of their rights to a company producing stone for the construction industry for 50 years. The agreement also established severe restrictions on movement and work, and the quarrymen were limited to few remaining quarries (CIPER, 2009). As a measure of compensation, the agreement included a money sum of 40,000 UF (nearly 800,000 sterling pounds), which was paid directly to the lawyer by way of professional fees (ibid). Eventually the quarrymen's association sued their own lawyer, who turned out to be simultaneously working for the developer. In the meantime, this judicial battle gave the ZUDC developers the time gap to build two condominiums, the large and exclusive La Reserva -that promises an ecological reserve- in the Pan de Azúcar hills and foothill inner valleys, and the smaller middle class La Sierra de Chicureo in the foothills (La Reserva, 2014; Prieto, 2009). As examined in the previous chapter, the enclosure of hills and the landscape is a fundamental feature of the green enclave attractiveness, for both ecological security and aesthetic reasons. The developers of this green enclave considered that the whole territory had to be secured and controlled, preventing unwanted activities and people. At the same time, the enclave next to this, the Chamisero ZUDC also began to develop in the late 2000s, acting as an additional enclosure (Figure 6.25).

Figure 6.25 Green enclaves and quarries in dispute in Pan de Azúcar and Chamisero ZUDCs [enclave boundaries in dotted yellow lines; perimeter of mining rights in dispute in red lines]. Source: author's own using data from Asociacion Gremial de Canteros de Colina (2011) over a screen capture of from Google Earth: Image © DigitalGlobe 2014.

From enjoying the freedom of being in between the edges of the agricultural valley and the Andes, the quarrymen's community shifted to a core but besieged position in the process of environmental transformation unleashed by the spread of a neoliberal urbanism and the urbanisation by green enclaves of Chicureo. Different metabolisms and modes of conceiving the territory overlapped in the southern hills of Chicureo, increasing the fragmentation and conflict. Not only are the quarrymen currently prevented to access many of their traditional domains, but the communal use of the hills has disappeared. As an example of this, one quarryman describes how it has become almost impossible for most of the quarrymen to herd their horses: "there is nowhere to keep them, all the land has been bought, do you realise? Not as before, when you brought the horse to the hill, and you left it there" (Interview 35, Activist, Chicureo, April 2013). Horses are not accessories for Chicureo rural communities: traditionally used as a work

force in farms and quarries, they are also used in the most important religious popular ceremony in the region, the Cuasimodo (Figure 6.26). The ownership of a horse becomes a powerful analogy of a wider cultural resistance to the urbanisation "there are those who resist... me for example, I do have... we do have a horse there" (Interview 35, Activist, Chicureo, April 2013).

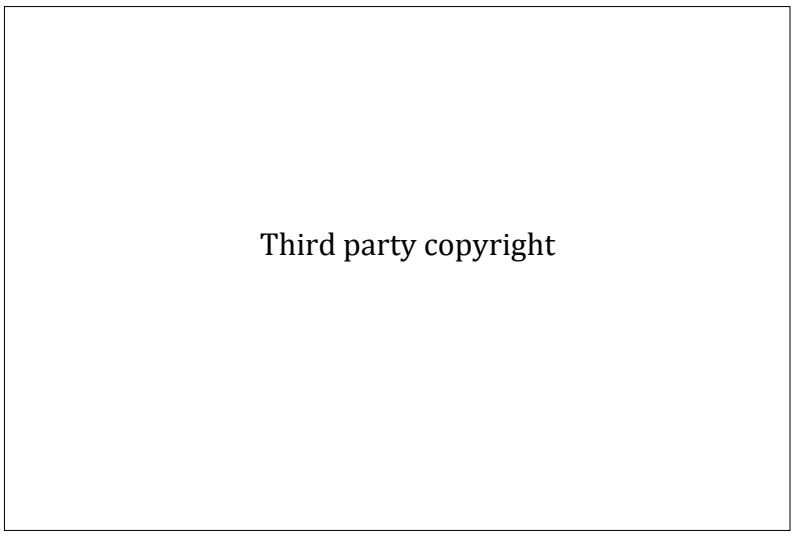

Figure 6.26 Cuasimodo popular festivities in Chicureo. Source: photo by "Cuasimodo Colina", March 2008.

The limitation of quarrymen's mining rights has diminished the area to be exploited by them, in a context of population increase in their village. As young people have started to accept jobs as construction workers in nearby developments, some of the old quarrymen emphasise the relevance for them that their craft not be lost, and their dream of having their descendants continuing the activity (Interview 35, Activist, Chicureo, April 2013). A quarryman leader and local historian reflected on their current situation: "our weak point as quarrymen is that by now they have us strategically surrounded, on one side La Reserva, on the other Chamisero" (Interview 35, Activist, Chicureo, April 2013). In this case the tragedy of the loss of the commons was not caused by any communal mismanagement, but by a capitalist-led urbanisation by green enclaves, and therefore this is a cost specifically exported to the locals by landowners and developers.

But at the same time, it has to be pointed out that, despite the informality of their market, the quarrymen have found a profitable niche in Chicureo, either selling countryside typical decorations for the wealthy *parcela* residents in the area or, mostly, selling cobblestones for developers looking for distinctive materials to add a rustic touch to their projects (Interview 35, Activist, Chicureo, April 2013). In fact, one may wonder, what has prevented the La Reserva developers to offer them a good deal and co-opt their activity? What has prevented the quarrymen to accept a deal that, as usual, in the name of the inevitable modernisation benefits a few and pauperises the bulk of the community? I have no straightforward answers to these questions, but it is plausible that, until now, land, family bonds and lifestyle are still more important than capital in the reproduction of the quarrymen's social life and identity, as the following dialogue between a group of the quarrymen's community leaders suggest:

> -[Man 1] My granddad, he carried cobblestones, a hundred years ago [...] then my dad, now my brothers... For instance, my wife's grandparents were always masons [...] the four grandparents were also sons of quarrymen, I mean, it's a thing with a lot of history...
> -[Woman] I believe that this has kept us in this place, because, without that, we would be already gone...
> -[Man 2] Yes, here, in the 1981 recession, the 1930 recession, the 1998 recession... I mean, the elders just kept producing cobblestone, even if those were not sold... So that speaks of an attachment, beyond everything, beyond the money.
> (Interview 35, Activist, Chicureo, April 2013).

In any case, their social identity has become a crucial arm in their current struggle. One of their leaders became the community historian, gathering oral stories, old pictures and documents, and writing a coherent narrative of their social history that links them to the Spanish stonemasons who migrated to Chile on request of the King of Spain, to build fortified cities, and then forward to the production of some of Santiago's most reverenced buildings and monuments. Whether accurate or not, this interpretation of a historical identity has enhanced the cohesion of the quarrymen's community, and has already provided them with a narrative to fight for their lifestyle recognition and protection in the metropolitan planning, claiming to be a 'traditional zone', a denomination they expect could help prevent new developments around their town and quarries (Interview 35, Activist, Chicureo, April 2013; Martínez, 2014). Indeed, the understanding the

quarrymen have about the nature of their conflict merges material and social dimensions. To them, the struggle with green enclave developers is fought in the field of social and symbolic identities and the control of resources and flows.

> One of the ugly things of developers is that, as they arrive to a place they change the names [...] For instance, we have a rock named *Piedra de los Pequenes* [Stone of the Owls] and now they call it *Piedra Santa* [Holy Stone]. Have you heard this? We have the Los Kilos ravine and they left it without name, see? So, this is the very first impact they cause [...] So the new generations, the kids... [Researcher: So you're saying it's an identity issue...] Sure, because when you erase people's identity... then all the rest is easier. So the first they try to do is erase the identity. For instance, we have an old *pirca* [stone wall] that circles the village, from 1641. What they did is take this wall, dismantle it and put in the pillars in the entrances of the condominiums, or tell the contractors to use these stones, to make the... to beautify what they need. [...] So, there they start, and after they try to erase the identity, they begin to erase the material stuff, and there we already have a problem, see? (Interview 35, Activist, Chicureo, April 2013).

When interviewed for this research, residents in the La Reserva enclave stressed their own lack of information and set any responsibility on the developers: "the quarrymen have the mining rights in the land. And when they [developers] sold [the sites] they never talked about this issue. It was not mentioned at all" (Interview 30, ZUDC Resident, Chicureo, March 2013). Property developers realised the potential threat the conflict represented on their own property and investment, but their perception was that the situation was solved by the 2007 legal agreement: "it subtracted value to La Reserva... it was a source of uncertainty, but when we moved that was already settled, there was a new owner, an agreement had been made and blah blah blah" (Interview 30, ZUDC Resident, Chicureo, March 2013).

But the conflict had an unexpected and potentially increasing impact for the green enclave residents, who supposedly would be benefitting from the quarrymen's ceasing of activities. Once the traditional regime of resource exploitation was shattered and the land and stone commodified, new forms of maximising the rent of the land and the resources emerged, uncontrolled. The company granted a rent for the quarries and a La Reserva contractor started an intense mining activity in La Pedregosa hill, to supply the high demand of stone on the part of the cement and concrete companies in the

former, and to meet the enclave's need of stone in the latter (Moraga, 2007). As a resident in La Reserva described, this has become by far the main source of noise pollution in the condominium, and identified the new industrial scale mining activity as the problem:

> Look, this village here is the quarrymen's, these people who extract, or traditionally have extracted the stone from the quarries in here, and particularly here... Now, what happened? Well, five years ago a mining company presented a mining concession, and the concession is part over La Reserva and part over Chamisero. So the guys initiated an exploitation, almost industrial, putting lots of trucks and things, against the almost artisanal exploitation the quarrymen made, that were just a couple of dynamite, a not too bothering thing (Interview 30, ZUDC Resident, Chicureo, March 2013).

The agreement against the quarrymen in the name of the property development and residential activity resulted in the increase of direct noise, visual and congestion impacts over the green enclave residents. This situation is likely to worsen, as the next developments to be inaugurated soon are precisely the closest to the industrial quarry site, as I could report in my walking transects (Figure 6.27).

Figure 6.27 Impact of the industrial quarries in La Pedregosa hill western flank (left) and active industrial quarry above the new condominium in the Chamisero enclave (right). Source: photos M. Sanzana Calvet (2013)

As the green enclaves continue to expand, the more the condominiums and their residents are in contact with both the quarrymen and the industrial quarries, the more the land rent increase pushes to the conversion of the remaining agricultural land, opening up scope for alliances and clashes. In any case, while the quarrymen keep resisting the materialisation of a new socio-nature against which they can only hold their stones and memories, the green enclave residents may come to realise that, under the rule of

neoliberal urbanisation, their recently acquired freedom and security are limited by the next and more profitable land use. The dispute for control of the flows of stone in a series of hills between developers and a quarrymen community not only evidences the extent of the policies of neoliberal land enclosure by the green enclaves, but the will to produce a new material and symbolic territoriality by the property developers. This case also shows how the commodification of land clashes with cultural identities that resist to be annihilated by the aggressive mode of urbanisation represented by the green enclaves. At the same time, it indicates the weakness of the ecological security of the residents, raised by developers as the raison d'être of the ban of the quarrymen, when larger mining operators began to mine the quarries increasing the current and potential impacts to the nearby condominiums.

6.7 Case 5: neoliberalisation of domestic waste management and recycling

In this last case over the urban metabolism of the green enclaves I focus on the management of the flows of domestic solid waste from the enclaves. The cycle of domestic solid waste in Chicureo is developed according to the metropolitan waste collection systems area. The waste is packed in bags and disposed in bins by residents, then collected by trucks, in this case from Starco, a branch of the Spanish-American KDM firm, the company licensed by the Colina municipality. This waste is directly transported to a KDM transference plant, in another borough of the metropolitan area, which receives the waste of 24 metropolitan boroughs. In the plant, the waste receives a primary selection to save recycling materials; then the refuse is compacted and transported by rail to a waste landfill. The KDM transference plant receives 850 trucks per day, and dispatches 8 to 10 daily rail convoys carrying each 700ton of waste to dispose in the 220 ha of a sanitary landfill (Figure 6.28) in the rural borough of Til-Til in the northern limit of the metropolitan region (KDM 2014).

Third party copyright

Figure 6.28 Waste disposal in Til-Til sanitary landfill (left) and waste train (right). Source: KDM (2014)

Since 2010, part of the waste is used to produce biogas and subsequently transformed into electricity in an energy plant on the landfill site, while the rest of solid waste is buried and covered by land. The organic liquids produced in the transport and manipulation are treated in the landfill and sent back to Santiago by the same rail line, where they are discharged into the sewage system (Chileresiduos, 2014). Overall, each day solid residential waste generated in Chicureo is transported 16 km to the transference plant and then 67 km by rail to the landfill (Figure 6.29).

Figure 6.29 Trajectories of domestic solid waste flows from the green enclaves in Chicureo (point A) to the transfer plant (point B) and then to the

landfill (dashed line). Source: author's own with data from KDM (2014) over a screen capture of Google Maps © 2015 Google.

The waste management system has reached an industrial scale efficiency in which the incentives are put on increasing the volume of waste to be collected in the city and disposed and processed away (Pizarro & Jara, 2015). However, this efficiency has patent environmental, economical and political implications. Not only the recycling rate within the system is very low, on average 2%[29] according to KDM (2014), but the profit for this activity (as well as the profit for producing gas or selling carbon bonds) does not belong to the municipalities and it is not accounted in the waste contracts. At the same time, it is not cheap for the municipalities: in 2013 waste collection represented the second largest individual item in the borough of Colina's annual municipal budget (10%), only second to the item of salaries, a share larger than the municipal contributions to health and education put together (SINIM, 2014).

To be developed, the system had to break the resistance of rural metropolitan boroughs to the installation of metropolitan scale sanitary landfills in their territories, because of the decrease of land values and the stigma and scaring of private and public investment in other activities. This struggle was known as the 'waste war' a conflict for the disposal of the metropolitan waste, which was lost by the rural mayors in the early 2000s (Sabatini & Wormald, 2004). For waste management companies, waste has been a source of unparalleled wealth, and the attractive long-term contracts with municipalities have triggered constant allegations of monopoly, illegal practices and corruption. Since 2010, the bribery of municipal authorities or the illegal financing of their political activities by KDM has been judicially prosecuted in the case of at least three metropolitan boroughs, including (Urquieta, 2013; Fernández et al, 2010). Through its many branches, KDM

[29]As a comparison point, according to the European Environmental Agency, in 2010 from thirty-two European countries considered only three had a rate of recycling of municipal waste lower than 4% (EEA, 2010). In 2014, a report from the UK parliament set that for 2012/2013 "recycling rates in local authorities across England range between 12% and 67%" (Parliament, 2014)

services the collection of waste in eleven boroughs, and receives the waste of twenty in its landfill, managing 59% of the metropolitan total volume (Pizarro & Jara, 2015).

Production and recycling of domestic solid waste in Chicureo

There is an even more direct link between the greening of the urban enclaves and the waste metabolism, and this is the development of a private recycling scheme in some green enclaves.

The neoliberalised metropolitan waste management system in which the borough of Colina operates is complemented by Chicureo's own neoliberalised recycling scheme. In 2010 and 2011 two ZUDC green enclaves in Chicureo (Santa Elena and Ciudad Chicureo) developed a scheme of 'green spots', a place with bins for the collection of recyclables (Figure 6.30) to where residents may voluntarily select, transport and dispose part of their domestic waste[30]. These schemes are managed by a private company (TriCiclos) that keeps developers and residents updated with the statistics, although it has no obligation in public accountability or coordination at the municipal level. Furthermore, no information is provided on how these materials are being recycled, how they can be tracked, and in which business model the company profit is made.

[30]In 2015, managers of the Ciudad Chicureo enclave began a scheme for the collection of electronic waste, in charge of eWaste Recycling Co., a private company that claims it will be sent to certified recycling plants in the US and Europe (El Mercurio 30 June 2015).

Figure 6.30 Recycling spot in Chicureo with information about the monthly volume recycled and its equivalence in energy and material savings. Source: photo by M. Sanzana Calvet (March 2013)

Developers at those two green enclaves have enthusiastically mentioned the existence of this scheme for recycling in Chicureo as an example of the green enclaves' leadership in urban sustainability, in a context in which municipal recycling schemes for domestic waste is not mandatory -indeed, it is hardly existent in Chilean cities[31]. Since their opening, these recycling spots have been part of an intensive propaganda from developers, authorities and the private sector as examples of ecological lifestyle and waste management in Chicureo. Year after year, the green enclave developers celebrate the records in recycling waste collected, "this year we should surpass the thousand tons of recycled materials by the neighbours of Piedra Roja and Chicureo", stated one manager of Ciudad Chicureo (El Mercurio, 2015) and the environmentalism of the green enclaves' residents. As the Ciudad Chicureo public relations stated at the beginning of a new collection campaign in 2013, "we had to add new recycling stations, and

[31]Recycling in Santiago has been a historical activity of informal low-income workers called *cartoneros*, who dig in the public bins to collect paper, cardboard and cans. In boroughs with strong *cartonero* activity their contribution has been estimated in reducing municipal solid waste up to 12% (CONAMA, 2005). In the 1990s charities began to place glass bins at the back of large supermarkets in middle and upper income boroughs, whilst in 2006 a spot with bins for voluntary recycling waste collection was installed in Vitacura, the wealthiest borough in Santiago, an initiative copied since 2010 by other metropolitan high-income boroughs (Rojas, 2013).

increase the service to respond to the huge demand of the area residents, who have shown a big commitment with the environment" (Bañados, 2013).

What are the rates of domestic waste produced in Chicureo? What are the rates of recycling within this private scheme? According to the Mayor of Colina (Municipalidad de Colina, 2013), Chicureo produces nearly 700 ton of monthly domestic solid waste, which represent nearly 1/5 of the borough's monthly waste. The population of Chicureo (30,000 inhabitants according to the borough's mayor) also represents 1/5 of the borough's population, which means they would be producing waste almost at the same rate as the low-income population of the rest of the borough, an anomaly in relation to the rest of the Metropolitan Region.

Studies of the Environment Ministry indicate that boroughs of high-income population produce domestic waste at a rate higher than other boroughs (MMA, 2010). However, according to the Municipal data (Municipalidad de Colina, 2013), Chicureo would be producing in average 0.89 kg per capita per day, much closer to the lowest metropolitan rate of 0.54 kg per capita per day, in the homogenously low income Curacavi borough, than the highest rate of 2.09 kg per capita per day, in the homogeneously high income Vitacura borough (MMA, 2010). That would be a confirmation of a population either with very low consumerism or very active in recycling.

Now, the hypothesis of low consumerism does not seem quite convincing, as a new shopping centre and three new supermarkets have recently opened in Chicureo, for instance, and more are on their way (America Retail, 2014; Tapia, 2014). Also, when asked in the interviews about their shopping practices, most of the residents answered indicating frequent trips to Santiago's most exclusive malls and supermarkets. The same is reflected in the survey, where most of the respondents favour Chicureo supermarkets and Santiago big stores as frequent places for consumption rather than local stores or self-produced goods (Table 6.7). This is not evidence of consumerism per se, but neither does it suggest any slow/local consumption pattern. Moreover, I assume that, in a highly class segmented society and in

such an income segregated environment, the patterns of consumption and production of waste of the population of Chicureo should be closer to the same income group in other municipalities of Santiago.

Table 6.7 Declared shopping frequencies of residents by localisation and type of commerce. Source: author's own from fieldwork survey.

Owner	Santiago supermarkets and big stores	Chicureo supermarkets	Local commerce and vendors	Self produced
Always or nearly	43%	55%	10%	6%
Sometimes	43%	37%	39%	25%
Never or almost never	14%	8%	49%	59%
No answer	-		2%	10%

Now, although some of the green enclave residents interviewed declared to be active recyclers and there is no reason to doubt it, the question remains if the enclave residents are in general, as a group, active recyclers, matching the image that developers' public relations attempt to deliver. As there are no official statistics on this, I used data from the developers of the two green enclaves with recycling points to estimate the impact of recycling in reducing the volume of domestic solid waste managed through the municipal system. My estimation is that it is a marginal impact, a saving of 0.06 kg per capita per day.[32] That means a household recycling rate just below 7%, quite better than the rate of the metropolitan municipal system, but very far below the results of other OCDE countries (footnote 30). This result indicates a relatively low impact of recycling, which is coherent with a metropolitan waste collection scheme in which recycling is still underdeveloped.

In the perception of the green enclave residents, people do not use the recycling facilities in Chicureo enough. When answering the fieldwork survey (Question 8), more than a third of the ZUDC residents declared they

[32] I made the estimation using the avaliable data of a monthly peak -and not the average- in the recycling spot in Ciudad Chicureo, of nearly 26 ton (Piedra Roja, 2013), adding it to the peak in the Santa Elena spot, about 15 ton per month (Interview 15, Developer, Chicureo, January 2013). From this total I estimated a daily average and then divided it by the population of Chicureo to find a daily per capita recycling rate.

never or almost never used the recycling facilities, whilst less than a third declared to use it weekly. In their critiques to the recycling system (Question 9), most of the respondents first considered the scheme needed more promotion. Some interviewees showed a strong commitment to recycling practices, either organising the house selection and collection to take to a recycling point, as in the case of ZUDC and *parcela* residents (Interview 24, ZUDC Resident, Chicureo, March 2013; Interview 56, *Parcela* Resident, Chicureo, April 2013), although they still considered that only a tiny minority of the households in Chicureo were doing the same. According to a green enclave project manager interviewed, the participation in recycling activities was only among 10 to 20 per cent of the population of that enclave (Interview 15, Developer, Chicureo, January 2013). This may seem incoherent with the developers' own publicised claims of the efficiency of the scheme and their insistence in the green lifestyle this scheme allows. However, developers have insisted that what they provide is a neighbourhood where, if willing, residents can experience a green lifestyle, rather than a solution for the metropolitan recycling issues (Interview 15, Developer, Chicureo, January 2013; Interview 2, Developer, Santiago, December 2012).

Digging into the results from the interviews and survey on recycling behaviour, a paradox arose. If I add my estimation of the volume recycled by the inhabitants of Chicureo to their rate of solid waste production, the result is still low in the context of metropolitan Santiago, of about nearly one kilogram per person per day. That would mean an awkward scenario of high income and presumably high consumption with low waste production and presumably low recycling. However, I believe this apparent inconsistency can be at least partially explained (setting aside any error of calculus from the municipality or mine). A significant population of residents from small and medium *parcela* enclaves in Chicureo, with larger plots and reported fruit trees and orchards, may be recycling in situ, mainly their organic waste. Indeed, as reported in the interviews by a small *parcela* enclave resident, his family consistently has used the organic waste to produce compost to be re-used in the plot (Interview 42, *Parcela* Resident,

Chicureo, April 2013). Organic waste has been found to be the main part of the domestic solid waste in Santiago Metropolitan Region, estimated -for high-income households- in 55% (45% food and 10% garden refuse) not counting other materials from organic origins as paper and cardboard (UCV, 2006). That would mean that there is a hidden figure of recycling in Chicureo that escapes both the neoliberal schemes managed by developers and the municipal accounts of waste. In any case, it seems that the lack of accountability and transparency of the waste management system of Santiago demands further research and much more transparency.

Domestic waste is a valuable resource for the political economy of those neoliberalised areas of the Santiago governance. As the management of the municipal waste has been transferred to private companies -funded by the boroughs budget- the incentives have not been placed in reducing the production of waste or recycling, but in getting rid of domestic waste as fast and discretely as possible to then collect more waste. In a context of high concentration of the industry and opacity of the public-private linkages, large socio-technical systems are put into operation to manage the flow of waste and transfer the impacts of the production of waste in Chicureo, as in most of the metropolitan boroughs, to some peripheral low income boroughs were either the waste is classified and compacted or disposed in large landfills. At the same time, recycling has become a key factor in the ZUDC enclave developers' campaign to reinforce the perceived sustainable character of the green enclaves and the eco-friendly behaviour of their inhabitants. These green spots have been successfully presented as a market-led choice for a green lifestyle, although they do not connect with other local recycling initiatives (as organic waste recycling by *parcela* residents) nor do they seem to integrate calls for reuse and consumption reduction.

6.8 Chapter conclusions

In this chapter I have shown how the neoliberal urbanisation of Santiago guided by green policies, environmental discourses and market niche strategies have been producing a substantial and singular process of socio-

environmental transformation of the Valley of Chicureo. This environmental transformation is a process of an ongoing transition from countryside to urban, in which successive waves of neoliberal urbanisation have converged. The decay of the agricultural activity, the subdivision or rural land in *parcelas* or residential allotments in the centre of the valley, the emergence of green enclaves in strategic piedmont areas, the growth of interstitial low income villages, the development of infrastructure networks, the expansion of a commercial zone, and the dense circulation of new goods, machines and people are all observable simultaneous processes -with different degrees of intensity, each- contributing to the production of Chicureo's current socio-nature. Among these, the development of the planned self-sufficient cities in the ZUDC areas as green enclaves has a major role in accelerating and deepening the environmental transformation, being the main attractor of people, infrastructure investment and generator of material flows.

These processes have weakened the public character of metropolitan governance and boosted the market segmentation of the socio-technical systems that regulate the material flows. The analysis of these flows involved in "making, maintaining and living" Chicureo (Bulkeley & Castan Broto, 2012) proved a key tool to understand more specifically how the urban metabolism of the green neoliberal urbanisation is producing environmental change and reproducing environmental inequality (Swyngedouw, 2004).

The main result of the environmental transformation of the Valley of Chicureo is the production of Chicureo itself as a product of green neoliberalism, a distinctive market brand of a new type of 'greener' urban socio-nature that emerges from strategies of neoliberal accumulation (Caprotti, 2014) and the provision of ecological security to elites (Hodson & Marvin, 2010a). Driven by wider processes of neoliberalisation, green enclaves are producing and reproducing a socio-nature that embeds a particular assemblage of social power, green neoliberalism and ecology.

Green neoliberalism in Chicureo has developed within a wider framework of neoliberalisation, set for instance by the privatisation of water, de-regulation of land markets, marketisation of water and mining rights, and development of a neoliberal governance of waste management, all of them contributing to processes of neoliberalisation of nature described as commodification, enclosure, marketisation, etc. (Castree, 2008; Heynen & Robbins, 2006). These processes are organised by a particular mode of addressing sustainability in planning policies and integrating environmental concerns in the property market, that is, by green neoliberalism (Bakker, 2010). The green neoliberalisation of nature is not merely destroying a pre-existent nature but rather transforming and producing new socio-natural assemblages -by intense material, market and symbolic action- that are becoming what is currently considered to be 'the environment' or 'nature' (Bakker, 2010; Swyngedouw, 2007).

Whilst in the development of the green enclaves all these neoliberal mechanisms are directed -and claimed- to produce a green output, either as a 100% sewage treatment, efficiency in water production and consumption, or household involvement in recycling, they work on a basis of socio-environmental exclusion and segregation, and contribute to the production and reproduction of environmental inequality of the non privileged. At the same time, the analysis of the cases shows how claims of greenness and demands of ecological security are being assembled to legitimate the control of resources, blurring the old territorial boundaries and social entitlements and establishing new ones. Those who control the flows also control the production of abundance and scarcity, increasing their socio-ecological power. Thus, for instance, the possession of groundwater becomes both territorial, economic and symbolic power: by owning such large quantities of water rights, developers in Chicureo not only can try to secure their present and future green enclave developments but they can also maintain the greenness of their products, securing a high market value for them. Additionally, they hold a powerful key in controlling other activities in the area, as well as a source of large profits by selling water to the utilities or directly to the green enclave residents. Although at an advanced stage, the

urbanisation of Chicureo by green enclaves is far from being a finished process, and resistance emerges as the defence against those modes of production, consumption and waste established by a green neoliberal urbanisation. If looking at Chicureo today is seeing a green neoliberal urbanism in the making, the analysis of the existent and potential socio-environmental tensions can only trigger questions about when its crisis will occur and what kind of response will take place then.

Chapter 7.

Green neoliberalism and the environmental discourses of the green enclaves

7.1 Introduction

This chapter focuses on the production of Chicureo's socio-nature as an arena in which social interests collide, compete and coalesce to either establish or contest socially legitimised imaginaries of urban greening, nature and sustainability. Whilst I have previously examined the role of material flows in the emergence of socio-environmental inequality and conflicts, here I investigate the main environmental discourses produced and reproduced by the actors making, maintaining and living the green enclaves, what they are and how they articulate with power and knowledge conflicts. Defined as narratives that structure the perspective of social actors on current environmental problems -and its fixes- in industrial society (Dryzek, 1997; Hajer, 1995), environmental discourses are considered key elements to understand the agendas of the actors involved in the greening of markets, industries and policies. I analyse the interviews to the actors by relating the environmentally significant content in their discourses with the mainstream discourse of ecological modernisation underlying most of green capitalism, which emphasises the possibilities of technological efficiency, institutional reform and market regulation to solve environmental problems (Spaargaren et al., 2009; Hajer & Versteeg, 2005).

I have argued for an understanding of the development of the enclaves as the result of the greening of neoliberal urbanism, which relates with a more general emergence of green neoliberalism as a radical capitalist approach to the environmental challenges and politics. Articulating the findings displayed in this chapter I propose that this greening of neoliberal urbanism in Santiago de Chile is producing a distinctive environmental discourse that, although it shares ground with a mainstream ecological modernisation, can be interpreted as a distinctive discourse of green neoliberalism. Green neoliberalism has been considered an environmental regime by which an agenda of economic growth, privatisation and deregulation is enhanced claiming environmental goals (Goldman, 2005), as well as a radical free market environmentalism seeking to solve environmental issues by the application of more market and deregulation (Bakker, 2011).

Analyses on the discourses on nature, environmental problems and fixes in the context of neoliberalisation have emphasised either their belonging to a broader ecological modernisation discourse on sustainability as efficiency and mankind control (While et al., 2004; Swyngedouw and Cook, 2003), or their insubstantial greenwashing character, a deceptive mimicry of mainstream green capitalism to boost private interests and legitimate deregulated markets (Greer & Bruno, 1997). Some critical scholars have questioned the effectiveness of the concept of greenwashing to capture the potential of environmental transformation embedded in the production of neoliberal natures (Bakker, 2010; Castree, 2008), whilst urban political ecologists have stressed the relevance of linking subjectivity to politics in the analysis of the discourses and its implications in the production of environmental injustice (Swyngedouw & Cook, 2009). As I argue below for the case of the green enclaves in Santiago, instead of a 'fake' discourse, greenwashing can be better conceptualised as part of the environmental discourse of green neoliberalism, in which unsubstantiated claims of greening are articulated with the adoption of substantiated innovations in urban sustainability as green certification, improvement of technical standards, and the development of eco-labelled planning and design. Through the analysis of the interviews I reconstruct what I see as a triad of the main environmental discourses, green neoliberal, ecological modernisation and political ecology, which either converge or diverge to frame what is green and what meanings it underlies.

To state that the production of the socio-nature is a disputed arena in which environmental discourses clash is to acknowledge the political nature of the subjective field. Thus, in this chapter I also scrutinise the environmental discourses in relation to the subjects that emit them, linking these discursive positioning to the social position of the actors to unveil how social power and environmental knowledge are intertwined.

The chapter is structured in three sections in which the antagonism between environmental discourses is examined, plus one section that explores the relationships between the actors' discourses and their social positioning.

The first (Section 7.2) presents the analysis of the discourses of the actors that express green neoliberalism. Taking into account the literature on environmental discourse, my focus is on registering and analysing four key elements of an environmental discourse: the notion of environment, references to agents and their motives, the models of urban governance that are promoted, and the role of knowledge in affirming or contesting what is green. Section 7.3 presents how an ecological modernisation discourse is structuring the narratives of the critics to greenwashing and free market sustainability. The following section (7.4) dwells on some interviewees' more radical critique to the green neoliberalism of the enclaves in Chicureo, in what I characterise a political ecological discourse. Section 7.5 presents the social linkages between the categories of interviewed actors', exploring the relationships between their roles in the making, maintaining and living of the green enclaves and their discursive positions regarding green neoliberalism. The conclusions (7.6) highlight the relevance of the findings over green neoliberalism as an environmental discourse in Chicureo, as well as the implications of the discursive antagonism between actors.

7.2 The environmental discourse of green enclaves

In this section, I analyse the relevant extracts of the interviews that sustain the presence of green neoliberalism as an environmental discourse produced in the context of the development of the green enclaves.

Chicureo is green. That is something on which the interviewees agreed upon through their discourse, although the meaning of this green was often controversial. In most of the market actors' narratives, the advancements in greening and sustainability in the growth of Santiago are depicted as the result of the free agency of market actors, as investors, developers, consultants and consumers, whilst the intervention of the state is depicted as an obstacle to this goal.

In their narratives, the different market actors referred to greenness through different concepts, as green, sustainable, eco, nature, and actors in the market side of the production of the green enclaves -as property developers,

service providers, consultants and consumers (residents)- were among the most enthusiastic in the description of this greenness. A project seller did not hesitate in vaguely defining the enclaves as "an endless set of green qualities" (Interview 53, Developer, Chicureo, April 2013), an idea that replicated the marketing discourses. Many of the interviewed residents considered 'green' as an indissoluble characteristic of the enclaves, "the greenest condominiums before the foothills" as an enclave resident proudly boasted (Interview 43, *Parcela* Resident, Chicureo, April 2013). To many residents the green feature was not restricted to the enclaves but was also present in the possibilities they open to access the surrounding 'nature'. As a resident emphasised: "Nature; absolutely. I mean, to live in the periphery of Santiago, close to anything that meant countryside, was a big achievement" (Interview 45, *Parcela* Resident, Chicureo, April 2013). Significantly, the discourses of the greenness of Chicureo emerged entrenched with the notion of investment, value and market, between both those who considered it a positive characteristic of the green enclave developments and those who viewed it as negative. As a developer explained, this greenness was crucial to increase the enclaves' market value, taking the example of the golf courses:

> The course is a green attractive of the allotment, which is indeed part of its commercial attractiveness: without the course... the allotment would be more opaque, so, the golf course gives them green spaces (Interview 2, Developer, Santiago, December 2012).

Many residents' discourses also shared the valuation of the greenness of the enclaves as a market attribute, by developing arguments on how the enclaves' green "gives more value to the sector and the properties" (Interview 51, ZUDC Resident, Santiago, April 2013). The idea of green as a valuable attribute to enhance life quality was accompanied by calculations of the relation between investment made and potential return. This notion of green as an asset to have or a commodity to trade is crucial to understand the intertwining of the green enclaves and urban neoliberalisation.

To other interviewed actors, as consultants, 'green' was a concept used to describe the environmental advancements of the market action in the green

enclaves' urbanism, architecture, landscaping or gardening, "an evolution, in the good sense, in the right direction" (Interview 16, Consultant, Santiago, January 2013), as a consultant responsible for developing several projects of green areas in Chicureo enclaves describes it. Some developers also considered that the enclaves were still halfway to be really advanced sustainability systems, while they were dominated by a "scenic green" (Interview 2, Developer, Santiago, December 2012). Although many interviewees shared the idea that the green enclaves were not yet fully sustainable eco-developments, there was a positive valuation of the development of some attributes in both the greening and the market valuation of these developments. Among these green-market improvements, interviewees mentioned water efficiency innovation in golf courses (Interview 5, Consultant, Santiago, December 2012), the integration regarding place topography and the slope inclination in new projects (Interview 44, Scholar, Santiago, April 2013), or the development of "ecological parks" made of well gardened or forested areas (Interview 15, Developer, Chicureo, January 2013).

Not unexpectedly, developers positioned themselves as the crucial factor in advancing the greenness and sustainability of the green enclave projects, on their own will. As an enclave project seller proudly stated, "about the preservation of archaeological sites and ecosystems, we did it because we wanted to" (Interview 15, Developer, Chicureo, January 2013). This will is sometimes accounted for as a sort of enlightenment, a genuine interest in sustainability of the owner's rather than the managers' project, as described by a project manager:

> When he [the owner] bought these first sixty hectares, he didn't know if the project was going to work, if he would be able to sell any plot at all, but he said 'let's plant, in the first years, the trees for the sixty hectares'. And he was told 'Have you gone crazy? What if this fails?'... And he said 'it doesn't matter, because if we succeed in ten years this will be a huge ecological park'. And so it was. (Interview 15, Developer, Chicureo, January 2013).

Developers also depict themselves as importing to the local industry leading knowledge on urban sustainability, as in another case where the CEO of a project explains that the owner's motivation in sustainability led him to

know foreign experiences and global standards of the industry, which were later tried to be adapted in the local project, as a project manager recounts:

> The experience of this project was born from the owner's motivation. The owner was very sensitive to the subject, one of the owners spent a year in London, and we put him in contact with the key actors of the area, and he visited the projects, he got time to know them all... and he got motivated... (Interview 11, Developer, Santiago, December 2012).

In any case, developers consider the greenness of the projects is allowed to develop in relation to a demand from the market, whilst their role is to recognise and interpret this demand. According to developers, this market forecast leads them to exceed the basic regulation standards for green attributes. For instance, as a developer described, "the share of green areas are above the regulation... regulations set a 7%, but, for market reasons, because the market is asking for it, the developments have a 9%, 10%, 11%" (Interview 2, Developer, Santiago, December 2012). In this line of reasoning, the market demand is seen as playing a key dual role in boosting or limiting the development of greener and more sustainable projects. The driver of the greenness is depicted as the result of their own interest, enlightenment and agency, not the result of a history of environmentalism or of public policies on urban sustainability. In the developers' discourse, consumers in general are depicted as lacking green awareness, constraining the developers' ability to offer more sustainability improvements. As a developer explained, "all those [sustainability] elements are not yet integrated by the consumer and therefore, nor are they by the developer, who reacts to the consumer" (Interview 11, Developer, Santiago, December 2012). The head of the developers' association also referred to this linkage, stating that: "We do what the people want. All the time we seek and research what the people want. If we don't do that we lose lots of money" (Interview 2, Developer, Santiago, December 2012).

When describing what people buying a house in an enclave want, developers portray an image of a extremely short term budget oriented consumer, wanting to get an instantly good deal and not willing to pay more for long term savings, as can be seen in the example of this developer,

explaining why the industry was cautious to develop further sustainability innovations:

> To install solar panels in the roof... and do all the connections and so on, that increased the cost... [Researcher: I see, that was too expensive...] No, not really, it was a reasonable price.... the thing is we are in a bid, so if a 100 m2 flat costs, let's say, 2400 UF and you have to price it in 2450 UF, the guy who's buying will run straight to your competitors because it is cheaper, and he is not concerned about any contribution to the environment, reduction of energy bills or to lower pollution... I mean, when this guy has to use his wallet it becomes a much more vital decision" (Interview 2, Developer, Santiago, December 2012)

Developers complained about this ingrained unwillingness to pay for green advancements among the house consumers, which as a project seller described, was even degrading the original 'eco' features of their enclave development, which in 2014 changed its name abandoning the eco-city label:

> Many saving systems were proposed, the first houses even included it, but as these cost more it became optional, and hence people do not chose those. So, most of them have the basics, anyway the thermal standard regulation is more than exceeded… (Interview 15, Developer, Santiago, January 2013).

Some residents echo this idea of the majority of house consumers being not 'eco-friendly'. A resident that saw himself as part of a group of neighbours "engaged with the ecology" (Interview 24, ZUDC Resident, Chicureo, March 2013) complained that even in his eco-labelled neighbourhood (the Ecourbe project) there were a majority of people "who don't even care [about recycling]" (ibid), which in his opinion was not driven by any economic rationality but just a lack of ecological culture. To another resident, the attitude towards recycling reflected the decision of the residents to evade environmental problems, as long as these did not affect them directly, so they tried to "not think about what is happening" (Interview 49, *Parcela* Resident, Chicureo, April 2013). In contrast, to other residents the main reason residents do no engage further and, for instance, "pay for the green plus" (Interview 30, ZUDC Resident, Chicureo, March 2013) was simply financial. Not caused by any greed or some short-term mentality, but because in the search of an upper-class lifestyle enclave people already got "so heavily indebted" (ibid) that assuming the additional cost of sustainability would impair their ability to live in Chicureo.

It seems paradoxical that at the same time that developers complain about the consumers' lack of willingness-to-pay for sustainability improvements, their companies increase the offer of green attributes in their products. This contradiction was explained by developers exclusively by a niche market strategy, that is, the opportunity they see in what they consider a high-income group awareness of the advantages of greener housing products: the higher the income group and education, the higher the willingness to pay for eco-efficiency, which means a market niche worth being captured. To one developer, there was a clear contrast between high-class customers and the rest:

> In the ABC1 [high income group] this is a totally assumed factor, people are now thinking in operational costs as a relevant cost, I mean, they are smart enough to perceive that. In C2 [middle income group] not so much; but below there this really sounds a very far issue, people haven't got this perception yet... (Interview 2, Developer, Santiago, December 2012)

In this perspective, greenness is conceived and perceived as a market asset, not only a valuable attribute for the affluent consumers, to fulfil their lifestyle demands, but a profitable investment for the industry, "because people demand public spaces of good standard to play sports, to share, to whatever... and green, because they need green, it gives value: because that's valued by the consumer" (Interview 2, Developer, Santiago, December 2012). This principle was shared by an enclave resident, for whom what is possibly propelling any environmental friendly behaviour is not a rise in the residents' ecologist engagement nor their ecological consciousness, but their increasing awareness of the economical rationality behind sustainability: "it is not the ecology; what generates consciousness is that one is spilling resources in every possible way. It's that simple" (Interview 32, ZUDC Resident, Chicureo, March 2013). A resident living in very elitist Las Brisas enclave stresses this point, by dismissing the existence of any concern for the environment among the enclave residents, and putting himself as an example, asserts that, "in the end, the ecological consciousness is just nonsense; I am interested in real numbers" (Interview 43, Parcela Resident, Chicureo, April 2013).

This correlation between smartness or cleverness, sustainability and wealth, that characterises the 'eco-smart' customers, opens the question of whether developers and privileged residents consider the rest of the population as 'eco-dumbs', neither wanting nor deserving a share of 'eco', and whose need for cheaper prices makes them ready to be skimmed with low-quality and non-green products. In any case, the perception of a deficit in environmental awareness among the Chicureo population is framed in a context of individualistic responses to environmental problems, of how residents are not developing the right "ecological use of the square metres you should take care in benefit of the others" (Interview 45, *Parcela* Resident, Chicureo, April 2013). Whilst property developers considered this an issue to be solved with the expansion of the market by a system of price incentives and subsidies (Interview 2, Developer, Santiago, December 2012), residents tended to consider this a responsibility of public institutions in educating the population, whilst enforcement of more strict environmental regulations for the area was not considered (Interview 45, *Parcela* Residents, Chicureo, April 2013).

This narrow view of environmental challenges that emerges from the discourses of green neoliberalism is one that dismisses the global character of the problems and considers them as private issues (individual or enclave scale), property rights and entitlements. In the case of the residents, this attitude can be observed in the way they describe their flight from Santiago's high levels of atmospheric pollution to a cleaner area by buying a house with better localisation in the countryside (Interview 51, ZUDC Resident, Santiago, April 2013), or by securing their water provision in the context of a long drought in the area by directly "buying the water rights [from the utility]" (Interview 43, *Parcela* Resident, Chicureo, April 2013).

As developers treat greenness as an elitist premium, the logical consequence is that it cannot be spread into the whole housing market, and the enclaves remain an exception in the eyes of the housing industry:

> La Hacienda here in Chicureo, or Las Brisas, those are allotments, of course, all ABC1, one cannot deny it, but they are *parcela* allotments in which most of their attractiveness is that they are green, their horizon is green... everything is green...

> but those are still exceptional examples (Interview 2, Developer, Santiago, December 2012).

That the green of the enclaves are associated to a sign of privilege and elite exclusivism is also recognised by the discourses of those who work daily in the green enclaves. When asked to value the environment of the enclaves, a housemaid noted, "the house of the employer is so green! There are so many trees and lawns...' (Interview 41, Worker, Chicureo, April 2013). In a reply to the same question, a construction worker pointed out, not without a touch of bitterness, that of course his *población* (low income neighbourhood) wasn't "that green" (Interview 47, Worker, Chicureo, April 2013).

Interestingly in these examples, among both developers and workers, the relationship between privilege and greenness appears naturalised, not as the result of social and power inequality. Indeed, in the discourse of green neoliberalism, the solution to the pitfalls of the market in spreading and deepening sustainability is, of course, more market, although enforced by the capture and direction of the state to boost private interests. Developers argue that the state must play a greater role, first by withdrawing from ineffective planning regulations and then backing the private sector by subsidising their initiatives in sustainability, which comes to be a demand to stick to one of the principles which guided the neoliberal restructuring of the state after the coup d'état: the development of a subsidiary state. When comparing Chilean cities with the US context, a developer describes the action of the Chilean public sector as seemingly close to those of bureaucratic socialism rather than the result of a radical neoliberal experiment that restructured urban policies:

> There [the US] the state says 'ok, I'll give you a benefit by reducing your taxes'. So, in the big cities it's quite clear to them. But here… regulation always comes first, and with the stick policy everything turns harder... If they say to me it's a 7% of green areas you have a 7% of green areas... But it happens that today you go to an allotment in Puente Alto and there you have a 10%. And why? Because the market asks for it, to sell, to attract people..." (Interview 2, Developer, Santiago, December 2012).

Other actors also backed developers' claims for state subsidies as a way to achieve further improvements on urban sustainability, rather than a shift in the industry paradigm. As a consultant justified:

> Indeed, [developers] have a higher awareness about the need to reduce the project's carbon footprint, but the issue is there are not enough incentives for that. The owners develop a project as an economical entrepreneurship. So what's missing are state incentives for green building on a city scale. Do you know any? Is there any? I don't think so (Interview 5, Consultant, Santiago, December 2012).

This emphasis in demanding green subsidies is not shared by other actors. In effect, in 2013 there were still very few subsidies for urban sustainability in Chile, but among those few, one of them was a state subsidy for solar water heating system in private developments, which "in the end makes the whole panel system cost free for the developer", as a developer admitted (Interview 17, Developer, Santiago, January 2013). In this context, the demand of subsidies by developers was criticised by some as a lack of conviction in their own successful green market-niche strategy, in which they could use the consumers' willingness-to-pay to finance more substantial green technologies (Interview 34, Consultant, Santiago, April 2013).

Many of the consultants see themselves as a factor that -with their professional knowledge- is changing the property market perspective on the environment. As they consider to be introducing more criteria of urban sustainability in the enclave projects, they see a change in the mentality of developers and consumers, shifting the property market to green. As a consultant and scholar reflects, "I think that they [developers] will slowly come to understand that it is not only an ethical issue, but that the same consumer will be more demanding, and if they are not leading they will lose markets" (Interview 44, Scholar, Santiago, April 2013). In this discourse it is the action of the market itself that is greening the industry, by the continuous competition of investors, consumers and consultants: "[do] you know what happens? I think the competition in the project design is turning them more attractive, for experts, and then yes, developers become more interested..." (Interview 16, Consultant, Santiago, January 2013).

Consultants consider themselves in a constant struggle with developers to stop their "usual landscape razing policy" and introduce sustainability improvements, as a scholar and consultant architect described it (Interview

44, Scholar, Santiago, April 2013). Recalling on his experience, this architect and scholar considers that consultants play a crucial role in integrating sustainability considerations in the projects' design and construction practices:

> You know that there are forests of *espinos* (hawthorns) so we had a lot of arguments with the developers because the *espinos*, they say 'those are ugly, they have a *población* look, they have thorns' and so on, but we insisted on placing native trees or climate adapted species, as the pepper tree, respecting the espinos and cutting the fences (Interview 44, Scholar, Santiago, April 2013).

These consultants, some of whom also scholars, depict themselves as the main drivers of the enclave greenness, mediating among the other actors. Their critique does not question developers' market approach, but rather highlights that in the housing market, in contrast with developers' conservative or justificatory discourses, green has become a very valuable attribute in the view of consumers. "My experience indeed is that the greenness is paying off", describes a landscape architect who has worked in several enclave projects in Chicureo (Interview 16, Consultant, Santiago, January 2013). As she explains, "we have done many things in Piedra Roja... And it does sell, because people value what is well done, the project is nice, attractive and in general it is green" (ibid).

To a scholar, the whole sustainability improvement in the property development industry in Chile is the result of a global paradigm change towards a green capitalism, a change led by the rise of market green standards, by a convergence of cultural and economic advantages that is reflected in new environmental governance set by the private sector.

> So I think this paradigm change is starting to strongly settle in society, and what was missing was probably who is willing to pay for the extra cost that taking those decisions entails. And what is interesting here is... that until now this cost is not tackled by the state, who is not leading the process, but it's being undertaken by the private sector for a very simple reason: because transnational companies operating in Chile are adhering to protocols and conventions that demand them that all their branches, and not only those in the US and Europe, must start to reduce their carbon footprint, to improve their labour relations, to turn into fair trade, et cetera, creating a new standard. (Interview 1, Scholar, Santiago, December 2012).

I have found that these narratives displayed by the market actors are not restricted to the interviews, but reflect a wider effort to shape a green urban imagination. In the context of the press review many publications draw my

attention to the widespread of these discourses on greenness. In publications of the construction industry for instance this distinctive greenness of the green enclaves has been portrayed as a remedy to the environmental evils of Santiago, promoting the 'flight from the city' to the green enclaves. At the very beginning of the construction of the Ciudad Chicureo, its commercial manager explained the conception of this green enclave:

> Taking the experience and learning from the failures shown by the city of Santiago, with an uncontrolled growth, inorganic, and not planned enough, we analysed over four years how to give way to a new city that would be self-sufficient and that would become a residential alternative to those who inhabit the Eastern sector of the capital (EMB Construcción, 2002).

More recently, when the green enclaves are a consolidated market niche, a supplement of a very influential and pro-business newspaper announced that "Chicureo becomes a green city", a headline followed by enthusiastic articles in which developers, authorities, residents and experts were quoted to support this idea (El Mercurio, 2014).

Green neoliberalism as an environmental discourse

From the systematisation of the main elements of these discourses on a market greennes of the enclaves, an environmental discourse that bears a specific notion of environment emerges, a reference to the agents of green neoliberalism and their motives, and the elements of urban governance by which the socio-environmental relationships are regulated. These elements, listed in the table below (7.1), can be seen structuring the main narrative of green neoliberalism in the context of the green enclaves.

Table 7.1 Elements of a green neoliberal environmental discourse. Source: author's own with categories adapted from Dryzek (1997) and Hajer (1996).

Notion of environment	Agents and motives	Urban governance	Role of knowledge
- Nature as resource: enclosure and commodification - Homeostatic market environmentalism: free market allocation of economic resources - Green as sign of economic rationality and status - Environmental problems as conflict over property and entitlements -Do not focus on global environmental limits but local performance - Do not consider historical goals: not a transition discourse	- Opportunism of private actors: developers, service providers and consumers by their own interests. - Environmental evils caused by state interventionism and consumers ignorance - Subsidiarity of the State: intervene to deregulate, concede and subsidise. - Stakeholders that defend their parcels, intervening in the present time with expectations of profits/benefits	- Privatisation, concessions and enclosures to private rule - Aggressive green marketing - Opportunistic market innovation (greenwashing)	- Interpret the market trends - Guide the greening - Enlighten the market actors - Seek expert legitimation

In this storyline Santiago's private sector is depicted as the champion of innovations in urban greening, improvements in urban sustainability and conservation of nature. As the conception of nature in the discourse of green neoliberalism is that of an economic resource -able to be enclosed and commodified- the homeostatic power of the market is extended to the environmental realm. Thus, environmental problems are to be solved by the optimal efficiency of the market action, and are treated as issues of property and entitlements. In this discourse the evils of growth are considered to be solved by the development of green markets (carbon bonds, certification, private environmental services), what synthesise the kind of expectation private actors have on the action of free market forces.

As a radical capitalist discourse, green neoliberalism is non-essentialist, that is, nature does not have an existence separated from society and the market itself. Also, there is no account of global environmental limits, but on the performance of local and immediate actions. This discourse, at least in the version registered by me, does not entail a historical narrative of transition, but rather the present moment, where choices are done based on individual

or corporative interests and expectations, without regard to global collective goals. As the environment is subsumed into the market, the only limits to the environmental action of the private sector are the obstacles set by the state political and economical intervention. Nature becomes, in this sense, socialised, whilst the environmental injustice or social inequality appear naturalised. The discourse of green neoliberalism that emerges in the context of Santiago urban neoliberalisation is one that stresses the opportunism of the market actors, which at the same time that they demand deregulation and privatisation may be asking for state subsidies and state mediation in conflicts. To briefly characterise the model of urban governance present in this discourse emerging from the experience of the green enclaves, one must not imagine an open and free market, but the concession -under certain conditions- by the state of shares of market (territories, networks and population) to the rule of private companies. In this discourse there are no citizens -and no politics- but consumers and stakeholders. Finally, it is through a greater or lesser use of legitimation by expert knowledge that the private sector can interpret the needs of the market and materialise the green developments.

7.3 Greenwashing as an ecological modernisation critique to green neoliberalism

The notion of an existing discourse of green neoliberalism arose not only from pieces of discourse favourable to it, but also from the criticisms of other actors to it. Although these critiques are far from being uniform, they tend to share two aspects: an explicit perception that the greenness of the enclaves has been part of a greenwashing mechanism by developers, and an implicit rooting in a -broadly defined- ecological modernisation discourse which implies the understanding of what a sustainable green development would be.

In the course of the research greenness and marketing appeared as a crucial field of dissent between the actors in my discourse analysis. To many of those who had critiques to the development of the green enclaves, green neoliberalism was greenwashing, a marketing discourse of deception by

which the claim of the projects' greenness -promoted to raise market niches- often unfulfilled, and when actually fulfilled, the resultant greenness constituted a hindrance -not improvement- for a sustainable urban greening. For instance, whilst for the developers and residents it represents an honest way to promote or compare the green improvements, other actors considered that the enclaves' green marketing was a mechanism for the greenwashing of the developments and for a low record in sustainability.

To many of the critics the greenwashing meant the green enclaves were not as green as the marketing campaigns claimed. Some of the critics did not see any environmental improvement in the projects, as the director of the environmental department in the town of Colina, for whom developers never had proposed any substantial greening for the enclaves in Chicureo, as she asserts, "no developer has ever told me they are going to establish a green city" (Interview 21, Municipal State Official, Colina, March 2012). Some of those who are discontent with the impacts of the enclave boom in Chicureo, as a director of a water canal users' association, claim that the greenness in the enclaves is only a sort of downgraded green: "not worth calling the developments' green areas as 'green', after they destroy a crops field" (Interview 50, Activist, Colina, April 2013). Consultants working for the housing industry raised hard criticism over the developers' low environmentalism beyond the marketing. For instance, the usual practices of developers in planning and building their developments, particularly in the peri-urban areas, are depicted as utterly deprived of any serious concern about local ecosystems and sustainability worries. A consultant reflecting about her experience as a landscape designer on an enclave project concluded that she was hired to provide green legitimacy to the project, but in the end the developer dismissed the core of the job:

> We did a very conscientious work, identifying all the species; we went there with botanists, all the way to the thing, also identifying the fauna... We planned to preserve the ravines as green areas, setting a minimal area of intervention and then left the rest as a nature patch... and they actually just razed everything! They didn't care about anything... (Interview 27, Consultant, Santiago, March 2013).

There was some recognition of some improvements in urban sustainability in the green enclaves among some interviewees, related to those more

sellable and visible aspects of a greenness, but as an official from the Ministry of Agriculture stated, that did not challenge the main unsustainability of the enclaves' lifestyle:

> I see all minor improvements directed to a sense of energy efficiency, because the lifestyle there is also very inclined to consumerism... I believe this thing of greener condominiums is just a shift to make them friendlier, more sellable... Also, to sell more they still have a landscaping centred in having lots of green lawn, despite some advancement in the introduction of arid climate adapted species (Interview 36, Ministry State Official, Santiago, April 2013).

To others, sustainability is a problem of scale, as a scholar specialised in the study of walled developments stated, that the problem of these loosely labelled green developments is that their environmental impacts on a city scale were disregarded: "those are slogans from the developers, I agree that it does not necessarily mean [the developments] have not any green attribute, but obviously the unlimited growth of the city is unsustainable" (Interview 7, Scholar, Santiago, December 2012). Other interviewees, as consultants working for the industry in urban and landscape design, considered that developers lacked a holistic approach to sustainability: "what they rather do is to improve the house thermal insulation when this allows them to attract clients, with a marketing campaign that promises lower heating bills" (Interview 46, Consultant, Santiago, April 2013). A similar position was held by a landscape architect running a consultancy firm, who explained that developers hiring services of green consultancy, as landscape architecture, landscape gardening, sustainable architecture, too often limited the consultancy to those elements that would enhance the project image and sales, rather than develop any coherent sustainability strategy:

> I believe the developers use a lot the landscaping and sustainability as a marketing tool, if that contributes to the selling, you see... and at the end of the day, they are able to pay for the design and conceptualising services, that more often than not are the concepts used for selling, right? (Interview 27, Consultant, Santiago, March 2013).

For instance some residents differentiated those enclaves where residents had real access to the ecological attributes of the place and could truly live the ecological experience, and those where residents were deceived by the marketing campaign:

> We fully enjoy it [the enclaves environment], we like it very much. Because, as I was telling you, we have access to it. But that [environment] of Chamisero and the others [green enclaves] is a fraud. [For the residents there] it's something like 'I can only see the ecological reservation', in inverted commas (Interview 30, ZUDC Resident, March 2013).

In any case, many of the critics to greenwashing shared the view that it veiled the unsustainability of a very specific kind of green, which was seen not following scientifically backed standards of sustainability. To an energy expert working in the green certification of buildings, as the ecological services of the local environment were not properly assessed and the residential sustainability standards were still insufficient, the 'green' or 'eco' labelling was rather "just greenwashing from the developers" (Interview 13, Consultant, Santiago, January 2013). Also, as an ecological activist argued, the problem with the enclaves in Chicureo was not their failure to fulfil its promise of greenness, but that they were developed against more sustainable land uses and activities:

> Not only do they portray it green in the marketing: there are really many lawns, many trees, but that land should be destined to an agricultural activity, and...this is the unsustainable green. There is a green that can be unsustainable, as the golf courses, the large lawns, they are green but unsustainable, and those developments are on the same path. (Interview 19, Activist, Santiago, March 2012).

Another consultant developed ideas in the same sense, arguing that most of the so called green improvements in the developments were just a result of what the current technological standard provided and the local regulations demanded, and therefore, by just adding two or three of these elements, developers "believe to have the right to state that these are intelligent houses, or that they are ecological houses... and therefore the project would be sustainable" (Interview 34, Consultant, Santiago, April 2013).

In their discourses, activists often depicted the behaviour of developers as opportunistic, as trying to adopt a green posture to have their project approved and sold. Those in particular who were involved in conflicts with developers' projects also described it as a usual political strategy to overcome opposition from the community:

> We had a student working with us, because she was writing her thesis about urban temperature increase... she had lots of evidence that in this estate there were constantly 2 degrees less than in Santiago centre... so her projection was if the trees were taken away the temperature of the centre would rise further up to 5 degrees...

> And she recently mentioned to someone that the developer was now looking for her results, to use her study, because they wanted to present a new and very ecological project... so typical!! (Interview 35, Activist, Santiago, April 2013).

Many of these critics to greenwashing point out to the lack of a real sustainability in the green enclaves, but there is also dissent among the critics on what it is that defines urban sustainability. To some, sustainability could be assured by adopting green standards with some degree of expert or scientific endorsement, as some standards already available in the market. In this case, Chicureo's pretended greenness was as a case of "marketing abuse, a problem in the communication of sustainability", as a consultant from a university consultancy firm stressed (Interview 46, Consultant, Santiago, April 2013), that could be easily stopped by the use of more accountable indicators, as for instance some green certification schemes for urban sustainability as LEED. Whilst to some interviewees it was just a matter of time and information to the adoption of the LEED standard into enclaves and other private developments (Interview 46, Consultant, Santiago, April 2013), other interviewees argued that some developments could not be certified because the indicators used by LEED were not appropriate for their kind of peri-urban development. As a developer involved in a failed attempt of neighbourhood certification reflects, "LEED is made for more urban developments, not rural ones, [with] huge quantity of restrictions related to urban issues, as not to subdivide the project in condominiums, a lot of things..." (Interview 17, Developer, Santiago January 2013). Contrastingly, for other actors the schemes of green certification have also followed the fallacy logic and become part of greenwashing, a process motivated by economic rationality and not by ecological consciousness, as argued by an architect and enclave consultant:

> Today the company that invests resources to be sustainable is the company that goes through a certification, that will have that logo, that will do a little of greenwashing, hmm... to sell and push for their product (Interview 34, Consultant, Santiago, April 2013).

Some interviewees considered LEED a standard highly biased by an idealised American suburban model, lacking coherence in its sustainability parameters, whilst they favoured the development of more contextual-aware standards (Interview 34, Consultant, Santiago, April 2013). To a scholar and

highly renowned Chilean architect the adoption of LEED reveals an uncritical trend in urban neoliberalism for which scholars hold no little amount of responsibility:

> Why is LEED so relevant today? Why do the Chilean agencies work with this standard? [Researcher: Because it is a well-recognised one?] Sure, but there also other recognised standards, and we could have our own. What happens is that in the scholarly world there is also an American imposture, a fashion of copying and not developing what's our own (Interview 44, Scholar, Santiago, April 2013).

One of the critiques to the enclaves' greenwashing is that, beyond the greenness or not of the masterplan, those projects fail to consider sustainability for the operational duties and performances. As a regional director in the Ministry of Housing stated, "you gain nothing by having perhaps a super green project if it doesn't consider how it is to be managed" (Interview 6, Ministry State Official, Santiago, December 2012). Despite differences in what would be greenwashing and what not, critics to the green enclaves agreed that in principle greenwashing could not drive real greenness or effective sustainability, as a consultant working in certification stated: "the more greenwashing the less sustainability" (Interview 13, Consultant, Santiago, January 2013).

To a university professor and former urban development authority in the Ministry of Housing, green labels and slogans in the enclaves are related to the production of an imaginary of suburban utopianism similar to the American dream of "escape from the city, into nature" (Interview 26, Scholar, Santiago, March 2013), a process by which he argues "the construction of the imagery of an eco-city, [that] has nothing ecological and nothing sustainable". As the same scholar argues, from their beginnings the ZUDCs in Chicureo lacked a sustainability conception as the one mainstreamed after the Brundtland report. As he asserts, "the word sustainability appears nowhere [in the ZUDC regulations], not even the word ecological" (ibid).

Scholars also highlighted the central role of the weakening of the state and the capture of public policies by private interests in the expansion of greenwashing. To the head of an urban sustainability centre, the property

market is only a subsystem performing actions framed by the state's restrictions, incentives and omissions: "the market works as a whole batch of rules, set by the state... private actors press for their interests and lobby, but in the end it is the state that sets the rules". (Interview 3, Scholar, Santiago, December 2012). In the same direction, to the dean of an architectural school the core of environmental issues have arisen from a downgraded conception of planning and the oblivious conception of public that the civilian authorities have inherited from the neoliberal ideology:

> Nobody is interested in city planning: we sold the idea that a plan is not fashion, that authorities can't generate proper policies... and in any case policies are neither supervised nor assessed, so nobody knows if they work, until there is a crisis... (Interview 1, Scholar, Santiago, December 2012).

Ecological modernisation as the critique to green neoliberalism

The main environmental discourse emerging from the analysis of the critique to green neoliberalism is one which overall matches ecological modernisation (Table 7.2). As such, it does not differ from what has already been stated on ecological modernisation, in that it proclaims a divide between society and nature, one which has led to a crisis that can be ultimately managed by understanding nature's functioning -through scientific knowledge- and intervening it with the right technologies and reforms.

Table 7.2 Elements of an ecological modernisation critique to green neoliberalism. Source: author's own with categories adapted from Dryzek (1997) and Hajer (1996).

Notion of environment	Agents and motives	Urban governance	Role of knowledge
- Nature as a biophysical source of limited resources and eco-systemic services - Human intervention has triggered ecological crisis - Nature as a global and external phenomena eventually threatening human survival -Sustainability depends on knowing how to manage and engineer nature - Green as sign of sustainability only if functional	- Globalised framework for sustainability set by multilateral agreements and global standards. - State intervenes to regulate, implement and co-produce urban sustainability with market agents. - De-regulated markets distort sustainability by greenwashing - Social actors distort sustainability by particular interests. - Scientists and consultants hold verifiable and reliable environmental knowledge	- Consensus and collaboration between actors. - Demand of institutional reforms and cultural change. - State the ultimate regulator to find optimal economical, ecological and social urban development.	- To arbitrate the validity of claims of greenness - Entrust scientific institutions as sources of truth - Produce real solutions and fixes to environmental problems compatible with economic growth

7.4 A political ecological critique to the green enclaves

From the analysis of some discourses a different critique to the greening of the enclaves emerged, one that diverged from ecological modernisation by establishing concerns of environmental inequality, neoliberalisation and the uneven distribution of social power.

For instance, critical voices from the academia emphasised how green marketing was deeply linked to neoliberalisation of planning and of nature. To a geographer, the development of green enclaves entail an appropriation of the environmental commons: "from an ecological point of view [...] the core is the commodification of natural goods and services, as the lagoon in Chicureo, the Andean foothills in Alto Macul, or the Panul forest" (Interview 7, Scholar, Santiago, December 2012). To him, the emergence of green enclaves is being driven by a complete withdrawal of the state in favour of urban neoliberal forces, by which "property market, and market in general, is what regulates those spaces, which are spaces of neoliberalism" (Interview 7, Scholar, Santiago, December 2012).

Another scholar points out the contradictory character of the environmental commodification, which he describes as a symbolic enclosure of the commons, by which such attributes as parks, foothills and landscape are presented by the advertisements as attributes of the projects, but which in the end constitutes an "ecological fallacy" (Interview 14, Scholar, Santiago, January 2013). In his words, the fallacious character of these enclosures lays in that the ecological attributes are not integrated to the projects, as there is currently no "notion of continuity or ecological corridor or any other way that allows to effectively link, in a functional and ecological way these urban interventions with the natural processes" (Interview 14, Scholar, Santiago, January 2013). To this scholar, this fallacy has been a deliberate attempt of property developers to win market niches of social groups expressing a need for green, but as he added, even those green attributes that effectively were part of the project, as facilities and gardens, the environmental impacts of the projects would be huge. The debate over commodification also opened a window to what it meant in relation to an ecological lifestyle, the way the green is lived. In the perspective of some interviewees, the commodification of the environment is linked to the production of a life experience for the enjoyment of a customised 'nature' for elitist groups, as an official from the Ministry of Agriculture asserts,

> The ecology they [developers] sell is associated to an experience; move to a place that is not the city centre, they can breathe another air, see a different landscape. See the stars. But all that surrounds them [residents] is being sold. They [developers] do not perceive the environmental services as a benefit, but rather they make an assessment of the landscape value in accordance of what the person is willing to pay for a plus, for the experience of countryside or nature embedded in the place (Interview 36, Ministry State Official, April 2013).

Some actors were also keen to consider the development of the green enclaves in a broader framework of political dispute and power struggles. While for some activists the coalition between private and public sectors involves only part of the actors, leaving space for contradictions within the state sphere, other activists depict a public-private relationship as a rather strategic alliance. In the first case, the development of the green enclaves is explained by the capture of the state by private interests, which creates a

contradiction in the state among pro and anti urban growth factions, as explained by an ecologist leader:

> We distinguished between the policies of the Ministry of Housing, completely co-opted and captured by the property development industry... and the Ministry of Agriculture that was trying to do its job and save the agricultural activity. (Interview 19, Activist, Santiago, March 2013).

In this case this situation has led to what the same activist considered a "shift of positions" (Interview 19, Activist, Santiago, March 2013), by which ecologists end up defending the state environmental institutions they criticise, against the coalition of officials and developers. In the second case, the state and the private sector are portrayed as parts of the same "pro-growth" and "pro-capitalist" power coalition (Interview 37, Activist, Santiago, April 2013), in which governmental officials work as a branch of economic interests: "So, in the end you think 'but is the government there to save, protect or help the entrepreneurs? Or is it there for the people?' And no, it isn't for the people" (ibid).

The elements of the narratives, systematised in the table below (7.3) depict an environmental discourse that stresses the political origin of the environmental impacts of the green enclaves. The capture of the state by a pro-growth agenda is seen as the main driver of urban unsustainability, by the green light to the neoliberal commodification and enclosure of nature in the urbanisation of Chicureo. Market discourses on urban sustainability are presented as a fallacy, to be unveiled by critical knowledge and fought by an anti-growth coalition of social and state actors.

Table 7.3 Elements of a political ecological critique to green neoliberalism. Source: author's own with categories adapted from Dryzek (1997) and Hajer (1996).

Notion of environment	Agents and motives	Urban governance	Role of knowledge
- Nature as a realm being degraded and fragmented by social and economical processes - Environmental sustainability of the environment depends on scientific and political independence, otherwise a green fallacy	- Withdrawal of the state to in favour of market forces - Capture of the state distorts verification of sustainability claims. - Property developers greening the urban to win market niches -Critical actors to reconcile sustainability and environmental justice	- Pro-growth urban regime - State split between interests from the market and social groups - Market actors control the material fabric of the city - Anti-growth coalition	- Unveils commodification of nature and uneven distribution of impacts - Challenges state-market green fallacy

7.5 Mapping the linkages between actors and discourses

One of the guiding principles of UPE, mainly drawn from Marxist contributions to the interpretation of how capitalism is produced, is that environmental discourses and practices of actors are driven by their positions in relation to reproduction of power and capital (Gabriel, 2014; Holifield, 2009). To approach the actors' positions I have initially grouped the interviewees in several categories, taking their public role in the production of the green enclaves as the organising principle, as presented in the methodology chapter. By departing from the individuals' affiliation in an institution or organization and widening the categories I have classified the interviewees in seven broader categories of actors, thus providing an overview on both the actors' social identities and their roles in the social production of the enclaves. This categorisation (Table 7.4) covers a wide range of actors and functions involved in the production of the green enclaves, enough to scrutinise the role of these categories of actors in the conception, plan, regulation, build, trade, inhabiting and resistance of the green enclaves.

Table 7.4 Categories of actors sampled in this research.

Interviewees	Agency	Main category
Owners and senior CEOs of property development companies. Representatives of the industry (developers/builders association).	Decision to develop; fund; direct market strategy; organise construction; lobby with regulators and authorities; provide and manage supply and services.	Developers
Managers and sales agents of property development companies.		
Professionals and practitioners as architects, landscape architects, urbanists, lawyers, and any other profession involved in Santiago's enclave projects planning, design, and development.	Conceive; plan; design; calculate; legalise; guide; supervise.	Consultants
Professional or directive staff belonging to private non-academic institutions and associations dedicated to the study or research of the built environment in Santiago.		
Professional or directive staff from ministerial offices and departments involved in the Chicureo enclave planning, approval, governance or management.	Conceive; create framework; plan; assess; authorize; regulate; control.	State officials
Professional or directive staff from municipal level involved in the Chicureo enclave planning, approval, governance or management.		
Private university based academics involved in the enclave research and debate.	Research; teach; debate; critique.	Scholars
Public university based academics involved in the enclave research and debate.		
Members of ecologist and urban social justice organizations involved in conflicts with the Santiago's peri-urban enclave development.	Pursue communal interests; repel unwanted activities and land use changes; spread alternative ideas and ways of life.	Activists
Inhabitants of the enclave hinterlands participating in community organizations and associations.		
People currently inhabiting a house in a Chicureo ZUDC enclave, without distinction between owners or tenants.	Buy/rent or build a house and plot; inhabit the house with their family; become neighbours.	Residents
People currently inhabiting a house in a Chicureo parcela enclave, without distinction between owners or tenants.		
Employees hired by companies or individuals to work permanently or seasonally in the enclaves.	Building; garden; repair; service houses.	Workers

Through the research -particularly in the fieldwork- it became evident that the boundaries between these actors' categories were often blurred and the formal position of the actors was less rigid that it initially seemed, with many linkages between the categories. Although these linkages between actors and institutions are limited to the public information about the actors' affiliation registered in the fieldwork[33], the exercise of mapping these

[33] The relationships tracked here can be formal commercial or work relationships, as well as some of a more political nature, as when an actor also participates in another institution formal space. However, more subtle linkages between the individuals, as political party

relationships provides a valuable insight of how the actors of the population sample are socially bound in the production and reproduction of the green enclaves. A first and general overview on the linkages between categories of interviewees and institutions, as shown in Table 7.5 below, indicates that significantly more social linkages between interviewees and institutions classified as part of the private sector were identified than in the other categories, independently from the size of its population sample. Significantly, most of these linkages were between categories of the same private sector, meaning interviewees had more than one affiliation of the private sector, that is, they were playing roles in different institutions involved in urban development.

Table 7.5 Social linkages identified between sectors per population sample. Source: author's own.

	Private Sector (n=17)	Public Sector (n=11)	Civil Society (n=34)
Private Sector	26	7	4
Public Sector	7	0	7
Civil Society	4	7	2
Total linkages	37	14	13

A more specific analysis of the linkages between categories of actors indicates that interviewees from property developers and private university categories have by far the largest identifiable amount of affiliations to other social categories in the whole sample. The figure below (7.1) depicts the presence of linkages between interviewees and institutions, providing an approximation to the variety and density of linkages between the sampled actors involved in the socio-natural production of Chicureo.

memberships or family, friendship and business bonds are not likely to be registered by this exercise.

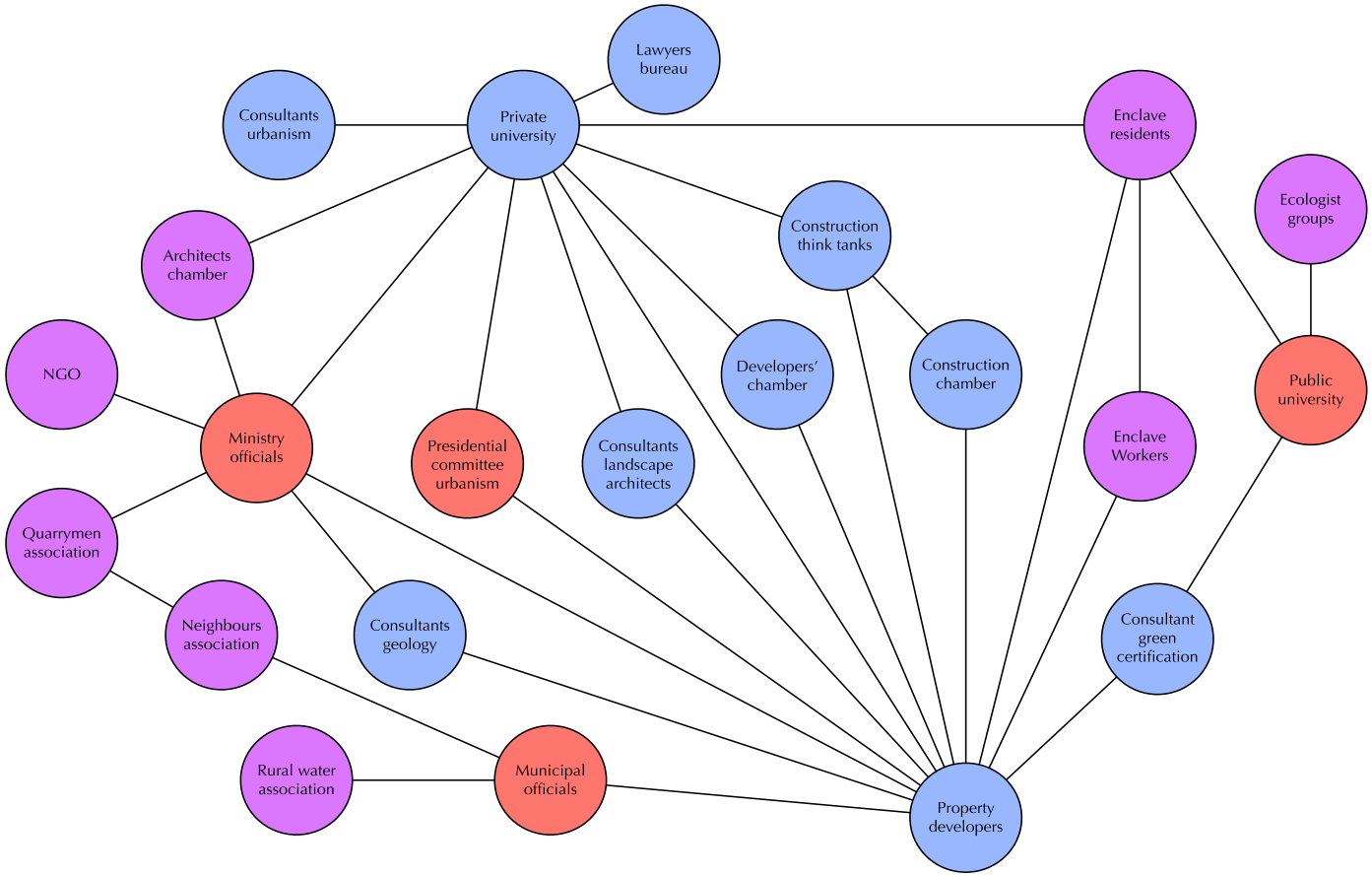

Figure 7.1 Links between the interviewees' institutions and social categories [blue=private sector; red=state; purple=civil society]. Source: author's own.

These linkages confirm that property developers are strategically well linked to a diversity of institutions in the state and private sector. Although there is no causal inference from this result that can be made here, social linkages have been reported as a valuable asset in the non-meritocratic reproduction of the Chilean elite and economic groups (Espinoza, 2010; Montero, 1997). Independently of why these linkages happen to be there, whether to comply with regulations, for random reasons or to intentionally develop privileged access to institutions and organisation, I interpret the existence of these social linkages as politically and economically significant. In the light of recent corruption scandals in Chile, that are revealing the too close tie between private companies and politicians in both law and policy making processes and project approval and supervision, I can only hypothesize that these linkages may not be dissociated from the property developers' action of advancing their interests.

The analysis of these social linkages between categories of actors involved in the socio-natural production of the green enclaves cast light on another suggestive phenomenon. Although in this case I expected the actors from the public sector, by the wide legal and geographical range of their action to show at least as many links as the private sector, this is not evidenced by the analysis of the sample. Instead, it is the category of universities, and most of all private universities that displays a significant level of social linkages. Actors from the universities (scholars) were well linked to both the private sector and the civil society, whilst actors from the state (officials and authorities) displayed a strong link with actors from the civil society. In relation to the civil society it is significant that most of the linkages of the interviewees in this category where towards state institutions.

The first implication of these findings reinforces the idea that in the production of the socio-nature, rather than single actors in rigid positions, the subjects are varied networks of actors that may coalesce and clash. Thus, this 'map of linkages' will serve as a framework to interpret these relationships with regard to environmental discourses of the actors and their position in 'pro' and 'anti' green enclaves' coalitions. The second

implication highlights the density and diversity of social linkages of actors from the private sector. Although this is a rather expectable finding in the context of the proposed research framework for urbanisation of Chicureo under a green neoliberal urbanism, the diversity of linkages from scholars from private universities ran against my own original perception of a very low incidence of university' scholars –which was a frequent complaint among scholars themselves- if compared to the power of the industry and the state in framing and developing the green enclaves.

This latter finding is worth examining. When analysing in detail the trajectories of those interviewees that are scholars, I became aware that many of them also played a role in other areas involved in the production of the enclaves simultaneously with their academic positions. For instance, scholars often worked as architects, landscape architects or consultants for the private sector. It was not rare to find -either in the press or in the interviews- that some scholars repeatedly changed seats from the public to the private or to the civil society. One such remarkable case features a scholar who, when interviewed, was also the manager of a property development project and was later appointed to be the head of an urban development department at the Ministry of Housing and Urbanism (MINVU). Another case worth mentioning is that of a scholar and former authority of the same department who, when interviewed, was also a consultant, and later was appointed as the head of the recently created Council of Urban Development. I am not stating that scholars -in general- are involved with the development of green enclaves. What I believe my findings show is, first, that my sample of scholars represents well a group actively involved in the production of the green enclaves, and secondly this group seems to be a crucial part of the circuit of production of the greening of neoliberal urbanism that produces the green enclaves. These scholars, most of them formed or working in the Pontifical Catholic University[34],

[34]A Vatican institution, the preferred by the Chilean conservative economic elite, alma mater of the Chilean Chicago Boys (before and after their link to Chicago University). As it is also where I did my own master's studies and forged some of the academic relationships that opened the door to access some of the interviewees, this finding motivated my reconsideration of the rather external positioning in the research that I originally envisaged.

appear to be continuously swapping roles between the state, the market and the civil society, as policy makers, practitioners, researchers and critics. This sample, which I see as part of a network, seems to be playing a very relevant role weaving a social legitimised knowledge about ecology and sustainability with the industry and the public policies, as it emerges in the next section from the role of expert knowledge in the discourses of green neoliberalism.

To close this section I relate the social position of the actors with their discursive posture regarding green neoliberalism. To map the convergences and divergences between environmental discourses and the actors' social position, I draw from sociological theorisation on conflict that proposes the formation of triads as the basic configuration in which social confrontation is developed (Caplow, 1968). My focus is put on how the actors align themselves either to promote or contest the discourse of green neoliberalism emerging from the making, maintaining and living the green enclaves.

The figure below (7.2) depicts the triad green neoliberalism, ecological modernisation and political ecological environmental discourses. At one pole of this antagonism are those who put the rationality of free-market and neoliberalisation of nature in the centre of sustainability, as developers, residents and some consultants. Those who discursively contest green neoliberalism, as scholars, activists, state officials, workers and some consultants occupy the other pole. The field of the opposition to green neoliberalism itself seems to be divided between two main lines of emphasis, that seem to converge in opposing the green enclaves and diverge on the foundation of the critique. One position is the one taken by those who see green neoliberalism as a false environmentalism, as greenwashing, and favour an ecological modernisation approach to an objective urban sustainability, stressing regulation of the markets and more primacy to expert and scientific knowledge. The other position, held by a smaller number of people develops a more radical critique of what can be considered a political ecological approach. In this, not only greenwashing

but also urban sustainability and power are subjected to critique, as reported in the discourses of some scholars and activists.

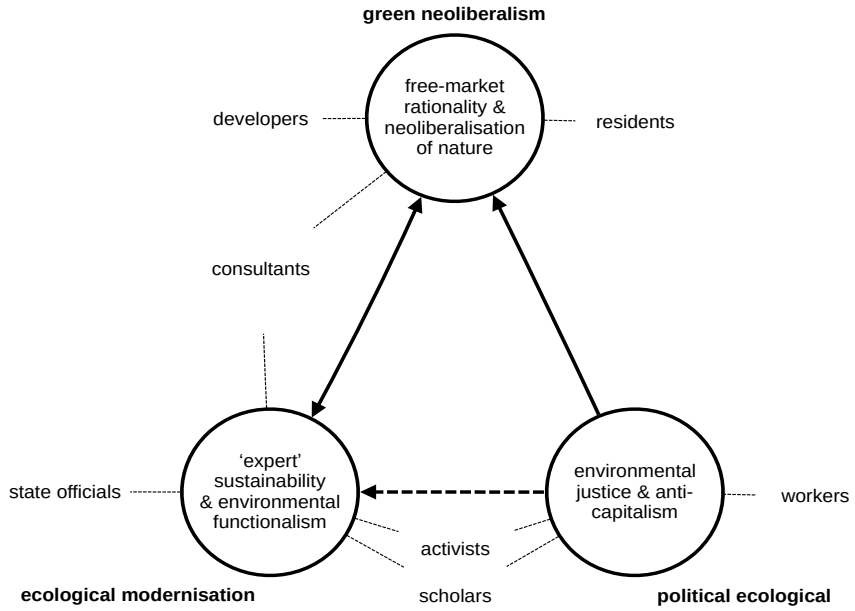

Figure 7.2 Discursive antagonisms to green neoliberalism.

In this antagonism, green neoliberalism emerges from the discourses of those who belong to the private sector, whilst in its opposition there is a convergence of actors from the state, the civil society and the private sector (in the case of those speaking from a sustainability rationale close to ecological modernisation) or from the civil society alone (in the case of the sprouts of political ecological discourses). Although limited to a sample of actors, this discursive alignment of the environmental narratives and imaginaries from the actors indicates how the actors' discourses and social positions converge and diverge in the production of the neoliberal and green enclaves in Chicureo.

7.6 Chapter conclusions

The greening of neoliberal urbanism in the case of the development of the green enclaves in Chicureo is not restricted to the innovations in planning policies and changes in the metropolitan masterplan in 1997, nor is it limited to the niche market strategies of the property developers that have seen the opportunity to multiply their profits by offering premium green

enclaves. I argue in this chapter that among the environmental discourses emerging from the narratives of the actors, there is one that is distinctive of green neoliberalism, around which the other discourses articulate.

The green neoliberal discourse emerging from the making, maintain and living the green enclaves combines elements of pure economic rationality with discourses legitimating an elitist and exclusionary neoliberalisation of nature. Rather than proposing it as a remedy to solve any environmental problem, individuals and groups deploy it as a discourse that rationalizes their own search of economic dominance and ecological security. As presented in the section on greenwashing, much of the critique to green neoliberalism stresses the deceptive and marketing-only greenness promoted by the green enclaves, vehemently calling for a stronger regulation based on measurable and accountable sustainability backed by the knowledge of experts. This critique seems to dismiss, maybe too hastily, the scale of the environmental transformation and the impact in Chicureo of those greening innovations that are taking place, and takes for granted the objectivity of sustainability.

As an environmental discourse, green neoliberalism seems to be crucially distinctive from ecological modernisation regarding two main issues: first, it seeks on-the-spot technological efficiency rather than global impact taking into account planetary ecosystemic limits; and second, it is a discourse that does not aim for the idea of 'transitions', but for a materialisation of a market utopia in the present. If you can live the (green) dream now, why bother with an unforeseeable future? In this sense, it can be said that green neoliberalism is a discourse that is bounded only by what can be technically, economically and politically achieved and, despite its offers of sustainability, it seems to propose no horizon to be reached by any transition.

These discourses represent different imaginaries on the environmental, economical and social meaning of the greenness of the urban enclaves in Chicureo. As such, these discourses are not only diverse but competing

visions by which interests of social groups and networks have become politically and environmentally articulated to fight, *for* or *against*, policies, reforms or interventions. These discourses indicate the constant effort of the actors in establishing coherent narratives about what nature, urban nature, and sustainable urban greening is and is not. The findings on the crucial role of scholars in producing, communicating and applying a legitimised environmental knowledge by which the green enclaves could be built, lived and contested reveals the political complexities of the subjective production of a socio-nature. In this context, the main issue of my analysis was not to establish the fakery of green enclave sustainability, but to unveil the framework by which this sustainability is validated, who benefits from it, and what configuration this new urban socio-nature adopts.

Chapter 8.

Conclusions

8.1 Synthesis

This thesis examines the urbanisation of Chicureo by green urban enclaves, originated by the greening of neoliberal urbanism in Santiago de Chile, and the socio-nature it has produced. The focus on how the post-dictatorial policies were produced and what resulted from this undoubtedly leads to a story of change: it highlights how innovations in policy and urbanism, cultural change, urban growth and environmental transformation are producing new divides in Santiago de Chile. Through the changes that occurred in the context of a cautious political transition, private actors -a fast growing income elite and the new property developers- thrived, influencing the development of urban policies and markets in their benefit in the new democratic scenario.

I have argued that the green enclaves in Chicureo have developed thanks to the greening of planning policies and housing market, a process originated in the disputes over regulation of urban neoliberalism in the early years of the political transition. The evolution of Santiago metropolitan planning policies since Pinochet, particularly how urban growth was conceived in the dictatorial and the post-dictatorial period, frames the political context. The environmental discourses on urban greening and sustainability, which were fast permeating Chilean public opinion in the 1990s post-Rio ambiance, played a remarkable role in the changes in urban policies in the political transition. Sustainability became a key discourse to justify and guide the planning changes by which neoliberal innovations were introduced to direct the urbanisation of Chicureo by green urban enclaves. This greening of neoliberal policies advanced a pro-growth agenda defended by a coalition of politicians, market stakeholders and urban elites who also championed urban greening. The evidence reveals a market-driven greening of the neoliberal urbanism by which green enclaves have been made, maintained and lived, which adds to the overall argument of the emergence of a framework in which greenness and sustainability align with processes of securitisation, exclusion and commodification of urban nature.

However, a fundamental part of my argument is that this analysis of the greening of neoliberal urbanism -and what would be a neoliberal sustainability- has to be extended beyond the political origins and green urbanism of the enclaves, to the very reconfiguration of material flows and socio-environmental relationships it triggered in the metropolitan territory. I have argued that an Urban Political Ecology analysis of the urbanisation of the green enclaves was necessary to understand how power and projects of urban development were embedded into the materiality and subjectivity of the new urban metabolism of the green enclaves, producing a new green and neoliberalised socio-nature.

In the following section I present the highlights of the narrative of the urbanisation of Santiago's countryside, departing from the reforms to urban neoliberalism to the consolidation of the green enclaves as the main mode of urban development in Chicureo and the socio-environmental transformation it triggered. I have structured this narrative in a sequence of processes to answer the research questions. My focus is put on the emergence of a green neoliberal urbanism and the new socio-natural assemblage of city and countryside produced by the urbanisation of Chicureo by green urban enclaves.

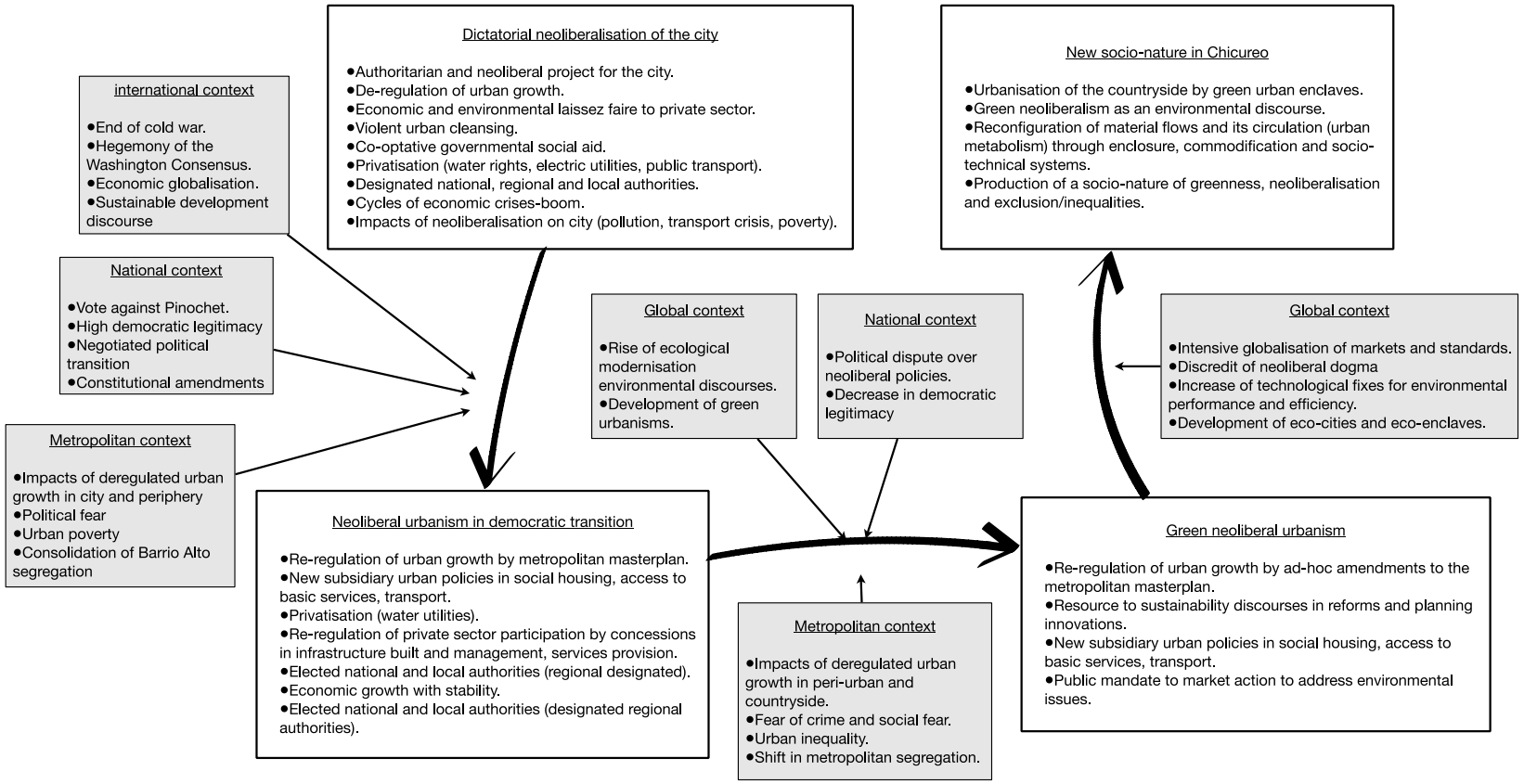

Figure 8.1 The greening of neoliberal urbanism and the production of a new socio-nature in Chicureo. Source: author's own.

Planning policies and the greening of neoliberal urbanism

In answer to my first research question, I found that the link between the urbanisation by enclaves in Chicureo and the greening of neoliberal urbanism in Santiago de Chile lays in the political dispute between coalitions for advancing or receding urban neoliberalisation. The planning regulations that emerged from this dispute were a settlement that allowed the development of an experiment with innovative neoliberal policies for advancing urban sustainability in a specific area of the metropolitan countryside. The green urban enclaves of Chicureo seem to be a different type of experiment from those urban experiments in climate change (as described by Bulkeley & Castan Broto, 2012) or even from enclaves explicitly experimenting in urban sustainability as some eco-cities (Caprotti, 2014). My interpretation of the evidence is that although Chicureo can be conceptualised as a laboratory of green modes of metropolitan urbanisation in post-dictatorial Santiago, it results from pro-neoliberal strategies to adapt to a more restrictive political context and boost pro-growth agendas, leading to the emergence of a green neoliberal urbanism in Santiago de Chile.

Through the analysis of the evolution of the policies for urban planning, social housing, infrastructure and service provision involved in the urbanisation of Chicureo, I have shown how the urban enclaves have developed not by the mere continuity of a *laissez faire* urbanism imposed by military force, but by the attempts to reform it as part of the political transition in the post-dictatorial period, in which environmental discourses played a core role. These reforms began by tackling some of the more striking urban impacts of dictatorial policies, such as poverty, pollution, transport and the de-regulated urban growth of Santiago. The metropolitan masterplan enacted in 1994 expressed a clear will in rolling back dictatorial urban neoliberalism, by enabling a stricter urban growth boundary, setting a green belt of agricultural lands and natural protected areas, promoting the densification of the city centre, and developing a mandatory decontamination plan that restricted motorisation.

The greening of neoliberal urbanism originated in 1996 when, focusing on backlashes in the conservation of agricultural land nearby Santiago, a pro-neoliberalisation coalition of politicians, technocrats and property developers enacted an ad-hoc policy to boost sustainable metropolitan growth in a rural corner of the metropolitan region, the province of Chacabuco. Through an amendment to the metropolitan masterplan, they opened a breach to advance neoliberal urbanisation by assigning large areas of the countryside to a scheme of low-density urban growth under conditions, the ZUDCs. This initiative was promoted as a necessary step to stop the subdivision and urbanisation of agricultural land triggered by the speculative action of landowners and urban dwellers seeking to have a second home in the metropolitan countryside. Moreover, the whole amendment to the metropolitan masterplan was presented as a virtuous plan by which the private initiative would contribute to a sustainable urbanisation by developing new self-sufficient cities, in which the market competition of private actors, spaces and networks would provide to the social needs of the enclave stakeholders and consumers.

The plan converged with other reforms enacted at that time to reregulate neoliberalism, such as new concessions areas for utilities, privatisations with supervisory bodies and the boosting of construction industry and housing market through subsidies and incentives. These reforms included: a) the privatisation of the water and sanitation utilities, advocating the need to improve the metropolitan water environment by expanding the wastewater treatment; and b) the development of several PPP schemes to boost the construction of new urban motorways under the form of BOT concessions, connecting the Barrio Alto with the CBD, the industrial districts and the areas of urban growth (particularly Chicureo) to save public resources and improve the air quality in the city centre.

The reregulation of neoliberalism meant the spread of a neoliberal urbanism (Peck et al., 2009), a new decentralised framework for urban development in which the idea of a city itself was blurred and replaced by mega-projects, flows of financial investment, networked infrastructures and concession

areas. And at the same time, at the centre of this new framework were the environmental discourses stressing urban sustainability as one of the main flagships by which these initiatives sought legitimacy.

Market environmentalism in the making of the green enclaves' urbanism

Instead of the building of self-sufficient cities in the countryside, the amendment to the metropolitan masterplan triggered the development of clusters of green urban enclaves in Chicureo, largely dependent on Santiago for jobs, services and recreation. These green enclaves sharpened the local divide between the poor and stigmatised urban centre of Colina and the newly urbanised wealthy areas of Chicureo. I have established, in answer to the question on the role of the market environmentalism, that both the greening of the housing market and the resource to environmentalist motives by the entrepreneurialism of property developers played a crucial role in this development, along with the greening of planning regulations and policies.

By analysing both urban enclaves' marketing and urbanism I have established that the greening of neoliberal urbanism is the result of both the introduction of 'green' innovations by property developers as from innovations in neoliberal planning. The most interesting findings are those that signal how the market environmentalism of the green enclaves influenced the greening of neoliberal urbanism, and why this influence led to a divergent path of urban development for Chicureo.

On the issue of the property market greening, the key of my analysis is the development of niche market strategies by property developers. By turning Chicureo into a brand of elitist greenness in the housing market property developers sharpened their competition for upper income groups stressing the environmental attributes of the green enclaves. To capture not only the top, but also the whole upper income segment, property developers enhanced more differentiated niches of green within Chicureo to achieve competitive and complementary advantages. Although it is a debatable issue whether the property developers respected the regulations established by the

Plan Chacabuco -for instance in the percentage of social housing- it is clear that they used the planning framework to create new enclosed and premium environments made, maintained and lived by a neoliberalised housing market, along with privatised utilities and de-regulated services. As the analysis of the marketing and pricing strategies revealed, the emergence of green urban enclaves in Chicureo meant the establishment of a premium market for high-income house consumers organised according to each consumers' segment's willingness to pay for a greener urban lifestyle in a countryside area. Thus, a strategy for the highest-profit, the capture of land markets, the development of socially cleansed and controlled neighbourhoods, and the control of environmental resources, all led to green enclaves instead of open cities.

As shown in the analysis of the marketing, in their offer of green urban enclaves, property developers assemble images and discourses representing a promise of an urban environment where greenness is a core value of the developments, assembled with security and privilege, and not devoid of a utopian character. Instead of being a challenge to Santiago's already segregated and exclusionary pattern of urbanisation, the green enclaves seem to reinforce this latter, notably by turning either country club, eco or suburban styled greenness into a new attribute of exclusivism. Although the concept of nature has been remarkably present in the marketing discourses, what is emphasised in these advertisements besides the localisation in a valley landscape is almost always a produced nature, a built environment of a constructed green inhabited by a very specific social group of upper middle and high-income families.

This promise of green in the urban enclaves of Chicureo is mediated by the resource to different typologies of green urbanism, among them ecological urbanism. Ecological urbanism is considered to have a core role in the making of the eco-enclaves (Caprotti, 2014; Hodson & Marvin, 2010a). In the green enclaves of Chicureo I found ecological urbanism to be one among other modes by which the greenness is made and the greening of neoliberalism is materialised. Although some enclaves and some specific

condominiums may be seen as *proto* or emerging eco-enclaves, I chose the notion of green enclaves as a more comprehensive description of these developments, one that accounts better for the heterogeneity and contradictions within green neoliberal urbanism.

There are three main typologies of green urbanism in these green enclaves: that of a country club urbanism, predominant in the very exclusive *parcela* enclaves; that of an ecological urbanism, concentrated in two exclusive ZUDC enclaves; and that of a suburban urbanism, predominant in two less exclusive ZUDC enclaves. Although overall the attributes of country club and suburban urbanism are displayed more frequently than those of ecological urbanism, the latter is presented with a more diversified pool of attributes, and it is the predominant form of urbanism advertised for some new condominiums in the green enclaves. While assessing the materialisation of the marketed attributes in the field, attributes of ecological urbanism ranked lower than the country club and suburban types, but at the same time, new attributes of ecological urbanism were found, in most of the cases reflecting green initiatives of house owners.

Among the most remarkable and widespread attributes of ecological urbanism found in both marketing analysis and the fieldwork respectively were the use of passive technologies for energy efficiency and the development of green areas. Those green attributes of energy efficiency were basically related to the improvement of insulation systems, always presented in both marketing and general discourses as an economic saving mechanism rather than an environmental benefit, as could be, for instance, the reduction of CO2 or other greenhouse gas emissions. The green attributes related to green areas and parks meant the design, building and maintenance of these areas in accordance to ecosystemic design and landscape principles, most of which aimed to reduce water consumption, although no accountability of the overall water consumption of the enclaves was found. In contrast to these common green attributes of the green enclaves, other attributes cited in eco-enclaves, as globally recognised certification schemes for urban sustainability (as LEED), socio-technical

systems explicitly designed for low (or zero) carbon, or district systems for recycling and reusing of resources and materials were totally absent.

Besides ecological urbanism attributes, what green enclaves shared with the eco-enclaves is a search for ecological security (Hodson & Marvin, 2010a). This attempt of ecological securitisation was materialised through many ways, including green urbanism and urban design. A significant finding was my realization of how ZUDC's and elitist *parcela* enclaves display a strategic urban design that takes advantage of the ecological and geographical conditions of their localisation to reinforce the spatial and social insulation of the developments. Additionally, these green enclaves use wild areas in the surrounding hills as buffer zones, as well as green attributes to secure the membrane that regulates the flow of people, vehicles and animals *to* and *from* the urban enclaves.

Urban metabolism and the production of a new socio-nature in Chicureo

The urbanisation by large scale and exclusive green enclaves, a story of planning innovation and market success, is radically transforming Chicureo. The capture of the rent gap created by the land use change has been maximised by property developers through the creation of a niche market for high and upper-middle income groups attracted by prices, exclusivism and greenness. Whilst Chicureo became a valued brand in Santiago's property market, it deepened the environmental transformation of the valley, by speeding up the rate of land use change from agricultural, pastures and wild areas into discontinuous urban areas serviced by new networked infrastructures and services. The massive investments in the building of the green enclaves have been complemented by the development of premium private infrastructure for mobility (as premium motorways) and basic services (as water and sanitation, petrol stations, electricity, communications). From being a depopulated and hardly accessible rural valley in a stigmatised borough by the time of the original metropolitan masterplan in 1994, twenty years later Chicureo came to concentrate the largest offer of houses for upper income groups. The wave of newcomers increased the market attractiveness of the area and triggered more private

investment in houses, educational services and commerce. An increasing population of upper income groups has settled in Chicureo, reaching nearly 30,000 inhabitants, notwithstanding the high rates of mobility to and from Santiago central business district and Barrio Alto for working, studying, shopping, recreating and socialising.

Under an Urban Political Ecology perspective I developed the analysis of the environmental transformation triggered by the urbanisation of Chicureo by green urban enclaves as the production of a new socio-nature (as proposed in Heynen et al. 2006), in which subjective and material dimensions influenced by a political context merge to give birth to a new type of metropolitan development. The materialisation of the neoliberal greening of planning and the market promise of greenness, exclusivity and security of the urban enclaves has transformed a zone of crops and wild foothills into a gardenified urban environment in which ecological designed parks coexist with highly water-consuming gardens and sports courses. This environmental transformation has been often developed under a tabula rasa policy that razes topography, ecosystems and historical landmarks and builds a new environment based on a market-functional but idealistic -even utopian- model of urbanism and urban life.

Instead of a system of self-sufficient cities, the green enclaves have developed as an irregular urban cluster with an urban metabolism that enabled a reconfiguration of socio-technical systems on a metropolitan scale (considering the proposals of Hodson and Marvin, 2010b), combining some degree of autarky with the enclosure of the resources of a broad area and the extension of its systems to capture or discharge resources at metropolitan or wider scales. By analysing the cases of the flows of water, stone and waste, I demonstrate that the neoliberalisation of resources, by privatisation, enclosure, commodification and marketisation, and their circulation through networks of private infrastructure are crucial to produce and maintain the green attributes of the urban enclaves and therefore to sustain the attractiveness of the upper-market niche strategies of developers. Regardless of the valuation of the urban enclaves' greenness by the actors, that is,

whether their discourses considered it either greenwashing or a genuine advancement in urban sustainability, the socio-nature produced by this urban metabolism involved the production of a new gardenified urban environment. As I have shown, the materialisation of the green urban enclaves replaced the continuum of agricultural-pastures-wild land use with an evolving and discontinuous urbanisation that combines destruction of rural areas with the construction of a variety of urban districts endowed with a new green made of gardens, green courses, parks, and ecological reserves.

The development of private schemes for domestic waste recycling in some green enclaves represents an attempt from developers to enrich the experience of living green. In these schemes, producing sustainability demands residents to actively contribute to a multi-scale recycling network. The development of private schemes for recycling in some green urban enclaves, run by a private company and based on the voluntary disposal of waste by residents in green points, has been consistently marketed by developers as an indicator of their -and the residents'- commitment to sustainability and the emergence of a green lifestyle in the enclaves. Although this emphasis given by developers reinforces my argument of the centrality of green in the market and identity of the urban enclaves, the actual estimations suggest the recycling efficiency of the scheme is rather low, and that it displays very low degrees of accountability and traceability.

Flows of domestic waste from the green urban enclaves enter the privatised municipal waste management system of the metropolitan region, by which the waste is exported to low-income peripheral boroughs to be compacted and disposed in landfills. This waste management system displays a remarkable efficacy in keeping Chicureo clean of domestic waste, although with a high impact in the municipal budget. My assessment of the volumes of domestic waste produced in Chicureo indicates that informal management of organic waste in *parcela* enclaves -either by its in situ disposal and composting or by its removal by non regulated private operators- may explain the relatively low rate of domestic waste per capita for Chicureo. This is achieved with a considerable environmental impact, as

suggested by the reports of pollution of water canals, irregular burns, and the proliferation of illegal dumpsites. What seems crucial in this metabolism of waste is that it redirects the waste flows of individual households to metropolitan landfills and energy production plants, as well as to metropolitan and global recycling industries. The socio-technical systems put in place represent a choice for a specific type of waste sustainability, in which the incentives of both the 'municipal' and the green enclaves' waste management schemes are put on the collection of waste at an industrial scale, by market means, either efficiently or less than efficiently. No strain has been placed on the reduction of consumption, improvement of ongoing processes of informal management of organic waste by *parcela* residents, local reuse of materials or other cooperative or non neoliberalised forms of managing waste that could be also linked to urban sustainability.

The evidence gathered in this research suggests this process of environmental transformation has not been socially neutral: the making and maintenance of havens of green and abundance for upper income groups sharpened environmental inequality (Swyngedouw & Cook, 2009), externalising environmental impacts to the local low-income population of the area and subjecting the population of workers of the enclave to practices of social discrimination. The analysis of the urban metabolism has been crucial to evidence how a green neoliberal urbanisation has produced Chicureo as a distinctive assemblage of market, social privilege and environmental inequality between some spaces of abundance of green and resources and spaces of scarcity. The control of water flows, circulated through premium infrastructure networks, built and controlled by the private sector, has sustained the greening of Chicureo. It has done so at the cost of increasing the uncertainty of the future availability of water, by the depletion of the water table in a context of local drought and global climate change on one hand, and at the cost of diverting flows from other uses, as feeding rural communities or poor urban areas in the same borough.

The takeover and concentration of water has been developed by mechanisms of privatisation (by which water and sanitation utilities were

privatised creating high standard concessions for upper income populations); through enclosure of the resource, as the public concession of large shares of water rights to developers and utilities; commodification, as the trade of water rights in a deregulated market; and water grabs, by the unaccounted and sometimes irregular extraction of water from the water table by developers and residents. I have shown that the scale of water usage to maintain the greenness of the green urban enclaves in Chicureo -a process developed by high standard infrastructures and technical systems for water extraction, production, transport, discharge and treatment- seems to be disproportionate for Chilean urban standards, and reaches rates closer to very dry and exclusive areas found in the Emirates or California.

The neoliberal governance of water and the socio-technical systems ensure an efficient, continuous and reliable provision to satisfy the green enclaves' needs of drinking water, recreation and gardening. However, it does not question the legitimacy of these water needs, nor does it challenge the production of inequality that it creates in the water provision for the enclaves, particularly for low-income rural communities in the area that are denied the access to the green urban enclave sources and systems and face a scenario of water scarcity, depending on non-reliable small local systems or from water trucks. The evidence indicates that, as proposed among others by Swyngedouw (2004), the new urban metabolism is also political, in which and through which social power, class privilege and environmental inequality are produced, reproduced and naturalised into a new socio-nature by the materiality of the flows.

However, although some resources have been captured with little resistance -as the large agricultural plots that fell under speculative practices of the land owners- the urban metabolism of the green urban enclaves is being contested by those opposing the neoliberalisation of resources and the socio-environmental impacts of the new configuration of infrastructures and flows. As an example of this, the takeover of areas with mineral resources by the green enclaves has produced a strong clash with local communities of quarrymen and stonemasons, whilst the disruption of water canals

traditionally used for agriculture is already producing disputes among farmers, enclave residents, urban poor and developers. The case of the conflict for the quarries and the flow of stone is a powerful example of how the dispute for the metabolic flows gets politicised, as it puts at stake a raw dilemma between production or destruction of a territory, an economy, a lifestyle and a whole cultural representation of how the material world connects to social identity. As I witnessed in the field, environmental inequality and the tensions the new neoliberalised metabolism produced by the neoliberal urbanisation of Chicureo are not limited to the outside of the green enclaves. The production of greenness involves the enforcement of written and unwritten practices of exploitation, exclusion and discrimination inside the green enclaves, disciplining the workers who make and maintain these developments (as the construction workers and house maids) in the right use of the green areas, that is, keeping them 'clean' from their social identities and bodies.

Environmental discourses in the production of a new socio-nature

The analysis of the urban metabolism of the green enclaves opened the way to link materiality and environmental transformation with the production of a new subjectivity by which flows, power relationships and social identities are interpreted. Through the analysis of the green enclaves' marketing, official documents, press and especially semi-structured interviews I interrogated the subjective production of Chicureo as a socio-nature, in which the actors took discursive positions about the greenness of the enclaves and its socio-environment relationships. My fourth research question asked about the predominant environmental discourses to be found in the narratives of the actors making, maintaining and living the green enclaves. The centrepiece of my analysis was to interrogate the environmental discourses in relation to their adherence to a mainstream ecological modernisation discourse, which emphasises the possibilities of technological efficiency, institutional reform and market regulation to solve environmental problems (Spaargaren et al., 2009; Hajer & Versteeg, 2005).

There is a triad of environmental discourses in the dispute for explaining the origins and meaning of the green enclaves: one discourse that aligns itself with the greenness promoted by green neoliberal urbanism; one discourse critical to green neoliberalism on urban sustainability that fits ecological modernisation; and yet another discourse critical to neoliberalism which displays elements of political ecological discourse in its critique to capitalism and sustainability.

I define the first of the above-mentioned discourses as the environmental discourse of green neoliberalism, issued mainly by property developers and residents in the green enclaves. Instead of social reforms to markets and institutions, and scientifically legitimised management of environmental limits, as proposed by ecological modernisation, the discourse stresses a combination of free market solutions, technical efficiency, aesthetical environmentalism and individual choices. Although in this discourse, allusions such as contributing towards the environment by recycling or helping nature by keeping the place green are repeatedly found, there is a remarkable lack of references to specific local and global environmental problems, particularly those related to climate change. Furthermore, this discourse emphasizes living green now, and no mentions are made to a horizon of urban sustainability.

Most of the criticism to the neoliberal green of the green enclaves was contained in the discourse of ecological modernisation stressing the weakness of the sustainability parameters developed by the urban greening of the property developers, which was often described as mere greenwashing. This discourse, mostly held by state officials, consultants and scholars, criticised the lack of efficiency of the market-led-only sustainability of the green enclaves, and appealed for a reform introducing both more scientifically legitimised environmental knowledge and the action of the state to regulate the market and set objective parameters of sustainability. Another source of criticism towards the neoliberal greenness of the green enclaves was the discourse of those actors, mainly activists and critical scholars, who saw an uneven distribution of the social, economical

and environmental impacts of the urbanisation of Chicureo. In this discourse, the mainstream discourses of sustainability are depicted as discourses of power, either state-enforced or market-led, to favour economic growth and back the *status quo* in the production and reproduction of social and environmental inequality. It is remarkable to find that despite their differences, both critical discourses ultimately presented urban nature as independent from human society, to be either managed or preserved.

An unexpected finding regarding the role of the scholars in the production of the green enclaves of Chicureo was made whilst comparing the actors' discourses and their social position. I came to acknowledge that scholars were playing a crucial role in the production of the green urban enclaves in Chicureo, by working in the state in making planning and regulation, collaborating with property developers in green enclave projects, researching and diffusing environmental discourses, and participating in environmentalist movements. This finding highlighted in a very concrete way the relevance of environmental knowledge and discourses in legitimising both power and resistance in the production of Chicureo's socio-nature.

Developing an urban political ecological perspective to study the green enclaves in Santiago de Chile

Barely heard in the first two decades of the post-dictatorial period, voices pointing out to the continuity of neoliberal urbanisation in Santiago's urban development are now seriously considered in the community of Chilean scholars and policy makers. Along with acknowledging the persistence of some of the dictatorial neoliberal macro-economic policies and regulatory framework, critical scholars have been highlighting the development of new mechanisms for neoliberalisation on planning policies, housing market stimulus and privatisation of infrastructure and service provision.

Through this research I aimed to contribute to this debate, specifically casting light on the role of discourses of urban sustainability and greening in the development of a post-dictatorial neoliberal urbanism. Through the

analysis of the greening of planning policies and market strategies I offer an interpretation of the role of politics and environmental discourses in the development of a new type of urbanisation in the metropolitan countryside, the green enclaves in Chicureo. I am contributing with a Latin-American case to the study of the elitist urban enclaves in which claims of ecological efficiency merge with the search of ecological security for elites and the greening of the economy, and hopefully, also to the debates on the greening of neoliberalism.

Scholarship on Santiago's contemporary urban development has convincingly highlighted that raising or blurring social and planning boundaries has been the core issue in the disputes for the making of urban policies, either in contexts of authoritarianism or democratisation. The case of Chicureo is no exception, and inscribes itself in the attempts of neoliberal policies to overcome limits to spatial and economic growth. However, this research specifically unveils how neoliberal policies of urban growth in Santiago shift from a concern on urban land as a spatial resource, whose scarcity the neoliberal policies try to overcome to boost private economic activity, to urban land as also a source of socio-environmental resources to sustain specific urban projects. In this process, the greening of neoliberal urbanism shows the relevance acquired by the control of environmental resources in advancing a neoliberal and elitist project of urbanisation, and how environmentalism becomes instrumental to the consolidation of this green neoliberalism. The green enclaves signal the limitations the pact for a political transition set to those willing to shift urban policies away from the agenda of those who benefited from dictatorial neoliberalism, more so when considering the hegemony of the Washington Consensus in the 1990s and a context of globalisation in which the flows of knowledge and capital, as well as the technological and symbolic power were increasingly removed from the state sphere.

This thesis also brings new topics under the scrutiny of Urban Political Ecology, contributing to the knowledge of how a new socio-nature is produced by the urbanisation of the countryside driven by the greening of

neoliberal urbanism in Santiago de Chile. Although recent studies on changes in the patterns of residential segregation in Santiago have highlighted the walled developments of Chicureo as a case of neoliberal urbanisation, the analysis of its environment is still absent, prompting questions such as: What does it mean to say that, in relation to the urban enclaves of Chicureo, neoliberal planning policies and housing market in Santiago became greener? What does this greening mean to the way socio-technical systems and environmental regimes are set by the urbanisation by green enclaves? And what socio-nature is emerging from this greening of neoliberal urbanism?

This study has brought to light the environmental transformation that is producing a gardenified urban environment that brings new socio-ecological continuities and discontinuities in which traditional boundaries of rural and urban are erased whilst new boundaries of privilege and mobility are raised. By analysing the urban metabolism of Chicureo, the thesis has also deepened the understanding of how elitist and market visions of urban greening are materialised into a new urban socio-nature, through processes of neoliberalisation of nature, discriminating social relationships, and the development of new socio-technical systems to control the material flows needed to sustain the green enclaves. In the production of the socio-nature of Chicureo, the subjective interpretation of certain elements of materiality and lifestyle as green revealed to be as important as the capacity of the new socio-technical systems to produce and control the circulation of flows that sustain that materiality and lifestyle. As making, maintaining and living the green enclaves all demand the continuous circulation of flows through an uneven urban metabolism, the new urban socio-nature of Chicureo produces and reproduces its greenness along a local and metropolitan socio-environmental inequality.

The greening of neoliberal urbanism that made possible the development of green enclaves in Chicureo has emerged through the tensions of the political transition and the mainstreaming of environmentalism. Political transformism and market opportunism were at the core of the greening of

neoliberalism in Santiago de Chile, as was the adoption of environmental discourses by actors from the state, the private sector and civil society, and the introduction of a broad range of green innovations in planning, urbanism and urban design.

The denunciation by critics of property developers' greenwashing is as valid as the latter claim the existence of a free-market driven greening. Although the standards in urban sustainability proposed by the green enclaves refer to basic environmental issues, as wastewater treatment or better insulation systems, it is not hard to see already existent indicators that under global trends sustainability is moving fast towards more sophisticated systems of management and certification. I would say, paraphrasing David Harvey[35], that *there is nothing unsustainable about Chicureo*. Only that its version of sustainability supports a neoliberal and elitist project that produces green as it produces new forms of environmental inequality.

Green neoliberalism can also be read as a radical statement over sustainability and nature, in which sustainability is what the market recognises as so, and the only environmental limits to growth are those set by capitalist inner dynamics. The issue with the green enclaves is that species, ecosystems and alternative modes of socio-ecological relationships are being discarded in order to make, maintain, and live their neoliberal sustainability. The day, in a predictably near future, that one condominium in a green enclave is awarded a more legitimised green certification scheme (as LEED), would mean only a step forward in consolidating green neoliberal sustainability, and also a step forward in the enclosure, depletion and destruction of other socio-natures. The utopian content of the green neoliberalism discourses and practices of the green enclaves lay not in the future but in the instant one can buy its escape from the city and live the green experience. It is a spatial and social utopianism, in which a notion of transition barely exists, or if any, dwells not in a progress in a temporal scale to a foreseeable and measurable future, but in the present expectation

[35]"[There is] nothing unnatural about New York City" (Harvey, 1993 p.28).

that socio and environmental relationships can continue to be managed in favour of the privileged.

At the same time, environmental discourses are becoming a core issue in the experience of being urban. New public regulations and market standards for greener and more sustainable cities can be easily found in one's everyday life, from throwing the waste into the 'right' bin to buying a more ecological laundry detergent. Being an urbanite is being ruled by a tremendous stress of living green, in which scientific discourses of planetary environmental change feed social fear through catastrophist narratives and boost opportunist and speculative strategies for environmental management. Under a world in turmoil it is hard not to understand those who choose to evade themselves to a life in green and private limited utopias, even at the risk of sacrificing the public and political character of the urban life. Although they stand alone, the green enclaves of Chicureo are not an exceptional dystopia, a monstrous appendix of the city, but the consequence of political struggles over strategies of urban development that affect the city as a whole. It remains to be seen whether, beyond the failure of the planning utopias of self-sufficient cities and the market success of green neoliberal enclaves, Chicureo can one day be integrated in the quest for a more democratic and egalitarian urban greening of Santiago.

In this sense, it would be interesting to reflect here over the normative implications of this thesis. This thesis has been an attempt to present a novel understanding of the urbanisation by green enclaves in Chicureo as part of a long process of neoliberalisation in Chilean society, one in which through changes -such as consensual reforms, policy innovations and adoption of environmental discourses- neoliberal principles driving urban development in Santiago de Chile stayed more or less as they were. It has been argued by some planning authorities and property developers that the conditioned development in Santiago de Chile, which resulted in green enclaves in Chicureo, is a successful case of a win-win strategy in urban growth policies. For them, despite its impacts the green enclaves in Chicureo have led public-private partnerships to solve infrastructure and housing needs,

dirving private participation to improve socio-environmental standards, such as environmental sustainability and social integration. In other words, this sceheme brought together the best of urban planning and property market, sparing state resources to be directed for more socially efficient uses. Critics to this scheme -both from the academia and civil society- have pointed out that, under the flag of urban sustainability and urban greening, this process has turned into a neoliberal-oriented state capture by large developers, which has allowed elitist income groups to capture environmental resources. If something, my research has shown that both planning process and market development are not politically neutral processes, neither it is the character of the socio-natural assemblage being produced by these.

Now, what normative implications can be legitimately stated by this academic dissertation if one recognises the highly politicised character of planning and market choices and omissions makes the of normative implications? I believe that at least one, which is neither directly related to the degree of free-market involved in the making of urban policies, nor to the degree of true -say, not greenwashing- sustainability of the greening of the city. The first normative implication, an imperative I would say, is that in a democratic regime the political character of the production of the urban must be taken in account, and therefore the inclusion of the existing diversity of social -and ecological- actors, economic interests and political sensibilities must be acknowledged and integrated into the planning process as much as into the urban governance. I believe the case of Chicureo demonstrates that no exceptionalism on this imperative should be allowed, either driven by fiscal purposes, economic growth goals, and the search of expert knowledge or good intentions in sustainability improvement. An ecological city should be, before all, a city made by the democratic dialogue of citizens, either this latter are conceived as people and ecosystems or socio-natural assemblages.

8.2 Orientations for future research.

Although the analysis of the urbanisation of Chicureo has shown the role of local/contextual based environmental concerns and attributes in the

production of the greenness of the urban enclaves, the way in which state, private sector and civil society -in cities subjected to neoliberalisation- are responding to globally spread environmental concerns such as climate change demands further investigation. This area of research would require a strong effort in comparative analysis of cases of green enclaves in different geographies and planning contexts, along with a substantial development of research methods fitting the Urban Political Ecological theoretical framework. To expand the study of the sustainability of the green enclaves also demands to explore its long-term continuity. Whilst most of the eco and green enclaves reported in the academic literature are in planning or early operation stages, it would be relevant to develop research programs to examine the evolution of these enclaves, either in scenarios of crisis in which these developments are abandoned or in scenarios of success in which their attractiveness leads to the densification and urban reconfiguration.

One of the areas not covered by this research that could lead to a fruitful research is that of the bottom-up urban enclaves inspired by communitarian environmentalism. Are there such enclaves in cities under neoliberalisation? And if so, how would the divergences and convergences be in the urban metabolism, environmental governance and impacts between these and those top-down such as the large market-led green enclaves of Chicureo?

Finally, as both researcher and citizen I keep a deep interest in following up how the green enclaves in Chicureo will evolve in the current context of political tension in Chile, in which the framework of the democratic transition and its neoliberal logics are being increasingly contested. In the wake of a severe crisis of legitimacy of the political system, the hegemonic image of what a city should be is being challenged by a diversity of emergent social and political actors willing a more democratic, socially just and ecologically responsible society. What effect the increase of political tensions would have in the ongoing processes of production of socio-natural enclosure and divides remains of course unknown. What really matters

today is that questions on what city -and what nature- is worth to be lived and shared remain open in the political imagination of the many.

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Appendices

Appendix 1. Chilean neoliberalism

A great deal of attention has been paid to the neoliberal reforms in Chile under Pinochet's dictatorial government, both by its radical approach and the context of human rights violation in which those were established (Klein, 2008; Kurtz, 1999; Anderson 1996; Silva, 1991). These reforms were conceived by a group of Chilean economists trained and in close ties with the Chicago University, a group that also took relevant governmental places in the implementation of the policies (De Castro, 1992). Their main goals were to revert the developmentalist strategy installed in Chile from the 1930s which, influenced in Keynesian formulas sought to establish the strategic direction of the economy in the state and boost internal markets and social and political inclusion (French-Davis, 2003; Boeninger, 1997).

The first bundle of neoliberal policies was implemented in 1975, with a radical macro-economical and fiscal adjustment, also called fiscal shock, monetary shock or shock treatment that was set to end public debt, reduce the inflation and stimulate the private capital formation (French-Davis, 2003; Foxley, 1982). This shock included measures such as cuts in the governmental budget, liberalization of most of the previous controlled prices, privatization of previously nationalized companies and liberalization of the exchange rate. From 1979 to 1981, during an intense but short economic boom derived from export growth and the expansion of private debt, the legal and institutional foundations of the new political, economical and social order were set, with the enactment of a new constitution drafted under both a neoliberal and national security doctrine, and approved in a contested referendum (French-Davis, 2003; Silva, 1991).

While some of those policies were immediately implemented, some had to wait: in 1982 an economic crisis derived from the explosion of the private debt bubble of the financial sector hit the country, and the state intervened with pragmatism to rescue the economy, which caused a loss of power of the neoliberal group in the government. By 1985, once the crisis was reverted the military government retook the neoliberal agenda and privatized the state owned energy and communication companies, first selling shares to its workers and then opening them to large private capitals, as in the case of the company of telephone service, telecommunications, electricity generation, electricity distribution, steel, chemical minerals, pharmaceutical, and airlines among others (Marcel, 1989). From 1987 the economy started a new cycle of growth that lasted almost uninterrupted until the post 2009 world crisis, pushed by a world rise in the copper price (the main commodity and a large share of GDP), following an economic model based on private-led exporting sector of commodities, minerals and agroforestry goods and the increasing development of a tertiary sector of

services, with high levels of participation of foreign investment and multinational firms (Larroulet, 1994).

The 'Concertación', the centre-left coalition[36] that governed from 1990 to 2010 did not *rollback* neoliberalism as this did with the previous system (Fischer 2009). Despite this, organic intellectuals from this coalition have continuously argued that neoliberalism was replaced in 1990 by a new model considered to be a 'social market economy' or a model of economic growth with equity (French-Davis, 2003). The strategy of the new policies, according to what was present by a realpolitik assessment of the possibilities of change in a period of political transition, was not to abolish the macro-economic policies nor the economic architecture of the system set by the dictatorial regime but rather promoted a package of reforms aiming to modernise and increase the control of both state and private activity. Privatisations were not reverted or eliminated but new privatisation was made more transparent, new supervisory powers were given to control the market exchange and the monopolies, and a new model of state concessions was developed to regulate the private exploitation of natural resources, infrastructures and services (French-Davis, 2003; Foxley, 2004).

A process sponsored by the US Department of State and the Vatican, the conditions for the political transition included the renounce of political violence and the acceptance of representative democracy and market economy by the by then democratic opposition to Pinochet (Garretón, 1994). From its origins, the seek of consensus between the main actors was the guiding principle of politics, and strategists of the Concertación centre-left coalition that came to government in the 1990-2010 period called this new regime the *democracia de los acuerdos*, the democracy of the agreements (Boeninger, 2007). However, this consensus considered a highly asymmetrical correlation of power, in which the elected government had a social and electoral majority whilst the military and the right had the armed forces and economic and media power respectively, also reserving for themselves a power of veto in institutional lockouts know as authoritarian enclaves[37] (Garretón, 2015). This did not prevent political conflict to occur, but limited its escalation by setting a framework for politics in which the limits were gradual and consensual reforms. Despite these claims of end of neoliberal policies, critical economists and other scholars have consider that the core of the neoliberal model remains untouched, and that indeed, what

[36] The coalition uniting Socialist, Social Democrats and Christian Democrats was officially named as 'Concertación de Partidos por la Democracia', literally 'the arrangement of parties for democracy', widely known by its shortened version 'La Concertación'.
[37] After withdrawing from the presidency, Gen. Pinochet strategically barricaded as Commander in Chief of the Army threathing the civilian authorities with the use of force, a position he left in 1997 to occupy a non-elected chair in the Senate.

those reforms achieved was nothing less than a deepening of the model (Ruiz & Boccardo, 2014; Moulián, 2002; Fazio 1996, 1997).

Appendix 2. Green capitalism.

Since the early political economical theorists that begun the study and critique of capitalism, this economic system has been described as operating through the transformation of nature by labour and technology, demanding the continuous incorporation into the economic exchange and capital accumulation under the form of stocks of minerals and species, land, energy sources, material resources and commodities (Marx, 1968; Ricardo, 1891; Malthus, 1836; Smith, 1776).

Through its development, the scale of expansion and depth of capitalist social, material and environmental relationships is considered to being producing an unprecedent of impacts on Earth's Biosphere, to the extent some have proposed we are living in the Anthropocene, a new geologic era defined by this anthropic impact (Steffen, Crutzen & McNeill, 2007). Whilst resource scarcity has been a pilar of economic theory, the idea that economic growth has to account for Earth's biophysical limits only rose to mainstream scientific and political debates with the United Nations Conference on the Human Environment in Stockholm in 1972 and the the Club of Rome report on 'Limits of the Growth' (Sohn, 1973; Meadows, Meadows, Randers & Behrens, 1972).

Nowadays, facing both the consequences of an historical accumulation of environmental impacts and the rise of a global environmentalism, capitalism is challenged to adopt environmental discourses and practices in an attempt to reconcile economic growth with the limits of nature to regenerate a liveable environment for human species.

Theorisation on the reconcialiation of the environment and economic activity has build on the notion of sustainable development (Brundtland et al., 1987). Framed by the "Brundtland Report" issued by the World Commission on Environment and Development in 1987, the notion of sustainable development asserts that economic activity has to be balanced with social and environmental dimensions, a notion that spread after its operationalisation in a global agenda of goals and policies by the the United Nations Conference on Environment and Development in Rio de Janeiro in 1992 (UNCED, 1992). In this period, most of the more visible advocates of capitalist development as multilateral agencies, corporations and theorists transited from a denial of responsibities of capitalism in the production of ecological crises to a partial acceptance of environmental limits, but, more importantly, to position the greening of capitalism as a viable and necessary path to cope with environmental degradation and planetary ecosystemic challenges (Bakker, 2010).

The most relevant theorisation on reconciling capitalism and environmentalism feeding the debates on green capitalism is ecological modernisation (Latour, 2007; Mol, 2002; Buttel, 2000; or Hajer, 1996). Broadly speaking, ecological modernisation proposes a set of reforms needed to adapt developed societies and economies to the ecological challenges, as well as the adoption of proper policies to preserve the ecological 'sustenance base' of the market economy and liberal democracy (Spaargaren & Mol, 1992; Mol & Spaargaren, 2000). The assumption of ecological modernisation is that, by integrating concerns on environmental sustainability, economy can turn into a major force in contributing to solve the ecological problems it has contributed to cause (Spaargaren, Mol & Sonnenfeld, 2009). Whilst some authors emphasise how market-led technological innovations can improve the ecological efficiency of the economic and productive activity (Janicke, 2008), others focus on the role of social practices and institutional transformations that drive structural changes in developed societies (Mol & Spaargaen, 2000). Some of the principles of ecological modernisation have been popularised and developed by proponents of the greening of capitalism and the enactment of market environmentalism (McKendry, 2008). Critics of ecological modernisation consider it as a discourse that advocates policy changes without addressing those "systemic features of capitalism that make the system inherently wasteful and unmanageable" (Hajer, 1995:32). As Harvey (1996:378) asserts, ecological modernisation is a discourse that "refuses to the […] trade off between environmental concerns and economic growth in zero-sum terms" and continuously emphasises 'Win-Win' examples to reassure its profitability.

Rather than a theory green capitalism is a multitude of proposals developed under a general program for the advancement of free market and economic growth solutions in the agenda of sustainability, "a set of responses to environmental change and environmentalism that relies on harnessing capital investment, individual choices, and entrepreneurial innovation to the green cause" (Prudham, 2009:1595). The idea of developing a 'Green Economy' is depicted as a proposal for a radical greening of capitalist economy to produce what has been labelled, among others, as 'Green Capitalism', 'Climate Capitalism', or 'Natural Capitalism' (Goldstein, 2013), This is expected to be achieved by reforming corporate control, shifting to a service economy or introducing a sustainability ethics in business, to address both current environmental problems and some consensual pitfalls of capitalist development (Hawken, Lovins & Lovins, 1999; Barnes, 2006; Speth, 2008; Greer, 2001).

Green economy is considered to achieve its momentum also in a context of post 2008 crisis, and according to some critics has been positioned "to

supersede sustainable development as the hegemonic discourse in global environmental governance" (Corson, MacDonald & Neimark, 2013:3). Since then, proposals for a 'Green New Deal', 'Green Stimulus' and 'Green Economy', have sprung across the market actors and policy makers, as concepts that attempt to differentiate themselves by the models of capitalism they advocate, that is, their regulatory balance between state and markets, as well as by their models of greenness (Tienhaara, 2014).

The landmark proposals for Green Economy policies have been shaped by the United Nations Environmental Program (UNEP), which in 2008 launched the Green Economy Initiative and in 2012 organised the Rio+20 UN Conference on Sustainable Development where these ideas were world spread (Tienhaara, 2014). In the core of the UNEP definition of Green Economy lays the belief in the potential of capitalism for an absolute decoupling between environmental impacts and economic growth, that will allow the reconciliation of well-being and social equity with the reduction of environmental risks and ecological scarcities, while one of its most innovative policies prescribes the price of natural capital and the commodification of ecosystem services (Tienhaara, 2014). While original proposals for a 'Green New Deal' emphasised reforms to control the financial sector and boost energy efficiency and renewable energy, a new line of proposals for a 'Green Stimulus' stresses recovery aims rather than structural reforms (Tienhaara, 2014). These recovery policies are based on introducing fiscal stimulus to achieve economic recovery and simultaneously boost greener economic areas, as those related to low-carbon energy production, energy efficiency, as well as water, waste, and pollution control (Robbins et al., 2009), and are expected by some to help tackle climate change by backing the transition to a low-carbon economy (Edenhofer & Stern, 2009). The 'Green New Deal' has been described as a climate change politics in which apocalyptic discourses filled with scientific facts are deployed to convince the public to embrace sustainability by reforming capitalism (Goldstein, 2013). Authors as Brown (2008) and Parenti (2012) have emphasised the decisive participation of state and science technocracy in the building of a 'Green New Deal' against neoliberal economic and environmental regimes.

Whilst to proponents of green capitalism environmental problems may be 'fixed' by technological and economic changes within capitalism, for its critics this greening could entail unpredictable threats, as the concentration of economic power and knowledge in "those corporations producing and deploying the green technologies" (Harris, 2013:469). To Marxist theorists, the novelty in the current development of capitalism is that it not only means that Nature is being increasingly subsumed into Capital, but that this operation is increasingly justified by environmental concerns (Foster &

Clark, 2012, O'Connor, 1988). For its critics, green capitalism is considered "[to attach] environmental politics, semiotically and ideologically, to the reproduction of conditions of capital accumulation" (Chang & Sheppard, 2013:60).

Appendix 3. Research phases.

Phase	Objective	Timeline
Upgrade	Present a doctoral research project Preliminary literature review Preliminary research questions and hypothesis	Sep 2011 to Nov 2012
Pre-field (1st)	Case study selection Preliminary thematic guide Preliminary press review Study population sampling	Sep 2012 to Nov 2012
Fieldwork (1st)	Networking and contact Interview Exploratory trip to Chicureo Press review	Dec 2012 to Feb 2013
Pre-field (2nd)	Preliminary scanning of enclave marketing Strategy for field visits to enclaves	Feb 2012
Fieldwork (2nd)	Study population sampling Interview In situ enclave transect Online survey Press review Magazine advertisement selection	Mar 2013 to May 2013
Complementary	Remote secondary data gathering Official documents Studies and statistics Magazine advertisement selection	Jun 2013 to Dec 2014
Processing	Interviews transcription Notes transcription NVivo course Preliminary coding Photo selection Advertisement selection Transfer survey results into spreadsheet Magazine advertisement processing Data base on enclaves	Jun 2013 to Oct 2013
Analysis	Discourse analysis Content analysis Quantitative analysis of survey Visual data analysis Transect data analysis	Oct 2013 to Sept 2014
Writing	Write chapters Present first dissertation draft Revisions-Rewriting Present dissertation to examination	Oct 2014 to March 2016

Appendix 4. Interviewees' categories by primary institutional identity, sample size and gender.

Category	Actor	Institution, organization or sector	Sample	Female /Male
Developers	Developers	AGSA - Chicureo enclave developers	5	1/5
		Brotec-ICafal - Chicureo enclave developers		
		Manquehue - Chicureo enclave developers		
		Urbanya - Santiago peri urban enclave developers		
		ADI - Developers Association		
Consultants	Consultants	EA Buildings - green certification and sustainable buildings	8	4/8
		Guerrero, Olivos, Novoa y Errázuriz - lawyers		
		IDIEM - green certification and sustainable buildings		
		Panorama - landscape architecture		
		BL Benkel Larraín - architecture		
		ATISBA - urbanism		
		Hidrogeologia y Medio Ambiente Sustentable - hydrogeology		
		Harris Illanes - architecture and landscape architecture		
	Think tanks	CDT - Technological Development Centre	4	2/4
		IC - Building Institute		
		Fundacion Chile		
		CA - Architects Association		
State officials	National/Regional government	Agriculture Ministry	9	3/9
		Environment Ministry		
		Housing Ministry		
		Public Works Ministry		
	Local government	Colina municipality	2	1/2
Scholars	Scholars	University of Chile	6	0/6
		Catholic University of Chile		
		Del Desarrollo University		
		Diego Portales University		
Activists	Activists	Acción Ecológica - ecologist organization	3	1/3
		Defendamos la Ciudad - foundation		
		Red de Defensa de la Precordillera - ecologist organization		
	Community organization members	Los Canteros - quarrymen association	4	1/4
		Los Canteros - neighbours association		
		Colina water channels - users association		
Residents	ZUDC enclaves	Santa Elena enclave	11	5/11
		Pan de Azúcar enclave		
		Chamisero enclave		
		Ciudad Chicureo enclave		
	Parcelas enclaves	Las Brisas de Chicureo enclave	8	3/8
		Condominio Las Higueras enclave		
		Los Jardines de lo Pinto enclave		
Workers	Workers	Ciudad Chicureo enclave	2	1/2
		TOTAL INTERVIEWEES	62	22/62

Appendix 5. NVivo thematic nodes from interviews.

URBANISM	URBANISATION
737 references	411 references
_ wealthy municipalities attempts to improve sustainability	_ urban growth critique
_ water treatment and reuse	_ Santiago transport system failure
_ urban sustainability actors	_ capitalism models
_ study place	_ parcelas de agrado development
_ spatial inequalities -water	_ legal conflicts
_ security or population control	_ enclave urbanisation growth
_ security driver for developments	_ enclave social housing
_ security and fear	_ enclave development history
_ restricted access	_ Santiago development
_ quarry mobility	_ developers other projects
_ private services network imposition	_ Andean foothill urbanisation
_ middle class developments sustainability improvements	_ Zudc development
_ marketing sustainability critique	_ Zudc conditions
_ market led sustainability drivers	_ Zudc conditioned planning
_ market led sustainability	_ borough masterplan
_ market green leadership	_ urban planning national policy
_ local production and market	_ state urban policies failures
_ integration with other sectors	_ state laissez faire planning
_ governance enclaves	_ state inefficiency
_ governance ecological enclaves	_ PRMS
_ enclave urbanism	_ planning critique
_ enclave urban design	_ land use liberalisation
_ enclave undeveloped green features	_ foreign urban growth
_ enclave sustainability approach	_ expansion versus densification debate
_ enclave social housing	_ city planning
_ enclave services	_ state housing policies planning
_ enclave road access	_ planning regulations
_ enclave regulations	_ conditioned development other tools
_ enclave public space	_ Santiago property market
_ enclave protected nature	_ land use change and market speculation
_ enclave protected archaeology	_ land rent value
_ enclave property market	_ state developers convergence
_ enclave projects mitigation - impacts	_ property taxes
_ enclave population composition	_ municipality attitude to developers
_ enclave planning improvement	_ corruption
_ enclave ownership	_ university role
_ enclave mobility	_ think tanks role
_ enclave market services provision	_ developers demand subsidies/incentives
_ enclave houses typology	_ consultants role
_ enclave heating cooling systems	_ Santiago road governance
_ enclave green projects flagship	_ Santiago governance
_ enclave green marketing	_ new mayor Providencia and Santiago
_ enclave green areas urbanism	_ governance municipal local borough
_ enclave geography restrictions	_ developers strategy enclave
_ enclave evolution dwellers perception - impacts	_ EIA state institutions and regulations
_ enclave connection with Santiago	_ EIA governance
_ enclave building system	_ EIA enclave projects
_ enclave architecture sustainability	
_ class attitudes and sustainability	
_ city sustainability improvements	
_ Chicureo service provision	
_ Chicureo road system - impact	

CITIZENSHIP	SUSTAINABILITY
185 references	280 references
_ visual archive memory	_ sustainability regulations
_ urban invasion	_ sustainability needed improvements
_ symbolic reset	_ sustainability market
_ status	_ state water subsidies
_ state social organization convergence	_ state urban sustainability policies, institutions,
_ state role in conflicts	regulations
_ state attitude towards social organizations	_ state sustainability projects failure
_ state activist conflict	_ state sustainability policies critique
_ social relations	_ state green subsidies
_ social power	_ Santiago sewage-gas plant
_ social participation in planning	_ Santiago metabolism projects economic
_ social organizations strategies	viability
_ social organization	_ recycling land compost
_ social movement politics	_ professional approach to sustainability
_ social movement demands	_ pollution air plan PPDA
_ social identities front	_ peripheral urbanisation as sustainability
_ segregation	improvement
_ school activities	_ people motivation for green areas demand
_ rural life	_ opportunities for urban sustainability renewal
_ quarry organization	_ non-sustainable architecture urbanism
_ quarry conflict	_ LEED growth in Chile
_ private citizenship	_ greenwashing developments
_ press attitude	_ green market sustainability innovation
_ political system	improvement
_ political perspectives	_ green market propaganda
_ political independence	_ garden enclaves sustainability improvements
_ political class critique	_ green certification enclaves
_ place culture	_ green certification
_ new middle classes	_ green areas public planning
_ neighbours ecological concerns	_ green areas management
_ neighbourhood life	_ globalisation
_ lifestyle quarry	_ foreign experiences in urban sustainability
_ land conflict	_ environmental regulations for developments
_ interaction dwellers agricultural workers	_ ecological consciousness
_ increasing demand for space	_ ecologic commodification goods and services
_ gender roles	_ discourses on enclaves sustainability and
_ fear	greenness
_ family models	_ developers mentality
_ enclave workforce	_ developers market sustainability approach
_ enclave work regime	_ developers follow people
_ enclave neighbours relationships	_ developers environmentalism
_ enclave jobs	_ debates on urban sustainability process
_ enclave inhabitant identity	_ consumer economical sustainability
_ digital networks	rationalisation
_ developers strategy conflict	_ consumer economical reluctancy towards
_ developers activities organization	sustainability improvements
_ cultural change	_ conceptions of urban sustainability debates
_ consciousness system	evolution
_ consciousness political	_ Chicureo sector sustainability improvements
_ Colina population	_ agricultural productivity grows despite urban
_ citizens rights	sprawl
_ citizens participation	_ agents sustainability coordination
_ citizens organised social movements	
_ citizens duties	
_ Chicureo future	

ECOLOGY	ECOLOGY
506 references	506 references
_ impacts land use	_ workforce re-production
_ impacts fauna and flora	_ workers use of city parks
_ impacts enclave urbanisation congestion	_ workers socialisation
_ impacts borough	_ workers perception of enclave nature
_ impacts agriculture	_ worker use of enclave space
_ impact water	_ worker day regime
_ impact noise pollution	_ worker borough
_ impact material and symbolic commons appropriation	_ water scarcity
_ impact light	_ water provision, sources and utilities
_ impact infrastructure networks	_ water privatization and law
_ impact economical life costs	_ water management
_ impact air pollution	_ water law and regulations
_ construction impact	_ water infrastructure
_ dwellers workers relationship	_ water governance and market
_ dwellers work dynamics	_ water enclave
_ dwellers use of services and facilities	_ water cost enclave
_ dwellers use of natural areas	_ water consumption
_ dwellers use of common areas	_ water conflicts
_ dwellers settle in	_ water climate change
_ dwellers religiosity	_ waste recycling attitudes dwellers
_ dwellers relation with Santiago	_ waste recycling
_ dwellers relation with Colina	_ waste collection, disposal and treatment
_ dwellers previous location	_ territorial complexity
_ dwellers organization	_ stone use
_ dwellers motivation to move to enclave	_ environmental in justice
_ dwellers mobility	_ enclave water sustainability
_ dwellers house sector	_ enclave water bodies
_ dwellers everyday ecologic behaviour	_ enclave ground water
_ dwellers environmental valuation	_ enclave fauna and flora species
_ dwellers enclave comparison	_ enclave environmental impacts general
_ dwellers ecological initiatives	_ enclave environmental impacts dwellers view
_ dwellers developers conflict	_ enclave energy projects
_ dwellers demand for incentives or subsidies	_ enclave energy
_ dwellers consumption behaviour	_ enclave ecological management
_ dwellers agriculture conflict	_ enclave eco lifestyle
_ dweller sustainability valuation	_ developers raze
_ dwellers green expectations	_ developers mitigation

Appendix 6. Survey questionnaire.

1. How many years have you been living in Chicureo?

- Less than 1
- 1 to 4
- 5 to 9
- 10 or more

2. Before dwelling in Chicureo you use to live in the following borough:

- Las Condes, Vitacura o Lo Barnechea
- Santiago, Providencia, Ñuñoa o La Reina
- Colina
- Other from the Metropolitan Region
- Other from abroad

3. From the following possible motivations, please indicate how relevant each one was in your decision to live in Chicureo:

	Not relevant at all or almost not relevant	Little relevance	Rather relevant	Very relevant or totally relevant
Exclusivity/distinction				
Privacy/tranquility				
Security				
Price/opportunity				
Access/mobility				
Schools/education				
Neighbourhood life/community				
Nature/environment				
Sustainable technologies/ecological design				

4. In what sector of Chicureo do you live?

- Piedra Roja
- Hacienda de Chicureo
- Chamisero
- La Reserva
- Las Brisas de Chicureo
- EcoUrbe Santa Elena
- Around Chicureo Avenue
- Ayres de Chicureo
- Remanso de Chicureo
- Sector La Luz
- Santa Cecilia/Lo Pinto
- La Sierra de Chicureo
- Other (which?)

5. You would say that your house is placed in:

- A detached allotment (parcela)
- A compound of parcelas
- A condominium or private neighbourhood
- An urban neighbourhood/low income settlement (población)

6. In a typical week, how do you and your family move to the following places?

	Mostly by private car	Mostly by public transport	Mostly walking/bicycle	Mostly combining car and other transport modes
Workplace				
Study place				
Shopping				
Recreate/amusement				
Access/mobility				

7. How often do you go to the following places?

	Never or almost never	Once a month	Once a fortnight	Once a week	Daily
Commerce/services in Colina					
Commerce/services in Chicureo					
Commerce/services in Santiago					
Workplace outside Chicureo					
Study place in Chicureo					
Study place outside Chicureo					

8. How often you or a family member visits a recycling clean spot?

- Once a week
- Once a fortnight
- Once a month
- Never or almost never

9. What critique would you make to the recycling system of Chicureo?

- Not enough to the number of residents
- Lack of diffusion/promotion of its use
- Its use was to be mandatory
- Demands too much previous work of triage/separation
- They make a profit with my waste
- There is low transparency levels about the waste destiny
- Must be integrated in the municipal waste collection system
- I have no critiques
- Other (explain)

10. What would be your estimate of your home's monthly bills of water, electricity and gas, comparing a Summer and a Winter month?

	Less than $50,000	Between $50,000 and $125,000	Between $125,000 and $225,000	More than $225,000
Water/bottled water/sewage (Summer month)				
Water/bottled water/sewage (Winter month)				
Electricity (Summer month)				
Electricity (Winter month)				
Gas and paraffin (Summer month)				
Gas and paraffin (Winter month)				

11. How often do you buy food and basic goods from the following commerce?

	Never or almost never	Sometimes	Always or almost always	Electricity (Summer month)
Supermarket and large stores in Santiago				
Supermarkets in Chicureo				
Supermarkets in Colina				
Small local commerce/shops				
Self production				

*Other (explain)

12. How willing to pay are you for infrastructure/equipment/services that save energy/water?

- Not willing
- Little willing
- Neither few not much willingness
- Rather willing
- Very much willing

13. Please value the following environmental attributes of Chicureo:

	No value	Few value	Some value	Many value
Urban design and landscaping of condominium and/or house				
Possibility of walking, excursions, trips				
Sustainable technologies of water/energy savings/efficiency, etc.				
Outdoor sport facilities and recreation as lagoons, golf courses, polo courses, etc.				
The motorways easing connectivity				
The natural landscape of the valley and foothills				

14. Please indicate which are, in your opinion, the 3 main environmental problems of Chicureo:

- Water quality or access
- Water overconsumption
- Air pollution
- Excess of waste
- Lack of recycling
- High energy consumption
- Lack of sustainable technologies
- Climate change
- Plagues (animals/plants)
- Lack of a good standard public transport
- Loss of agricultural soil
- Destruction of natural ecosystems
- Lack of a city centre/central plaza
- Lack of public parks
- Loss of landscapes
- Lack of local jobs and services

15. How do you perceive the environmental behaviour of the following social groups with regard to Chicureo?

	Very negative	Rather negative	Neither negative nor positive	Rather positive	Very positive
Neighbours from your sector					
Residents in Chicureo in general					
Residents in Colina & *poblaciones*					
Visitors					
Property developers					
Constructors and workers					
House maids/nanas					
Farmers and agricultural workers					
Quarrymen/stonemasons					
Transporters					
Car drivers					
Municipal authorities					
Municipal workers					

16. If you were asked to provide a definition, where will you put the emphasis in the notion of ecological citizenship?

- In our environmental responsibilities towards others (unknown others, future generations, other species).
- In our rights to a clean environment and sustainable use of natural resources
- In a balanced combination between rights and responsibilities

17. How much do you agree with the following statement: “to live in Chicureo has made me develop a more ecological citizenship”.

- Total disagreement
- Some disagreement
- Neither agreement nor disagreement
- Some agreement
- Total agreement

18. In your opinion, who holds the largest responsibility in relation to the environmental issues in Chicureo?

- Borough
- State/government
- Developers
- Private companies/utilities
- Residents of Chicureo
- Citizenship of Santiago Metropolitan Region
- Other (explain)

19. In your opinion, how ecological is Chicureo?

	Chicureo is much less ecological than...	Chicureo is more or less the same ecological	Chicureo is much more ecological than...
Santiago centre			
Borough of Pudahuel			
Borough of Las Condes			
El Golf business district			
Borough of Quilicura			
Entrepreneurial City of Huechuraba			
Borough of Peñalolén			
Borough of Ñuñoa			

20. How much relevance to you think the following factors have to improve the environmental quality of Chicureo?

	Not relevant at all or almost not relevant	Some relevance	Neither relevant nor irrelevant	Rather relevant	Very relevant or totally relevant
Increase the use of sustainable technologies					
Increase scientific research					
Promote public policies of environmental regulation and conservation					
Promote public policies of environmental economic incentives					
Strength democracy and people's participation					
Strength the private sector's sense of environmental responsibility					
Strength the individuals sense of environmental responsibility					
Allow the free market action					
Improve the social integration and living together					
Fight segregation and inequality					

Appendix 7. Field trip log.

Description of field section visited	Date	Trip num.
Enclave	28-11-2012	1
High street	28-11-2012	1
Public highway	28-11-2012	1
Road	28-11-2012	1
Enclave	15-12-2012	2
Enclave	15-12-2012	2
Private highway	15-12-2012	2
City	09-01-2013	3
Enclave	09-01-2013	3
Public highway	09-01-2013	3
Public highway	09-01-2013	3
Road	09-01-2013	3
Road	09-01-2013	3
City	12-01-2013	4
Enclave	12-01-2013	4
Public highway	12-01-2013	4
City	21-03-2013	5
Enclave	21-03-2013	5
Public highway	21-03-2013	5
Enclave	26-03-2013	6
Private highway	26-03-2013	6
Enclave	03-04-2013	7
Enclave	03-04-2013	7
Enclave	03-04-2013	7
Periphery	03-04-2013	7
Public highway	03-04-2013	7
Enclave	04-04-2013	8
Private highway	04-04-2013	8
Periphery	07-04-2013	9
Private highway	07-04-2013	9
Enclave	08-04-2013	10
Enclave	08-04-2013	10
Enclave	08-04-2013	10
Enclave	08-04-2013	10
Enclave	08-04-2013	10
Enclave	08-04-2013	10
Enclave	08-04-2013	10
Enclave	08-04-2013	10
Hill	08-04-2013	10
Periphery	08-04-2013	10
Private highway	08-04-2013	10
Public highway	08-04-2013	10
Enclave	11-04-2013	11
Enclave	11-04-2013	11
Enclave	11-04-2013	11
Enclave	11-04-2013	11
Private highway	11-04-2013	11

Description of field section visited	Date	Trip num.
Enclave	13-04-2013	12
Public highway	13-04-2013	12
Enclave	14-04-2013	13
Public highway	14-04-2013	13
Enclave	15-04-2013	14
Enclave	15-04-2013	14
Enclave	15-04-2013	14
Public highway	15-04-2013	14
Road	15-04-2013	14
Enclave	16-04-2013	15
Public highway	16-04-2013	15
City	17-04-2013	16
City	17-04-2013	16
Enclave	17-04-2013	16
Enclave	17-04-2013	16
High street	17-04-2013	16
Private highway	17-04-2013	16
Public highway	17-04-2013	16
Road	17-04-2013	16
Enclave	18-04-2013	17
Enclave	18-04-2013	17
Public highway	18-04-2013	17
City	20-04-2013	18
Enclave	20-04-2013	18
Enclave	20-04-2013	18
Public highway	20-04-2013	18
Road	20-12-2014	19
Enclave	20-12-2014	19
Enclave	20-12-2014	19
Enclave	20-12-2014	19
High street	20-12-2014	19

Appendix 8. Contents of environmental assessment file by type.

Data	Document
Developers	DIA-EIA
Localisation	
Scale	
Urbanism	
Architecture	
Landscaping	
Basic infrastructure plan	
Timeline and stages	
Expected units and population	
Environmental impacts	
Ecological baseline	EIA
Mitigation and compensation	RCA
Project approval or refusal	RCA

Appendix 9. Media sample.

Media	Format	Tendency
El Mercurio	Newspaper (printed and online edition)	Conservative elite
La Tercera	Newspaper (printed and online edition)	Liberal elite
La Segunda	Newspaper (online edition)	Conservative elite
Que Pasa	Magazine (online edition)	Liberal elite
Terra	Online news	Foreign news agency
Pulso	Online news	Liberal elite
Chicureo.com	Online news	Local news
El Dinamo	Online news	Left wing
The Huffington Post	Online news and opinion	Liberal global elite

Appendix 10. Blogs as sources of media content.

Title	Source
La desdemona	http://ladesdemona.blogspot.com/2012_03_01_archive.html
Asalto a la Hacienda Chicureo	http://chicureo1926.blogspot.com/
Hugo's Blog	http://evoluciochicureo.weebly.com/
Gringa de Chicureo	http://gringadchicureo.com/tag/chicureo/
Trafico de Influencias	http://traficodeinfluencias.blogspot.com/2012/01/carta-abierta-ines-perez-la-dona-de.html
Politica Publica.cl	http://www.politicapublica.cl/2012/01/12/chicureo-o-lo-peor-de-lo-nuestro-por-iskra-pavez-soto/
Manos de Chicureo	http://patchworkmipasion.blogspot.com/2009/06/manos-de-chicureo.html
The Twin Birds	http://thetwinbirds.blogspot.com/2011/09/panorama-chicureo-bazar.html
La Sierra de Chicureo	http://lasierradechicureo.blogspot.com/
Piedras de Chicureo	http://wwwpiedraschicureo.blogspot.com/
Alobos75	http://alobos75.wordpress.com/tag/chicureo/
El Cantar de la Lluvia	http://elcantardelalluvia.cl/2006/11/meseta-en-chicureo.html
Propiedad Facil	http://blog.propiedadfacil.cl/siguiendo-la-ruta-de-los-famosos
Secundarios.com	http://www.secundarios.com/estudiantes/threads/solución-nanas-chicureo.67968/
Colina linda	http://colinalinda.blogspot.com
Chicureo, el lugar	https://twitter.com/chicureo

Appendix 11. Sample of magazines for marketing analysis.

Title	Examined editions	Period	Type
CA - Ciudad Arquitectura	8	Oct 2011 to Jan 2013	Architecture
dContruccion	13	Feb 2012 to Jan 2013	Building industry
SustentaBit	15	Jun 2009 to Dec 2012	Building industry
EnConcreto	14	Oct 2011 to Jan 2013	Building industry
VD Vivienda y Decoración	8	Nov 2012 to Jan 2013	Architecture, Landscape Architecture and Decoration
MásDeco	8	Nov 2012 to Jan 2013	Architecture, Landscape Architecture and Decoration
Capital	4	Nov 2012 to Jan 2013	Business
Qué Pasa	4	Nov 2012 to Jan 2013	Politics
ED	4	Nov 2012 to Jan 2013	Architecture, Decoration and Housing Design

Appendix 12. Website revision per category of actor.

Category	Website owner	Number of issues examined
Private sector	Developers	39
	Property estates agents	6
	Motorway concessioner	2
	Water/electricity/recycling company	5
	Consultants	6
State	Ministries	9
	Local government	1
	Superintendents	2
Civil society	Think tanks	3
	Universities	5
	Social/activist organizations	3
	NGOs/Foundations	7
	Chambers and association	7

Appendix 13. List of webpages reviewed.

PRIVATE SECTOR		
Actor	Type	Source
TriCiclos	Private utility company	http://www.triciclos.cl
Aguas Manquehue - Aguas Andinas	Private utility company	http://www.aguasandinas.cl/
Sembcorp Aguas Chacabuco S.A.	Private utility company	http://www.sembcorp-aguaschacabuco.cl/index.php
Ecoline	Private utility company	http://www.ecoline.cl/
Altos de Chamisero	Private Developer	http://www.altosdechamisero.cl/
Piedra Roja	Private Developer	http://www.piedraroja.cl
Aconcagua S.A.	Private Developer	www.iaconcagua.com
Agsa	Private Developer	www.agsa.cl
Almagro S.A.	Private Developer	www.almagro.cl
Artyco	Private Developer	http://www.artycochile.cl/
Avellaneda	Private Developer	www.constructoraavellaneda.cl
Beltec Inmlbiliaria	Private Developer	www.beltec.cl
Besalco Inmobiliaria	Private Developer	www.besalcoinmobiliaria.cl
Brotec Icafal S.A.	Private Developer	www.brotec-icafal.cl
Cimenta S.A.	Private Developer	www.cimenta.cl
Crillón Desarrollos Inmobiliarios S.A.	Private Developer	www.crillon.cl
DEISA Desarrollo Inmobiliario Santolaya Ltda.	Private Developer	www.deisa.cl
Enaco S.A.	Private Developer	www.enaco.cl
Desarrollo Inmobiliario FFV S.A.	Private Developer	www.ffv.cl
GA Inmobiliaria	Private Developer	www.cdelosvalles.cl
Inmobiliaria Lo Campino	Private Developer	www.vallelocampino.cl
Inmobiliaria Las Pircas	Private Developer	www.laspircas.cl
Inmobiliaria Manquehue Ltda.	Private Developer	www.imanquehue.com
La Reserva Inmobiliaria	Private Developer	www.lareserva.cl
Marafuera S.A.	Private Developer	www.marafuera.cl
Numancia Ltda.	Private Developer	http://www.numancia.cl/
Parque Arauca Ltda.	Private Developer	www.parquearauco.cl
Paz Corp Ltda	Private Developer	www.pazcorp.cl
Penta Inmobiliaria	Private Developer	www.pentainmobiliaria.cl
Inmobiliaria PY S.A.	Private Developer	www.py.cl
RVC Corp	Private Developer	www.rvc.cl
Siena Inmobiliaria	Private Developer	www.siena.cl
Sinergia Inmobiliaria S.A.	Private Developer	www.isinergia.com
Inmobiliaria Socovesa S.A.	Private Developer	www.socovesa.cl
Desarrolladora Inmobiliaria y Constructora Valle Grande S.A.	Private Developer	www.vallegrande.cl
Fernandez Wood S.A.	Private Developer	http://www.fernandezwood.cl/
Wood Inmobiliaria	Private Developer	www.iwood.cl
Inmobiliaria IMSA	Private Developer	www.imsa.cl
Empresa Constructora BELFI S.A.	Private Developer	http://www.belfi.cl

PRIVATE SECTOR		
Actor	Type	Source
H&C Inversiones	Private Developer	http://www.hycinversiones.cl
Idea Inmobiliaria	Private Developer	http://www.idea.cl/
Portal Inmobiliario	Estate Agents	www.portalinmobiliario.cl
Trovit Casas	Estate Agents	http://casas.trovit.cl/
El Inmobiliario	Estate Agents	http://www.elinmobiliario.cl/
Pabellon de la Construcción	Estate Agents	www.pabellon.cl
Cecilia Gimeno	Estate Agents	http://www.ceciliagimeno.cl/
El Barrio Propiedades	Estate Agents	http://www.elbarrio.cl/
Atisba	Consultant firm	http://atisba.cl/
EA Buildings	Consultant firm	http://www.ea-buildings.com/
IDIEM Universidad de Chile	Consultant firm	http://www.idiem.cl/
Miranda y Nasi	Consultant firm	http://www.sellocasaverde.com/inicio.html
Guerrero, Olivos, Novoa y Errázuriz	Consultant firm	http://www.guerrero.cl/
Panorama Consultores Ltda.	Consultant firm	http://www.panoramaweb.cl
Association of Private Estate Developers - ADI	National Chamber	http://www.adi-ag.cl
Chilean Association of Architects - CA	National Chamber	http://www.colegioarquitectos.com/
Association of Architects Offices - AOA	National Chamber	http://aoa.cl/
Chilean Institute of Landscape Architects	National Chamber	http://www.ichap.cl/
National Chamber of Real Estate Services - ACOP	National Chamber	http://www.acop.cl/

CIVIL SOCIETY		
Actor	Type	Source
Green Building Council Chile	Council	http://www.chilegbc.cl/
Centro de Investigación y Planificación para el Medio Ambiente - CIPMA	NGO/Foundation	http://www.cipma.cl
Instituto de Ecología Política	NGO/Foundation	http://www.iepe.org/2011/
Defendamos la Ciudad	NGO/Foundation	www.defendamoslaciudad.cl/
Fundacion Terram	NGO/Foundation	http://www.terram.cl/
Chile Sustentable	NGO/Foundation	http://www.chilesustentable.net/
Observatorio Latinoamericano de Conflictos Ambientales	NGO/Foundation	http://www.olca.cl/oca/index.htm
Casa de la Paz	NGO/Foundation	http://www.casadelapaz.cl/
Red por la Defensa de la Pre Cordillera	Social organization	www.redprecordillera.cl
Salvemos El Panul	Social organization	http://defensapanul.wordpress.com/
Acción Ecológica	Social organization	http://www.accionecologica.cl/
Building Institute IC	Technical Adviser	http://www.iconstruccion.cl/
Technological Development Corporation - CDT CCHC	Technical Adviser	http://www.cdt.cl
Fundación Chile	Technical Adviser	http://www.fundacionchile.com/home
Diego Portales University - UDP Faculty of Architecture Arts and Design	University	http://www.udp.cl/facultades%5Fcarreras/arquitectura%2Dartes%2Ddiseno/
Chilean Catholic University - PUC Geography department	University	www.geo.puc.cl/
PUC - Institute of Urban and Territorial Studies IEUT - Urban Sustainability Centre	University	http://www.ieut.cl/
Development University - UDD - Faculty of Architecture and Art	University	http://arquitectura.udd.cl/
University of Chile UCH - Geography department	University	http://www.fau.uchile.cl/portal/departamentos/geografia/63396/presentacion

STATE		
Actor	Type	Source
Municipalidad de Colina	Municipality	www.colina.cl
Housing Ministry - MINVU	Ministry	http://www.minvu.cl
Environment Ministry - MMA	Ministry	http://www.mma.cl
Metropolitan Region Ministry Secretary - SEREMI MINVU	Ministry Division	http://www.seremi13minvu.cl/
Direction of Technology - DITEC MINVU	Ministry Division	http://www.minvu.cl/opensite_20070227165957.aspx
Environmental Assessment Service - SEA MMA	Ministry Division	http://www.seia.cl
Urban Development Division - DDU MINVU	Ministry Division	http://www.minvu.cl/opensite_20070212170027.aspx
Servicio Agricola Ganadero - SAG	Ministry Division	http://www.sag.cl
Dirección General de Aguas - DGA	Ministry Division	http://www.dga.cl
Dirección de Obras Hidráulicas - DOH	Ministry Division	http://www.doh.cl
Superintendencia de Servicios Sanitarios - SISS	Regulator	http://www.siss.cl
Superintendencia de Electricidad y Combustible - SEC	Regulator	http://www.sec.cl

Appendix 14. Main questions in interviews per category of actor.

Appendix 14.1 Developers.

- Do you know of projects that are using certification schemes in urban sustainability to develop their projects?
- Would you say that high-income groups of consumers have more awareness of the economic efficiency of sustainability improvements?
- Thinking on the case of Buenos Aires, where some private developments for high income groups have taken a choice for the green instead of following a standard in urban sustainability: would you say the same is happening in Santiago?
- At what rate do you think are the new private developments in the adopting being developed with urban sustainability innovations?
- What is the role of market initiatives in the emergence of more sustainable developments?
- I realised the marketing of the projects is emphasising a lot attributes of green, ecological, natural or sustainable ones. Do you agree with me? If yes, why do you think this is happening?
- Is the final consumer willing to pay for a greener housing product?
- Can you describe the basics of your projects? Size, houses, price, urbanism, design, infrastructure, services, transport, etc.
- How is your project adopting green standards or improvements in urban sustainability?
- Are there specific innovations in sustainability in the houses of the project?
- How did you solve the water issues in your own project, in a dry area?
- Are you using state subsidies to develop any sustainability improvement?
- How did your project enter the SEIA?
- What are the environmental liabilities of your project?
- How important is the landscaping and gardening for this project development?
- How did your project solved the mandatory are of 5% for social housing?
- Are state enacted regulations and technical standards boosting the emergence of more sustainable developments?
- Overall how do you see Santiago in a path towards a sustainable or green city?
- How do you perceive the adoption of sustainability policies and discourses by the property market?
- Do you think the developments in Chicureo are worth to be considered sustainable or green?
- Do the municipalities play any relevant role in promoting urban sustainability in the projects in Chicureo?
- In the case of waste management and recycling, are the new condominiums in Chicureo promoting recycling?
- In the case of water, are the new condominiums in Chicureo promoting water efficiency and savings?
- What is the standard of wastewater treatment in the new condominiums in Chicureo?
- How is the cost treatment of wastewater being funded: by costumers, by utilities or by the state?
- Who is in charge of operation and maintenance of the new developments once they get inhabited?
- Do you think the debate of planners, authorities and developers about the urban limits of Santiago and the densification versus expansion divide does matter?

- What do you think on the need of tax and financial incentives to the market to developed urban sustainability?
- Can you list please some projects you consider flagship of urban sustainability in Santiago?
- Can you suggest me one or more people worth to interview?
- Do you think Santiago's property market, with high rate of building and high rate of bank loans is under threat to become a bubble?
- What actors do you see pushing the debate on urban sustainability in Santiago?
- What is your opinion of the conditioned development schemes as those of Chicureo?

Appendix 14.2 Consultants.

- Can you broadly describe the activity of your bureau?
- Do you work with certification schemes for urban sustainability?
- Who are your clients? What do they demand?
- Are developers willing to develop more sustainable or greener projects?
- Overall how do you see Santiago in a path towards a sustainable or green city?
- How do you perceive the adoption of sustainability policies and discourses by the property market?
- What actors do you see pushing the debate on urban sustainability in Santiago?
- What is your opinion of the conditioned development schemes as those of Chicureo?
- What are the paradigms on sustainability you take in account to develop your projects?
- Why do you think there is a boom in LEED certification in Santiago?
- Do you know projects adopting certification schemes in Chicureo?
- How does certification increase the value of a project?
- Which are the usual partners and counterparts of your bureau?
- Do you perceive an increase in the coordination of public and private actors involved in developing urban sustainability?
- Are the initiatives in urban sustainability in Santiago directed to high income groups only?
- Are developers and residents in Chicureo extracting water illegally?
- Can you explain to me the water market?
- Is the water table in Chicureo being depleted?
- How does the hydrological system of Chicureo works?
- In average how much water uses an urban dweller in Santiago?
- What is the role of the public agencies in water governance?
- How is defined and measured water efficiency in Santiago?
- Do you think the developments in Chicureo are worth to be considered sustainable or green?
- Do you think there is an increase in the ecological consciousness of the population? And what about the developers?
- In your area who do you consider is contributing to urban sustainability?
- I realised the marketing of the projects is emphasising a lot attributes of green, ecological, natural or sustainable ones. Do you agree with me? If yes, why do you think this is happening?
- What is the contribution of your bureau in developing new standards or new certification in urban sustainability?
- What would be a green or sustainable project of a private development?
- In your experience, what would make a sustainable neighbourhood?
- May I know what projects is your office working on now?
- How does it work, the LEED certification process for a building?
- Can you explain how does the ZUDC planning work?
- How is the social housing issue being solved by developers in Chicureo?
- What are the improvements in urban sustainability the new metropolitan masterplan brings?
- What is the role of mayors in the metropolitan masterplan?
- What is the role of the landscape architect in introducing sustainability in the housing projects for developers?

- What is the role of education in improving sustainability levels in the property industry?
- Is there a link between lack of know-how and professional capabilities and the degree of urban sustainability a city can achieve?
- Has been any significant evolution in urban sustainability both in policies and the industry since you entered your professional activity as a consultant?
- Do the municipalities play any relevant role in promoting urban sustainability in the projects in Chicureo?
- Do you see any advancement in the waste management and recycling in Chicureo?
- Can you list please some projects you consider flagship of urban sustainability in Santiago and Chicureo?
- Can you suggest me one or more people worth to interview?

Appendix 14.3 Residents.

- Where do you live? Can you please describe your place?
- Is your house in a parcela or a condominium?
- Who do you life with?
- When did you move to Chicureo? Why?
- Where did you live before?
- When you first came was your neighbourhood already inhabited?
- Are all your neighbourhoods the owners of their houses? Do you of people renting their houses in Chicureo?
- What kind of people lives in your neighbourhood? Can this description be applied to all Chicureo?
- What did attract you the most in your property? Do you consider greenness and sustainability played a central role in your choice? Why?
- How is your every day life? Do you or any other member of your family work, study, shop in Santiago?
- Where do you go in Santiago and how often?
- What travel mode and route do you/family use?
- Do you or any other member of your family go often to Colina town? What for?
- I think most people in Chicureo avoid to go to Colina. Do you agree with this idea? Why?
- How do you move inside and outside the neighbourhood? Can you describe the transport system that serves Chicureo?
- Are there bottlenecks in Chicureo?
- How do you describe the environment of Chicureo?
- How has Chicureo evolved since you moved in here?
- Does your house have any improvement in sustainability, for instance in design or efficiency?
- How does the waste management system works in your neighbourhood?
- Do you or any other member of your family use the recycling facilities? How often?
- What is your opinion of the recycling system?
- Do you see any advancement in the waste management and recycling in Chicureo?
- Besides the bins in Santa Elena and Piedra Roja do know of any other scheme of recycling in Chicureo?
- How do you manage the house's organic waste?
- How does the water and sanitation scheme of your neighbourhood works?
- Have you heard about this arsenic pollution on water in a neighbour borough? Does this concerns you?
- How do you water the garden? How often? Where does the water comes from?
- Do you know how where does the water for the neighbourhood gardens comes from?
- How do your hose get electricity? What is the utility servicing your neighbourhood?
- How expensive is to live in Chicureo?
- How much do you pay monthly on basic services? Is it cheap or expensive?
- Have you had problems in the supply or quality of basic services?
- Kids more often aware of environmental issues and sustainability than adults. Do you think this sentence applies to Chicureo?
- Do the municipalities play any relevant role in promoting urban sustainability in

the projects in Chicureo?

- Can you list please some projects you consider flagship of urban sustainability in Santiago and Chicureo?
- Overall do you see Santiago in a path towards a sustainable or green city?
- Do you consider Chicureo/your neighbourhood as green/sustainable/eco/natural? Why?
- How much did the developer emphasise greenness as an attribute of this neighbourhood?
- Did the developer offered you specific improvements in sustainability? Can you remember them?
- Do you see any environmental problem or conflict in Chicureo?
- Does life here makes you more aware of environmental issues?
- How do you rate the ecological consciousness of your neighbours? Can you explain me why?
- What is lacking Chicureo?
- What can be done to improve sustainability in Chicureo/your neighbourhood?
- Do you have plagues? What is the usual fauna here?
- In your opinion what are the main environmental impacts of Chicureo?
- As neighbours do you have any organization?
- Is Chicureo well represented in the municipal council?
- Do people here participate in politics?
- How is the relationship between residents and developers? Are there conflicts? How are these solved?
- Do you know about the enclave regulations? What do you think of it?
- Do you have a nana? What is her role?
- Is there social integration in Chicureo?
- How is social life in Chicureo?
- Do the municipality play any relevant role in promoting urban sustainability in the projects in Chicureo?
- Do the municipality develops activities for the residents of this neighbourhood? Which?
- Do the developers do activities for the residents of this neighbourhood? Which?
- Do you consider security plays a central role in life in Chicureo?
- Is there too much crime in Chicureo? Are residents afraid?
- How often you or your family use the green areas and facilities in Chicureo? Which ones?
- Do you know of any public space in Chicureo?
- Do you ride a bike in Chicureo? Do you run? Do you do trekking or walking in the nearby hills? Where do you go and how often?
- Do you know of any ecological reserve or natural park in Chicureo?
- Do you know about the quarrymen village and their conflict with the developer? Do you have an opinion on this issue?
- Do you buy from rural villagers of Chicureo? Do you know any local shop?
- Do residents of the enclaves establish relationships with people from the rural villages?
- I noticed there are new supermarkets and shopping centre in construction. In your opinion is this a good thing for Chicureo?
- What are the pitfalls of living in a private neighbourhood?
- Do you play golf? Do you visit the golf clubs?
- Do you identify yourself with being from Chicureo or rather with Santiago?
- Can you suggest me one or more people worth to interview?

Appendix 14.4 Scholars.

- What is your field of interest and scholarship?
- How is urban development in Chicureo related to your own research topics?
- What is the scope of your academic unit?
- Overall do you see Santiago in a path towards a sustainable or green city?
- What actors do you see pushing the debate on urban sustainability in Santiago?
- Do you think there is an increase in the ecological consciousness of the population? And what about the developers?
- Do the municipalities play any relevant role in promoting urban sustainability in Santiago/Chicureo?
- Can you list please some projects you consider flagship of urban sustainability in Santiago and Chicureo?
- Do you see improvements in urban sustainability in Chicureo?
- What do you think on the need of tax and financial incentives to the market to developed urban sustainability?
- How is your assessment of Chicureo's urban development?
- In your opinion how is neoliberalism related to the development of Chicureo?
- How may urban neoliberalism affected the environmental regime in Chicureo?
- Why is people being attracted to that place? Do any kind of environmentalism play a relevant role in people's decision?
- What are the main impacts of Chicureo urban development?
- Is Santiago's property market turning 'green'? What is the driver of advancements in urban sustainability, if any?
- I realised the marketing of the projects is emphasising a lot attributes of green, ecological, natural or sustainable ones. Do you agree? If yes, why do you think this is happening?
- What problems and goals led to the development of the ZUDC policies?
- In your opinion, does the ZUDC policies been successful?
- What has changes in urban policies since the introduction of the ZUDC?
- Is conditioned planning now the standard of planning?
- Is Chicureo an urban part of Santiago?
- Which has been the role of the state in achieving or not better sustainability standards?
- What is the role of market initiatives in the emergence of more sustainable developments?
- Is the lack of a metropolitan government an obstacle to developed better policies on sustainability?
- What is are the main environmental discourses among the actors involved in the production of Chicureo?
- Are everyday practices and behaviours changing along with the rise of environmental discourses?
- What is the role of environmental regulations in the development of the enclaves in Chicureo?
- What has been the role of planning policies in promoting a more sustainable city?
- What is the role if scientific knowledge in establishing sustainability standards?
- What has been the role of scholars in the adoption of sustainability discourses and practices in urban policies and planning in Santiago?
- Do you see any link between local environmental conflicts and the country's political context?

- Do you see environmental conflicts as a sign of strength of our democracy?
- Are there the enclaves in Chicureo worsening segregation and social discrimination issues?
- Why do you think there is a boom in LEED certification in Santiago?
- Can you suggest me one or more people worth to interview?

Appendix 14.5 Workers.

- How long have you been working in Chicureo?
- Why did you move to work in here, and how did you get the job?
- Where are you originally from?
- Where do you live and how do you get to the work and return everyday? Time, transports, cost, etc.
- How much do you pay in rent?
- What is your job? How is your routine in a normal workday?
- Do you use manage the use of water in your job?
- Are you satisfied with your work?
- Where do your employers buy food and basic goods?
- Do you have breaks or lunch time?
- How do your employers solve heating issues?
- Can you walk free through the condominium?
- Can you use the common areas of the enclave?
- Have you had issues with the security for being in the enclave?
- Do you have to use uniform?
- Do you meet other people working in Chicureo? Do you have meetings?
- Do you think Chicureo is a green place? Does it have more nature than in other places in the city?
- What green areas do you use when not in here?
- Do you think people of Chicureo care about the environment? How do they show this care?
- In your opinion, do your employer care about the environment?

Appendix 14.6 State officials.

- What is your work? How does it relate to urban sustainability?
- What are the current goals of your unit in urban sustainability?
- How is your unit involved in the development of Chicureo?
- What are the usual steps property developers have to take to build private neighbourhoods?
- Which has been the role of the state in achieving or not better sustainability standards?
- What is the vision of urban sustainability of the state?
- What is the role of environmental regulations in the development of the enclaves in Chicureo?
- What has been the role of planning policies in promoting a more sustainable city?
- Is the lack of a metropolitan government an obstacle to developed better policies on sustainability?
- How is the work of the many institutions, units and government levels involved in urban sustainability being coordinated?
- Which are most remarkable of the state in driving urban sustainability?
- And which are most remarkable still unachieved goals?
- Can you briefly explain how does the governance of Chicureo works?
- How was the approval process of the enclave projects in Chicureo?
- What were the conflict in that process?
- What were the most relevant environmental conditions set by the regulation?
- What were the most relevant environmental conditions set by the environmental approval process?
- What is the status of the decontamination plan PPDA? How is it related to the enclaves?
- What are the most relevant regulations in relation to the enclaves sustainability?
- How is the borough's masterplan related to sustainability policies in Chicureo?
- Overall do you see Santiago in a path towards a sustainable or green city?
- What actors do you see pushing the debate on urban sustainability in Santiago?
- Do you think there is an increase in the ecological consciousness of the population? And what about the developers?
- Do the municipalities play any relevant role in promoting urban sustainability in Santiago/Chicureo?
- What are the main impacts of Chicureo urban development?
- What can be considered the most urgent environmental problems to solve in Chicureo?
- Is there a link between environmental problems and segregation and inequality?
- How has evolved Chicureo from a planning perspective?
- Do you see improvements in urban sustainability in Chicureo?
- What do you think on the need of tax and financial incentives to the market to developed urban sustainability?
- How is your assessment of Chicureo's urban development?
- In your opinion how is neoliberalism related to the development of Chicureo?
- How may urban neoliberalism affected the environmental regime in Chicureo?
- Can you explain the governance of water and the system of water rights in Chicureo?
- Why is people being attracted to that place? Do any kind of environmentalism play a relevant role in people's decision?

- Is Santiago's property market turning 'green'? What is the driver of advancements in urban sustainability, if any?
- I realised the marketing of the projects is emphasising a lot attributes of green, ecological, natural or sustainable ones. Do you agree? If yes, why do you think this is happening?
- What problems and goals led to the development of the ZUDC policies?
- In your opinion, does the ZUDC policies been successful?
- What has changes in urban policies since the introduction of the ZUDC?
- Is conditioned planning now the standard of planning?
- What is the role of the private sector in the emergence of more sustainable developments?
- Do you see any link between local environmental conflicts and the country's political context?
- Do you see environmental conflicts as a sign of strength of our democracy?
- Are there the enclaves in Chicureo worsening segregation and social discrimination issues?
- Why do you think there is a boom in LEED certification in Santiago?
- Can you list please some projects you consider flagship of urban sustainability in Santiago and Chicureo?
- Can you suggest me one or more people worth to interview?

Appendix 14.7 Activists.

- Can you broadly describe the activity of your organization?
- In general terms who participates in your organization?
- How do you define your activism? What is your main cause?
- Overall do you see Santiago in a path towards a sustainable or green city?
- What actors do you see pushing the debate on urban sustainability in Santiago?
- Do the municipalities play any relevant role in promoting urban sustainability in Santiago/Chicureo?
- Can you list please some projects you consider flagship of urban sustainability in Santiago and Chicureo?
- Do you consider Chicureo/your neighbourhood as green/sustainable/eco/natural? Why?
- How is your assessment of Chicureo's urban development?
- What is your opinion of the performance of politicians in representing your concerns?
- What is the main conflict and how did it originated?
- Which are the sides and the actors involved in the conflict? How have coalitions developed? Have alliances changed?
- Have developers tried to negotiate?
- What role has played the SEIA in this conflict?
- How do you see the role of public authorities in your conflict? Has it changed?
- Are developers willing to develop more sustainable or greener projects?
- Is there support in the public opinion/other organizations of the civil society for your cause? In general terms, what kind of support?
- Do you see any link between local environmental conflicts and the country's political context?
- Do you see environmental conflicts as a sign of strength of our democracy?
- Can you describe the basic architecture of the agricultural canal system in the borough?
- Do developers participate in the management of water canals in Chicureo? How?
- What are the origins of this community?
- How is water involved in your conflict?
- What water scheme serves the community?
- What role plays education in your conflict?
- What role has played the justice system in your conflict?
- What is the main economic activity in this community?
- Is the youth concerned of these issues?
- Can you describe the environmental attributes of the area in conflict?
- How has the conflict changed your perception of the area in dispute?
- Is there any economic trade between the community and the project developers?
- Do you consider the rise of environmental and grassroots movements can drive major changes in the economic and political system in Chile?
- Is the Chilean society experiencing a cultural change in relation to environmental issues?
- Is Chilean society still trapped in consumerism?
- Can you suggest me one or more people worth to interview?

Appendix 15. Energy flows (electricity)

Framework of the industry

The Chilean electrical sector was fully privatized under the military regime and later regulated under the civilian governments. This process led to an end of the state monopoly and functional integration in favour of a diversity of private actors divided in areas of production, transmission and distribution. Despite the multiplication of the actors, now granted specific spatial concessions (as in the water sector), market concentration remains high by the existence of few controllers and the vertical integration (Fischer & Serra, 2007). Whilst energy infrastructure and distributions have been greatly improved, the state has been left to fund and manage the provision of private infrastructure for rural electrification programs left outside concession areas, as well as subsidising urban low-income population (ibid).

The Chilean electrical system is divided in three sub-systems: a main interconnected grid in the country's well populated Southern and Central regions (SIC); a smaller although growing network in the far Northern regions with high rates of mining consumption of energy (SING); and diverse local networks in regions and localities of more remote access in the far South. Chicureo's energy comes from the SIC, whose main sources are - in no less than three quarters- coal and biomass thermal plants placed in coastal and central areas, and then hydro power from large dams in the southern and patagonian Andes, diesel and natural gas (LNG) powered thermal plants accounting for nearly one quarter, whilst a mix of minor sources such as solar, wind and biogas account for the rest (Ministerio de Energia, 2013). In relation to the sources of this energy, almost 80% of the country energy is produced by four private companies: ENDESA 33% (Italy); AES Gener 17% (Chile); Colbún 16% (Chile); and GDF Suez 12% (France) (BBVA, 2014).

Since the early 2010s both fossil fuel thermal plants and large dams have been increasingly contested by local communities and social movements, by the perception of very negative local impacts to communities health, native ecosystems as well as to the local economy and common resourcess (Ulianova & Estenssoro, 2012; Rivera, 2010). Lately global impacts on climate change and concentration of political and economical power are also reported as perceived negative impacts fought by their contestants (Romero T., 2014; Carrizo & Berger, 2014; Fuenzalida & Quiroz, 2012).

Electricity distribution system and conflicts

Electricity in Chicureo is mainly provided from the SIC by two electrical concessions: the Southern and central areas being serviced by Chilectra

S.A., a company privatised by the military regime in 1987, while a Northern corner (including the Colina town) is serviced by the Colina Electrical Company, also owned in 99% by Chilectra (Compañia Electrica de Colina, 2014). The controller of Chilectra is ENDESA, from the Italian ENEL.

The way in which electricity is distributed to the green enclaves in Chicureo is through a network of large transmission towers that feed an electrical substation in the nearby borough of Lampa. From there smaller electrical poles distribute to the Chicureo electrical feeder, from where a modern system of underground cables transport the energy to the large green enclaves. The same substation feeds the rest of the borough, but with a different system and by a different company. In the large green enclaves there are no air wires, and the only poles seen are for streetlight (Figure A15.3). In contrast, individual *parcelas* or smaller *parcelas* condominium have a different standard, with cables in air networks sustained by street poles, poles for the house connection, poles for telephone lines, and is some cases, different poles for the local electricity wires, those wires distributing energy to larger enclaves.

Figure A15.1 Standards of street electrical distribution in small *parcelas* areas (left) and large ZUDC enclaves (right). Source: Photos by M. Sanzana Calvet (2013).

In 2010 the 8.8 earthquake that hit the Southern central zone severely damaged the Lampa substation and shown the vulnerability of Chicureo electricity provision. Although many electrical stations were damaged around the country, including the Lampa one that provides to Chicureo, a week after the seism only a 3% of the Chicureo clients had electricity, a rate lower than in some areas closer to the quake epicentre nearly 350 kms South (Interview 23, Resident, Chicureo, March, 2013; Chilectra, 2010).

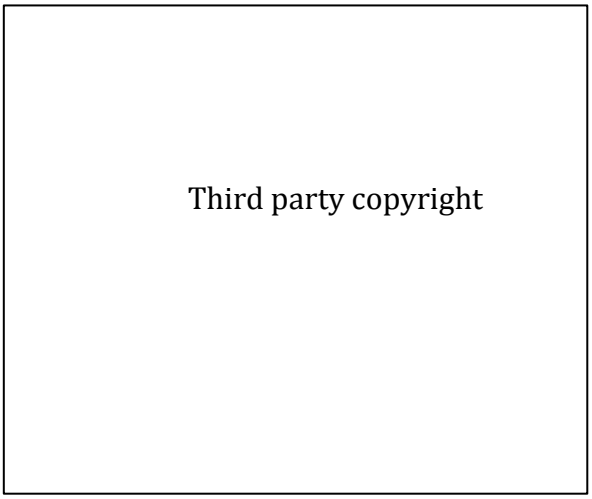

Figure A15.2 Earthquake damaged Chilectra electrical substation for Chicureo. Source: Chilectra (2010)

To solve this vulnerability and in prevision of the fast urbanisation and population of the area the electricity utility started in 2012 a project to build an electrical substation in Chicureo, linking it with the networks that feed the Barrio Alto by a 6,2 km transmission line sustained by 17 towers and 3 poles (Chilectra, 2012). The residents of the exclusive enclave of Casas de Hacienda declared war to the project, claiming that the project had only an approved environmental impact declaration for the transmission line and not for the substation, and in September 2013, the lawyer of 300 residents presented a judicial order to stop the works (La Tercera, 2013).

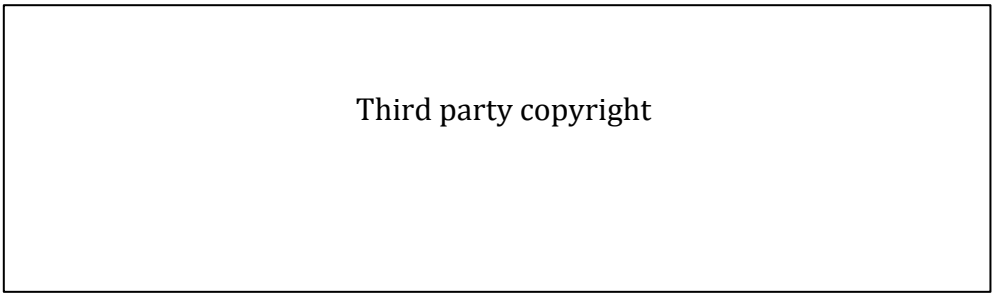

Figure A15.3 Transmission line project map near enclave (centre); and resident describing the project's area of impact (right). Source: Chilectra (2012); Saavedra (2013)

The core of the issue for the residents was the landscape and environmental impact of the towers, and the feeling their status wasn't considered, and even in their refusal of the projects the residents emphasised the differences between them and low income communities. As the administration committee stated in a newspaper interview

> We are not a poor community; we are not interested in a money offer to be convinced of something we don't want... To build in here we have to comply with

> standards, respecting the environment, there is a golf course, promenade areas, all this will be broken with this they want to do to us. (La Segunda, 2013).

In the trial the community asked the company to develop an underground line, in accordance with what they believe are the enclave standards (Pulso, 2013). For the electrical utility lawyer, "it is paradoxical that those who will benefit from the increase of energy capacity in the area are litigating against in the Justice Court" (ibid). To the date a sentence has not been issued, but the project continues to be developed (Figure 7.27).

Figure A15.4 Construction of Chicureo substation (left) and electricity tower behind Hacienda Chicureo enclave (right). Photos M. Sanzana Calvet (2014)

It seems unlikely that the project will be reverted or dismantled, particularly considering that neither property developers nor the developers' association or the construction chamber (the mighty private actors in Santiago's urban development) have made any public attempt to support the residents.

Politicising electricity consumption estimations

Until today [2014] there are no publicly available specific statistics on electricity consumption in the Chicureo enclaves. Besides the lack of cooperation from the electricity utility this research found that the 2012 National Census, which among others contained information in population, income and use of electrical devices, was invalidated and the data suppressed from public access, leaving a void of information. How thus approach the flows of electricity towards the final residential consumers, and how estimate if its rate is high, normal or low?

On the first problem, estimating households typical consumption I develop an exercise with the answers gathered from the fieldwork survey applied to residents in a middle income ZUDC enclave in Chicureo, specifically from a question that asked for a typical monthly electricity bill in winter and summer (Figure A15.1).

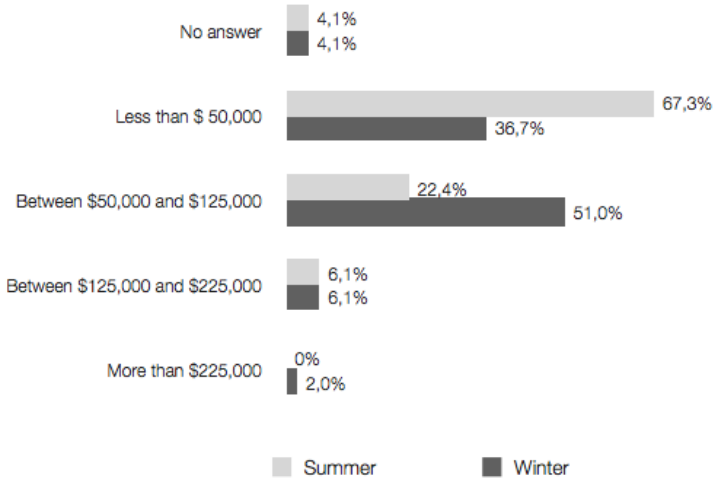

Figure A15.5 ZUDC enclave households declared monthly electricity bill by season.
Source: own elaboration from fieldwork survey (2013).

As it seems that consumption is higher in winter than in summer, I chose the former season to develop the estimation, that is, when it seems to be more used, possibly to heating purposes. As a regulated industry, electricity utilities have their prices set by an official decree: I used that set in April 2013 to the utilities operating in Chicureo to convert from money into kWh (Chilectra, 2013b). The results, plotted below, indicate that all the ranges of consumption in a typical winter month were distributed above 220 kWh.

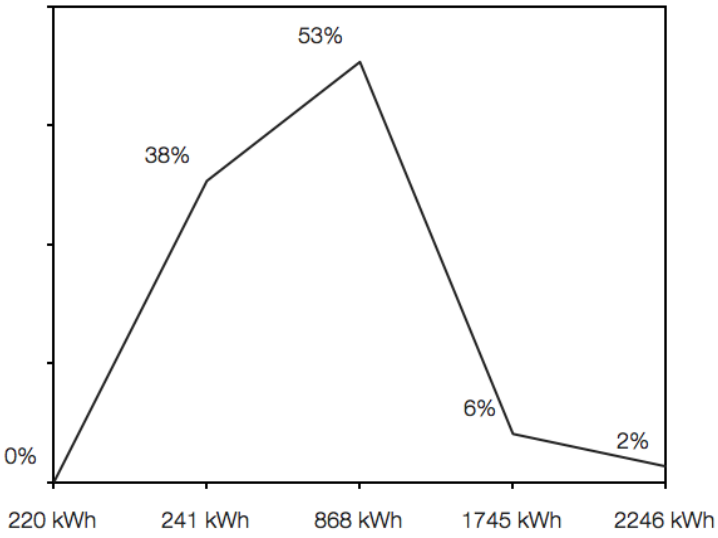

Figure A15.6 Winter consumption estimation of electricity per surveyed customers.
Source: own elaboration.

The interpretation of this result is the following: 220 kWh is the monthly average consumption for clients in the Santiago's Metropolitan Region

(Chilectra, 2013a). Thus, whilst nearly 40% of the respondents are just above the average range, this preliminary estimation suggest that the majority of residents overpass the average by a rate of at least nearly four times.

There are at least two very interesting areas that demand further development in this section. First of all, international comparison by type of house and income group -and hopefully other green enclaves- with both metropolitan areas in the Global South and developed North. Also, it would be extremely valuable to assess the household electricity consumption of the new condominiums with energy efficiency technologies that are beginning to spread in the house market top of the line, as described in the Garden Enclaves chapter, but those are just beginning to be sold. By now, the data gathered indicates a high and very high residential use of electricity in the Chicureo. This results must be added to the continuous and intense use of electricity demanded by both the enclaves' water management systems, which relays on electrical power to run the engine mechanisms of wells, pools, lagoons and garden irrigation, and the security management systems of electrical fences, electrical gates, electrical communication systems, CCTV, road lights, security lights, which suggests that not only to build but to maintain the green enclosure of the enclaves may imply a very high flow of electricity.