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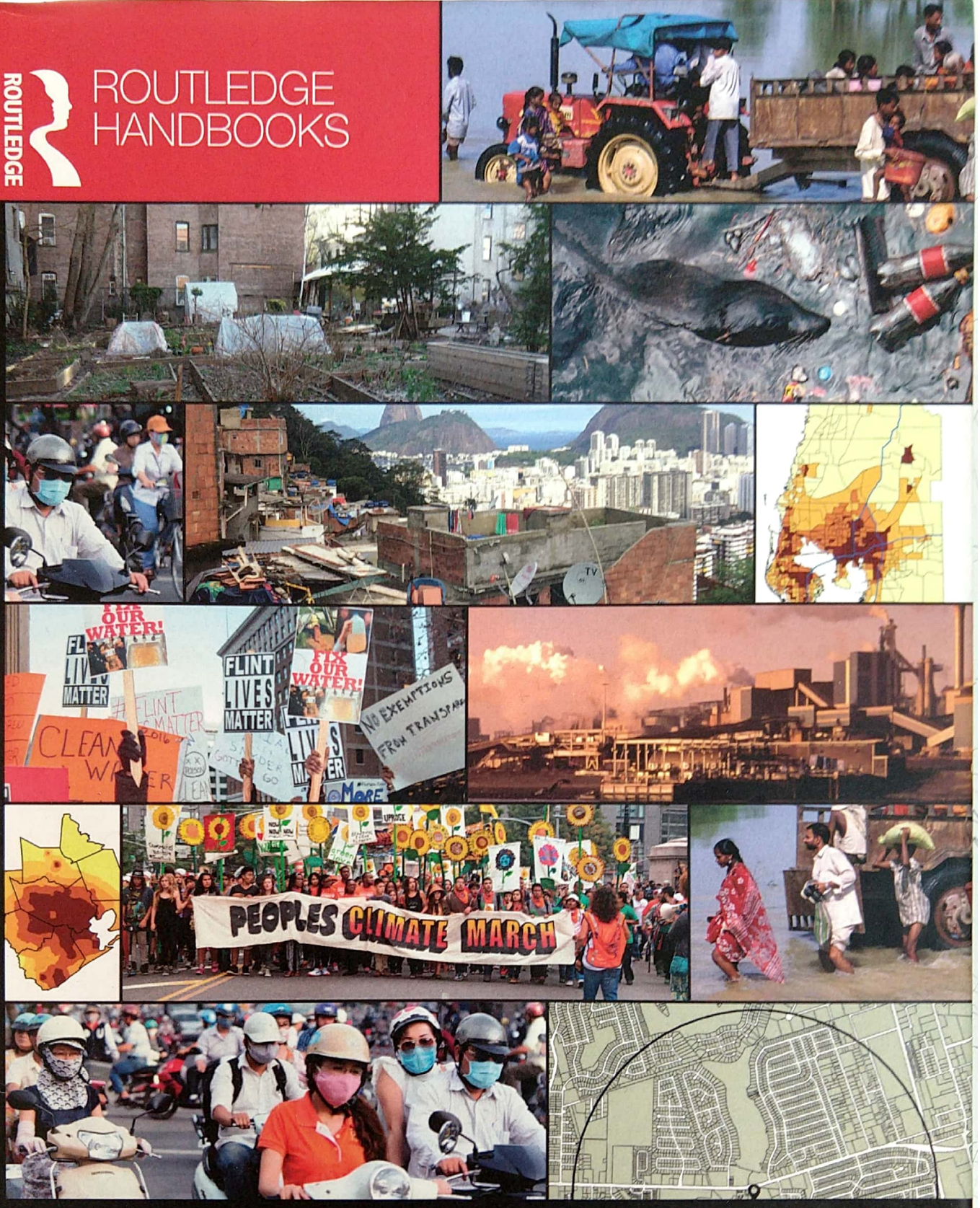

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URBAN ENVIRONMENTAL (IN)JUSTICE IN LATIN AMERICA

The case of Chile

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Introduction

In 2014, Latin America and the Caribbean (LAC) was the second most urbanized region in the world with approximately 80 per cent of their population living in urban areas (United Nations [UN] 2014). In the 1950s and 1960s an urban explosion took place through rural–urban migration and rapid and uncontrolled urbanization. In the context of import substitution policies and associated industrialization processes, millions of farmers migrated to the cities in search of new employment opportunities. Evidently, this arrival of people in a vertiginous volume and velocity exceeded the capacity of the urban economy to absorb this workforce and of the local and national governments to meet the growing demand for housing and basic services (Romero 2007). The new urban residents had no other option but to occupy peripheral areas informally, by self-constructing slums that were isolated and often exposed to natural (floods and landslides) and anthropogenic (landfills and polluting industries) hazards. This problem still persists today, as 160 million people, that is almost 30 per cent of Latin America's urban population, live in informal settlements (Jiménez 2015).

Despite the persistent problem of access to formal housing, urbanization in Latin America has had positive effects that have increased the income of residents and improved access to health and education. In the last 20 years, the Human Development Index in Latin America has increased by 10 per cent and the poverty rate reduced by half between 1990 (12 per cent) and 2012 (6 per cent) (Jiménez 2015). Nevertheless, hiding behind these figures is one of the most serious social problems that defines the intensity of environmental injustice: the enormous inequality in the distribution of wealth that is characteristic of the region. Latin America continues to be the most unequal region in the world (Jiménez 2015).

Explosive growth, informality and inequality have created serious environmental problems that more specifically result from the lack of provision of basic services, such as garbage collection, potable water or sewage systems. Social movements have emerged that have put these environmental problems on the public agenda in general, and the urban environmental justice agenda in particular, the latter being manifest in an increasing number of socio-environmental conflicts in the region.

According to the Environmental Justice Atlas (2016), the most important conflicts in the region have been those related to solid waste management, access to water, and the impacts

of polluting industry. Conflicts over waste management in cities have focused on the transport and final disposal of waste into open dumps or landfills in urban areas. Examples include the social movements opposed to the "Doña Juana" landfill in Bogota-Colombia, and the open dump operated by the company Tersa del Golfo in the Province of Mexico. Social movements have debated the management of and equitable access to water in relation to projects such as the "Alto Maipo" hydroelectric plant in Santiago de Chile, the operation of the Sogamoso hydroelectric plant in Colombia, and the privatization of water in the city of Guayaquil in Ecuador. Finally, activism has developed around the pollution impacts that industries generate, such as the struggle of communities near industries that use asbestos in Bogota-Colombia, or the struggle against the production of cement in the communities of Hidalgo-México.

While social and political activism on urban environmental justice has been consolidating in recent years (see also Chapter 43), research on urban environmental justice in Latin America is still under-developed. Publications on urban environmental justice in Latin America started in 2003, and to date there are only 21 publications in total (according to searches in Scopus, Web of Science, Redalyc, Scielo and Google Scholar). In these, there are different thematic emphases among the different countries of the region and different methodological approaches are applied. In general, the scientific research in the region is highly concentrated in Mexico and Chile, although other countries are involved as well.

Research has been conducted in Mexico using concepts from urban environmental justice as a framework. The main focus of the research led by Grineski and Collins (2008, 2009, 2012, 2015) has been about social environmental differences present on the border between Mexico and the United States (see Chapter 42), identifying that in cities such as Juárez and Tijuana, there is greater exposure of the population to hazards, both natural (floods and landslide) and anthropogenic (chemical emissions, air pollution from industry), than in cities such as El Paso, located in Texas.

Research in Chilean cities has focused on how distinct socio-economic groups are unequally affected by environmental risks (Vásquez & Salgado 2009 and Romero et al. 2010), air pollution (Romero et al. 2013), temperature and heat islands (Romero et al. 2010) and environmental impacts from urban expansion (Henriquez et al. 2009). There has also been, to a lesser extent, concern about inequitable access to urban green spaces (Vásquez & Salgado 2009; Reyes & Figueroa 2010; Vásquez et al. 2016).

In Argentina there are studies about exposure to pesticides in urban areas (Berger 2009), unequal access to public services (García 2003), distribution of environmental quality indicators between different cities (Celemin 2012) and environmental suffering (Auyero & Swistun 2009). In Bolivia, there are two studies about unequal access to water (see Chapter 27) in an urban environment (Bustamante 2012; Crespo 2009). In Montevideo, Uruguay, a study has focused on the effects of lead contamination in the city (Renfrew 2007), and there has been a study in Cuba on community actions to improve the urban environment (Anguelovski 2013) and in Colombia on air pollution (Romero et al. 2013).

In summary, urban environmental justice research in Latin America is recent, scarce and concentrated on the classic distributional aspects of environmental problems, such as natural hazards and pollution, and environmental goods, such as green spaces and public services, among different social groups. Another characteristic of these studies is the dominant interest in working with socio-economic classifications to assess inequalities over other social classifications based on ethnic, age or gender aspects.

In order to go into more detail and depth, over the rest of the chapter we examine the case of Chile, first presenting some background on its urban development model before then investigating more specifically the Chilean environmental justice agenda. In concluding the

chapter we synthesize the current state of the urban environmental justice agenda in Chile by looking at gaps in research and practice, and propose directions for future research.

Major development issues of Chilean cities and the processes behind them

Chile is one of the most urbanized countries in the continent and in the last few decades has been undergoing a process of 'metropolization' (Hidalgo et al. 2009). While the capital, Santiago, is the undisputed economic and political centre of the country, in recent decades other metropolitan regions have formed, such as Valparaiso-Viña del Mar on the coast of the central zone and Concepción-Talcahuano in the south. At the same time, there are several intermediate cities that in the last two decades have experienced growth rates higher than those of the large cities (Henríquez 2014). In many cases, this growth dynamic is associated with productive and extractive activities characteristic of the Chilean development model. In that context, there are important urban development processes concentrated around activities such as aquaculture, forestry, mining and agribusiness. Both these activities and associated urbanization processes are steadily increasing the pressure on natural resources such as water, air and land. Together with the negative impacts of these interventions, a more organized and strengthened activist community has generated more frequent environmental conflicts during the last decade.

What has left its mark on the way cities are developing in Chile is the neoliberal urban policy that was adopted under the military dictatorship in 1979 and has since seen only minor revisions. Today Chile's accelerated urban growth processes are poorly regulated and planned, produce strong social-environmental segregation patterns and respond primarily to the profitability criteria of financial capital.

Apart from still being one of the most neoliberal countries in the world, due to its geographical conditions Chile is also one of the countries with the greatest levels of exposure to natural hazards, such as volcanic eruptions, earthquakes and tsunamis (see further discussion below). As a consequence, in recent years there have been major socio-natural disasters that have revealed the weaknesses of a territorial planning process subsumed to the market. Another problem related to Chile's neoliberal urbanism is unequal access to environmental goods and services, which adds an environmental dimension to social segregation. A good example of this is the disappearance, reduction and deterioration of vegetation, including croplands, natural areas and wetlands (Smith & Romero 2007) that is associated with the uncontrolled growth of urban areas and resulting spatial fragmentation.

Development of academic research, public policy and civil society mobilization

In response to the conflicts and tensions emerging around Chile's urban development model and strongly neoliberal politics, academic research, public policy and civil society have become increasingly engaged in questions of urban environmental justice. There are three main issues in Chilean cities that have characterized the urban environmental justice agenda: 1) socio-natural disasters; 2) contamination and pollution; and 3) green spaces.

Socio-natural disasters

Chile has seen a series of major events in recent decades: a volcano eruption in Patagonia in 2006; one of the five strongest earthquakes (Mw=8.8) ever recorded worldwide in

central-southern Chile in 2010; a disastrous fire in the port city of Valparaiso in 2014; and storms, landslides and earthquakes in different locations in 2015. All of these events have left important lessons with regard to urban environmental justice, the two most important being: 1) an unequal exposure to threats by different social groups as well as differences in the levels of vulnerability (Vargas 2002; Bankoff 1999); and 2) a lack of recognition and participation of communities as valid interlocutors when defining prevention plans and reconstruction measures when disaster occurs. In Chile it is evident that political action and governance processes, including non-decision making, in many instances tend to increase levels of vulnerability and the unequal distribution of risks, thus promoting scenarios of environmental injustice (Sandoval et al. 2015).

In post-disaster scenarios in Chile – in particular during reconstruction processes – associative community spaces have been shaped and built upon people's grievances and demands for the exercise of citizenship rights in the affected territory (see also Chapter 28 on flooding). Ugarte and Salgado (2014) investigated these issues in Patagonia, where in May 2008 a volcano eruption severely damaged the small city of Chaitén. Residents were forced to evacuate the city, regardless of local knowledge or family and community organization, which displaced families to bigger cities with very different prevailing lifestyles and social structures compared to the small and rural Patagonian city. Subsequently, without any participative processes, the city was declared uninhabitable by the government, and people were banned from entering because it was considered too risky. As an alternative, a new Chaitén was proposed to be established in a location close to the former one. However, this process was strongly questioned by the inhabitants, who claim not to have been properly consulted, positioning themselves in open opposition to the relocation. In this scenario, the spatially and politically displaced inhabitants began to organize and generate resistance (Ugarte & Salgado 2014; Sandoval et al. 2015). In this case it is possible, therefore, to observe the emergence of collective demands focused on the reconstruction of the community and its territory, moving from individual concerns to what Schlosberg (2013) has identified as the articulation of collective and community environmental justice issues.

In a similar vein, post-disaster community organization for recognition and participation, after the magnitude 8.8 earthquake and tsunami of 2010, included claims about irregularities in granting subsidies, delays in the construction of poor quality housing and unjustified expropriation of land and forced displacement. This unleashed a high level of discontent in the population (Fuentes & Shüler 2014; Imilan & Fuster 2014; Ugarte et al. 2015), resulting in demonstrations against the solutions provided by the government and a demand for greater participation in reconstruction processes. Various social organizations converged in the National Movement for Fair Reconstruction (NMFR), which has taken on the task of reporting irregularities and channelling demands that have been highly critical of the public–private and essentially market-based solutions the government has provided. Based on the ideas proposed by Harvey (2013), the actions of the NMFR (and organizations involved in it) can be interpreted as a claim to the 'right to the city', that involves the freedom to make and remake ourselves and our cities, beyond individual interests. Therefore, the actions and motivations of NMFR tend towards overcoming the idea of an organization directly linked to one particular territory, developing instead the idea and practice of networked territories (Ugarte et al. 2015). In this context, demands are identified that are not only individual, but that operate under a territorial logic of community in cases where it is the very functioning of the city that has been affected (Schlosberg 2013).

In summary, the demands for fair reconstruction showed that the recognition of affected populations as stakeholders is required in order to bring justice to post-disaster settings. However, as Schlosberg (2013) points out, it is crucial to realize how the concept of justice

is used, understood, articulated and demanded. In this regard, what is denounced in the cases we have reviewed is deficient participation and the lack of knowledge about the needs, projects, and desires of citizens in the decision making processes. This demands greater levels of recognition and participation of citizens in the management of their territories and in the mitigation and restoration processes following from the impacts of extreme natural events.

Contamination and pollution

In Chile, as in other countries, problems of environmental contamination have been at the forefront of the environmental justice agenda since its beginning, in terms of both political mobilization and academic research. In fact, a considerable part of the numerous socio-environmental conflicts that Chile has witnessed in the last two decades has been attached to problems of urban pollution, which in turn is the result of the manner in which the neoliberal development model intertwines with urbanization processes and patterns. In the following, three issues of environmental contamination are briefly explained: 1) air pollution; 2) environmental contamination disasters; and 3) the emerging concept of 'sacrifice zones'.

In an important number of Chilean cities, air pollution (see Chapter 26) has been a longstanding problem (Meléndez 1991). Although the main sources responsible for atmospheric contamination are transportation, industry and the use of firewood (Romero et al. 2010), the relative importance of pollutants in different cities across the country varies and depends on both the city's economic base and geographic conditions. Also, within the cities affected by contamination problems an unequal socio-spatial distribution can be observed which transforms into a distributive environmental justice problem and is also discussed in those terms. In one of the few existing studies, Romero et al. (2010) determine for the city of Santiago a geography of atmospheric contamination (of PM_{10}) that coincides with the historic pattern of socio-economic segregation: in the richer and much greener eastern part of the city, contamination with particulate matter (PM_{10}) is lower than in the poorer western part of the city. The authors (Romero et al. 2010: 59) thus conclude that there is the "existence of levels of environmental injustice that would require mitigation and compensation measurements specifically targeted at balancing the spatial distribution of climates and contaminants". However, they also highlight that new real estate dynamics – gated communities for the middle and upper classes being installed in formerly poor neighbourhoods – lead to increasing socio-environmental heterogeneity, which makes the development of justice-based mitigation and compensation mechanisms more complex. On the political level a first milestone with regard to air pollution was set when the government echoed both the scientific evidence and the mobilization of NGOs and approved the first Plan for Prevention and Atmospheric Decontamination of the Metropolitan Region (PPAD), which was enacted in 1997/1998 and actualized in 2004 and 2010. While in its first version the PPAD focused on diminishing PM_{10} concentration, the actualization that has been followed since 2015 (called "Santiago Respira") focuses on the reduction of finer particulates ($PM_{2.5}$). Furthermore, in its "Decontamination Plans, Strategy 2014–2018", the government proposes a range of actions with a view to decontamination in mid-sized cities, especially in the south of Chile (Fundación Terram 2014). Thus, while the issue of contamination is being addressed on the policy level, it is not being done with explicit consideration of environmental justice claims.

Environmental contamination disasters are another face of urban contamination, which is closely related to the extractive development model. Here a simultaneously tragic and important event has been the disaster in the Nature Sanctuary of the Cruces River – near

to the city of Valdivia – that according to Sepúlveda (2011) "marked a before and after in the environmental history of Chile". The disaster began in 2004 with the discharge of effluent from the pulp mill of the Arauco forestry company into the Cruces River, which led to the death of hundreds of black-necked swans and the degradation of an important wetland. For several years, a local citizens' environmental movement confronted the polluting company, which belonged to one of the largest economic groups in the country, but it denied responsibility. Because of the 'agency' of the black-necked swans (in the sense of actor-network theory, see Sepúlveda & Villarroel 2012), the grotesque denial of responsibility from the company, and the ongoing work of the NGOs, the conflict received significant media attention throughout the country. In fact, the development of the conflict gave a major impetus to the environmental institutions of the country, which were modernized substantially in 2010. As a result, in 2013 one of the recently installed environmental courts (see Chapter 12) convicted the company, giving important recognition to the infringed ecosystem and the affected communities, principally those related to the collapsed tourist industry of the region (Sepúlveda 2011). Although there has been undeniable progress in terms of the modernization of the environmental institutional landscape, in the environmental justice movement there is agreement that modernization did not take the opportunity to remedy the lack of citizen participation, which is one of the most important issues.

Considering the unequal socio-spatial distribution of the contamination caused by the development model of the country, the term 'sacrifice zones' has been applied. In Chile these are understood as territories and human settlements (usually small and medium-sized cities) that are environmentally devastated by the cumulative effects of industrial developments. An emblematic case of such a sacrifice zone is the Bay of Quintero, where a large number of polluting industries are concentrated and where in 2014 38 000 litres of oil were discharged into the sea. From an explicit environmental justice perspective, the influential NGO Fundación Terram (2014: 13) determines that the "areas that are highly contaminated as a result of the current development model, the lack of public policies and the negligence of authorities, constitute sacrifice zones of fundamental rights of the communities that live there". These zones in general show high levels of poverty, a marked weakness in basic services such as potable water, deficient public health systems and poor citizen participation in territorial decision making. Faced with this reality, in 2014 the first conclave of sacrifice zones took place where mayors from the Puchuncaví, Quintero, Tocopilla, Huasco and Coronel municipalities met and decided to push towards the creation of the "Union of Sacrifice Zone Municipalities". Several meetings followed and a list of demands was presented, one important point being the strengthening of regulations to diminish PM_{10}-related air pollution, which severely affects the sacrifice zones.

Green spaces

Concern for urban green spaces (see Chapter 35) has emerged only recently in the environmental justice agenda in Chile. Once basic needs such as health, education and housing have been satisfied, at least in general and quantitative terms, concerns about the quality of urban life have slowly moved to aspects related to the neighbourhood, such as infrastructure, public spaces and green areas. Interest in the unequal distribution of urban green spaces in Chile essentially began to appear in the second half of the 2000s, when studies began to measure and understand the degree of unequal access to these spaces. Using purely statistical approaches, these studies have concentrated on the distributive dimension of environmental justice from the early stages of research.

These investigations have shown that there is a markedly unequal distribution of green spaces in Chilean cities, especially in Santiago, where most research has been done. For instance, Escobedo et al. (2006) show that municipalities of low socio-economic status have less urban tree cover than municipalities of high socio-economic status. In addition, higher-income municipalities have a greater diversity of species, and fewer but larger trees (De la Maza et al. 2002; Escobedo et al. 2006). Reyes and Figueroa (2010) add that municipalities of lower socio-economic status have fewer green spaces and less access to large public green areas. Vásquez (2009) and Vásquez and Salgado (2009) found that this type of unequal distribution of green areas can also be observed at an intra-communal level, especially in peripheral municipalities where the fragmented pattern described by Borsdorf and Hidalgo (2010) for Latin American cities is most strongly manifested. As a consequence, a major deficit of green spaces has arisen, especially in the residential complexes developed by the state's social policies, which have focused on the massive construction of a large number of houses of low quality, at a high density, with almost no courtyards or public green areas.

Few studies have addressed such issues in other Chilean cities. However, the Ministry of Environment (2011) indicates that, in general, there is an increasing availability of green spaces in cities following a north–south gradient. In a similar vein, Vásquez and Salgado (2009) found that the close relationships between socio-economic status and availability of green areas identified in the municipality of Peñalolén in Santiago does not exist in San Pedro de la Paz in Concepción, in the south of the country. This may be because of the reduced need for irrigation to maintain urban green areas due to the rainier climate that exists in southern Chile. The difference in purchasing power and relative or municipal budget available to irrigate green spaces thus becomes more important in central and northern Chile, where arid and semi-arid conditions predominate.

This unequal distribution of urban green spaces occurs both in private and in public spaces. For private space the explanation is that small houses have very small courtyards and that these are normally used to expand housing rather than being kept as gardens; in the case of public green spaces, the causes are given by the low availability of municipal resources for the creation of green spaces and especially for maintaining them.

Until now, there have been limited efforts from public policy to moderate these inequalities. One of the initiatives created for this is the Urban Parks programme of the Ministry for Housing and Urban Development (MHUD), which acts to create urban parks in municipalities that have a lack of green areas. These parks are financed by resources from the MHUD and thus not from the municipal coffers, hence large parks can be established in municipalities that would not have sufficient resources for their creation and maintenance. At the same time, the Quiero Mi Barrio programme from MINVU (Ministerio de Vivienda y Urbanismo, Ministry for Housing and Urbanism) aims to make improvements in the urban environment of degraded neighbourhoods of low socio-economic status, commonly including the construction or restoration of green areas within these interventions.

Meanwhile, in the sphere of civil society, NGOs and community organizations concerned with urban green spaces have begun to defend and reclaim them. There are at least two foundations (Mi Parque and Cultiva) that aim to create and rehabilitate public green areas in poor neighbourhoods, using participatory design techniques (see Chapter 23) and community and municipal commitment. These foundations operate with donations from members and companies, where the latter make their contributions through their corporate social responsibility programmes or through compensation for environmental impacts. Although there is a lack of mid- and long-term impact assessments of these initiatives addressing environmental justice, positive outcomes in terms of recuperating green spaces can already be observed.

In addition, neighbourhood organizations have emerged in response to an unmet demand for urban spaces that can contribute to improving the quality of life. These movements have emerged in poor neighbourhoods, many of which were developed by the social housing programme of the state. These movements have been mostly directed at protecting green spaces threatened by road or real estate projects, or at the acquisition of vacant lots to transform them into plazas or community gardens (Opazo and Jaque 2014).

Across these cases, the broad and diverse concern for urban green spaces may be associated with a resignification of what Chilean society understands by the environment, which now encompasses environmental conditions as they are experienced every day where one lives or works.

Synthesis and final reflections

As this chapter has shown, the urban environmental justice agenda in Latin America (see also Chapter 43) and in Chile may be still incipient but seems to be in a gradual process of consolidation. The cities in this region have specific characteristics compared to other regions of the world, particularly considering the effects of the nexus of explosive urbanization, informality, segregation and inequality. While on a general level this applies to Chile as well, here informality is less an issue while socio-spatial segregation and inequality go deeper than in other countries of the region. This translates into environmental justice being a particularly pressing problem in the highly segregated and unequal Chilean urban areas.

In this context it makes sense that Chile stands out in Latin America in terms of the scientific production of work on urban environmental justice, which includes studies not only on the distributive dimension of environmental threats, but also on environmental amenities. Chilean civil society has become increasingly concerned about both the distributive dimension in terms of social groups' vulnerability to socio-natural disasters and pollution problems and the inequality of access to urban environmental assets such as green and blue spaces. This could suggest interesting future directions for the urban environmental justice agenda in other Latin American countries, extending beyond the distribution of environmental burdens once they overcome the persistent problem of lack of basic infrastructure, sanitation and services. Looking the other way around, Chile with its free-market based development ideology (see Chapter 6) can benefit from lessons delivered by more progressive political regimes in the region. In Ecuador and Bolivia, for instance, environmental justice claims are, at least implicitly, part of the conceptions of the '*Sumak kawsay*' or '*buen vivir*', the philosophy of 'good living'. This ancestral Andean cosmovision is based on a harmonious relationship between man, community and nature and in important ways influenced the new constitution of Ecuador in 2008. In this, on the one hand, the social and cultural rights of Indigenous communities were strengthened, while on the other, the rights of nature itself were codified in constitutional terms for the first time.

Chilean society and especially its political elites still have a long way to go in politically recognizing its development model as a structural cause of urban environmental injustice. Rather, in Chile the environmental justice agenda currently is driven by a civil society that sometimes explicitly and sometimes implicitly includes the environmental justice issues of distribution, recognition and participation as part of the comprehensive process of strengthening democracy in post-dictatorship Chile.

In terms of academia, the brief review of literature on the Latin American and Chilean research agendas has shown that there is little work that explicitly alludes to the concept of environmental justice, but there are many more studies that do that implicitly, particularly

in the areas of socio-natural disasters, contamination and pollution, and green areas. For academia to contribute further to the urban environmental justice agenda, not only is more research needed that addresses environmental issues from the explicit perspective of justice, but also approaches whose theoretical and methodological focus capture the full complexity of environmental justice questions. In this sense, it is important to strengthen but also to go beyond the distributive dimension and address processes and problems of participation and recognition for communities affected by injustice (see Chapters 9 and 10). This would incorporate variables for understanding both the structural and subjective dynamics that are found behind the production of the unequal distribution of risks, services and environmental amenities. Studies are needed that approach the intersubjective construction of 'justice' and the 'environment' in conflict situations and in civil society actions, as has been seen in post-disaster reconstruction planning or citizen mobilization around environmental contamination events. In addition, only a better understanding of the effect of the scarcity and weakness of institutionalized spaces for participation on the trajectories of citizen actions can illuminate how to articulate them effectively into formal structures.

On a more consensual level there is a need for more and better instances of dialogue between the political, academic and civil society spheres in order to provide feedback and align the respective agendas on environmental justice in the country. Research could be more participative and qualitative (see Chapters 23 and 24), fostering the demands emanating from affected communities and, at the same time, being a source of accessible and local information for these communities. A bottom-line demand and goal is to recognize citizens as valid actors and interlocutors in the political sphere when designing mitigation and management strategies in the context of, for instance, socio-natural disasters, pollution events and access to green areas.

However, if the current extractive development model and the processes of unplanned urban growth which are maintaining or deepening current levels of socio-spatial inequality are not tackled, environmental injustice problems are highly likely to remain in place. Given this scenario, the challenge is to move forward in shaping institutional mechanisms that safeguard environmental justice as a civil right that should have a constitutional character. This is a particularly relevant discussion in Chile given the current national political debate about the possible content of a new constitution designed under a democratic regime.

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