Development inequity:

Advancing distributive justice by localizing SDG indicators for municipalities in Chile

By

Diego H. Castillo Peredo

B.S. Business and Economics
Pontificia Universidad Católica de Chile
Santiago, Chile (2012)

Submitted to the Department of Urban Studies and Planning
in partial fulfillment of the requirements for the degree of

Master in City Planning

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

May 2020

Author_____
Department of Urban Studies and Planning
May 15, 2020

Certified by_____
Associate Professor Gabriella Carolini
Department of Urban Studies and Planning
Thesis Supervisor

Accepted by_____
Professor of the Practice, Ceasar McDowell
Chair, MCP Committee
Department of Urban Studies and Planning

Development inequity:

Advancing distributive justice by localizing SDG indicators for municipalities in Chile

by

Diego H. Castillo Peredo

Submitted to the Department of Urban Studies and Planning
On May 15, 2020 in partial fulfillment of the
requirements for the degree of Master in City Planning

Abstract

Through examining the Sustainable Development Goals (SDGs) at a municipal scale in Chile, this thesis demonstrates that localizing the development agenda is required for advancing distributive justice in the country. Because the mainstream development narrative suffers from contradictions similar to those of the discourse of Chile's economic progress, the SDGs are expected to be insufficient for revealing inequities, which compromises their own goal of "leaving no one behind." Despite the improvements in poverty reduction and access to basic services, three conditions suggest significant distributional and spatial equity concerns: the heterogenic conditions among Chilean municipalities; the presence of a unitary and centralized government; and the high dependence on economic factors of the local capacities for advancing development. However, the localization of the 2030 Agenda presents an opportunity for elevating local conditions and balancing national and local capacities. Through the disaggregation of eleven SDG indicators, this research analyzes the development performance of municipalities based on their internal dispersion and precision, spatial distribution, and correlation with sociodemographic and economic characteristics. Data is obtained from publicly accessible sources used by the country to calculate its official statistics and progress reports. Using a resource-based and capabilities approach on distributive justice, the quantitative analysis serves to assess to what extent localization can help advance spatial equity. The results show that aggregates can be deceiving, concealing significant local variation and masking important deficiencies, and that the lowest-performing areas are biased toward rural, satellite, less-accessible, and resource-scarce municipalities. These findings support the need for localizing development agendas to subnational scales as a way of promoting distributive and spatial justice. Moreover, increasing the resources and the agency of municipalities to take action upon their own development is also necessary to advance distributive justice. This analysis underscores the limitations of the SDG framework in exposing less developed areas within the country and their shortcomings in advocating for an appropriate narrative of development. As their adoption and influence increase, this research contributes to expand knowledge on how to operationalize them for advancing sustainable development with equity.

Thesis Supervisor: Gabriella Carolini
Title: Associate Professor, Department of Urban Studies and Planning, MIT

Thesis Reader: Samantha Dotto Salve
Title: Data and Monitoring Officer, United Nations

Keywords: Chile, SDG, sustainable development, localization, municipalities, distributive justice, development indicators, disaggregation

Acknowledgements

To the Department of Urban Studies and Planning, the Lloyd and Nadine Rodwin Fund, and MISTI Chile, for your generous support, which was essential for the fulfillment of this research.

To Gabriella, my thesis advisor, for the incredible dedication and guidance in this process. I am extremely grateful for your trust in me and for helping me expand my thinking and constructively challenge my ideas. Also, to my reader, Samantha, for responding to my random contact for a short inquiry but then giving me such insightful feedback.

To the Asociación Chilena de Municipalidades and Ministerio de Desarrollo Social y Familia for the shared resources, knowledge, and time.

To the team at MITOS, for their constant support and flexibility, and for giving me an incredible opportunity to learn. Brian, Ken, and Yael, it was a pleasure to work with all of you.

To the MCP cohort and everyone at DUSP for their kindness and warmth, particularly to those who opened their doors (literally) and invited me in, making me feel welcomed in a foreign place.

A toda la familia latina de DUSP, sin su compañía no hubiese sobrevivido estos dos años en Cambridge; me hicieron sentir que no estaba tan lejos de mi casa. Dani, Dani, Vane y Nati, gracias por la paciencia en escuchar mis aburridas ideas y por la oportunidad de ser parte de sus propias tesis por todo un año.

To my good friends, Shail, Dani, Zoë, Radhika, Julia, Cami, Ángeles, and Meesh, for making me laugh, hearing me complain, and joining me to the Muddy's throughout these two years. To my roommates, Zack and Stephen, for bearing with me the tribulations of writing a thesis in social isolation during the COVID19 pandemic. And to Apaar, for sharing with me this journey and inspiring me every day to be more passionate and ambitious.

Finalmente, también quiero agradecer a mi familia por su preocupación, por siempre confiar en mi, y por su apoyo incondicional en esta loca idea de renunciar y venirme a MIT, sin ese apoyo no hubiese podido hacerlo. A todos mis amigos en Chile, a quienes afortunadamente coincidimos en Cambridge durante estos años, y a quienes han estado conmigo en los buenos y difíciles momentos de esta etapa.

Table of Contents

List of tables

List of figures

Acronyms

AChM	*Asociación Chilena de Municipalidades* / Chilean Association of Municipalities
CASEN	*Encuesta de Caracterización Socioeconómica* / Socioeconomic Household Survey
CONAMA	*Comisión Nacional de Medio Ambiente* / National Commission on the Environment
ECLAC	Economic Commission for Latin America and the Caribbean
EEVV	*Estadísticas vitales* / Vital statistics
FCM	*Fondo Común Municipal* / Municipal Common Fund
GDP	Gross Domestic Product
GTF	Global Taskforce of Local and Regional Governments
HLPF	High-level Political Forum on Sustainable Development
HLG-PCCB	High-level Group for Partnership, Coordination and Capacity-Building
IAEG-SDGs	Inter-agency and Expert Group on SDG Indicators
IMF	International Monetary Fund
INE	*Instituto Nacional de Estadísticas* / National Statistics Institute
IQR	Interquartile range
MDE	*Ministerio de Energía* / Ministry of Energy
MDG	Millennium Development Goals
MDS	*Ministerio de Desarrollo Social* / Ministry of Social Development
MDSF	*Ministerio de Desarrollo Social y Familia* / Ministry of Social Development and Family
MIDEPLAN	*Minsiterio de Planificación* / Ministry of Planning
MINECON	*Ministerio de Economía* / Ministry of Economy
MINEDUC	*Ministerio de Educación* / Ministry of Education
MINREL	*Ministerio de Relaciones Exteriores* / Ministry of Foreign Affairs
MINSAL	*Ministerio de Salud* / Ministry of Health
MINVU	*Ministerio de Vivienda y Urbanismo* / Ministry of Housing and Urban Planning
MMA	*Ministerio del Medio Ambiente* / Ministry of the Environment
MOP	*Ministerio de Obras Públicas* / Ministry of Public Works
NVR	National Voluntary Report
ODS	*Objetivos de Desarrollo Sostenible* / Sustainable Development Goals
OECD	Organization for Economic Co-operation and Development
ODEPLAN	*Oficina Nacional de Planificación* / National Planning Office
REM	*Reportes estadísticos mensuales* / Monthly statistics report
RETC	*Registro de Emisiones y Transferencias de Contaminantes* / Registry of Pollutants

SEREMI	*Secretaría Regional Ministerial* / Regional ministerial secretariat
SERVEL	*Servicio Electoral* / Electoral Services
SDG	Sustainable Development Goals
SII	*Servicio de Impuestos Internos* / Internal Revenue Service
SINIM	*Sistema Nacional de Información Municipal* / National System of Municipal Data
SPV	*Subsecretaría de Prevención del Delito* / Subsecretariat of Crime Prevention
SRC	Stockholm Resilience Centre
SRCel	*Servicio de Registro Civil e Identificación* / Civil Registry and Identification Service
SUBDERE	*Subsecretaría de Desarrollo Regional y Administrativo* / Subsecretariat of Regional Development
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNGA	United Nations General Assembly
UNSD	United Nations Statistics Division
VLR	Voluntary Local Review
WCED	World Commission on Environment and Development

Chapter 1. Introduction

1.1. The Chilean narrative

The typical story

In Chile, there is stark contrast between the narratives of the official development discourse and the social claims in the streets. While the country praises itself for its positive and continuous economic growth over the last decades, the events sparked after October 2019 tell an opposite story of inequality and frustration. Both violent riots and peaceful rallies spawned a social movement that calls for a deep and structural change in the relationships between the political and economic elites and the rest of the population, one that would help reducing the income inequalities and improving the living conditions of the lower and middle classes. In other words, there is a call for distributive justice and equal opportunities. Yet, although the movement has challenged the bases of the Chilean economy and democracy, including the very constitution of the country, the antagonism between the poster child narrative of growth and the different reality on the ground does not either start or end with 2019's social uprising.

The typical story for Chile is one of economic success, particularly when compared to its peers in Latin America. This discourse traces back to the change in the political and economic systems after the coup d'état in September of 1973. The narrative of success has been constructed around the improvement of aggregate macroeconomic indicators, which has been praised both internally and externally. In 1980, the National Planning Office (ODEPLAN) highlighted how the new government had managed, by the end of the decade, to achieve positive GDP growth, stabilized previously high inflation rates, shifted from fiscal deficit to fiscal surplus, and increased both foreign and public investment in the country (ODEPLAN, 1980). Their message is reinforced by a regional comparison, where only a couple countries were performing as well as Chile on those metrics. By 2004, 14 years after the country returned to democracy, the International Monetary Fund (IMF) highlighted how "Chile has enjoyed a strong and stable economy while the economies of many of its Latin American neighbors have stagnated and suffered repeated financial crises" (Kalter et al., 2004, p. 1), hence praising how the country achieved a better economic performance than its neighbors. Their assessment was that Chile's inflation stability, fiscal discipline, and trade and financial opening macroeconomic policies had enabled the per capita income to increase almost fivefold between 1980 and 2001. The increased wealth, in turn, helped bringing the poverty headcount ratio

down from almost 40% in 1990 to about 13% before the 2007-2008 financial crisis (OECD, 2007). This success story was then bolstered in 2009 when Chile was officially invited to join the Organization for Economic Co-operation and Development (OECD), an intergovernmental organization that congregates many of the wealthiest and most prosperous nations in the world. Again, the invitation was given in reference to the country's successful macroeconomic performance and prudent fiscal policies (Gurría, 2009), even after recently departing from a recession period.

All these facts had been at the core of the narrative of the government, particularly those of the political center and right. The importance of economic growth, measured through indicators of aggregate performance like GDP, fiscal balance, and employment levels, has been the cornerstone of the government's discourse on development and progress of the country. And the consequent reduction of poverty rates has been the proof that the strategy has worked (Foxley, 2004). Perhaps with the only exception of President Bachelet, democratic governments since the early 1990s have reinforced growth as the engine of prosperity for Chile and as both an object of pride and the mechanism to overcome a transitory negative shocks during the State of the Nation speeches (Aylwin, 1993; Frei, 1994, 1999; Lagos, 2000, 2006; Piñera, 2013, 2018, 2019). As a result, the idea of stability became then an admirable attribute of the country's economy and a distinguishable feature that puts it above its regional counterparts (OECD et al., 2019).

The alternative story

However, there has been growing disagreement with this narrative, and challenges to the veracity and accuracy of economic performance as a good indication of development have increased despite its persistence as the mainstream discourse. An alternative discourse around the high levels of inequality has then emerged as the clearest indication of failure of the Chilean model. The growing years between 1990-2006 saw high and stagnant inequality ratios, with a Gini coefficient going from 0.57 to 0.54 only (OECD, 2007). Much of the inequality was due to a high concentration of wealth in the top 5% with a more homogeneous Gini of 0.38 for the rest of the population (Solimano & Torche, 2007). The following decade saw mild improvements, with a Gini of 0.46, no better than other Latin American nations like Brazil or Mexico and about 50% higher than other OECD nations (OECD, 2020a). Although becoming an OECD member served the optimistic discourse of Chile well, it did also raise the bar to measure the performance of the country. Besides income inequality, the performance of other dimensions gained relevance along with economic reviews, highlighting concerning gaps in education, job quality, pensions, gender equality, and environmental sustainability (OECD, 2018). Part of these issues can be attributed to the lower public

expenditure on these areas (Castelletti, 2013; OECD, 2020b) which originated in the market-based approach established in the mid 1970s.

The success in expanding and stabilizing the economy and bringing overall poverty down had become insufficient in the eyes of many. The protests in Chile after October 2019, the largest in 30 years, demonstrated that the perception of inequality was not only in the indicators, but for a long time, it had been growing in the Chilean society until a point where a small increase in Metro fares triggered a nationwide social upheaval. The possible causes of the turmoil are many, and include excessive structural inequalities, precarious social rights, and abusive pricing for electricity, public transportation, healthcare, and housing (Garcés, 2019), accompanied by price hikes in many of these dimensions in the past months (Albert & Miranda, 2019). Significant blame was given to the neoliberal economic regime established in the country since the 1970s as a structure influencing not only the economy, but also public administration, politics, and people's social relationships (Ossandón, 2019). As a consequence, these events brought doubt about the praised stability of Chile and produced uncertainty about the future economic performance of the country, disrupting, in turn, foreign exchange rates, private investment, and expected growth (Benítez, 2019; MercoPress, 2020).

Although these issues did not start with the protests in 2019 but much earlier, they, nonetheless, exposed to a large audience in Chile and internationally three counterfactuals of the typical story of the country beyond the already known income inequalities. First, the success story is only shared by a limited part of the society and rejected by a large proportion of the population. Second, the numbers that authorities use to support that message do not relate to the realities on the ground. And third, the inequalities are prevalent beyond just income, present in many if not all dimensions of the society. As a result, these points bring attention to both metrics that could counterbalance the focus on macroeconomic performance and to the justice implications of the Chilean path towards development overall.

1.2. The development discourse

The general message

Despite development indicators being more critical of Chile's situation, they have similar issues of those of the economic growth narrative. In 1980, ODEPLAN highlighted the progress in social development, as they called it, after the coup d'état. Along with wealth, the country was proud of improvements such as increased accessibility to education at all levels, increased housing supply and

subsidies for lower income households, and better healthcare performance with reduced undernourishment and child mortality rates (ODEPLAN, 1980).

By 2005, after Chile signed in 2000 the UN Millennium Declaration and committed to work towards the advancement of the Millennium Development Goals (MDGs), the country released its first report regarding its progress so far. In that document, the nation highlighted again the significant reduction of poverty and extreme poverty, undernourishment and mortality rates, and access to education, meeting already some of the targets for 2015 and being close in several others (MIDEPLAN, 2005). Later advancements towards the MDGs brought a more nuanced message. The mentioned improvements anchored the development message in the solid progress in core indicators of health and education, but also recognized that there were important distinctions to make within these dimensions and challenges remained for many of their subareas, for example, with obesity in addition to undernourishment, quality and not just access to education, or prevalence of gender inequalities across sectors (MIDEPLAN, 2010). Later, under the framework of the Sustainable Development Goals (SDGs), the message in 2017 followed the same common trends: significant reduction of poverty, important improvements in hunger and health indicators, prevailing concerns on labor conditions, income and gender inequalities, plus ecosystem conservation and climate change as a novel theme (MDS, 2017). Lastly in 2019, the story was along the same line, but with focus on improving the quality of jobs and education and a more strict multidimensional measurement of poverty that showed worse conditions in Chile than when looking at income only (MDSF, 2019).

Still, despite these challenges, the Sustainable Development Solutions Network and Bertelsmann Stiftung ranked Chile 31st out of 162 in their global ranking of SDG performance (J. Sachs et al., 2019). In the report, the country ranks as the first one in the Americas, highlighting the achievements on poverty reduction, quality education, clean water and sanitation, affordable and clean energy, and sustainable cities. To a great extent, the better results relative to the rest of Latin America are because of the higher institutional capacity of the country (Castro, 2015), which integrates a stronger coordinating structure with a dynamic policy development towards the SDGs, and a more active international cooperation agenda (Rueda, 2019).

The problems with the message

Overall, the development narrative is positive for Chile and better than for most of its neighboring countries. However, despite real improvements in development indicators, the loud message against injustices places doubt on the accuracy of these metrics as much as it does for the macroeconomic ones, questioning how well they also represent the realities on the ground. Moreover, to what extent their progress depends on the economic regime is also an issue of contention. The sustainability of the country is inevitably

tied to the economic development model, which has been unable to reduce the inequalities and is putting significant pressure on its natural resources, posing a challenge to the ecosystem as much as for the society (Solimano & Schaper, 2014).

Two common trends on the economic and development messages are that they speak for the majority and attempt to convey a message for higher level institutions. They often rely on binary metrics, categorizing people by whether they meet a threshold but without assessing how good is to be above or how bad is to be below it. Furthermore, development indicators and the policies that impact them are, for the most part, in the hands of governments, therefore, being subject to bias towards the message they want to convey. People on the ground do not own the statistics, and the aggregate numbers can be very distant from their realities, especially if they fall into the group below the threshold while the message highlights the achievements of the other. The receive events in Chile demonstrated how an aggregate picture that ignores the experiences on the ground can be devastating for stability, which, therefore, questions the actions as much as the metrics that can inform to those actions.

A system of indicators that can put forth a narrative that communicates diversity of realities and that can be relatable to people's particular conditions is definitely more complex than the usual shortlist of metrics used in Chile to refer to its progress. It needs, by definition, to expand its thematic scope, open up to address spread and not just averages, and scale down to relevant and relatable scales, closer to the reality it intends to represent. It means, in other words, to stop having a homogeneous message for everyone, and embrace a multiplicity of messages, particularly those of people under disadvantaged conditions that otherwise are overlooked by authorities. Nevertheless, Chile's conditions present a challenging environment to do so.

1.3. Challenges for a representative message

Diversity of living conditions

The first challenge is posed by the heterogenic environmental and socio-demographic conditions along the 4,270 km of territory north to south in Chile. These, in turn, reproduce at three scales: macro-regions, intra-region, intra-city. Regarding the first, the differences are largely determined by the biophysical environment of each region, which then relates to their natural resources endowment and characteristics of their economic structure and performance (Rowland, 2017). Roughly speaking, the northern regions of Chile are characterized by an arid environment with desert landscapes. These regions

concentrate most of the mining activity, which is the most important economic sector as well as the is largest one for the country, which yields them higher per capita incomes compared to other regions (OECD, 2009). The central regions enjoy milder temperatures and agglomerate most of the population, particularly within the Metropolitan Region which houses about 40% of the country total. The economy is more diversified, with a significant share of manufacturing, commerce, and financial services concentrating in the cities and a significant share of agriculture and agroindustry in the rural areas. The southern regions have a craggy forested landscape with climates going from temperate to subpolar. They hold most of the continental water bodies of the country, which break the topography through lakes, rivers, and fjords. The economy of these regions concentrates around forestry and fishing.

Although economic sectors are very well delimited by the location of different natural resources in these macro-regions, there are important sub-regional variabilities. Some administrative regions of Chile present a high degree of economic diversification (Rowland, 2017) and there are sub-regional clusters centered around specific localized activities, such as tourism (I. Rodríguez & Sanhueza, 2019). For all regions, the population is largely divided in either urban or rural areas, with a low amount of people living in intermediate conditions (OECD, 2009). The conditions of rural communities are far from uniform and change across macro-regions. In the north and south extremes of the country, people live more concentrated in urbanized areas, and the communities outside those areas are sparsely scattered across vast territories, more than for the mid-southern regions where communities are more interconnected. Rural areas in the country have largely suffered from public disinterest and disinvestment, being conceptualized as "non-urban" areas linked to the development of the agriculture industry rather than around an intrinsic characteristic (Toro, 2016).

Similarly, their urban counterparts are also not homogeneous. Cities in Chile present significant levels of segregation, with households of similar socioeconomic status clustered together in clearly delimited areas of the city (Ruiz-Tagle & López, 2014), a process intensified by the real state strategies that push gentrification of neighborhoods and bring together higher-income households into an area (Sabatini et al., 2017). In this context, cities present important demographic segregation patterns based on income. Ethnic groups seem to locate following an enclave-like pattern, but still their ethnic differences are less determinant than the socioeconomic ones (Sabatini & Rasse, 2017). Migrants follow a similar concentration pattern. Lower-income newcomers cluster where their communities had arrived before, but wealthier migrants tend to not agglomerate among themselves but rather disperse within the higher income areas of cities like Santiago (Castillo & Razmilic, 2020).

Centralism and concentration

The second challenge is the high levels of concentration in terms of both where the administrative structure is located and where the government's attention is centered. The constitution defines Chile as a unitary state, with a strong central power that holds most of the administrative, political, and fiscal powers (Constitución Política de la República de Chile, 2005). The President, the cabinet, and the headquarters of all the public services are located in the capital Santiago. Geographically, there are three levels of administration with different levels of responsibility and representativeness: regions, provinces, and municipalities. Regions are led by a presidential appointee, the intendent, who is supervised by a regional council which is elected democratically. Their responsibilities are limited and largely related to issues of planning, public infrastructure, supporting local governments, and the allocation of a regional budget. Provinces' governors are also appointed directly by the President and are in charge of purely administrative issues, including the correct operation of public services and public safety and order. Lastly, municipalities have an elected mayor and council. Their main roles include exclusive powers for local social and economic development, regulating and enforcing zoning and building permits, providing urban amenities, and enacting certain ordinances for the benefit of the jurisdiction, and shared responsibilities of delivering part of centralized services like public health, public housing, or primary education.

There is no regional legislation in Chile, and the decentralized government bodies have limited financial capacity to implement actions beyond their administrative functions (AChM, 2015; Bessert et al., 2003). Policies are decided centrally by each ministry and are decentralized for implementation at regional level through the regional ministerial secretariats (SEREMIs). These bodies are the regional representation of the ministries for each region and work conjointly with the intendent and regional council in executing, and sometimes tailoring, the different policies, programs, and projects. The offices for these services are located in the capital of each region, which is often the municipality with the largest population.

As with the administration, people and economic activities are heavily concentrated as well. About 41% of the population live around the capital in the Metropolitan Region and another 22% splits between the Valparaíso and Biobío regions (INE, 2017). The Metropolitan Region also concentrates 45% of the total GDP of the country, and is followed by the three northernmost regions of Arica y Parinacota, Tarapacá, and Antofagasta holding about 20% of the GDP (Banco Central, 2018). As a result, this concentration creates a significant, and perhaps disproportionate, degree of attention of the national authorities to the capital, a behavior that reproduces within regions as well. Overall in the country, 88% of the population live in urban areas and only one region has below 70%.

This geographic concentration of the administrative structure, population, and wealth exists at both the national and regional levels and causes a double neglecting effect over the areas that do not agglomerate any of these items. Nationally, the Metropolitan Region attracts most of the attention for government officials, politicians and policymakers, businesses, or the media. Similarly, in the regions the attention is biased toward capitals where the population and natural resources concentrate.

Access to resources and services

The third challenge is the economic factors that determine the accessibility to resources and services of communities across the country. On the one hand, this is influenced by the commoditization of social services and the preponderance of market-based logics for their delivery. With the social and economic reforms of the 1970s, Chile became not only a market economy but a market society, introducing and promoting the expansion of private actors in primary, secondary, and higher education institutions, clinics and healthcare services, and pension funds administration, which differentiated the quality of those services based on the capacity of users to pay for them (Solimano, 2012). Almost all social and basic services in Chile are fully or partially privatized, and in many activities, there is no public alternative, like for water and utilities. As Solimano argues, this has produced important gaps on the quality of public and private providers with significant distributional impacts on who can access each, along with price increases and expansion of debt to pay for expensive services like higher education. The model did not change when the country returned to democracy in the 1990s and was only subject to targeted reforms in the benefit of the poorest quintile.

The Chilean economy, as explained, depends heavily on its natural resource endowment. Mining, forestry, fishing, and agriculture are some of the largest sectors contributing to the country's GDP, and constitute, by and large, the activities that sustain the livelihoods outside of the Metropolitan Region, which is otherwise specialized in manufacturing and financial services. However, Chile lacks a clear and strong diversification strategy of its productive sectors, which could foster new industries and reduce the dependency on natural resources exports (Ffrench-Davis, 2010). As explained by Solimano (2012), medium and small size businesses represent a significant proportion of the productive structure and have a higher participation outside the Metropolitan and mining regions. But they suffer from similar inequalities of low- and middle-income families and are largely subject to the conditions imposed by big corporations. Moreover, most regions depend on commodity exports, therefore being exposed to the fluctuations of the international markets, while the diversified urban economies are much more resilient (Daher, 2003). To a large extent, the economic policies of the country had aimed to accommodate and promote private and foreign investment, while trying to maintain the internal economic equilibrium as the international markets

evolve (Ffrench-Davis, 2010). But since the largest economic sectors are physically limited to certain locations, as they centralize most of the public and private interest, communities outside their reach are excluded from the benefits of these activities. Per-capita incomes in Chile correlate with the spatial distribution of natural resources endowments and with the presence of political and administrative activities predominantly in Santiago (Badia-Miró, 2015). As the author shows, provinces outside these areas have average economic structures and below-average incomes.

Furthermore, these dynamics affect municipalities as much as individuals. Their income largely depends on the economic activity and property taxes collected within the jurisdiction, but since low value properties are exempted and clustered together with the lowest income population, most municipalities are unable to produce enough resources to provide an adequate level of services to their residents (Razmilic, 2014). Wealthy communities can access and afford good quality services because they have the means for it but low- and middle-income households outside the economic centers of activity depend on what the public system is able to provide for them, which is many times limited. As a result, the level of development across the country is heavily interwoven with the wealth and resources of the community, which in turn, is generally associated with proximity to natural resources, as well as service and political activities.

Combining the challenges

None of these dynamics are new in the region, and they had been conceptualized by dependency theorists since the 1960s under the metropolis-satellite paradigm. With this idea, the three factors of heterogeneity, centralism, and economic capacities come together in the form of power relations that favor the centers or metropoles and that neglect the periphery or satellite communities, which are regarded as pastoral and isolated (Frank, 1971). Prebisch (1963) argues that both the social and productive structures in Latin America respond to a pattern that hampers social mobility, concentrating wealth in few privileged groups who do not produce more capital but rather increase their consumption, leaving the rest in less productive activities and without economic incentives. Following this logic, the centers or metropoles develop as they exploit their satellite communities which are left underdeveloped, a process that replicates at all scales: the national metropolis extracts from its satellite provincial capitals, which, in turn, extract from its own satellite localities, creating a chain of dependency of the farthest end of the country with the most prominent metropolis and even beyond, with the global economy (Frank, 1969). Consequently, as Frank argues, both development and underdevelopment are outcomes of a single process, rather than the former an earlier status of the latter.

This paradigm has been contested and considered more as a set of common features of the facts instead of a sufficient explanatory theory for every context (Halperin-Donghi, 1982). Nevertheless, despite the criticism, I consider the metropolis-satellite paradigm useful for putting together the pieces presented so far, and I adopt it because it is useful for thinking about solutions. On the one hand, it puts the different communities across Chile in a hierarchic order based on power instead of in a neutral or accidental relationship. And on the other, it brings doubt on the notion that the same model that helped the development of some areas will work if applied to the least developed ones, as they are both results of one larger structure that essentially needs underdevelopment to produce more development. With decades of a similar discourse in Chile, and an increasing contestation on the trajectory so far, particularly today, this framework helps shifting the attention to the "satellites" and thinking about solutions directed to empower them rather than funneling actions through the center's logic.

1.4. Opportunities for an adequate discourse

The SDGs present a good opportunity for solving some of these issues. The United Nations (UN) 2030 Agenda was adopted in 2015 as an effort to continue the eradication of poverty and working towards prosperity of humanity and the planet, acknowledging that a multidimensional approach that considers social, environmental, and economic sustainability is imperative. All member states including Chile signed the agreement and agreed to implement, monitor and report the progress to the High-Level Political Forum on Development (HLPF). The country, moreover, is already working towards it. The agenda establishes 17 goals that aim to advance prosperity and peace for people and the planet, with a strong focus on partnership across actors to meet that aspiration. They had become the largest and most comprehensive set of development indicators that have been internationally adopted as well as a driving force across actors to influence public and private institutions worldwide. They were constructed through a consultation process including multiple members of civil society, therefore having more widespread support than earlier efforts led by the UN.

The framework includes 17 goals, with a total of 169 targets and 231 indicators. The thematic areas include poverty and inequality, health, hunger, education, gender equality, access to basic services, responsible and fair production, consumption and growth, ecosystem conservation, climate change, and peace and partnerships. The SDGs build upon already standardized development indicators globally, but also include novel areas and metrics that are still under discussion regarding how to appropriately measure them. Goals and metrics are highly correlated, with improvements in some areas working as enablers for

others (Le Blanc, 2015; SRC, 2016). In addition, the 2030 Agenda has explicit visions of equity and justice behind it, which are reflected in the "leave no one behind" motto. The Agenda includes aspirational goals of 100% completion for many of its metrics, which means every single person below the predetermined standards must be brought up to that level at minimum. These targets are based on an idea of justice comes from a human rights approach, including the right to development (UNGA, 2015b). Moreover, it incorporates the idea of intergenerational equity by conditioning the well-being of future generations on past and current actions, mostly reflected in the environment-related goals. The goals directly attempt to reduce the footprint of human activity in the planet, so it does not preclude people from taking advantage of the ecosystem in the future.

A system of indicators that can communicate relatable information for communities on the ground, and especially to those who disagree with the traditional development discourse of the country, needs to be sensible to the challenges mentioned and able to capture the nuances as these issues overlap with each other. In a context of heterogenic living conditions across the country, a centralized administrative structure, an economy concentrated on the urban cores and on natural resources, and a market-based approach for public service delivery, a geographic disaggregation of metrics appears advantageous for such purpose. In this context, the UN SDGs provide a good starting point that encompasses the relevant areas to look at. Yet, in order for the to address the prevalent inequalities of the country, they need to be scaled down to an appropriate scale where that reveal these issues.

That approach would be of contribution if the unit of subdivision meets at least four requirements. First, maximizing the differences between boundaries and minimizing the differences within boundaries. Second, comprising significant differences in many dimensions at the same time. Third, relating in a meaningful way to the communities it will represent. And fourth, be operationalizable in terms of measurement and implementation of actions to address the problems.

1.5. Research approach and methodology

Research questions and hypotheses

The SDGs present a useful framework to amend Chile's development discourse and facilitate the work towards it since they raise the standards compared to the measurements the country usually relies on. They incorporate a more complete vision of sustainable development that goes across most dimensions of social life and its impact on the ecosystem. They, moreover, put forth a vision of justice that seeks to provide

each person with what they need to be prosperous, closing the gap between underprivileged and privileged groups. Additionally, they explicitly incorporate a goal (SDG10) to deal with inequality, which is perhaps the greatest challenge for Chile. Lastly, they became a globally accepted framework and the mainstream referent regarding sustainable development for national and subnational governments, businesses, and civil society organizations alike.

However, as I described, Chile has issues of accuracy on its social indicators as much as on its economic ones, and its conditions of heterogeneity, centralism, and economic conditions present major challenges for aggregate metrics to be effective and relatable to the realities on the ground. Although the SDGs do propose certain disaggregation of their metrics into regions and for some population groups determined by gender, age, income, disability, or immigration status, they are largely focus on a national scale of action.

This thesis is an effort to explore how inaccurate is the typical discourse of economic growth for the different communities of Chile but in the realm of development indicators, and to understand whether the SDGs provide a sufficient structure to connect the realities on the ground with what aggregate metrics can achieve. I will start from the framework they provide but go beyond their mandate since I believe their aim is right, but their scope is insufficient. In this context, I ask three questions:

- In the context of Chile, to what extent are the SDGs capable of "leaving no one behind" in the development path of the country?
- To what extent could the localization of the SDGs contribute to advance distributive justice?
- What can we learn from disaggregating the SDGs that could inform opportunities for fostering sustainable development at a local level?

I hypothesize that local characteristics that describe the heterogeneity, centralism, and economic conditions of the locality are not neutral to the development status but correlated with different degrees of performance, thus indicating additional areas of concern that have to be taken into account. Accordingly, I argue that in order to advance distributive justice with the operationalization of the 2030 Agenda in Chile, the localization effort must come along with an effort to strengthen the local and institutional capacities that could support that strategy. In other words, disaggregating SDG metrics is only the first step of a larger effort to empower local communities so they can act upon their own development.

Methodology

I will use mixed methods to answer these research questions, combining exploratory research to inform the design of a consequent quantitative analysis. For the first part, I will conduct secondary research

of scholarly literature, government reports, and documents from multilateral organizations and international working groups. I will also conduct interviews with government-related officials to lay out the relevant context around four issues, which will inform how to measure the subnational development indicators, the criteria to choose a sample list of SDG indicators, and a list of sociodemographic and economic variables to correlate them with.

The qualitative research (Chapter 2: Background) is divided in four. Section 2.1 will provide a background on the idea of development, with its current and past theorizations and departure from the paradigm of economic growth, in order to explain its evolution into the definition contained in the 2030 Agenda. I will track the most relevant international agreements that shaped the mainstream UN agenda on development. In addition, I will explore the main ideas of justice that support the SDGs as well as appropriate theories of distributive justice that can frame the analysis of the localization later on. For this section I will rely on scholarly literature, government-affiliated reports, and UN resolutions. In section 2.2, I will explain the theorization about sustainability indicators, what they should encompass and aim to achieve. I will also explain the goals, targets, and metrics of the SDGs and refer to the major critiques about them and their predecessor. This analysis will be drawn from scholarly literature. Section 2.3 will refer to sustainable development in Chile particularly, explaining the institutional framework for its implementation, its integration with the national agenda, and the current status of the SDGs in the country. Legal documents, semi-structured interviews, and literature will inform this section. Finally, section 2.4 will examine the idea of localization, the support for a localized 2030 Agenda, and current efforts on localizing the SDGs or similar development indicators. Additionally, I will provide a background on the municipal governments, which are the selected unit of analysis, explaining the advantages of this approach for studying and advancing distributive justice. Government-affiliated reports, academic literature, and semi-structured interviews will inform these last two sections.

These four sections will inform the approach for the quantitative analysis overall (Chapter 3: Analysis). I will first select a sample of 11 of the 231 available indicators to carry out the research. The selected metrics can be found in Table 1, and the details of the criteria in section **Error! Reference source not found.**. The rest of the section will explain the additional information, caveats, and limitations regarding the quantitative research. This section will draw from governmental primary sources of data to estimate the indicators at municipal scale. Section 3.2 will review the results from the statistical analysis of dispersion for each selected indicator, as well as from the correlational analysis to establish relationships between these indicators and other contextual metrics. I will inspect these outputs from the perspective of the overall performance against the targets, the dispersion of values, their spatial distribution, and their correlation with other socio-demographic and economic indicators.

Lastly, in Chapter 4, the quantitative results will be qualitatively assessed based on the theoretical framework established in Chapter 2. The outputs of the calculations will serve as evidence to respond to my three research questions, revealing why an aggregate SDG agenda is insufficient to advance distributive justice.

Table 1: Summary of the selected SDG indicators

Indicator	Description	Label
1.2.2	Proportion of people living in poverty in all its dimensions according to national definitions	Multidimensional poverty
2.2.2	Prevalence of malnutrition among children under 5 years of age, by type (wasting and overweight)	Child malnutrition
3.2.1	Under-5 mortality rate	Child mortality
4.c.1	Proportion of teachers who have received at least the minimum organized teacher training for teaching at the relevant level in a given country	Teacher training
5.5.1	Proportion of seats held by women in local governments	Government gender equality
6.1.1	Proportion of population using safely managed drinking water services	Safe drinking water
7.1.1	Proportion of population with access to electricity	Electricity access
10.2.1	Proportion of people living below 50 per cent of median income	Poverty risk
11.2.1	Proportion of population that has convenient access to public transport	Public transit access
12.5.1	National recycling rate, tons of material recycled	Recycling rate
16.1.1	Number of victims of intentional homicide per 100,000 population	Homicide rate

Chapter 2. Background

2.1. The idea of sustainable development

History of the idea of development

Development is a heavily disputed concept that has had various meanings throughout time, which find their foundations in also contested normative world views. As Esteva (2010) recounts, the word can be traced back to the eighteenth century and, until recent times, it largely referred to a positive advancement towards some desirable goal based on universal law. To a large extent today, the concept keeps the same meaning and conveys the best of intention (W. Sachs, 2010). Yet, Sachs argues, it is contour-less and can mean too many things. It is then pertinent to review the history of the idea of development to understand what it means today, particularly for understanding what the 2030 Agenda proposes.

Development as a concept radically changed after the post-World War II speech of Harry Truman, when he reduced the earlier notion of development to a matter of income levels and economic poverty, which, in turn, produced two immediate consequences (Escobar, 1995; Esteva, 2010; W. Sachs, 2010). First, it categorized two-thirds of the world's population as underdeveloped in the region of Latin America, Asia, and Africa, while Europe and the US became the referent of the development status. And second, it established a duality between development and underdevelopment, where the now called underdeveloped nations must think of themselves as that first in order to aspire to be developed. Accordingly, this declaration produced effects that last until today in both the theorization around the idea of development and about its implementation because of the quest to develop that started after. And although its initial idea has evolved significantly over the years, it remains contested because its foundations had been debunked: industrialized countries are not thought at the top of the scale anymore, development has negatively impacted society and the planet, and the gaps between rich and poor had expanded rather than reduced (W. Sachs, 2010).

Despite many negative perceptions around both the theory and the practice of development, the concept has evolved and transformed positively in the past seven decades. It started as an equivalent of economic growth, but, in parallel, the notion of social development coexisted until eventually merging with the mainstream conceptualization, which later also incorporated environmental concerns, being reframed as sustainable development (Esteva, 2010). In particular for Latin América, Cuéllar and Moreno (2009)

offer an account of the evolution of development that is divided into four major stages. I will use their structure to lay out the historical evolution in the region depicted in scholarly literature, and then expand how, in parallel, these notions have evolved by way of international dialogue and agreement.

At first, between the postwar years until the early 60s, development transitioned from pure economic growth to a broader conception of socioeconomic development. The expansion of the economy, particularly on the poorest sectors of society, was though to be the mechanism by which these families will leave poverty and acquire sufficient resources to reduce inequalities (Cuéllar & Moreno, 2009). The notion was purely quantitative at the beginning. Exponents such as Lewis or Singer depicted a linear path from underdevelopment to industrialization with prescriptive solutions for essentially any economy, guiding them to reduce their poverty ratios by increasing productivity and incomes (Lewis, 1954; Singer, 1952). In a second stage, development went from socioeconomic development to national development. After the Cuban Revolution in 1959, dependency theory emerged as a new conceptualization for the concept in Latina America particularly, which shifted the attention on the role of governments and the politics of the relationships between developed and underdeveloped nations (Cuéllar & Moreno, 2009). The status of underdevelopment in the region was now understood as being produced by the same processes that led to the development of the North/West, who set the standard on how to assess the development for the rest based on them rather than on the economic and sociopolitical characteristics of the "underdeveloped" nations, establishing a necessary connection of dependency between the centers or and the peripheries (Frank, 1971; Prebisch, 1963). A third stage corresponds to the emergence of sustainable development. Between the late 60s and the late 80s, the state-led ideas fell and gave rise to neoliberal conceptions more aligned with the early stages, in tandem with the ascension of military governments into power and their subsequent downfall (Cuéllar & Moreno, 2009). The 1980s period was later called the "lost decade," because the market-based approach did not produce the expected growth and only expanded prevailing inequalities, along with increased violence and hardships throughout the region (Cuéllar & Moreno, 2009; Escobar, 1995). Yet, as a consequence of the backward progress in socioeconomic terms and of the recognition by the Club of Rome that the world was finite and endless exponential growth impossible (Meadows et al., 1972), the importance to balance growth with environmental sustainability gained mainstream acceptance. It, moreover, challenged the notion of sustainable growth and instead put forth the idea of sustainable development with the need of improving throughput efficiency, reducing extraction, and containing consumption (Daly, 1990). Lastly, the idea of human development came into place, which expanded the scope of development based on a human rights and capabilities approach and re-centered the idea around people rather than in the economy, principles that were largely taken by humanist, ecologists, and the political left in Latin America (Cuéllar & Moreno, 2009).

International agreements on development

The transformations development, particularly into sustainable development, did not only pertain to the intellectual circles, but it started permeating and solidifying through international dialogue and working agendas. In 1987, the Brundtland Report mainstreamed the concept of sustainable development as the necessary path to solve the present failures caused by economic expansion and environmental degradation, as well as the impact on future generations (WCED, 1987). The report portrayed sustainable development as a global issue of national and international concern, that affected both developed and developing nations and that presented enormous institutional challenges. It described sustainable development as a continuum, an evolving process rather than a time-bounded local intervention. It built upon past declarations that had already centered development around the fulfillment of human rights and the necessity of meeting that goal in environmental protection ("The Cocoyoc Declaration," 1975; UN 1973), but departed from that view in the sense that unified humans and nature as the objectives of development.

In 1992, the Agenda 21 established a roadmap for achieving global sustainable development around social, environmental, and institutional thematic areas (UNCED, 1992). It defined national governments as the primary actor for advancing development and, at the same time, stressed the need for multilateralism and inclusion of non-governmental organizations, subnational governments, and civil society in achieving these goals. The agreement, however, was based upon moral standards and not enforceable under international law. Later, the Millennium Declaration led to a stronger individual and collective commitment to eradicate the most extreme forms of poverty globally through the adoption of the MDGs (UNGA, 2000). The declaration, moreover, strengthened the role of the UN in orchestrating the path towards development through its international institutions.

Fifteen years later, the MDGs and their remaining challenges set the stage for the adoption in 2015 of the 2030 Agenda. All the UN member states adhered to keep working towards sustainable development under five pillars–people, planet, prosperity, peace, and partnership–and measure their progress under 17 SDGs (UNGA, 2015b). These goals include a total of 169 targets and 231 indicators that expanded the scope of the MDGs beyond the primary issues of the least developed nations into challenges that affect developed countries as well, becoming the most comprehensive and specific enterprise that has been adopted globally. The agreement came three months after the adoption of the Addis Ababa Action Agenda, which committed the mobilization of domestic and international resources for addressing the sustainable development challenges and highlighted the additional role of private businesses, trade, and debt on this endeavor (UNGA, 2015a). However, that plan was not functionally integrated with the 2030 Agenda,

although the latter included procedural goals to improve the means of implementations of the agenda itself. The 17 SDGs are:

- No poverty
- Zero hunger
- Good health and well-being
- Quality education
- Gender equality
- Clean water and sanitation
- Affordable and clean energy
- Decent work and economic growth
- Industry, innovation, and infrastructure
- Reduced inequalities
- Sustainable cities and communities
- Responsible consumption and production
- Climate action
- Life below water
- Life on land
- Peace, justice, and strong institutions
- Partnerships for the goals

Sustainable development today

Throughout this historical transition, three ideas had become part of the mainstream notion of sustainable development that simultaneously support and contest the sufficiency of the propositions of the 2030 Agenda. The first and most clear idea is that sustainable development refers to the interlinkages and trade-offs between economic, social, and environmental sustainability with multifold and interlinked objectives (Goodland & Daly, 1996). As the authors argue, each dimension aims for different goals that depend on each other. Economic sustainability aims for growth, efficiency, and equity. Social sustainability for empowerment, participation, cultural identity, institutional development, and social mobility and cohesion. Environmental sustainability for ecosystems integrity, carrying capacity, and biodiversity conservation. In addition, it rejects the notion that economic growth is at the center of development and a priority over social or environmental concerns, which has been constantly debunked in the literature because of its unfeasibility it in a constrained world (Daly, 1990, 2005; Meadows et al., 1972), its lack of

empirical evidence to explain the growth of countries (Kenny & Williams, 2001), and its technocratic belief that poverty is a problem of lack of inputs when it is rather about the lack of rights and political will (Easterly, 2013; Goodland & Daly, 1993). This three-dimensionality is represented today in the nature of the first fifteen SDGs, with, broadly, goals 8, 9, 10, and 12 in the economic dimension; 1, 2, 3, 4, 5, 6, 7, 11 in the social; and 13, 14, 15 in the environmental, although highly interlinked in the targets and indicators.

The second feature of sustainable development is that it pertains not only to the present moment but directly impacts future generations. Although sustainable development includes its three dimensions as equals, sustainability and preservation of the environment have been placed as essential for sustaining the first two (Goodland & Daly, 1996; Reid et al., 2017; SRC, 2016). The continuous population growth and strain over resources needed to feed future population have led some authors to anticipate the collapse of society because of insufficient food, stressing the dependence of human welfare on the ecosystem and shifting the attention from today to future generations (Ehrlich & Ehrlich, 2013). In consequence, as mentioned by Daly (2005), sustainable development must then necessarily include two additional considerations beyond the three dimensions. First, that it must address intergenerational equity, and second, that it should measure it with a strong sustainability standpoint. Strong sustainability differentiates from its alternative, weak sustainability, in that it takes a non-substitutability of capital approach, or in other words, that natural capital is both irreplaceable by human or man-made capital and that it is non-substitutable by other forms of natural capital (Neumayer, 2003). Intergeneration equity then stresses the need to ensure that present human activities do not preclude the capacity of future generations to thrive, which can only be achieved with the preservation of the ecosystem in its natural form. In this context, as mainstreamed by the Brundtland Report, sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43), a notion that is particularly prevalent in SDGs 7 and 12 to 15.

The last element is that sustainable development is embedded within and dependent on an institutional and political arrangement. After World War II, underdevelopment meant economic poverty, and its solution was under the responsibility of development institutions led by developed countries in the West/North (Escobar, 1995). However, Escobar argues, development became a technocratic, ethnocentric, and top-down practice by these countries that reproduced their imaginaries for the so-called underdeveloped poor but not by them. This dynamic expressed a geopolitical imagination that served as a justification for these actions in the name of development, and to think of an alternative people must first be aware of their own geopolitical imagination (Slater, 1993). Within this context, sustainable development has increasingly become about embracing different worldviews and conceptions of development, about giving agency to

local actors to decide about their own development, and about the necessity of democracy and participation (Nederveen Pieterse, 1998). However, local participation has also been seized for ideological gains, and instead of total devolution of state power into local actors, there must be an appropriate balance (Mohan & Stokke, 2000). Moreover, strong and legitimized states can be essential in protecting nations from global threats, and their role must be supported rather than weakened (Annan, 2003). These dynamics are captured by SDGs 16 and 17 with a focus on building a strong internal institutional framework that can include all levels of governments as well as promoting collaboration with international organizations, NGOs, the private sectors, and civil society.

These features can be summarized under a set of values that sustainable development cares about. One, the sustainability of the three dimensions of sustainability: society, environment, and economy. Two, the sustainability of future generations subject to the actions and prosperity of the present generation. And three, the sustainability of a democratic system that includes all actors of society. However, the wide range of dimensions to sustain creates tensions among them, sometimes putting them at odds. Judging these trade-offs then is neither a neutral nor obvious process, but dependent on normative worldviews. In consequence, justice then becomes a fourth integral component of sustainable development creates the framework under which these conflicts are resolved.

Justice and development

The SDGs are framed under a rights-based approach, based on human rights and the right to development. The human right to development was affirmed by the UN in 1986, unifying a set of civil and political rights, with economic, social, and cultural rights under international law, and took more than twenty years of discussion to adopt (Sengupta, 2000). As the author argues, its adoption is a significant milestone in the evolution of development because it commanded states, agencies, and individuals to implement the right, and its offense is considered as grave as violating any other human right. The declaration, in particular, proclaims that states have the responsibility of enabling the process of development, that the affected individuals would participate effectively and meaningfully on the process, and that they will be entitled to a fair distribution of resources (UNGA, 1986). However, the asymmetric global trade and governance order, along with the insufficiency of resources to bring the development to everyone present major challenges for its implementation (Fukuda-Parr, 2012).

The concept of justice applies when there is an allocation of rights and duties and the distribution of social and economic advantages (Rawls, 1971). According to Rawls, the primary subject of justice are the social institutions that participate in this process, including the procedural mechanism itself, and “social

and economic inequalities are to be arranged so that they are both to the greatest benefit of the least advantaged" (p. 83). Distributive justice, the concern over the allocation of goods and resources, is then an essential component of the idea of development in general and of the goals stated by the 2030 Agenda in particular. It deals with four interrelated dimensions: the preconditions for which it pertains at all, the subject over which justice is assessed, the object that gets distributed, and the normative significance of this process (Olsaretti, 2018). Different notions of distributive justice can serve to judge the 2030 Agenda as a process to achieve justice as well as the outcomes that come as a consequence of its implementation. Moreover, notions of justice, as put forth by the right to development approach, can assess the extent to which states are distributing its power across actors for the purpose of development (UNGA, 1986), and nation-state remain the clearest boundary to execute distributive justice upon despite processes of global nature (Miller, 2009). Hence, distributive justice is pertinent for the assessment of both equity-related issues around the social, environmental, economic, and intergenerational nature of sustainable development, as well as for the promotion of a democratic and just institutional and political arrangement.

I argue that conceptions of justice are particularly important to review because of the scope of this research of the highly unequal context in Chile. Equality generally refers to either justice or homogeneity, yet the problem with inequality is largely an issue of excess rather than of poverty (Lummis, 2010), and it comes from a shortage of right, not from a shortage of inputs and technical capacities (Easterly, 2013). Therefore, an assessment of the contributions of the localization of the 2030 Agenda towards justice must be frame under a particular notion of it. In this context, Ramanujam et al. (2019) examine the three most important conceptualizations of distributive justice that are relevant to examine development–and the SDGs–for a highly unequal nation: utilitarianism, resource-based theories, and the capabilities approach. I start from their classification and expand to what is appropriate for the focus of this research.

Utilitarianism, and for this purpose welfarism as well, come from economics and propose a scheme that judges the allocation of resources to individuals based on the utility or welfare they provide to them (Dworkin, 2000). They can be distinguished from each other in that utilitarianism cares about an aggregate sum of happiness and misery, whereas welfare is concerned with the positive side alone. Utilitarianism is, therefore, not appropriate because it allows compensating the achievements of many against a few, or of some goal against another (Ramanujam et al., 2019), similar to the notion of weak sustainability (Neumayer, 2003). Still, regardless of this distinction, neither of them is a useful framework, Dworkin argues, because what constitutes welfare for each person is subjective and inscrutable for the distribution of resources, and the definition of welfare becomes part of a political goal that is incapable of having collective acceptance.

Secondly, resource-based theories are based on the idea that people must have equal access to resources (Dworkin, 2000; Ramanujam et al., 2019). In Dworkin's view, resources can have various

meanings and are not constrained to wealth or physical resources, but include personal qualities like strengths, talents, or disabilities. A society should aim to equalize resources, so no one is incapable of achieving as others based on the resources they have access to, but not based on their personal preference for certain resources nor on the welfare they can achieve with them (Dworkin, 2000). A similar notion is proposed by Rawls, who defines the primary goods that are subject to justice as liberty and opportunity, income and wealth, and the bases of self-respect, which are "to be distributed equally unless an unequal distribution of any or all of these goods is to the advantage of the least favored" (Rawls, 1971, p. 303).

Lastly, the capabilities approach is in direct contestation with the resource-based theories. It starts from the reality of people's condition and how that determines what opportunities are available for them, therefore what they can achieve (Ramanujam et al., 2019). It has three key components: functioning, capabilities, and agency (Alkire & Deneulin, 2009). As described by Sen, functionings are "the various things a person may value doing or being", capability "refers to the alternative combinations of functionings that are feasible to achieve" (Sen, 1999, p. 75), and agency "the ability of people to help themselves and also influence the world" (p. 18). As Sen argues, the success of a society corresponds to the freedoms they achieve, rather than on the total welfare they obtain. In that sense, it builds beyond welfarism and utilitarianism and establishes resources as the tools by which a person realized the functioning, reducing the previous notion of resource posed by Dworkin and Rawls (Alkire & Deneulin, 2009; Sen, 1999). Furthermore, it is deliberatively incomplete, not providing a predefined list of what are valuable capabilities (Sen, 1999), a gap that Nussbaum proposes filling with ten central capabilities (Nussbaum, 2011). The capabilities approach is, however, a framework of thought, not a theory of justice, which has been mistakenly taken for (Alkire & Deneulin, 2009; Ramanujam et al., 2019).

These three approaches, welfarism, resources, and capabilities, question each other and regard the other as inadequate or insufficient to deal with distributional equity concerns (Alkire & Deneulin, 2009; Dworkin, 2000; Nussbaum, 2011; Ramanujam et al., 2019, 2019; Sen, 1999). Because the accusation they present against the other do overlap by where each author draws the boundary of their own and their counterpart's definitions, I will not attempt to identify the single most appropriate proposition but instead, highlight the relevant notions of these theories that are important for the purpose research. In that regard, combining these approaches allows complementing the standards by which to examine justice in sustainable development with a consequentialist perspective–the fairness of the outcomes in terms resources or freedoms–and a deontological one–the fairness of the system that leads to the outcome, the institutional arrangement or the SDGs themselves (Nagel, 1997).

Accordingly, both resources and capabilities are helpful in assessing the concerns of sustainable development. On the one hand, the Dworkin and Rawls' notion is advantageous for judging the allocation

of resources that lead to social, environmental, and intergenerational equity concerns because it avoids engaging in rival or subjective perceptions of what is their value. It eliminates arbitrariness of distributing based on contextual or cultural differences, and it is more practicable when concerned with distributions among communities within the country and not within individuals. Furthermore, it fits better the thematic segregation of issues under the SDGs, that generally measure the accessibility to a service, the attainment of a standard, or the lack thereof, which can be conceptualized as the resource to be equalized. In other words, the resource-based approach provides a framework to assess distributive justice among the core dimensions of sustainable development.

Sen, on the other hand, adds the relational dimension of agency, by referring to how both policies can advance capabilities of people, and how people can determine the capabilities they want to advance through policy (Sen, 1999), which I find a helpful standard under which to assess the distribution of institutional capacities in the Chilean unitary state. If the distribution of resources today is unfair, hence the distribution of sustainable development is unfair as well, given the complex, intricated institutional structure, power relations, and economic capacities, the solution for equalizing resources is neither evident nor quick. Therefore, thinking about the agency of each community to redress this situation is a useful framework to assess distributional equity of capacities that lead to achieving agency both vertically within the administrative structure of the country, and horizontally across communities.

Lastly, the selected frameworks of justice must also address the metropolis-satellite paradigm explained in 1.3, which established a relationship and order of conditions among the different areas of the country. The lack of development–or the lack of resources together with the lack of agency–is not a binary outcome but a spectrum of conditions, and, historically, has worked in greatest disadvantage for the most peripheric communities. A prioritarian approach then is useful for thinking about bringing distributive justice in a way that amends the historical disparities. This notion would then regards as better the combinations of efforts that bring development and capacity to develop proportionately more strongly to the areas that have been neglected most and that today are worse off (McCarthy, 2017).

2.2. Measuring sustainable development

Sustainable development indicators

Measuring sustainable development in a way that can effectively capture all the aforementioned dimensions of the concept and, at the same time, protect and promote justice is not an easy task. There is a

vast literature on development evaluation, development indicators, and sustainability indicators that precedes the MDGs and SDGs. Although their object of scrutiny is not always the same, it is sufficiently overlapped to shed light on what an adequate framework of indicators must include and measure to advance sustainable development. Accordingly, I will summarize some of the most prominent issues raised on the evaluation literature that are appropriate for the SDGs, regardless of whether the author refers to a particular metric, a particular intervention, or a larger framework.

Indicators serve a purpose. They can either have an analytical purpose, such as describing trends of issues, diagnosing a situation, or studying the interrelations within a system or have a poly-oriented purpose, focusing on the predicting future outcomes, or in planning, implementing, and evaluating an intervention (Baster, 1972). Yet, multiple issues challenge the intrinsic purposes of indicators under the intentions of sustainable development, which I have grouped around six broad themes.

First, thematic interdependence. A framework of indicators for sustainable development must reflect and help to address the interrelation and trade-offs between human systems, including social and economic areas, and natural ecosystems (Bamberger et al., 2016; Mori & Christodoulou, 2012; Norström et al., 2014). Second, interdependence of boundaries. The interrelation between the boundary of the evaluation and larger or external implications, such as global environmental impacts, must be incorporated, particularly to avoid piecemeal evaluation and consider leakage effects (Mori & Christodoulou, 2012; Picciotto, 2007; Uitto, 2019). Third, adopt a strong sustainability approach. The approach should recognize that natural capital is irreplaceable by other forms of capital and that it is essential for maintaining other human systems (Mori & Christodoulou, 2012; Neumayer, 2003). Fourth, give agency to the evaluand. The framework should include all agents involved in the process of planning and implementation, at all scales, shifting ownership of the evaluation process from external actors to the beneficiaries and local actors and embracing a more participatory, therefore complex, evaluation process (Bamberger et al., 2016; Norström et al., 2014; Picciotto, 2007). Fifth, policy coherence. It must facilitate the alignment between the international and national sustainable development agendas, being careful of supporting rather than interrupting ongoing development processes (Black, 2018; Castro, 2015; Picciotto, 2007; Rueda, 2019). And sixth, compensate the asymmetries. The system of indicators should counterbalance the focus on developing regions towards developed countries because the characteristics of their economies and policies impact the development capacity of other nations (Norström et al., 2014; Picciotto, 2007), and these nations are mistakenly considered more sustainable than the rest (Morse & Fraser, 2005; Wackernagel et al., 2017).

As noted earlier, the discussion around indicators reflects normative notions on what sustainable development means and must achieve (Baster, 1972). In this regard, there are two prevalent critiques around metrics and systems of indicators in general (not only the SDGs) that are important to consider. On one

side, that metrics have similar ambiguity issues of those of the notion of development and that terminologies are sometimes confusing (Parris & Kates, 2003). As the authors argue, metrics lose purpose as they attempt to serve too many objectives and measure broad goals with unclear definitions. On another side, that indicators are a reductionist and technocratic instrument which is insufficient for solving complex multidimensional issues (Bell & Morse, 2008). This critique argues that the development community is obsessed with quantifying problems, which is an incomplete and insufficient approach for effectively acting upon these issues. However, the authors also that sciences and practice have proven that quantitative metrics can be effective when they subdivide and explain systems into manageable component rather than oversimplifying them, and also acknowledge the incomplete nature of numbers in capturing all the relevant elements to consider.

When thinking about complex systems of indicators such as the SDGs, it has been suggested, moreover, that thematic aggregation of indicators into indices that can summarize the diagnostic into a single or a few metrics, as well as spatial aggregation into national or large scales is not a helpful approach (Alaimo & Maggino, 2020). The authors argue that, for the case of countries with significant biophysical, economic, social, and territorial differences, aggregating or weighting information poses a risk of compensating variables that independently show worrying levels, which must be evidenced to effectively advance sustainability in every relevant area.

Targets and indicators of the Sustainable Development Goals

The SDGs are an explicit proposal of how to measure sustainable development based on quantitative metrics. In total, they include 169 targets and 231 different indicators, with some of them repeating in more than one goal. The 17 goals are aspirational and do not specifiy any particular number, although some of them implicitly call for a 100% of achievement. For example, the first goal is to “end poverty in all its forms everywhere.”

The 169 targets have both explicit and implicit metrics with different ranges of specificity. Following the case of SDG1, its first target proclaims to “by 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day” which provides a clear threshold to determine success and failure. However, its second target of “by 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions” does have a quantitative metric (“half the proportion”) but less specific, as it depends on national definitions of multidimensional poverty, which could either not exist or not be comparable. On the other hand, the third target of “implement nationally appropriate social protection systems and measures

for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable" does not include any particular metric other than having complied with the stated requirements and has a subjective assessment of what "substantial coverage" could mean.

The 231 indicators can be classified into two groups. They can broadly be defined as process indicators or result indicators. The second category, moreover, can refer to an output, an outcome, or an impact. The first group measures the degree of completion of a process or the number activities performed, whereas the second one evaluates either the direct change in the action being measured (or output), the consequences as a result of that change (or outcome), or the longer-term achievements (or impact) (Gücümengil, 2017). The UN Statistical Division maintains an online list of the most updated version of each indicator (UNSD, n.d.-a). For the purpose of this research, I will only rely on the second category of indicators, and their specific methodology will be covered in Chapter 3. In addition, the indicators are also classified into tiers (I, II, and III). Tier I indicators have clear, internationally established methodologies and widely available data. Tier II indicators have clear and established methodologies, but either the data or the indicator is not generally produced. Tier III indicators do not have an agreed methodology or standards yet.

All the indicators within the SDGs are meant to be calculated for the progress of the whole nation. In addition, some indicators have a minimum required breakdown of information that varies depending on the nature of the metrics. Generally, these desegregations are based on sociodemographic characteristics, such as gender, rural/urban, immigrant status, disabilities, age groups, and others, while some indicators also require a breakdown by subnational regions. Strategic guidelines set by the Cape Town Global Action Plan highlight the importance of data disaggregation for all the relevant population groups in order to advance the 2030 Agenda with the purpose of "leaving no one behind" (HLG-PCCB, 2017). The Action Plan encourages increasing the coverage of high-quality statistical data for all areas of the country and integrating it with geospatial information. Along these lines, the Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs) provides referents and standards for data disaggregation for the various categories suggested for the SDGs, including geographic location (IAEG-SDGs, 2018). Although some issues remain open, these efforts are keen on advancing disaggregation as a mean to advance the SDGs.

Critiques on the Sustainable Development Goals

Similar to the idea of development, the SDGs and their predecessor, the MDGs, have received wide criticism as well as suggestions for improvement. Overall, the MDGs were found to have several shortcomings, which include: the omission of inequality issues and many other important areas of

sustainable development, poorly designed goals for partnership, misalignment with human rights standards, a heavily technocratic approach, narrowly framed goals without a clear agenda supporting them, and a lack of coherence with ongoing development processes (Fukuda-Parr, 2016). Although many of these problems had been solved in the SDG framework, some still remain, and new critiques had appeared as well. Generally speaking, the literature about the SDGs refers to three major issues: the adequacy of their content, their capacity to effectively integrate the multiple dimensions of sustainable development, and the implications of their implementation.

Regarding the adequacy of the content, although having much greater thematic coverage, the 17 goals are criticized for having vague definitions, serving more as parameters for sustainability issues rather than clear goals (Sultana, 2018). In consequence, the lack of clarity leaves space for interpretation and confusion between goals, targets, and indicators (Dang & Serajuddin, 2020; Sultana, 2018). Moreover, the mixture of goals, targets, and metrics has various other problems: overlapping boundaries, trade-off within dimensions, unclear time horizons, reliance on incomplete and inconsistent data, and missing methodologies to assess progress (Dang & Serajuddin, 2020). From a different angle, other authors argue they have a limited scope. Natural ecosystems, which are an essential part of the progress on the agenda, remain underrepresented despite the improvements in environmental dimensions (Reid et al., 2017). Similarly, although the SDGs explicitly included goals for inequality, governance, and economy, which were missing in the MDGs, this progress is regarded insufficient (Fukuda-Parr, 2016). They also do not include distributive justice concerns regarding social, biophysical, and procedural inequity, and focus solely on intergenerational equity and sustainability (Lele, 2017).

Other scholars refer to the interdependence of the SDGs. These goals propose a significantly more integrated network of targets than the MDGs from which is easy to identify related targets that could be monitored together (Le Blanc, 2015). In this context, Stafford-Smith et al. (2017) propose seven policy actions that are needed to stimulate the linkages between the thematic areas and actors across goals: mobilizing capital dedicated to long-term investments, co-producing knowledge between developed and developing countries, encouraging actors to use system thinking, gearing trade policy towards enhancing the sustainable production and consumption, promoting integrative policies across sectors, placing leadership at a high level of government, and creating indices to track the most essential variables within the SDGs. Moreover, the SDGs were constructed in a less technocratic and more participatory process than their predecessors, starting with much wider acceptance (Fukuda-Parr, 2016), and validation together with interrelation can facilitate mainstreaming the areas that had received less attention (Le Blanc, 2015). Yet, the integrative capacity of the institutional dimensions of the SDGs limited, failing at linking governance

challenges and power relations that impact the outcomes as much as other thematic areas of sustainability (Le Blanc, 2015; Sultana, 2018).

Finally, the last set of comments refer to the implications of the SDGs. Overall, they had received critiques about their actual capacity to sufficiently advance the agenda they put forth. The MDGs were found to have various unintended consequences, such as diverting attention from other ongoing important processes and leading to siloed interventions rather than connected agendas (Fukuda-Parr et al., 2014). Giving the vast extent of the SDGs and its myriad of indicators, there is a risk of selectivity of the goals, simplification of the metrics and targets, and adaptation of the agenda by nations and stakeholders, which pose risks of leaving some themes unattended (Fukuda-Parr, 2016). Under the MDGs, the methodologies to estimates the cost of meeting each goal were faulty and produced problematic biases towards the less costly goals (Reddy & Heuty, 2008), which could intensify the selectivity issues. Furthermore, the development community believes that the SDGs have caught global attention and preponderance in the political agendas, but in reality, they remain highly irrelevant for national development policies (Easterly, 2015). As he argues, the SDGs were created with escape clauses for countries, and are non-enforceable to them under international law. Even more, some authors even consider the SDGs are leading to the wrong direction. Regardless of their improvements in environmental variables, they still regard developed nations as more sustainable than developing ones, even though developed counties generate most of the environmental impacts that hamper the sustainability and capacity to reduce poverty in the rest of the world (Wackernagel et al., 2017). Moreover, and more extremely, their "leave no one behind" motto could be considered a perpetration of a neoliberal political project framed as global development, which will reinforce the regime that led to the current unsustainability rather than solving it (Weber, 2017).

2.3. Implementing sustainable development in Chile

Institutional framework for the 2030 Agenda

After the adoption of the 2030 Agenda in 2015, Chile has empowered and adapted its internal institutional framework in order to implement the SDGs. Initially, the country created a national committee led by the Ministry of Foreign Affairs (MINREL) and formed by focal points from the ministries of environment, economy, and social development. The committee was responsible for advising the President of the country in the implementation and monitoring of the 2030 Agenda and served as a coordinating unit with all the governmental, international, academic, and civil society organizations that are part of the

Figure 1: Institutional framework for the implementation of the 2030 Agenda. Retrieved from *Informe Nacional Voluntario*, by MDSF, 2019.

agenda. The committee also included thematic working groups and technical secretariat. The working groups were focused on the economic, social, and environmental themes of the SDGs and were led by each of the corresponding ministries.

In 2019, the country restructured the governance for the 2030 Agenda implementation (Figure 1), keeping the working groups and including in national committee the Ministry of the General Secretariat of the Presidency (SEGPRES), which is responsible for advising and facilitating the President's agenda with the government's institutions. Also, an intersectoral working group was created, to be led by the undersecretaries of the ministries participating in the national committee. This group took over some of the coordinating responsibilities of the national committee, clarified the role and responsibilities of the technical secretariat, and established a national collaboration network with the counterparts within each governmental body that is involved in the agenda. All these changes were aimed at formalizing and strengthening the institutional framework at a higher level in the state administration and represent an improvement over the initial structure.

Although not officially included in the formal structure, there are a number of other administrative and state bodies, quasi-governmental agencies, international organizations, civil society organizations, academic institutions, and private companies that participate in the agenda and work on its implementation.

These organizations include (although not exclusively), the regional and municipal governments, the congress, the Chilean Municipalities Association (AChM), the United Nations Development Programme (UNDP), the Economic Commission for Latin America and the Caribbean (ECLAC), and many others. Their involvement has generally been in the form of informational sessions, capacity building workshops, and documentation and reporting of information (MDS 2017; MDSF 2019).

Status of implementation

In 2017, Chile presented its first National Voluntary Report (NVR) of the SDGs to the HLPF, together with a diagnostic report with the status of implementation. Given the breadth of the SDGs, I will not comment on every single dimension but instead, refer to the highlights and areas of interest communicated by the country. The report emphasizes improvements in poverty reduction, maternal health, access to basic services, and social security improvements. Besides the general challenges for adopting a sustainable path to development, the report highlights six SDGs and their particular challenges. Some of the key messages are listed below:

- SDG1: No poverty
    - Reduce income and multidimensional poverty levels, particularly the gaps within population groups such as women, disabled population, or between urban and rural areas.
    - Strengthen local, regional, and national planning capacities.
- SDG2: Zero hunger
    - Reduce child obesity
    - Strengthen agricultural development, farmer's associativity, and technical capabilities.
- SDG3: Good health and well-being
    - Accessibility to the healthcare system
    - Reproductive rights and LGBTI inclusion
- SDG5: Gender equality
    - Structural, cultural transformation for gender equality
    - Women participation gaps in workforce and government
    - Reduce gender violence
- SDG9: Industry, innovation, and infrastructure
    - Promote research and development, sciences, and innovation
    - Establish sustainable management of water resources
- SDG14: Life below water
    - Advance conservation of oceans and fishery resources

    - Include ecosystem perspectives for local and national planning
    - Involve civil society and private actors for sustainable consumption and waste reduction

The second NVR of 2019, reported under a different administration, focused on other five SDGs. Some of the most important challenges highlighted are:

- SDG4: Quality education
    - Strengthen the quality of public education at all levels and for vocational training
- SDG8: Decent work and economic growth
    - Foster private investment and increase productivity and innovation in small businesses
    - Promote the creation of jobs and improve inclusion within the workforce
- SDG10: Reduced inequalities
    - Address higher poverty rates in particular regions and rural areas
    - Continue reducing income and multidimensional poverty rates
- SDG13: Climate action
    - Create a long-term climate strategy aligned with the Paris Agreement
    - Capacity building at all levels to address climate change
- SDG16: Peace, justice, and strong institutions
    - Insufficient data for reporting other SDG indicators of critical importance
    - Improve public-private partnership and enable enforcement of certain SDG metrics

Both reports refer to the general institutional challenges remaining to implement and advance the 2030 Agenda. They speak about further communicating the SDGs across actors and promote the adoption of the agenda by different subnational and administrative bodies, as well as by the civil society. They also heavily emphasize the need for international cooperation for achieving the agenda and detail the breadth of international partnerships and multilaterals where Chile participates.

In the NVRs, as well as on the official website of the 2030 Agenda, the country highlights a myriad of policies, programs, and regulatory actions that are framed under one or many SDGs (MDS, 2017; MDSF, 2019; Secretaría Técnica ODS, 2018a). But although many of these actions do fall within the scope of a particular SDGs and contribute to their advancement, many precede the creation of the 2030 Agenda and are tied to longer-term reforms under discussion in the parliament. Others had also been part of the political agendas of the current and the previous administration, rather than policies born as part of the 2030 Agenda specifically. Although this does not mean these actions do not fit the goals, it is important to highlight that the SDGs were not necessarily the inspiration for many of them.

Today, the SDGs have not been officially integrated into policy decision-making in Chile nor in monitoring the performance of government units that provide the services directly measured on the goals. The government today follows its own political agenda and incorporates the SDGs as they match existing areas of interest and of national concern, just as Fukuda-Parr warned (Fukuda-Parr, 2016). This is also true for the decentralized administration–regional and municipal governments. Although they do have planning capacities and responsibilities that directly impact the SDGs, they are not required to used them and act more as suggested set of guidelines. Moreover, the metrics that the country decides to communicate on its NVRs responds more generally to the availability of information, the validations of methodologies, and the internal buy-in with the relevant teams rather than to a programmatic decision. Indicators not reported do not necessarily represent areas out of the scope of work of the government, neither indicators currently presented in the report reflect areas that have received political and administrative focus necessarily. Yet, along with the renewed institutional framework for coordination, the President has mandated the national committee to present a strategy for implementing the 2030 Agenda in the country, which could include recommendations such as expanding the scope of current public policies under discussion, tying teams' performance standards to the goals, or even disaggregating part of the agenda. However, although the strategy would be an advancement, it does not rule out the possibility of the national agenda to prioritize and adapt the SDGs as they contribute to the national priorities rather than expanding them to include the sustainability dimensions proposed by the 2030 Agenda.

The enforceability of the SDGs is heavily limited. Although the right to development does provide some foundations under international law, it has proven difficult to effectively enforce it (Fukuda-Parr, 2012), and the SDGs themselves incorporate explicit wording that, ultimately, allows for countries to ignore them and decide alternatively (Easterly, 2015). The UN does not have the authority to enforce nor to report the SDG agenda on countries, because the members had not conferred the institution that power. Regardless, Chile has been fairly proactive in following the UN goals for internal policy since the MDGs and today publishes about half of the indicators included in the framework. In relation to other countries, and as mentioned in Chapter 1, Chile ranks 31st worldwide and first regionally on SDG Index (J. Sachs et al., 2019). However, the SDG Index is not an official report of the SDGs, but an independent publication that uses internationally aggregated data sources. It does not consider all the indicators for the construction of the index, and the weighting methodology is not part of the SDGs. Still, it does provide a helpful metric to compare national performance between countries. In that sense, Chile's ranking is surprisingly high, particularly when considering it is the first in all the Americas. Still, a large number of inequality metrics, service quality standards, and other outcome indicators have low scores in the report. Similar to the NVRs' highlights, the SDGs showing important challenges are zero hunger; quality education; industry, innovation, and infrastructure; reduced inequalities; climate action; life on land; and peace, justice, and

strong institutions. In other words, areas across the multiple dimensions of sustainable development–social development, environmental conservation, and governance.

2.4. Localizing sustainable development

Localization and development

Localization in development has more than one meaning, generally referring to the degree of participation that subnational governments have in the planning, implementation, and measurement of the development agendas. According to Lucci (2015), localization has two notions. One, the process of monitoring the progress of development at a subnational scale, focusing on the inequalities within and across jurisdictions. And two, the role of the local governments in advancing the development agenda, particularly because they are responsible for the delivery of many of the services in the development arena (e.g., water and sanitation, electricity). Localization has also been explained as the idea of making the development agenda relevant to a local context or place (GTF, 2016; Patole, 2018). More recently, the Global Taskforce of Local and Regional Governments (GTF) described the concept as "the process of defining, implementing and monitoring strategies at the local level for achieving global, national, and sub-national sustainable development goals and targets" (GTF, 2019). Yet, although the localization has gained importance lately, the idea of elevating local authorities in the development process is not new and has been around for years, being referenced multiple times in the Agenda 21 and addressed in the Addis Ababa Action Plan (UNCED, 1992; UNGA, 2015a).

Localization carries various benefits for local and regional governments. It contributes to expanding the idea of "leaving no one behind" into the idea of "leaving no place behind" (GTF, 2019). This brings a geographic approach to development and improves the visibility of relevant communities by making the national progress contingent upon the local achievement (High-Level Panel, 2013). It can also promote the inclusion of local actors in the development process because it brings the agenda closer to communities on the ground compared to higher tiers of government, also encouraging ownership and appropriation from them (GTF, 2016; Patole, 2018). Lastly, it can help to align national, regional, and local priorities, mobilizing local resources, building local capacities, and enhancing collaboration and co-responsibility for specific actions (GTF, 2016).

In the context of sustainable development and the 2030 Agenda, localization requires proactive actions from all tiers of government around three issues. First, on the disaggregation of relevant data.

Localizing requires collecting and breaking down information to the scale of local communities, aligning data sources for reporting at all scales, contextualizing metrics to the appropriate scale, and supporting bottom-up monitoring of goals and targets. Second, localization needs decentralizing planning and policymaking powers from the central government into regional and local governments, along with improving their institutional capacities. Central governments must enable a legal framework that allows the transfer of responsibilities to local governments, building the operative skills need to carry out these tasks, and provide them or allow them to obtain the required financial resources, generally in the form of direct transfers from the central budget or from international organizations. And third, it needs to promote meaningful participation in two directions. Vertically, through the inclusion of local governments in the coordination of the national development agenda, and by promoting the SDGs as a framework to inform and direct local strategies. And horizontally, by enabling and promoting associativity between local governments nationally and internationally to foster knowledge exchange, communication, and further capacity building (GTF, 2016, GTF, 2019; High-Level Panel, 2013; Lucci, 2015; Patole, 2018; UNGA, 2015a).

For the purpose of this research, I will refer to localization as a process that, first, gives agency to subnational governments to act upon their own development in general and the implementation of the 2030 Agenda in particular. And second, as a process that makes the progress of the national agenda contingent upon the success of all its subnational territories independently, making monitoring and implementation relevant for local communities and the national coordination alike.

Status and current efforts on localization

Currently, the implementation of a localized 2030 Agenda has not responded in equal amounts to the three areas of work just mentioned. The work so far has generally focused on the inclusion of local governments in the national coordination processes and on the voluntary adoption of the 2030 Agenda by local governments into their planning processes. However, none of them are yet widespread approaches being implemented worldwide. The GTF (2019) highlights that 42% of the countries that produce NVRs include local or regional governments in the preparation of their voluntary reports and that only 34% include them in the national coordination committees. Nevertheless, many of these cases show satisfactory levels of coordination, participation, and bottom-up influence from local governments into the national plans, providing success examples for promoting bottom-up alignment and ownership of the agenda. Such is the case of countries like Brazil, Costa Rica, or South Africa, which can serve as parameters for other countries in their own localization process.

The adoption of the 2030 Agenda by individual local governments is ramping-up, yet so far includes only a handful of cases globally. Similar to the NVRs that countries choose to produce, local governments around the world are producing their own Voluntary Local Reviews (VLR) in which they address their status regarding the SDGs and frame their actions and challenges as part of the goals. A collaboration network called Local 2030 consolidates the published VLRs, which today includes the work of predominantly large, wealthy, and urban local governments for cities like Helsinki, Buenos Aires, Taipei, or New York. However, there is some representation of smaller towns, like the examples of Santana de Paraníba in Brazil and Shimokawa Town in Japan. As the name indicates, these reports are entirely voluntary, and it is at the discretion of each government how much or which dimensions of the SDGs to adopt, which indicators to reports, and how to align this review with current planning processes (Local 2030, 2019)

There are only a few cases of top-down localization efforts regarding data disaggregation and dissemination that are managed centrally for local governments. In Colombia, the Red de Ciudades Cómo Vamos has published a report and an interactive dashboard with metrics from the 17 SDGs for the 16 most important cities across the country, which include a total of 35 municipalities (although they are not disaggregated on the dashboard). The app includes historical data for most indicators, allowing monitoring yearly changes, and produces automatic projections into the year 2030 based on the observed trends to indicate the potential achievement of the SDGs by their deadline (Red Cómo Vamos, 2020). Brazil has perhaps the most exhaustive open access disaggregation effort existing at the moment, with data dating from 1991. Called the Atlas of Human Development, and not framed under the SDGs but under the Human Development Index instead, the atlas reports a long list of development indicators for all municipalities in the country, many of which are in fact indicators present in the SDGs. The online app allows the user to view the data from the perspective of a particular municipality, creating a profile with charts and tables of the evolution of demographic and social indicators, or to compare data spatially through maps, summaries by indicators, or customized queries (UNDP et al., 2020). Also in Brazil, a collaborative effort between 54 municipalities of the western area of the Paraná state produced a similar platform for the SDGs. The dashboard shows the performance on selected indicators for all the 17 goals between the years 2010 and 2015 for all those 54 municipalities, reporting also their progress on specific actions and on the dialogue with local communities towards advancing the agenda (UNDP & ITAIPU Binacional, 2020). Brazil has a long history disaggregating development indicators dating from the 1990s, and the country has gone as granular as representing some of these metrics down to the neighborhood scale. Since the times of the MDGs, Brazil has adopted these frameworks with a localized lens and worked towards reflecting the goals for municipalities so all layers of government administration can have relevant data for planning and implementing development policies.

Currently in Chile, there are no centralized efforts for disaggregating the SDGs for the local governments in the country. Moreover, although local governments are increasing their awareness of the SDGs, none of them has officially incorporated these goals in their planning processes or produced VLRs. Still, there had been standalone efforts of disaggregating development indicators carried out in the past, generally to address issues related to centralization, spatial inequality, and heterogeneity. Between 1997 and 2000, the Corporación Nacional de Medio Ambiente (CONAMA) led a participatory effort to coproduce a system of sustainability indicators for four regions of Chile, focusing on social, environmental, economic, and institutional issues and using a participatory approach for designing and prioritizing the metrics (Blanco et al., 2001). In 2012, Candia and Hurtado (2012) produced a municipal disaggregation of the MDGs in Chile, Brazil, Mexico, and Guatemala. Their research revealed significant spatial inequalities in MDG indicators of the four countries and highlighted how, for the case of Chile, there was a smaller proportion of municipalities close to achieving the MDGs and a higher proportion of low performing municipalities that have had minimal progress over the years.

The research on spatial income inequalities is, perhaps, more advanced than for other development metrics. For example, it has been exposed how a significant proportion of income inequalities across the country are explained by a spatial component (Paredes et al., 2016). As the authors show, the spatial component explained 23% of the inequalities in the year 2000 and 17% in 2009, and that the reduction between those years was largely caused by individual improvements rather than by spatial equalization. Moreover, they also highlight that 50% of the spatial inequalities are found at the municipal scale, 33% at the regional, and the rest for provinces (the administrative body in between those two). In addition, important efforts have been made in producing accurate poverty estimates for all (or most) municipalities in Chile. This work has focused on compensating the lack of data entries in areas of small sample sizes, which are also generally located in parts of the country with scarce population and limited accessibility (Casas-Cordero et al., 2016; Observatorio Social, 2017a). Poverty measures are of critical importance for local and national policies, and these efforts can serve as a case study for expanding the methodology to other thematic areas.

Together, all these examples show that, although there are efforts around the issue, most of it is done locally or ad-hoc, while there are only a handful of projects that centrally disaggregate and disseminate information. No country yet has produced a comprehensive list of SDGs indicators for all the local governments within a country, although existing cases in Brazil and Colombia show that it is not an unfeasible task. In Chile, some data exists from the current regional breakdown present on the NVRs, yet nothing has been produced for all municipalities holistically. Nonetheless, the evidence of the unequal

spatial distribution of MDG indicators in Chile and Latin America anticipate a similar outcome for the SDGs.

Localizing for the context of Chile

Subnational governments in Chile can refer to two decentralized administrative bodies: regions or municipalities. Regions are the largest subnational subdivision, and their governments are formed by an intendant, appointed by the President, and by a regional council, which is elected democratically. The regional government's responsibilities include designing and approving regional policies, programs, projects, and planning instruments around urban, economic, and social development issues. They are also responsible for administering the regional budget and assisting municipalities with their planning processes. Currently, they are undergoing a political reform that will transfer some of the central powers to them, increase their planning capacities and budgets, and replace the intendant by an elected governor.

Municipalities are the institution that administers the *comuna*, which is the smallest administrative subdivision of the country. Municipalities are led by a mayor and by a municipal council, all appointed by democratic elections. They have exclusive responsibilities around land-use and zoning regulation, executing construction and transit ordinances, and providing for certain public amenities. They also have shared responsibilities with the central government regarding the provision of services in areas of education, public health, environmental protection, economic development, public infrastructure and housing, urbanization, and risk mitigation and emergency management, among others (AChM, 2015).

There are 16 regions and 345 municipalities in Chile and the sum of all of them encompasses the totality of the territory. The numbering of the regions dates from the initial subdivision made in the 1970s with 13 regions numbered 1 to 12 from north to south, with the Metropolitan Region as the 13th, but with later reforms, three regions had been created and the numbering is not ordered geographically anymore. The full detail of regions and municipalities can be found in Table 9 in Appendix A.

Although I have been referring to local governments as the objective of localization, that is a misnomer for the case of the Chilean municipalities. Those are decentralized territorial and sectoral administrative bodies of the central government, ultimately dependent on the President of the country (Constitución Política de la República de Chile, 2005). They cannot be considered true local government, even though their representatives are elected independently because they do not have political nor fiscal autonomy because of their limited financial capacities (Borcoski, 2018). The resources for the municipal budgets come from three major sources: the collection of property taxes and other permitting, the Municipal Common Fund (FCM), and other direct transfers and sectoral funds. The proportion of these sources varies

across municipalities, with the richest generating most their income from taxes and the poorest largely depending on the FCM and other funds (AChM, 2015; Borcoski, 2018; OECD, 2007). The direct transfers have several sources, many of them targeted to specific areas, while others available in the form of competitive grants. About 78% of the properties in Chile are exempted from tax payments because of their valuation, and they tend to concentrate in the areas with the lowest incomes, heavily affecting the capacity of those municipalities to generate resources (Razmilic, 2014). The FCM acts as an equalizing fund to compensate these disparities, and its funds come from the autonomous incomes of each jurisdiction–largely the wealthiest municipalities–and then gets redistributed across municipalities based on a combination of equal parts, proportion of excepted lots, poverty ratios, and per capita autonomous income (AChM, 2015). This fund is regarded as an effective mechanism to promote horizontal equity among municipalities. In contrast, some of the vertical transfers that are considered regressive because of their bid-like process that shows a bias towards areas of national interests and that give the advantage to municipalities that can afford more skilled staff to prepare the proposals (Borcoski, 2018).

Given this context, I have chosen municipalities as the relevant unit of localization of the SDGs. On the one hand, it is the most granular subdivision that holds democratic representation within the country's administration. Therefore, municipalities do not only have the most proximate relationship with the local context compared to any other jurisdiction, but they also have political representation and powers bestowed by the constitution that allow them to act upon multiple development topics. They are responsible for providing many of the services that impact the outcome on the SDGs and, although limited, they hold financial and planning capacities to impact them. Besides, municipalities cover all the territory. On the other hand, it is the jurisdiction that is associated with the highest level of spatial income inequality (Paredes et al., 2016), which has shown similar patterns in other development indicators like the MDGs (Candia & Hurtado, 2012). Larger countries in the region have already started localizing the agenda at this scale, demonstrating the approach is feasible and valuable for a region that shares similar patterns of centralization.

Challenges for successful localization

Now, having chosen a unit for localization, I will highlight the most important challenges regarding the implementation of this localization process and explain how it can help to advance distributive justice. Generally, the challenges of localization are related to the scope of its approach: having available and precise data, producing a workable framework able to coordinate between the local and national scales, and being able to make the national targets and metrics relevant to the local context (Lucci, 2015). From a different perspective, Patole (2018) poses that the most prominent challenges are not on the technical

capacity of localizing neither in obtaining the data, but rather on the cost of implementing this tasks, which has not been clearly determined yet. The GTF report argues that despite the growing commitment by local governments, their inclusion in the national coordination of the SDGs has not been matched, and that it is necessary to increase collaboration, local monitoring and local capacity building, and the means of implementation regarding the enabling regulation and the financial resources needed (GTF 2019).

The issues raised by the GTF connect the idea of localizing the 2030 Agenda with the ideas behind decentralization. The objectives of these two processes are similar, and some of the intents of localization intertwine with ongoing political agendas about decentralization in Chile. Yet, decentralization has a wider scope than localization. This concept refers to the transfer of delegation of political, administrative, and fiscal powers from the central government into regional or local governments, which for the case of Chile, is a process with strong historical and political roots originating from the changes done in the 1970s (Valenzuela & Rojas, 2017). Localization, on the other hand, and for the purpose of this research, refers to the deliberate disaggregation of a centralized development agenda in regard to its implementation and monitoring. Although it does require some level of decentralization to be effective, it does not aim for the delegation or devolution of state powers ultimately, but to the shift of political attention and increase of agency in favor of the local areas. Regardless of these differences, both notions share common issues and support one another.

In general, administrative, political, and fiscal decentralization must be done harmoniously in order to ensure an effective and efficient decentralization process from the central to the local or regional governments, and the success of this process depends largely on equipping the receiving authorities with the adequate capacities (C. Rodríguez, 2010). The author stresses the necessity of transferring fiscal powers and removing discretional allocation of resources to promote adequate decentralization and autonomy. Bessert et al. (2003) evidence reduced inequalities for the municipal healthcare system in Chile as a consequence of effective financial decentralization aided by the equalization effect of the FCM, which has not been corresponded at the regional level because this tier lacks a similar horizontal mechanism. In this context, municipalities have been fundamental in the decentralization debate, and expanding their financial autonomy beyond what the FCM is capable of today is regarded as a priority for increasing their means of implementation (Borcoski, 2018; OECD, 2017). Moreover, having additional types of capacities has shown successful decentralization outcomes in four regions of Chile (Díaz & Rivera, 2014). On one side, the authors refer to managerial capacities, which include subnational collaboration and coordination, clarity of roles and responsibilities, and good financial allocation and execution practices. Additionally, they also stress the social capacities regarding empowerment and associativity of local actors, strong leadership, and a solid social capital, which, in turn, includes the cohesiveness of social networks, intersectoral links, and

trust between civil society and institutions. These actions, although motivated by decentralization intention, can help advance localization as well.

Nevertheless, because of these challenges, decentralization efforts do not always lead to positive results. There is both positive and negative evidence in Latin America, largely influenced by the combination of different levels of fiscal, political, and administrative decentralization and the particular context under which the processes were implemented, making it impossible to certainly assess the outcomes of decentralization (Carolini et al., 2019). Moreover, the idea of local, which has generally responded to a binary view of state/global versus local and embodied a spirit of empowerment by grassroots groups, could anyways be part of an ideological agenda (Mohan & Stokke, 2000). In this context, the authors argue that the notion can be obscuring local inequalities and internal power relations and suggest that it should be taken cautiously.

All this being said, it is a recurrent argument that an effective process of localization that aims at increasing the agency of municipalities must come accompanied with an improvement of their means of implementation, which largely depend on their financial capacities. Although there must be a balance between the local and central powers, promoting distributive justice in Latin America depends on empowered local communities that can counterbalance the historical process of centralization, which, in turn, needs resources (Guimarães, 1994). Consequently, by placing a national agenda in a geographically and locally bounded context, the localization of the SDGs is a process that works towards spatial justice because of what it fosters. On the one hand, it uncovers for the national scale the reality of the local, diagnosing the severity of the situation for each of the goals and targets. On the other hand, it will necessarily force a dialogue regarding the means that municipalities have for addressing their deficiencies.

This process is important because the context of Chile and Latin America is one that has moved in the opposite direction, towards centralization and accumulation of the surplus of capital by the centers/metropoles at the expense of the peripheries/satellites. A process that repeats at all scales: between Santiago and the other regions in the country, and between those regions' capital and their satellite communities alike (Frank, 1969). Framed under prioritarianism, localization helps to advance distributive justice for sustainable development if it helps to equalize the different individual indicators of the SDGs by placing first the improvements on the areas that are worse off (i.e., the satellites), pushing beyond just meeting the minimums set by SDGs. Yet, since a major enabler of this process is that each municipality has the required means of implementation–or agency–to intervene in their favor, localization would contribute to distributive justice if it also helps to equalize these capabilities prioritizing the worse off municipalities as well. These capabilities include a mixture of bottom-up participation and a top-down transfer of capacities, out of which financial resources are perhaps the most important and unequal ones.

Chapter 3. Analysis

3.1. Description and methodology

In order to answer the research questions, I will select a shortlist of SDG indicators to be disaggregated for all the municipalities in the country where there is available and reliable information. The selection criteria are based on the rubric laid out in the following section. The results of this exercise will then be analyzed in four consecutive ways. First, I compare the national and subnational scores with the SDG target for each indicator. Second, I analyze the degree of dispersion of the scores within each indicator. Standard measures of dispersion will be used to assess the magnitude and characteristics of the gaps, including interquartile ranges (IQR), and boxplots. Third, I identify the spatial distribution of the results across the territory of Chile to understand potential correlations regarding location of the less developed areas. And fourth, I correlate each SDG with sociodemographic and economic characteristics of each municipality.

Selected SDG indicators

Only a subset of the 231 total indicators in the SDG framework are feasible to scale down to municipalities. The objective of the selection process was to obtain one indicator for each goal (i.e., 17 indicators). However, not all goals have applicable or relevant indicators for municipalities, therefore the final selection considers only 11 indicators. The following criterion was used to determine the most appropriate indicator.

- The indicator is reported by the country in any of its NVRs.
- The indicator belongs to the Tier I or Tier II categories. Tier III was considered only for cases when no Tier I or II indicators were available.
- Data is either publicly accessible on an online platform or can be easily obtained by requesting it from the corresponding government agency.
- Data can be categorized by or attributed to a municipal jurisdiction.
- The variations on the value of the indicator across municipalities cannot be solely attributed to geographic, meteorological, or environmental conditions.

- The variation on the value of the indicator across municipalities cannot be largely attributed to one-time or conjunctural events in the year of analysis.
- The changes in the value of the indicator follow a progression and are meaningful to assess differences; in other words, a higher/lower result can be attributed to a better/worse condition.
- The indicator is not an input or process indicator.

For all the indicators that meet the criteria above, the following logic was used to determine the most appropriate one for each goal:

- The municipal estimate is available for all or most municipalities.
- The municipal estimate has the lowest expected bias from the data, being the most robust of all the alternatives.
- Outcome indicators are preferred over output indicators.
- The indicator has a significant correlation with the achievement of the corresponding goal. In other words, an improvement in the indicator can be clearly identified as an advancement in the attainment of the goal and is not just supplemental in nature.

Table 2 summarizes the results of this process and the final list of the 11 selected indicators. The calculation methodologies and assumptions for all the selected indicators follow the recommendations given by the UN and the particular methodologies used by the country. The metadata documents produced by UN Statistics Division (UNSD), detailed in Table 11 in Appendix B, were used as supporting guides for the calculations and assumptions (UNSD, n.d.-b). The national metadata documents were also used, particularly for the indicators reported under national methodologies (Secretaría Técnica ODS, 2018b). The reasons why the country chooses to report with a national methodology, but generally respond to the capacity of the available data to adjust to the exact UN definitions and in the international consensus on the appropriate methodology. Reported Tier III indicators usually use a national methodology because of those reasons. Table 2 highlights whether the reported information follows an international or national standard. As laid out in the filtering criteria, two tier III indicators for SDG10 and 12 had to be chosen because of the lack of good tier I or II alternatives. This exercise does not consider other suggested disaggregation of data based on population groups, such as sex, age, or others.

Table 2: List of selected indicators

Goal		Indicator (official code and description)		Short Label	Tier	Methodology
1	End poverty in all its forms everywhere	1.2.2	Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	Multidimensional poverty	II	International
2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	2.2.2	Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)	Child malnutrition	I	International
3	Ensure healthy lives and promote well-being for all at all ages	3.2.1	Under-5 mortality rate	Child mortality	I	International
4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	4.c.1	Proportion of teachers in pre-primary; primary; and secondary education who have received at least the minimum organized teacher training pre-service or in-service required for teaching at the relevant level	Teacher training	II	International
5	Achieve gender equality and empower all women and girls	5.5.1	Proportion of seats held by women in national parliaments and local governments	Government gender equality	II	International
6	Ensure availability and sustainable management of water and sanitation for all	6.1.1	Proportion of population using safely managed drinking water services	Safe drinking water	II	International
7	Ensure access to affordable, reliable, sustainable and modern energy for all	7.1.1	Proportion of population with access to electricity	Electricity access	I	International
10	Reduce inequality within and among countries	10.2.1	Proportion of people living below 50 per cent of median income, by sex, age and persons with disabilities	Poverty risk	III	National
11	Make cities and human settlements inclusive, safe, resilient and sustainable	11.2.1	Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities	Public transit access	II	National
12	Ensure sustainable consumption and production patterns	12.5.1	National recycling rate, tons of material recycled	Recycling rate	III	National
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	16.1.1	Number of victims of intentional homicide per 100,000 population, by sex and age	Homicide rate	I	International

Municipal characteristics

As mentioned, the selected indicators will be correlated to sociodemographic and economic characteristics of municipalities in reference to the heterogeneity, centralization, and economics conditions of the area. I structured these variables in four groups. First, demographic variables, which focus on the level of rurality and population concentration within each municipality. Second, relevance variables, referring to the physical distance between the municipality and the metropoles and the total population. Third, accessibility variables that measures the ease of reaching the different communities within the territory. And fourth, wealth variables that measure the economic conditions that may impact development performance, looking at the public and private sectors. Table 3 lists the ten variables chosen.

Sources of data

The data sources for the calculation of the SDG indicators are the same ones used by the country in the latest NVR (MDSF, 2019) except for indicator 16.1.1, where an alternative dataset was found with the required municipal disaggregation.

Table 12 in Appendix B summarizes all the data sources used for the SDG indicators, and

Table 13 details the data sources used for the municipal characterizing variables. Out of the 11 indicators selected, six of them use administrative data sources. These include total universe of data points in the jurisdiction and generally an accurate representation of the situation of the municipality. In contrast, the other five indicators rely on a household survey (CASEN), as shown in

Table 12. Surveys only include a sample of the population, making the estimator subject to biases. The CASEN is a household survey performed every two years with the objective of assessing the socioeconomic conditions of the population, and its sampling methodology is designed to be representative for the country, its regions, and defined rural and urban areas (Observatorio Social, 2017b). The sampling methodology consists of, in simple terms, establishing a physical boundary and determining the types and number of households that must be surveyed given the composition within the boundary to ensure representativeness of the sample. The values of each observation are then multiplied by an expansion factor that depends on the proportion of people that this observation represents. Although this method does not aim for representativeness at the municipal scale, the survey does include that breakdown of information, nonetheless. Moreover, the authors provide expansion factors for every municipality and provide guidelines

Table 3: List of characterizing variables for municipalities

Variable	Description	Unit	Methodology
Demographic	Proportion of rural population	[%]	[Rural population] / [Total population]
	Population density	[# / sq. km]	[Total population] / [Total area]
Relevance	Distance to national capital	[kms]	Linear distance between [Municipality centroid] and [Santiago centroid]
	Distance to regional capital	[kms]	Linear distance between [Municipality centroid] and [Corresponding region capital]
	Population	[#]	[Total population]
Accessibility	Road density	[kms / sq km]	[Sum of length of all roads] / [Total area]
	Proportion of rural area	[%]	[Rural area] / [Total area]
Wealth	Municipal budget per capita	[$ CLP]	[Total municipality budget] / [Total population]
	FCM proportion	[%]	[Transfers from FCM] / [Total municipal budget]
	Average sales per company	[$ CLP]	[Reported sales] / [Reporting companies]

for how to use that information adequately. However, considering the nature of the survey, the estimators obtained from the CASEN may not be robust for municipalities with small sample sizes and populations, even if data is available. In addition, 22 municipalities are excluded from the survey altogether. They are classified as areas of difficult access by the MDS, meaning that the difficulty of physically reaching the households and the associated cost of doing it is too high for a population size that is regarded as too small. The excluded municipalities are listed in Table 10 in Appendix A.

Given that this thesis aims to elevate the development conditions of areas that are generally overlooked to compare them with the national performance, all the municipalities present in the CASEN were included for the analysis. Rather than removing the ones with few observations, I have created confidence intervals using a resampling bootstrap method for the mean of each indicator that does not meet the thresholds on observations and coefficients of variation suggested by the CASEN manual (Observatorio Social, 2017b). This process has been founds to be a reasonable approximation for small municipalities in Chile (Casas-Cordero et al., 2016). These intervals were constructed for indicators 6.1.1, 7.1.1, 10.2.1, and 11.2.1. The results were then compared to sensitivity scenarios that replaced the values on these indicators with the values of both ends of the confidence interval to see whether conclusions vary significantly. Indicator 1.2.2, which also comes from the CASEN, has been excluded from the sensitivity analysis given that it includes a much more robust and detailed process to supplement the survey with a small area estimate (SAE) methodology (Observatorio Social, 2017a).

The reference year for all the metrics is 2017, with the exception of indicator 5.5.1, which corresponds to the 2016 elections. The year 2017 coincides with the latest CASEN survey available at the

Table 4: Indicator labels, units, and formulation

Indicator	Short Label	Type [unit]	Formulation
1.2.2	Multidimensional poverty	Proportion [%]	[People in poverty] / [Total population]
2.2.2	Child malnutrition	Proportion [%]	[Malnourished under 5] / [Total under 5]
3.2.1	Child mortality	Rate [value by 1,000]	1,000 * [Under 5 deaths] / [Live births]
4.c.1	Teacher training	Proportion [%]	[Teachers with training] / [Total teachers]
5.5.1	Government gender equality	Proportion [%]	[Elected women] / [Total seats]
6.1.1	Safe drinking water	Proportion [%]	[People with access] /[Total population]
7.1.1	Electricity access	Proportion [%]	[People with access] / [Total population]
10.2.1	Poverty risk	Proportion [%]	[People below median income] / [Total population]
11.2.1	Public transit access	Proportion [%]	[People with access] / [Total population]
12.5.1	Recycling rate	Proportion [%]	[Recycled/reused waste] / [Total waste]
16.1.1	Homicide rate	Rate [value per 100,000]	100,000 * [Homicides] / [Total population]

time of the study, and with the latest census. Moreover, this version of the survey includes expansion factors for all municipalities except the 22 excluded ones. Given that the 2030 Agenda was signed in 2015 and it is still being implemented and institutionalized, the information in 2017 may not be showing results of successful implementation of the goals yet.

Indicators' methodologies and targets

Table 4 summarizes the chosen indicators' methodologies, including a short label to refer to the indicator in simpler terms, the unit of the metrics, and a simplified formulation for their calculation. The formulas respond to the national and international methodologies. From now on each indicator will be referred to by either its label or its code.

As previously explained, every indicator belongs to a single target, which is part of a larger goal. By design, the SDGs set their targets for the year 2030 and do not detail a ramp-up strategy or intermediate targets, with only a few exceptions that have earlier targets. The targets are the same for every nation and do not propose differentiated subnational targets other than stating that some metrics should be achieved for all people and particular population groups as well. This, of course, does not limit the capacity of countries to set more ambitious targets in terms of values and timeframe, as well as determining a pathway to achieve those by 2030. Nevertheless, although many targets define a specific number, others are only aspirational and just refer to improvements without setting a number. Still, each goal points out to a larger

target that, sometimes, could be associated with a particular number (generally zero). Table 5 provides the detailed targets as ratified by the UN General Assembly (UNGA) and also translates them to a more simplified, tangible value. The "explicit target" translates the target statement into a value and the "implicit target" does the same with the goal statement. As Table 5 shows, the nature of the explicit and implicit targets is different, and not all of them have a specific goal other than the increase or reduction of a number.

Limitations

This research disaggregates and localizes development indicators to the scale of municipalities. Although I argue it is a convenient and relevant scale to open up the data, municipalities, and any other geographical subdivision, could be replicating the same issues that occur at a national scale within its boundary, particularly the largest and most populated ones. It is not the intent of the analysis, however, to scale down to more granular units nor to determine the most appropriate level of disaggregation of the SDGs, but to provide an argument for disaggregating thereof, which can be insightful and implementable. Furthermore, although the difference in municipal development performance can be judged under a distributive justice lens, this subdivision may not be reflecting the most marginalized groups of the Chilean society necessarily, nor highlighting the people in most need within each jurisdiction. It is possible for people with low development standards to live in a municipality with a higher score than others with lower results. Lastly, as people move and commute across municipalities for their activities, their municipality of residency does not necessarily reflect their living conditions for all dimensions.

Regardless of concerns over the data sources used to calculate each indicator, the research assumes these are good mechanisms to measure progress for their corresponding target. Also, it is assumed that improvements in these metrics represent a meaningful improvement in the conditions of people or the environment with respect to that goal. The methodology filtered the indicators that seemed less related to the attainment of the goal. However, whether the selected indicator, or any other in the SDG framework, is the most appropriate metric to measure the progress towards that goal is not a question I will address. Concerns from practitioners and academics do exist regarding how appropriate the SDG metrics are; some of those were laid out in section 2.2. Furthermore, all the data sources used to estimate the indicators are subject to bias. Although it is believed that the ones selected have a negligible amount and precautions have been taken for every estimate, other biases may be present, nonetheless.

Finally, since each SDG contains multiple targets and indicators, the metrics selected for the research correspond only to a portion of each goal and cannot be used to assess the SDGs as a whole. Although the filtering process selected only indicators that are considered to be significantly correlated with

the achievement of the goal, they are insufficient on their own to evaluate either the level of progress of the municipality on a given SDG, the degree of variability of the goal as a whole, or the correlation of the goal with other variables. Moreover, potential conclusions derived from the analysis for a given indicator should not be directly extrapolated to other indicators not considered in the research and should remain only indicative. In that sense, the exercise is illustrative of the shortcomings of development indicators under the framework of the SDGs, but it does not argue that all the metrics face the same complications necessarily.

Table 5: Targets associated with indicators

Target		Indicator	Explicit Target	Implicit Target
1.2	By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	Multidimensional poverty	-50%	0%
2.2	By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons	Child malnutrition	0	0
3.2	By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births	Child mortality	25	Reduce
4.c	By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States	Teacher training	n/a	100%
5.5	Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	Government gender equality	n/a	50%
6.1	By 2030, achieve universal and equitable access to safe and affordable drinking water for all	Safe drinking water	100%	100%
7.1	By 2030, ensure universal access to affordable, reliable and modern energy services	Electricity access	100%	100%
10.2	By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	Poverty risk	n/a	Reduce
11.2	By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older person	Public transit access	100%	100%
12.5	By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	Recycling rate	n/a	Improve
16.1	Significantly reduce all forms of violence and related death rates everywhere	Homicide rate	n/a	0

3.2. Results and analysis

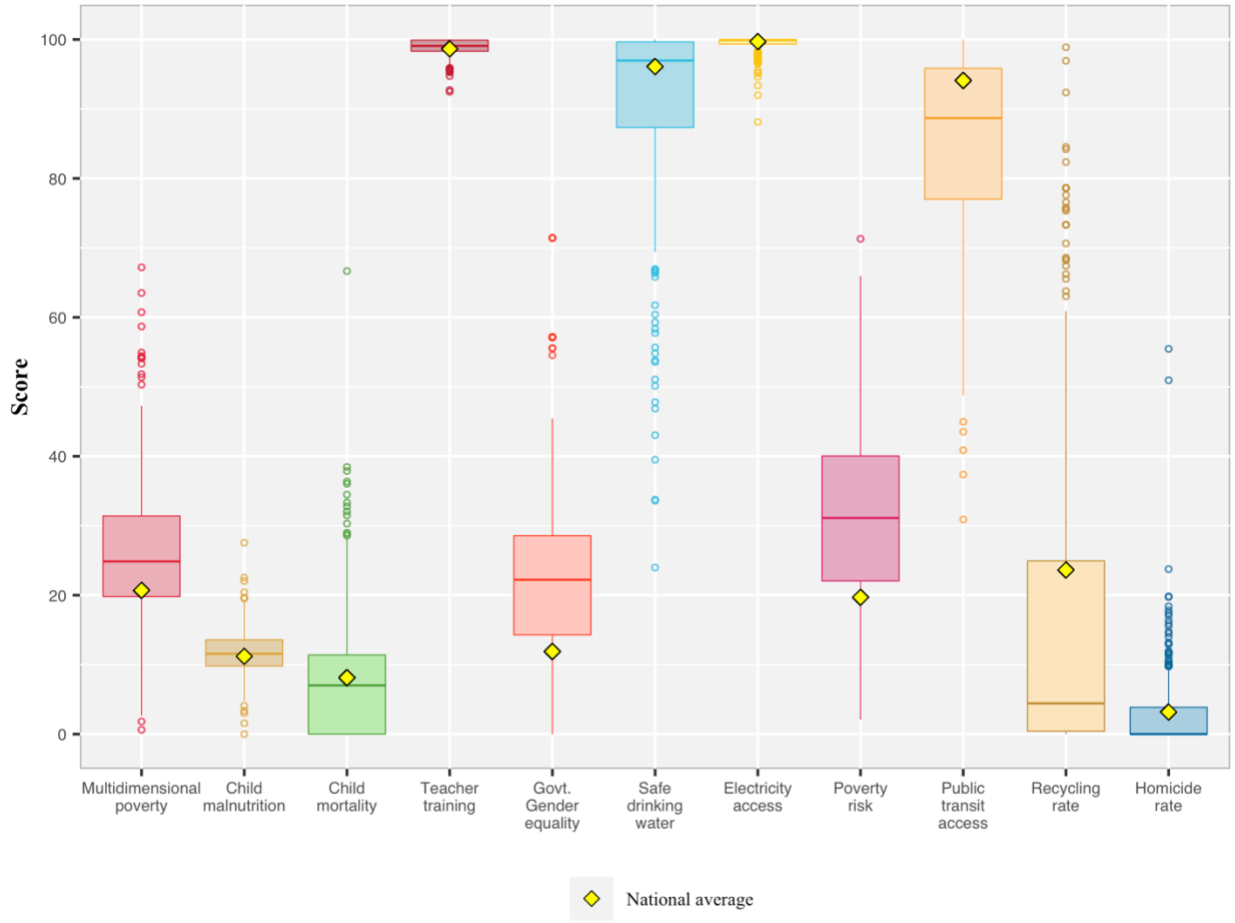
Performance: indicator score versus target

Figure 2 below summarizes the scores of the disaggregation of all 11 SDG indicators for the municipalities in Chile. The spread of values on each goal is represented by boxplots, highlighting five statistics: the lowest score, the first quartile, the median, the third quartile, and the maximum. The graph also includes the outliers of the distributions, which are represented by dots outside the whiskers of the boxplot. Outliers are still part of the first and last quartiles of the distribution. The y-axis of the chart represents the score of each municipality, and it is truncated at 100% (or just 100 for metrics other than percentages) only for graphic convenience. As detailed in Table 4, nine indicators are proportions that can range between 0-100%, for which the chart boundary represents the full range of potential values, but *child mortality* (3.2.1) and *homicide rates* (16.1.1) could go as high as their corresponding scale, 1,000 and 100,000 respectively. Still, since their values tend to be relatively small (reason why they are scaled up by a few zeroes), they fit well on the boundary of Figure 2.

Before I discuss what these results mean, it is important to consider two caveats. First, even though the variables share the same y-axis, a change of a single digit (+/- 1) is not comparable between indicators. A marginal variation on each indicator does not require the same level of effort, resources, or time to achieve necessarily. From a normative perspective, both the current value and a marginal change are subject to interpretation and hold different weights that depend on value-systems. In other words, a reduction of 1pp in poverty may not be valued the same as that same reduction in water accessibility. The second caveat is that metrics like *recycling rate* (12.5.1) or *government gender equality* (5.5.1) are free to fluctuate between 0-100% because they measure an absolute level of completion. In contrast, others like *poverty risk* (10.2.1) measure the relative situation of a group compared to the total, which means they cannot be equal to either 0 or 100 by design.

The situation of each indicator is different, but they can be grouped based on their national performance level. Seven of them have a fairly good performance: *child malnutrition* (2.2.2), *child mortality* (3.2.1), *teacher training* (4.c.1), *safe drinking water* (6.1.1), *electricity access* (7.1.1), *public transit access* (11.2.1), and *homicide rate* (16.1.1). For these indicators, the national average is close to either their explicit or implicit targets listed previously in Table 5. However, individually for municipalities, the assessment can vary greatly. For instance, *safe drinking water*, *electricity*, and *public transit* are above 90% of completion overall, but for the first and the last there are municipalities scoring below 50%. In contrast, *electricity access* is close to 100% for all the municipalities. *Child mortality* behaves similarly,

Figure 2: Spread of municipal scores per SDG indicator



with about half the jurisdictions below 10 but with many municipalities scoring above the target of 25. On the other hand, *multidimensional poverty* (1.2.2), *government gender equality* (5.5.1), *poverty risk* (10.2.1), and *recycling rate* (12.5.1) have somewhat poor performances compared to the aspirational targets. Therefore, there is a larger number of municipalities significantly far from the targets. *Multidimensional poverty* and *poverty risk* can be as high as 40% or more for a high proportion of jurisdictions, and *gender equality* and *recycling rates* are zero for many as well.

Dispersion: indicator score versus mean, median, and extremes

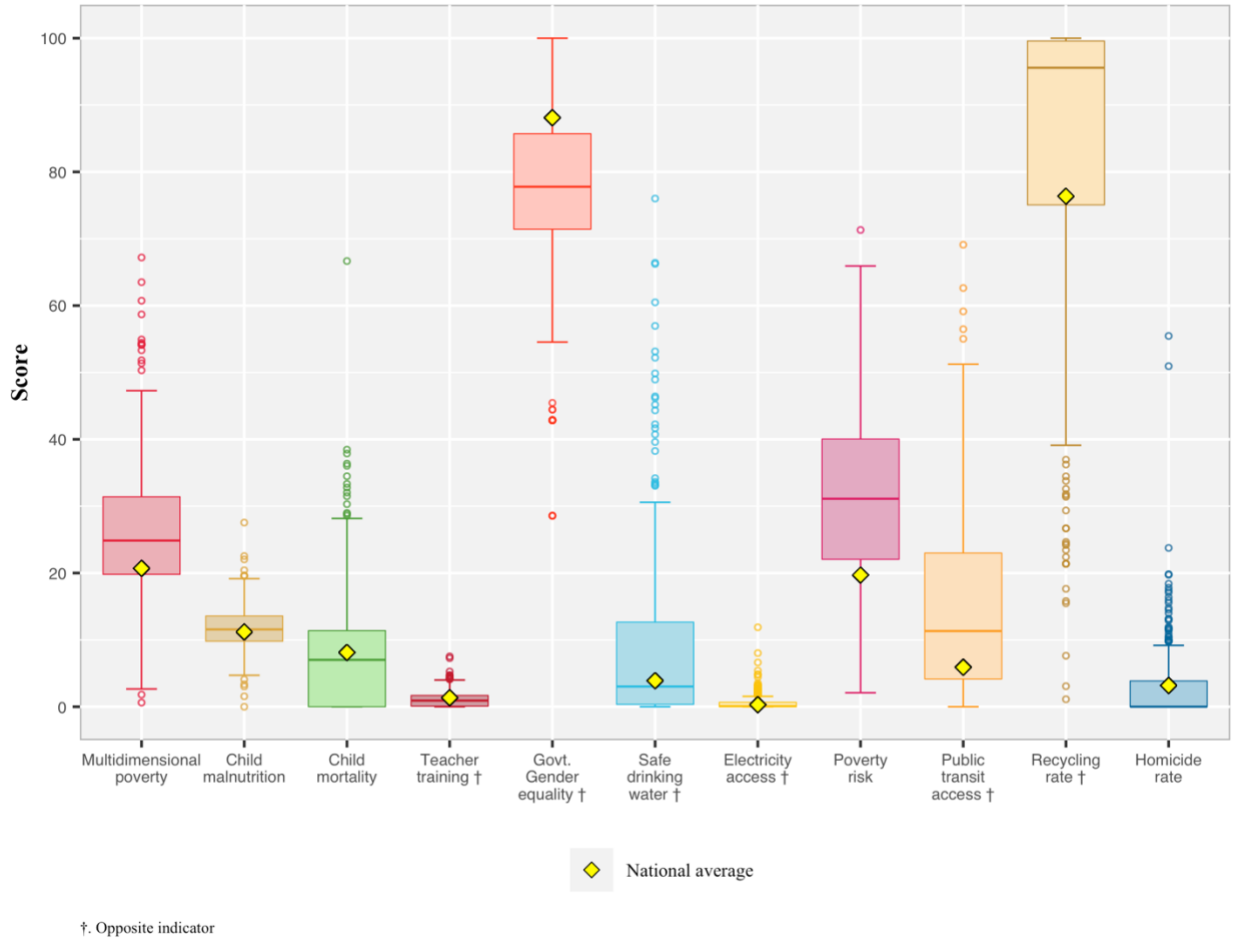
One difficulty in comparing the situation of each of the 11 indicators is that a higher value does not mean higher performance for each of them. Some indicators assess the degree of achievement or progress on something, while others measure the degree of an undesirable outcome. Therefore, moving up or down on the graph does not hold the same meaning. For this reason, I have inversed all indicators that reflect a

positive measurement into their inverse meaning: *teacher training* (4.c.1), *government gender equality* (5.5.1), *safe drinking water* (6.1.1), *electricity access* (7.1.1), *public transit access* (11.2.1), and *recycling rate* (12.5.1). Therefore, *teacher training* now represents the proportion of educators without adequate training; *government gender equality* the lack of women in local governments; *safe drinking water*, *electricity*, and *public transit access* the proportion of people without the services; and *recycling rate* the proportion of waste which is not recycled or reused. Although, as discussed, scales are not comparable and targets and scales are different, a rule of thumb for understanding this information is to think the lower the value, the better, with the exception of *government gender equality* (5.5.1), which should be around 50%. From now on, I will examine the indicators in this form. The results are shown in Figure 3 and all the corrected variables have a † mark. Additionally, Table 6 details the main statistics for each indicator, including the interquartile range and standard deviation.

As in the previous section, I will group the indicators based on their spread magnitude. Six of them have a relatively wide interquartile range or standard deviations: *multidimensional poverty* (1.2.2), *child mortality* (3.2.1), *gender equality* (5.5.1), *safe drinking water* (6.1.1), *poverty risk* (10.2.1), and *recycling rate* (12.5.1). Graphically, the boxplots of these indicators are long with particularly long whiskers and a significant number of outliers. These results are important because they demonstrate the reasons why it is necessary to be granular in the measurement of development indicators, otherwise the "leaving no one behind" motto can be endangered without knowledge.

There are three problems that come as a consequence of this issue. First, and perhaps the most critical, concealing local underperformance. There are indicators with high national scores that have very wide variability and include some municipalities with a considerably low performance. Such is the case for *safe drinking water* and *public transit access*. Second, low precision of the national average. *Government gender inequality* and *recycling rate*, for example, show a wide gap between the minimum, the maximum, and the central values. This implies the national mean is not a good depiction of the reality of most of the municipalities, because there is only a limited number of them around that value. And third, an indication of segregation. For instance, both *multidimensional poverty* and *poverty risk* describe the concentration of population in current or potential conditions of poverty. This population is not equally distributed across municipalities, suggesting, in turn, that wealthier households are also concentrated in some. Interestingly, even though *poverty risk* is a measure of income inequality in the country, the apparent segregation is clearer when looked at disaggregated data than at the average only. I will explore the spatial component of this segregation in the next section.

Figure 3: Spread of municipal scores per SDG indicator with adjusted variables



†. Opposite indicator

For the four remaining indicators with lower spreads, it is important to note that there are still municipalities that have a poorer performance within the distribution. Although not a widespread issue, the SDGs call for paying attention to these places regardless of a good overall performance. Thus, even if the spread is low, there is value in disaggregating the information to identify these limited number of places for the purpose of advancing distributive justice.

It can be noted from Figure 3 and Table 6 that the national average and the median value for many of the indicators also differ. This is due to the differences in the population of each boundary generally (as most of the indicators measure a condition or situation for the people within). If the mean is below the median, it means there is a higher concentration of people in the lower end of the distribution, which is, for example, the case of *public transit access*. In this context, Table 7 shows the percentage of the total population which is below the first quartile and above the third quartile, in other words, the number of people on the whiskers of the boxplots. This helps understanding the relevance of these municipalities in terms of population. If the population were to evenly distributed across municipalities, 25% of the people

Table 6: Summary of spread statistics per indicator

Indicator		National avg	Min	Q1	Median	Q3	Max	IQR	Std Dev
1.2.2	Multidimensional poverty	20.7	0.6	19.8	24.9	31.4	67.2	11.6	10.2
2.2.2	Child malnutrition	11.2	0.0	9.8	11.6	13.6	27.5	3.8	3.3
3.2.1	Child mortality	8.1	0.0	0.0	7.0	11.4	66.7	11.4	8.5
4.c.1	Teacher training	1.4	0.0	0.1	0.9	1.7	7.5	1.6	1.2
5.5.1	Government gender equality	88.1	28.6	71.4	77.8	85.7	100.0	14.3	15.7
6.1.1	Safe drinking water	2.6	0.0	0.4	3.0	12.7	76.0	12.3	13.1
7.1.1	Electricity access	0.3	0.0	0.0	0.1	0.7	11.9	0.7	1.2
10.2.1	Poverty risk	19.7	2.1	22.1	31.1	40.1	71.3	18.0	13.2
11.2.1	Public transit access	5.9	0.0	4.2	11.3	23.0	69.1	18.8	13.6
12.5.1	Recycling rate	76.4	1.1	75.1	95.6	99.6	100.0	24.5	23.2
16.1.1	Homicide rate	3.2	0.0	0.0	0.0	3.9	55.5	3.9	5.7

should be in these buckets. Focusing on the people above Q3 (i.e., the people living in the quarter of municipalities with the lowest scores for each distribution) the only two indicators with proportions higher than 25% are *teacher training* and *homicide rate*. Both these metrics are heavily skewed to zero and have a good performance. Hence, even though a high number of people is at the end of the distribution, it does not directly imply they are lagging too far behind. For indicators with long tails and a large quantity of outliers (*multidimensional poverty*, *child mortality*, *safe drinking water*, *poverty risk*, and *public transit access*), it is evident from the table that the municipalities with the lower values are less populated. This issue is relevant because it can be an argument against the necessity of too much disaggregation, which is important to balance on this discussion.

Spatial distribution: indicators along the territory

The previous section hinted at issues of income segregation, which are already known in the country. To understand potential segregation patterns, I will start with a top-down approach from region to municipality, looking at the regional distribution of the results, which is the only geographic breakdown suggested by the SDGs. Figure 4 graphs boxplots and dot plots for the 11 indicators in each of the 16 regions of Chile, following the same logic of Figure 3. The y-axis for each graph had been adjusted to fit the range of values in each plot. The regions are labeled by their number and ordered from north to south. The detail about each region can be found in Table 9 in Appendix A.

Table 7: Proportion of population in the outside quartiles

Indicator	Label	Q1	Q3	Below Q1	Above Q3
1.2.2	Multidimensional poverty	19.8	31.4	47.3%	8.8%
2.2.2	Child malnutrition	9.8	13.6	36.0%	10.8%
3.2.1	Child mortality	0.0	11.4	0.0%	10.9%
4.c.1	Teacher training	0.1	1.7	5.1%	34.0%
5.5.1	Government gender equality	71.4	85.7	32.8%	15.5%
6.1.1	Safe drinking water	0.4	12.7	47.9%	6.7%
7.1.1	Electricity access	0.0	0.7	0.0%	11.2%
10.2.1	Poverty risk	22.1	40.1	47.3%	7.3%
11.2.1	Public transit access	4.2	23.0	61.3%	6.4%
12.5.1	Recycling rate	75.1	99.6	22.6%	4.6%
16.1.1	Homicide rate	0.0	3.9	0.0%	31.3%

The chart suggests there is a distinct behavior for the center of the country, its immediate regions north and south, and the extreme ends. It is not possible to generalize trends for all indicators, but there are particular patterns for some. The indicator with a clearest regional trend is *child malnutrition* (2.2.2), which increases from north to south. *Multidimensional poverty* (1.2.2) and *poverty risk* (10.2.1) increase as moving away from the Metropolitan Region (XIII)–the region of Santiago–in either direction (north or south), but then it tends to reduce when reaching the extremes. A similar pattern can be seen for access to *safe drinking water* (6.1.1) and *public transit* (11.2.1), where outside the capital, there is a much higher dispersion of the values, although not a trend.

In terms of general performance and dispersion, the center (region XIII) and the southernmost regions (XI and XII) show better overall results. The regions in between them (VI, VII, XVI, VIII, IX, XIV, and X) seem to be the ones with the highest variability overall. Patterns to the north of the Metropolitan Region are less consistent across indicators. Nevertheless, despite these general trends, there is a high degree of municipal dispersion within each region.

An alternative bottom-up perspective to is to start from the municipal behavior and then map those patterns in the map. Figure 5 ranks the municipalities based on the number of times they fall into each quartile for the 11 indicators. They are ordered left to right from the one having more scores in the fourth quartile of each indicator distribution to the one with the least. This graph shows that there are many municipalities that tend to have their scores clustered on the lower end of the distribution of each SDG indicators, and vice versa.

Figure 4: Spread of municipal scores by region

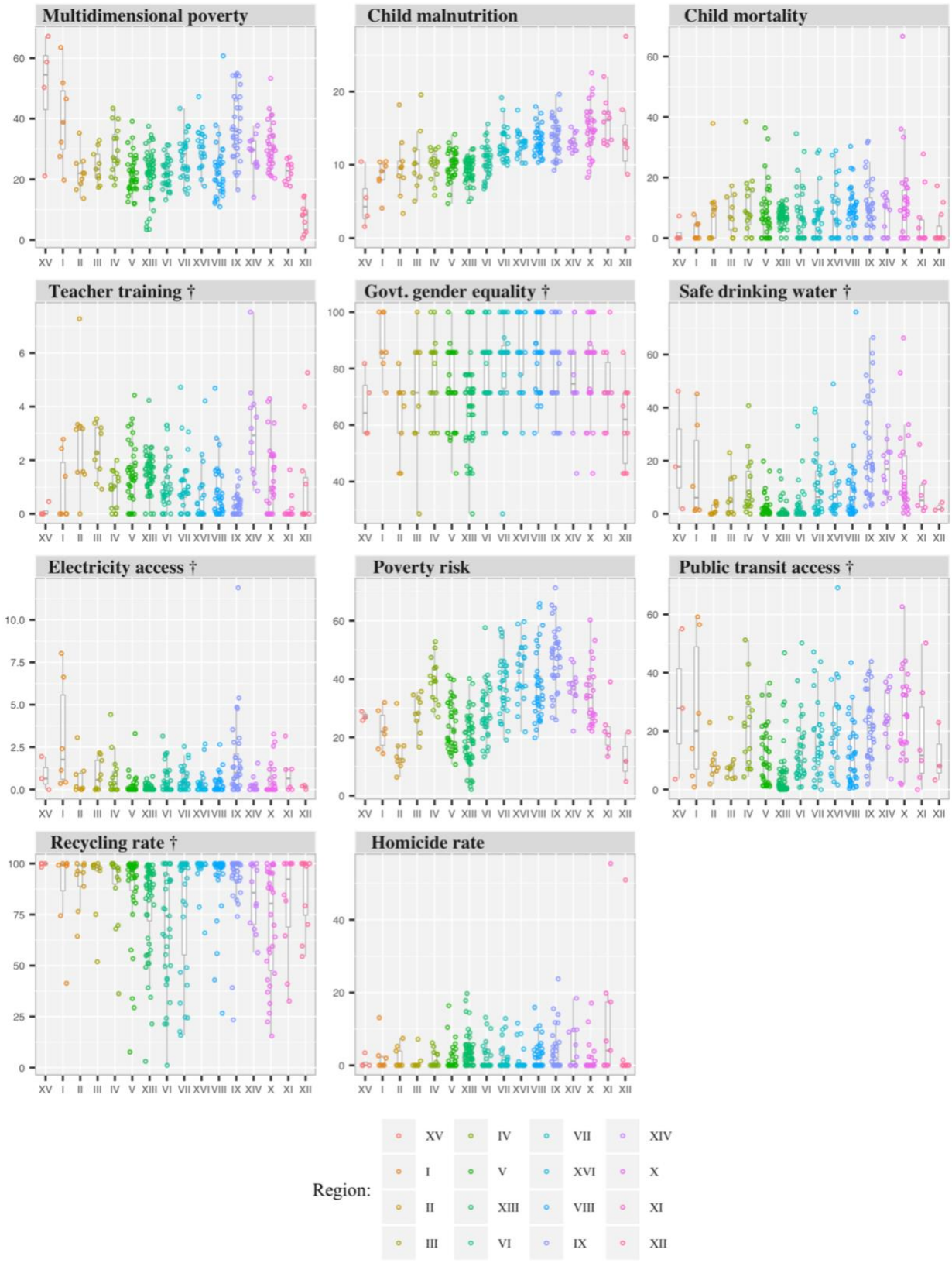
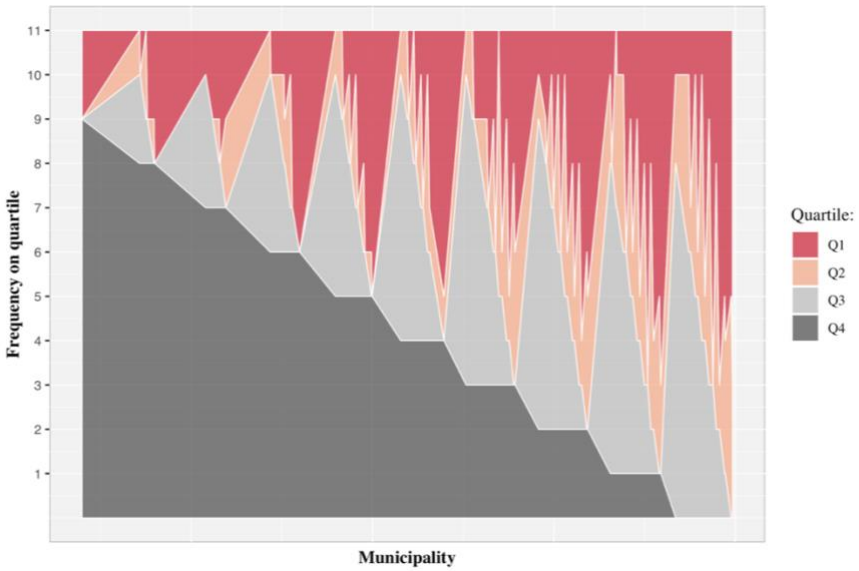


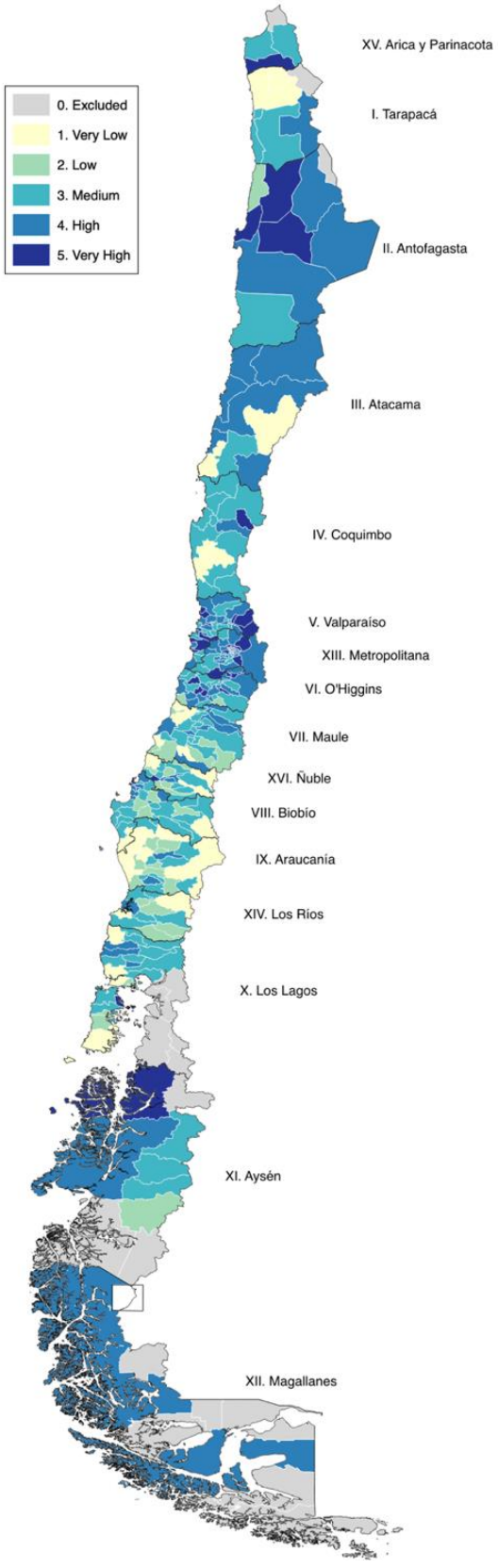
Figure 5: Frequency of municipal scores in the quartiles of each distribution



Based on this information, I categorized the municipalities in five groups based on their frequencies in the fourth and first quartiles. The *very low* and *very high*-performance groups have more than five scores within the fourth quartile and first quartile, respectively. *Medium* performance has a difference between these frequencies of no more than +/-1, and the *low* and *high* groups lie in between. I have excluded the 22 municipalities that do not have values for the indicators that come from the CASEN survey, as explained in section 3.1 and listed in Table 10, only showing the jurisdictions with results for all the 11 SDG indicators. Table 14 in Appendix C details the municipalities included within each group.

The map in Figure 6 shows all municipalities according to the five performance categories. Figure 4 revealed that the municipalities in the mid-south region of the country have the widest dispersions, which is the area that clusters most of the *very low* performance municipalities (regions VII to X). The remaining *very low* performance municipalities are scattered around the northern regions. None of them is located in regions XI and XII. Yet, this area clusters most of the 22 areas exclude from the calculation. *Very high*- and *high*-performance municipalities are, for the most part, concentrated around the Metropolitan region (XIII) and the mining regions of Antofagasta (II) and Atacama (III). In line with Figure 4, the mid-south regions of the country do not only have the widest dispersion of municipal scores, but those municipalities consistently show the worst performances across indicators. Similarly, municipalities in the center and north/south ends regions (II, V, XIII, VI, XI, and XIII) tend to perform much better across all indicators. Nevertheless, from the map and from the dispersion in Figure 4, it is clear that despite the geographic patterns in the performance of SDG indicators, there are significant variations within regions, therefore suggesting other factors could be in play as well.

Figure 6: Map by municipal performance category



Correlation: indicator score versus municipal variables

The last component of the analysis is understanding whether the performance of each municipality is correlated to some underlying conditions that would further support the argument for localization and reveal possible sociodemographic and economic characteristics that should be taken into account for advancing development and justice. As explained in section 3.1, the SDG disaggregation results were correlated with variables that reflect the issues of heterogeneity, centralism, and economic capacity of municipalities in terms of their demographics, relevance, accessibility, and wealth, as detailed in Table 3. Demographic variables refer to the degree of rurality and urbanization; relevance variables to the size and proximity of the jurisdiction; accessibility variables to the easiness of reaching every community; and wealth variables to the economic capacity, autonomy, and attractiveness of the area.

Table 8 summarizes the degree of correlation between each SDG indicator and each variable. The three categories (significant, low, or none) and the direction (+/-) had been determined using the Spearman correlation coefficient, detailed in Table 15 in Appendix D. An indicator has a *high* correlation if the absolute value of the coefficient is higher than 0.33 and *low* if it is higher than 0.2. The classifications were corroborated by looking at the graphical representation of these correlations detailed in Appendix D, and adjusted if the coefficient seemed inaccurate when compared to the graph. In addition, Table 16 shows the Pearson coefficients. Generally, Spearman's are higher (in absolute values) than Person's, which suggest that the relationships between the SDG indicators and the municipal characteristics are nonlinear. This is consistent with the information displayed on the correlation graphs that show many of these correlations have an exponential behavior.

The results on this table can be analyzed from both the indicator and the municipal variable perspectives. For the first approach, three insights about the behavior of indicators (and before discussing the relevance of each variable) are worth noting. First, that there is a high degree of correlation for the *poverty* (1.2.2 and 10.2.1) and *accessibility* (6.1.1 and 11.21.) indicators. Since the four of them have a high dispersion of values, this information reveals the variations are significantly related to socioeconomic and spatial factors. Although less ubiquitous, this is also true for other indicators with a number of *high* correlations. Second, that low performance on an indicator can be correlated to opposite directions by the same variable. Generally, lower results for most indicators are associated with more rural, more distant, and poorer municipalities. However, *child mortality* (3.2.1), *child malnutrition* (2.2.2), and *homicide rate* (16.1.1) follow an inverse pattern, having better performance on those areas, thus lower in more urban, central, and wealthier municipalities. This finding reveals that the individual results respond to more complex and nuanced reasons that cannot always be asserted by general trends. The last insight is that not

Table 8: Summary of correlations between indicators and municipal variables

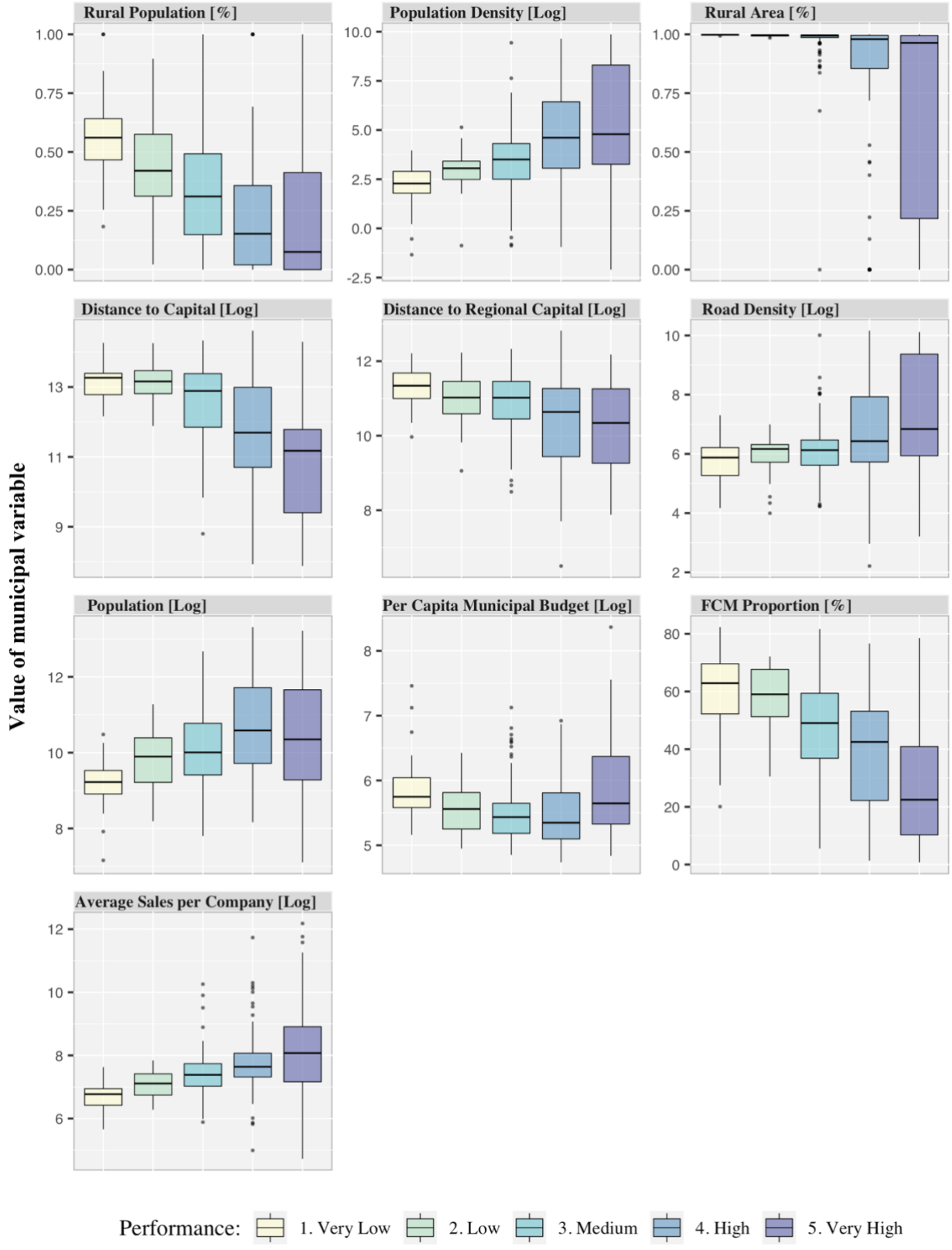
	Demographic		Relevance			Accessibility		Wealth		
Indicator	Rural pop.	Pop. dens.	Dist. Santiago	Dist. region capital	Pop.	Road dens.	Rural area	Per capita budget	FCM prop.	Avg. company sales
Multidimensional poverty	High (+)	High (-)	Low (+)	-	High (-)	-	High (+)	-	High (+)	High (-)
Child malnutrition	Low (+)	Low (-)	Low (+)	-	Low (-)	-	Low (+)	-	High (+)	Low (-)
Child mortality	-	-	-	-	High (+)	-	-	Low (-)	-	Low (-)
Teacher training	Low (-)	-	Low (-)	-	-	-	-	Low (-)	Low (-)	Low (+)
Government gender equality	-	-	-	-	-	-	-	-	-	-
Safe drinking water	High (+)	High (-)	High (+)	High (+)	High (-)	High (-)	High (+)	Low (+)	High (+)	High (-)
Electricity access	-	Low (-)	Low (+)	-	-	Low (-)	Low (+)	-	-	-
Poverty risk	High (+)	High (-)	High (+)	Low (-)	High (-)	Low (-)	High (+)	-	High (+)	High (-)
Public transit access	High (+)	High (-)	High (+)	High (+)	High (-)	High (-)	High (+)	High (+)	High (+)	High (-)
Recycling rate	-	-	-	-	Low (-)	-	-	Low (+)	Low (+)	Low (-)
Homicide rate	Low (-)	Low (+)	-	Low (-)	High (+)	Low (+)	-	-	-	-

all the dimensions are relevant for all indicators. The SDGs measure various aspects of development and the behavior of each dimension is, in the end, distinct for each. Considering this sample, socio-economic metrics are strongly associated with all four dimensions (demographic, relevance, accessibility, and wealth), whereas health indicators are only loosely related to them. Technical output metrics like *teacher training* and *recycling rate* seem to be impacted by the wealth variables for the most part. Government *gender equality*, however, is not related to any of these variables. These arguments support the need of localizing the SDGs. To some extent, it is necessary to open up the metrics because there are widespread trends that are masked by averages, which reveal challenges that must be addressed to advance development generally across the country. Yet, these trends are not sufficient to indicate how a municipality may be performing, because individual conditions are nuanced, and the real conditions will not be revealed unless the municipality is examined in detail. Therefore, the need of a granular measurement is mandatory in order to truly identify the true situation of a community.

Alternatively, looking from the perspective of the municipal variables, it is noteworthy that all the variables selected are correlated with at least four indicators, giving credit to the qualitative perceptions obtained from the background analysis. In particular, the proportion of rural population, total population and its density, distance to Santiago, the proportion of transfers from the FCM, and the average sales of companies have at least seven correlations and can, to a great extent, be associated with the development performance of a municipality. These results can be seen more clearly in Figure 7. The different graphs show the distribution of the values of each of the municipal variables grouped by the performance levels explained through different boxplots. From this figure, in can be supported that the municipalities with the lowest performances have various common trends. First, they have a higher percentage of rural population, lower population densities, and correspond predominantly to rural areas. Second, they are generally far from both Santiago–the capital of the country–and from the capital of the region they belong to. Third, they are areas with small populations. Fourth, they are more limited on resources, having relatively low municipal budgets per person, a higher dependency on the FCM–or a lower capacity to generate their own incomes–as well as higher proportion of small businesses.

However, it is not the exact opposite for the high-performing municipalities or the ones in the middle categories. The median values of these municipalities seem to go in the opposite directions, suggesting there are some general trends. Nevertheless, the highest performing category also have the widest spreads. This finding suggests that, although all high performers are largely more central, populated, urban, and wealthier municipalities, these are not necessarily enough attributes to describe more successful performance. In other words, country-wide, these metrics are not sufficient to differentiate sociodemographic or economic characteristics. There could be additional factors in play not considered on this exercise, or perhaps the rankings used to form the five categories must be replicated within these regions only.

Figure 7: Dispersion by performance category and municipal variable



Chapter 4. Discussion

I started this thesis by proposing three research questions: to what extent are the SDGs capable of "leaving no one behind" in the development path of the country? To what extent could the localization of the SDGs contribute to advance distributive justice? And what can we learn from disaggregating the SDGs that could inform opportunities for fostering sustainable development at a local level? I will now attempt to answer these questions using the insights from the quantitative analysis in Chapter 3 under the theoretical framework discussed in Chapter 2. In particular, I will refer to how the numeric results largely support the arguments in favor of localization, which can contribute to advancing the very goals of the 2030 Agenda. Rather than criticizing the SDGs per se, my objective is to identify how to work with them to achieve the desired goals of sustainable development and justice.

4.1. Localization, sustainable development, and distributive justice

To what extent is the SDG framework capable of "leaving no one behind"?

Through the disaggregation of SDG indicators for Chilean municipalities, I have demonstrated that the national aggregates that the country communicates to the HLPF through its NVRs can fail to represent appropriately the conditions of local communities from a municipal standpoint. There is a significant number of inadequately represented communities, in terms of number of municipalities and population. These, moreover, share similar sociodemographic and economic characteristics, which poses a risk to effectively advance the sustainable development of communities that had historically been postponed in the country. Therefore, if limited to national or large scales only, the SDGs risk hampering their own goal of "leaving no one behind."

The quantitative analysis revealed two problems in the relationship between the national SDG aggregates versus the municipal scores: precision and accuracy. On the one hand, when the spread of municipal values for an indicator is considerable, the national average is not a representative figure for the individual conditions of the local jurisdictions. Indicators such as *poverty risk* (10.2.1) and *recycling rate* (12.5.1) have interquartile ranges (IQR) of about 20pp and total ranges of more than 70pp, for a range of values that goes between 0-100%. This, in other words, means that the outcomes measured through the

indicators (i.e., people at risk of falling into poverty or tons of recycled waste) are particularly high and concentrated in certain municipalities, while other municipalities have very low values. On the other hand, results can be inaccurate because, nationally, the country may be above its target, but still have municipalities that have a very poor performance. *Child mortality* (3.2.1) and *safe drinking water* (6.1.1) illustrate this case, both having good overall and above-target performance, but with outlying jurisdictions where these conditions are significantly worse than for the rest of the country. *Safe drinking water* in particular has a long tail of values with low coverage of this service.

It is important to remember that the SDGs do require–or suggest–a geographic disaggregation of some metrics at a regional scale. As seen from the quantitative analysis, breaking down the indicators for regions can be insightful because there are regional patterns for certain areas. For example, *multidimensional poverty rates* (1.2.2) increase moving away from the Metropolitan Region (XIII). Although identifying these trends and making regional distinctions is important, particularly for regional policies and planning, the analysis also showed that intra-regional dispersion can be significant. In that sense, issues with accuracy and precision are still prevalent at the regional level. The municipal disaggregation then brings highly relevant information that the regional breakdown is incapable of producing, therefore supporting the argument for a more granular localization.

The issues in the accuracy and precision of the SDGs at a local level are problematic because they are in direct opposition to the "leave no one behind" motto. The results show that the lowest performing municipalities have in common conditions of higher rurality, smaller and scattered populations, longer distances to national and regional capitals, and poorer economic conditions. Historically in Chile, the development of these areas has been postponed by their counterparts, the wealthier urban cores or metropoles (Frank, 1969). Accordingly, because the SDGs operate at a largely national scales, they risk not focusing enough on some of the most underdeveloped areas within the country, or in other words, they risk perpetrating the current regime that left those areas underdeveloped in the first place.

The aggregate SDGs are, first, not capable of identifying these places, and second, could be inadvertently concealing them behind a successful aggregate performance. The targets for many of the examined indicators point to an aspirational goal with no particular threshold but encouraging continuous improvements. However, it is not realistic to believe that thematic areas approaching progress levels close to 100% will remain as priorities for national policies. Yet, they will still be problems at the local level and should be addressed as such. The predecessors of the SDGs, the MDGs, produced unintended consequences such as narrowly-focused interventions constrained by the scope of the goals themselves, rather than promoting an integrated solution (Fukuda-Parr, 2016; Fukuda-Parr et al., 2014). In a similar way, if the SDGs do not explicitly scale down sustainable development to a more granular scale, they could fail at

including every community–some of the least developed in particular–under their scope and only help advancing policies and actions relevant at the national level, therefore risking to "leave some behind."

To what extent could the localization of the SDGs help to advance distributive justice?

As previously explained, the development behavior of the Chilean municipalities fits, to a great extent, the metropolis-satellite paradigm proposed by Frank. The municipalities with the highest standard of development on the 11 selected metrics include some of the wealthiest, more urbanized, and more populated municipalities clustered around the political centers of the country or around profitable natural resources export industries. In contrast, the rural and remote areas are falling behind. These municipalities are outside the centers of economic activity, with the populations scattered in non-contiguous smaller towns sparsely distributed throughout the territory. Unless they have important natural resource endowments to exploit, these communities do not see affluence of private investment that could boost jobs, industry, and revenue streams for the population. Businesses in these municipalities have lower revenues, revealing their economy depends more largely on smaller companies. These municipalities, moreover, have higher *multidimensional poverty ratios* (1.2.2), which, beyond being a negative outcome in itself, also impacts the financial capacity of the local government. With a higher proportion of low-income households, less commercial activity, and smaller businesses, the income coming from taxes to the municipal government is lower than for other locations. This makes the municipal budget highly dependent on the transfers from FCM and insufficient for the delivery of the appropriate services to residents. Given that the population is less concentrated, the provision of these services is probably more expensive per unit, increasing the difficulty of attaining the same quality of service of other urban, wealthier jurisdictions. There are more than 40 municipalities that fall in the lowest performance category, which correspond to 9 of the 16 regions of the country. Individually by indicator, the municipalities on the lowest quartile of the distribution could group between 5% and up to 30% of the total population of the country.

These insights are not, however, entirely surprising or unanticipated. Income inequalities have a significant spatial component that has not improved over the years, and the disparities at the municipal scale explain most of the inequalities (Paredes et al., 2016). Besides, the MDGs showed similar patterns of municipal segregation in Chile and in other Latin American countries (Candia & Hurtado, 2012). The SDGs had also been criticized for not integrating the institutional and governance dimensions well enough as they do for other thematic areas (Le Blanc, 2015) and for failing at measuring the power imbalances among stakeholders that could hamper progress on development (Sultana, 2018). Accordingly, the insights derived from the disaggregation of SDG indicators go in line with earlier analyses about Chile and about the SDGs.

Regardless of these issues, the SDGs and the 2030 Agenda claim themselves to be also a tool to bring equity and justice to the least developed communities around the world. This notion has, nonetheless, not gone without criticism, particularly around the capacity of the SDGs to reveal distributive justice concerns on social, biophysical, and procedural inequities (Lele, 2017).

I argue then than the localization of the SDGs is an effective mechanism that helps to move towards distributional and spatial equity for the sustainable development of Chile. As I have summarized, localization of the SDGs has two aims. First, it is a process that disaggregates the indicators at a local level, making both the development agenda relevant for local communities and the national success contingent upon the local success. As a result, localization can help elevating the relevance of these areas for all levels of government administration. Second, it is also a process of giving agency to the local communities so they can act on their behalf, for which technical, institutional, and financial capacities need to be increased. In this context, localization helps advancing distributive justice because it provides a necessary starting point of revealing the spatial injustices. Moreover, it enables a discussion about what is needed to take action at the local scale and, at the same time, shifts the attention to the communities that are worse off, promoting a prioritarian view of how to solve these injustices.

Along these lines, there are three ways localization can advance justice: by equalizing development standards, by equalizing agency, and by elevating the worse off municipalities. First, from a resource-based perspective of distributive justice, localization can help equalizing the performance on the different thematic areas of sustainable development. As explained, the three most prominent dimensions of sustainable development refer to the sustainability of the environment, society, and economy, which are reflected in goals 1 to 15. By and large, the SDG indicators measure either the extent to which a service is provided for a community (e.g., *teacher training*, *safe drinking water*, or *public transit*), the outcome of a service that is given (e.g., healthcare provision impacting *child mortality* or *child malnutrition*), or the adoption and the result of the adoption of policies (e.g., women quotas for *government gender equality*). These services and policies are then the resources that must be equalized, in both quantity and quality. Equalizing quantity impacts the indicator that measures a direct provision (e.g., *safe drinking water*) while equalizing quality equalizes the outcome (e.g., better healthcare that leads to reduced *child mortality*). The SDGs and their targets are based on a human right and right to development approach. Accordingly, advancing distributive justice in sustainable development indicators means that the standards for all the municipalities should, at least, meet those targets, which would reduce the gap between the worse off and the better off necessarily. Yet, since some targets are aspirational and do not have a quantifiable metric other than “improving” or “reducing” something, indicators under these targets will not stop at a threshold but should keep improving, thereby continue closing those gaps.

Additionally, in order to advance distributive justice, the standards under which each municipality gets measured must be equal. The living conditions of rural and urban communities are different, and many of the benefits generated by the economies of agglomeration in cities may be harder to achieve in rural areas because of the lower population densities. However, the quality standard of a service should be the same for every area from a distributive justice standpoint. As an example, the national methodology of indicator 6.1.1, *safe drinking water*, differentiates between urban and rural, being more lenient in what is an appropriate water source for rural areas. The international methodology does not officially refer to making any of these distinctions. The results I have shown use the international approach for all municipalities, which then reveals a large tail of underserved areas, which may not otherwise be seen with a less strict methodology. Although I do not want to outright deny the validity of using multiple methodologies for contextual reasons, what is not appropriate from a distributive justice standpoint is to reduce the standard of certain areas because of cost differentials for providing the same quality of service. This would only artificially improve the results and preclude the capacity of those municipalities to reach a service quality as good as the one in cities.

From a capabilities perspective, localization can help equalizing the agency of municipalities to influence their own status of development measured by the SDG indicators. Sustainable development generally refers to the three environmental, social, and economic dimensions, as well as their thematic and intergenerational relationship. Yet, literature often highlights the need of adequate governance to enable the work towards these goals, emphasizing empowerment, participation, and democracy as essential values that must be protected and promoted–or sustained–as much as the other thematic areas. The SDGs deal with issues that are already within the scope of municipal governments such as water provision, waste collection, or local economic empowerment, and they are institutionally well-equipped to tackle many of these areas already. Along these lines, and recognizing both the centralized context of Chile that provides limited capacities to municipalities and the complexity of localizing a development agenda for 345 jurisdictions, equalizing the capabilities of municipalities to advance their own development is an essential component of advancing distributive justice. From a capabilities approach, this is analogous to equalizing agency, which is, in turn, achieved by equipping municipalities with the necessary regulatory framework and required institutional, human, and financial capacities.

Out of these capacities, the context of the Chilean municipalities emphasizes the lack of financial resources, which are interwoven with the economic conditions of the areas. Within cities, this lack of resources is associated with the spatial segregation of poor neighborhoods. Outside the big cities and in rural areas, this issue is largely impacted by the proximity to natural resources and opportunities for good exports. Therefore, a significant component for equalizing capabilities comes from equalizing the fiscal

capacities of municipalities. Deepening the horizontal distribution of the FCM or expanding the scope of vertical transfers from centralized budgets are alternatives to solve this problem.

Furthermore, localization also stresses the importance of participation of local governments in the national coordination of the 2030 Agenda and of building capacities for their staffs to take action on the SDGs (GTF, 2019). Currently in Chile, no municipality has produced an LVR nor are municipalities included in the national committee for coordination of the agenda. Although some individual municipalities are taking small steps to incorporate the SDGs into their current responsibilities and planning processes through collaboration efforts, this process should be centrally supported to increase agency equally. Wealthier, larger, and more internationally connected municipalities may be able to rely on their staff and resources, but others may not. It is then the role of both local and central governments to equalize capacities, so municipalities have equal agency to work towards their sustainable development.

Lastly, from a priority view, the equalization of resources and capabilities should value more the improvements on the municipalities that are worse off rather than on the better off. This prioritarian standpoint is particularly relevant to overcome the historical disregard for the satellite areas of the country, which include, moreover, a large proportion of the worse off municipalities. Monitoring indicators at a municipal scale is already a significant first step towards this direction, because it equalizes data availability. However, there are data gaps for many of the worse off (and other) municipalities. Generally, less populated and less accessible areas are either excluded altogether from important household surveys such as the CASEN, or have fewer observations, therefore impacting the robustness of indicators produced with that information. Conversely, explicit efforts in collecting data of equal quality for each municipality will be in alignment with a prioritarian approach. Because of the sparseness and distance of the population in these areas, the costs per person of collecting information is higher than in more densely populated municipalities, and therefore producing equally robust indicators will require higher per capita efforts.

4.2. Further reflections

What can we learn from disaggregating the SDGs?

Many aspects of this question have been answered already: the behavior of the indicators at subnational scale, their distribution throughout the territory, and their correlation with other sociodemographic and economic characteristics associate with different levels of progress have been shown and discussed previously. As it occurs with income distributions and the MDGs, SDG indicators are

spatially segregated in disfavor of rural, distant, and resource-scarce communities in Chile. As a result, they could be flawed representations of realities on the ground. In this sense, they are not far from macroeconomic indicators generally used in the country which had been criticized for being poorly connected with local realities.

In addition to those insights, a relevant takeaway is the feasibility of disaggregating the SDGs. Chile, fortunately, has good publicly accessible data sources that allow producing all these calculations. Moreover, efforts such as the Atlas of Human Development in Brazil demonstrate that monitoring a long list of development indicators for municipalities is possible. Brazil has 5,570 while Chile only has 345. Although bottom-up efforts are important and should be encouraged, centralized top-down disaggregation processes are more appropriate for advancing distributive justice and the mere reporting of indicators is already a significant step towards that goal. In this context, national disaggregation of SDG indicators is not an impossible task for the country. As Patole (2018) argues, the localization of the 2030 Agenda is not a matter of having the technical capacity to do so, but rather about who will pay for it.

Final considerations

I have so far elaborated on two issues the SDGs should do better: they must become more ambitious and intentional to address distributive justice and they must be localized to smaller subnational administrative units of the country. However, I wish to differentiate between the additional efforts in implementing sustainable development versus the additional efforts in implementing the SDGs. I have largely referred to the 2030 Agenda as a superimposed–but voluntarily adopted–set of guidelines for governments and said that adjusting this top-down framework is needed to move towards a more just outcome. Governments do adapt the agenda to their needs and priorities. Different ideologies, perceptions, conditions, and priorities inevitably shape the actions of governments, which then influences what to take from the 2030 Agenda that they regard as most convenient and appropriate for those conditions. With this reality in mind, it is not necessarily the SDGs that must be adjusted, but what the governments make of them. Conversely, even if the framework established by the 2030 Agenda remains intact, nations have the power of making their plans more detailed and ambitious towards justice. In other words, localizing for advancing distributive justice in development is a process that can be individually implemented by countries regardless of whether the SDG framework suggests it or not.

Furthermore, although I argue that the SDG metrics should be localized and that municipalities are an appropriate unit, the optimal set of development indicators for municipalities may not necessarily be the SDGs as they are right now. I am, in other words, differentiating between the need of localizing a

development agenda and defining the best metrics for that local agenda. For this research, I excluded indicators that do not make sense at a municipal scale, but I did not change the national metrics because the objective was to compare them locally. However, for real implementation at a different unit of analysis, we should expect a different set of appropriate measures. The priorities are different at the local scale, and the actors who could inform and shape the metrics have different perception of these priorities. Moreover, even if the SDG targets remain the same as for the national scale, the appropriate indicators to measure those targets at the local level can be different. The standardization of the SDGs is beneficial because it sets a single set of global standards that every nation in must meet, which creates consistent and fair metrics. Yet, adapting the SDGs to a consistent and appropriate set of indicators for municipalities or local governments across the world would, and perhaps should, produce a different list than the current SDG indicators. One that better represents the sustainability challenges for those levels of administration.

Chapter 5. Conclusion

Advancing distributive justice with localization

This research has shown how the localization of SDG indicators for the municipalities in Chile can help to advance distributive justice in the implementation of the UN sustainable development agenda. Through a sample of 11 indicators from different goals, I have demonstrated that the national scores can be inaccurate and imprecise measures of success for local areas of the country. Indicators show high dispersion levels among municipal scores, and even the ones with high overall performers present outliers with low values. As a result, the national scores can either be a misrepresentation of the municipal conditions or be masking areas with scores below the SDG targets, even if the target has been accomplished nationally. In addition, the municipalities with lower performances share a high proportion of rurality, smaller populations and densities, larger distances to the national and regional capitals, and generally lower economic capacities. These municipalities have a lower capacity to produce revenues, therefore depending more on transfers and redistribution funds to finance their development activities. However, although the worse off municipalities follow these trends, the opposite is not exactly valid for the better off. Higher performing municipalities do include the ones with opposing characteristics, yet this category also presents very high dispersions in terms of sociodemographic and economic variables.

As argued, the capacity of aggregated indicators to represent the realities on the ground is limited and can even be misleading. To a great extent, this issue comes from the conditions of Chile presented at the beginning of this research: heterogeneity among municipalities, regulatory and geographic centralization of government powers, and concentrated economic capacities. Nevertheless, the localization of the SDGs can be an effective process to advance distributive justice for municipalities as it reveals the unequal performances across the country. By adopting resource-based, capabilities, and prioritarian perspectives of distributive justice, I have examined how localization can be an effective process for advancing it as well as for advancing the goals of the 2030 Agenda. From a resource-based approach, localization can help to establish the SDG metrics as the object that should be equalized among municipalities. This notion is helpful to understand that both quantity of resources and services, as well as their quality, must be equalized in order to meet the targets set by the SDGs and to advance distributive justice. Individually meeting the targets set by the SDGs will narrow the gaps between the worse off and better off communities. The capabilities approach urges the equalization of the agency and capacities of each municipality to advance their own development to achieve distributive justice. In this context, empowering municipal authorities with adequate institutional, human, and financial resources becomes

essential, particularly for those municipalities that are worse off. The governing system, as well as the empowerment and participation of all stakeholders, is an essential component of the 2030 Agenda critical for the success of the other challenges of sustainable development. Therefore, equalizing capacities horizontally among municipalities and providing the spaces for them to participate and influence the coordination of the agenda vertically, can help promote distributive justice and facilitate the operationalization of a much more complex development agenda. Lastly, as the historical process of development has disregarded satellite areas within the country, elevating rural, distant, and resource-scarce municipalities to an equal level of importance with their counterparts is a move towards prioritarian distributive justice. The prioritarian perspective emphasizes the necessity of elevating these regions that had been long overlooked and making the country's success contingent upon the success of each individual location in order to attain a more equitable distribution of development spatially.

These findings support the overall trends of Chile described in the literature. Although the country has shown remarkable economic growth since the 1970s and significant reductions of poverty rates, the reconceptualization of the notion of development over the decades has also raised the bar on how to measure progress. In this context, important gaps in social, environmental, and economic issues have been elevated, and the unequal distribution of income, with its spatial component, has concentrated the critiques against Chile's progress. The municipal scale has already presented spatial inequalities for income distribution and development indicators alike, including the MDGs. Along these lines, the quantitative results of this research are not surprising but coherent with Chile's development gaps and the historical progress centered on macroeconomic metrics. Moreover, it suggests that if data disaggregation and consideration of the appropriate scale of measure are not discussed, development indicators may be failing to represent realities on the ground as much as the typical optimistic metrics of macroeconomic success of the country.

Making development indicators relevant

By and large, the critiques about the SDGs question how to develop rather than what to sustain, raising then questions on the implications of this process. There is widespread agreement on what sustainable development means–or should mean–for people, but there is less clarity about how stakeholders need to collaborate to advance it. Thus, the most important challenges of sustainable development are political rather than technical. In this context, localization is a process that complements the current development approach spearheaded by the SDGs and the efforts of data disaggregation, which can effectively bridge some of the gaps for advancing development.

On the one hand, localization connects the unit of subdivisions with the governance of that same unit. As I have argued, disaggregating indicators is important because it reveals distributional issues and enables taking action in favor of the underserved groups. Although it is essential to break down indicators into many sociodemographic categories (e.g., age, disability, or gender) to advance equity, these groups are different from a geographic subdivision like a municipality in that the latter has an organized structure, political recognition, resources to operate, and institutional and regulatory frameworks that shape and support these elements. In other words, it is different to disaggregate the data to local governments because they are–to a better extent at least–capable of governing the issue the localized metric communicates. Matching the evaluative scale with the administrative scale is important because it either empowers or reveals the lack of power of that scale, which, in turn, is an initial step towards increased agency. In the context of sustainable development, it scales down the relationship between people on the ground and government authorities to a much more relatable, relevant, and actional level of public administration, therefore connecting needs with indicators much better than what national indicators could ever achieve. As indicators' disaggregation for population groups is today more advanced in the SDG framework than geographic, municipal disaggregation, I argue for localization because it bridges that gap. Furthermore, localizing to municipalities has the potential of empowering the whole community, which in turn, that can also help to advance the needs of disadvantaged population groups within.

On the other hand, localization questions the relevance of using high-level indicators for the priorities of local needs. Once scaled down to a municipality, advancing the goals and targets of the SDGs requires questioning what the appropriate indicators to measure and track that progress are. Both the accuracy of a national indicator at a local level and the adequacy of that indicator as the optimal metric for measuring progress on that dimensions are challenged. They are questioned because of data constraints (e.g., availability or precision) and because local priorities look different than national priorities. The SDGs were designed as a global framework for global adoption, but they cannot cover the enormous diversity of conditions and needs of each community. Some issues they currently measure are relevant for certain areas of the country only, such as the case of safe drinking water accessibility in Chile. At the same time, they certainly miss other priorities that would not be feasible to incorporate for a global framework. However, working at a local scale brings flexibility, allowing specific metrics to be used for the areas where an issue is relevant only, which would otherwise be impossible to include in a standardized framework for everyone. Even though the SDGs care about standardization, adding flexibility under the guidance of the existing goals and targets will not undermine the 2030 Agenda's mission but, in fact, provide more means to advance it. Hence, I argue that localization will and should encourage the adoption of different local indicators according to the localized communities' priorities and conditions.

I consider the current conceptualization of sustainable development and its operationalization through the 2030 Agenda a constructive effort towards aligning thematic areas of work, time horizons, and a myriad of national and international stakeholders in an extremely complex global environment. However, through this research, I have taken a critical perspective of the SDGs because significant challenges remain ahead, and both facts and theories question the sufficiency of these efforts to achieve the goals of prosperity, justice, and sustainability. In this context, I advocate for localization as a mechanism that brings in more variables and actors because I argue that it is not possible to advance sustainable development without their meaningful inclusion. Although localization could seem to be adding additional, perhaps unnecessary, complexities for high-level administration, the findings of this research demonstrate that, on the contrary, it can facilitate and enable advancing development for everyone.

Ultimately, this thesis questions the way indicators measure the degree of development for Chile and other countries. I started the research by questioning why the messages that authorities construct with development indicators are not perceived the same by a significant number of people from their own realities. Indicators are only instruments to quantify a particular condition; they are useful if improving the indicator means a real improvement in those conditions. By examining the results that indicators show at different scales and revealing their differences, I am arguing that the scale of measurement is an essential question because differences in scale show very different conditions. Therefore, it is not trivial what is the most appropriate scale of measurement and there is no one-size-fits-all solution; it depends on the variable and on the context. Moreover, it leads to a discussion that can have further implications related to governance, decentralization, and fiscal policies. Beyond advocating for municipalities as an appropriate unit of disaggregation, as I have done so far, I also advocate for a process of identifying the most appropriate unit of disaggregation for the 17 goals and 169 targets in the 2030 Agenda.

Recommendations and further questions

Based on the results of this research, I propose a list of high-level recommendations to move forward. Chile has already created a functional and cross-cutting institutional framework to work and implement the 2030 Agenda, which provides an effective structure that can integrate subnational administration to move towards effective and efficient localization.

- Integrate subnational administration in the national coordination committee:

  Both municipal and regional administration should become part of the national coordination committee for the 2030 Agenda in Chile. Their inclusion would start a dialogue than can elevate the local constrains to advance the agenda from the bottom up, and to communicate knowledge

and capacities from the top down. The revamped committee has the opportunity to become a new forum that congregates all levels of public administration with the purpose of discussing policies to advance sustainable development under the guidance of the international framework set by the UN.

- Establish a working group to determine the appropriate localization scale:

  As part of the national committee, the creation of a working group formed by municipal, regional, and national representatives (e.g., ministries) should be entrusted to determine which parts of the agenda can be localized and to what scale. The working group should work with the three thematic commissions (social, economic, and environmental), as the nature of these issues may lead to different optimal arrangements. All tiers of public administration must participate in this working group, as suggested.

- Determine the appropriate indicators:

  As the working group for localization determines the appropriate scales of disaggregation, the indicators included in the SDGs for meeting each localized target should be reviewed to determine the optimal set of new, localized indicators. These new metrics may replace, remove, or expand from existing indicators, and the final list could be different for different parts of the country, as seen fit. However, differences should respond to local challenges that are not present in other areas, but not to relaxed standards or concessions for some areas.

- Identify data gaps:

  Entrust the existing working group for indicators to identify the data gaps for measuring the localized indicators. Certainly, some metrics will lack adequate information to estimate them today, but the availability can determine the phasing of the localization plan. It is important to identify the gaps and communicate them to the units of localization (i.e., municipalities or regions), creating space to propose innovative ways that can produce proxy variables or new data collection mechanisms

- Design an action plan:

  The identification of which indicators to localize, the appropriate scale, and the required adjustments on the metrics should serve as a baseline to produce a localization strategy. The strategy must build upon the current institutional capacities to carry on this process, work on the data gaps, and identify the required financial resources, technical skills, and policy or regulatory adjustments needed to produce an effective localization. The strategy should determine through which medium the localized agenda would be monitored and reported, the deliverables (e.g., the production of LVRs), the accountability of each actor in the process, and

a timeline of implementation. In addition, this strategy should align with the national strategy for the 2030 Agenda's adoption.

- Collaborate internationally:

  As this process would be new for the country, it should draw from international experiences, particularly from those in the region. International efforts can serve as case studies and benchmarking for Chile and can guide the different components of the localization strategy: the institutional arrangement, the allocation of responsibilities and resources, data collection, indicator selection, as well as reporting and communication mechanisms.

Finally, both these recommendations and the final results of the research lead to further questions beyond the scope of this work, which are essential to finding the answer for a successful implementation of a localized agenda. First of all, how can localization be operationalized in Chile? Many processes must be inspected to answer this question, including political, administrative, fiscal, and regulatory decisions. Whether to transfer capacities and which ones to transfer from the central to municipal governments requires a more detailed examination of the country's institutional landscape. Within the scope of operationalization, studying and identifying the most appropriate indicators for local sustainable development also needs further research.

Second, what factors can better explain the differences in the development performance of areas with similar contextual characteristics? The categorization of municipalities by development performance showed clear trends in disfavor of a specific set of sociodemographic and economic conditions of the ones lagging behind. However, wide variability, particularly among the most successful municipalities, indicates there must be additional explanations as to why an area advances and why others do not. Further research would help to identify potential causality among these variables and look into a more precise assessment for different thematic areas.

Lastly, the last question refers to how to dovetail localization for social and environmental scales. The 11 indicators selected belong mostly to the economic and social dimensions, and there are strong supporting arguments for municipalities to be an appropriate unit of localization. Since the SDGs do require breaking down metrics by other characteristics other than geographic subdivisions, how to integrate these various ways of disaggregation can be further analyzed. In addition, the most appropriate subdivision for environmental issues may differ from that of municipalities, perhaps more closely related to regions, or by some topographic units. The coordination between different scales of localization must be studied, so the overall system is coherent and effective.

Appendix

A. Municipalities

Table 9: List of regions and municipalities of Chile

Region Number	Region Name	Municipality Code	Municipality Name	Regional Capital
XV	Arica y Parinacota	15101, 15102, 15201, 15202	Arica, Camarones, Putre, General Lagos	Arica
I	Tarapacá	1101, 1107, 1401, 1402, 1403, 1404, 1405	Iquique, Alto Hospicio, Pozo Almonte, Camiña, Colchane, Huara, Pica	Iquique
II	Antofagasta	2101, 2102, 2103, 2104, 2201, 2202, 2203, 2301, 2302	Antofagasta, Mejillones, Sierra Gorda, Taltal, Calama, Ollagüe, San Pedro de Atacama, Tocopilla, María Elena	Antofagasta
III	Atacama	3101, 3102, 3103, 3201, 3202, 3301, 3302, 3303, 3304	Copiapó, Caldera, Tierra Amarilla, Chañaral, Diego de Almagro, Vallenar, Alto del Carmen, Freirina, Huasco	Copiapó
IV	Coquimbo	4101, 4102, 4103, 4104, 4105, 4106, 4201, 4202, 4203, 4204, 4301, 4302, 4303, 4304, 4305	La Serena, Coquimbo, Andacollo, La Higuera, Paihuano, Vicuña, Illapel, Canela, Los Vilos, Salamanca, Ovalle, Combarbalá, Monte Patria, Punitaqui, Río Hurtado	La Serena
V	Valparaíso	5101, 5102, 5103, 5104, 5105, 5107, 5109, 5201, 5301, 5302, 5303, 5304, 5401, 5402, 5403, 5404, 5405, 5501, 5502, 5503, 5504, 5506, 5601, 5602, 5603, 5604, 5605, 5606, 5701, 5702, 5703, 5704, 5705, 5706, 5801, 5802, 5803, 5804	Valparaíso, Casablanca, Concón, Juan Fernández, Puchuncaví, Quintero, Viña del Mar, Isla de Pascua, Los Andes, Calle Larga, Rinconada, San Esteban, La Ligua, Cabildo, Papudo, Petorca, Zapallar, Quillota, Calera, Hijuelas, La Cruz, Nogales, San Antonio, Algarrobo, Cartagena, El Quisco, El Tabo, Santo Domingo, San Felipe, Catemu, Llaillay, Panquehue, Putaendo, Santa María, Quilpué, Limache, Olmué, Villa Alemana	Valparaíso
XIII	Metropolitana de Santiago	13101, 13102, 13103, 13104, 13105, 13106, 13107, 13108, 13109, 13110, 13111, 13112, 13113, 13114, 13115, 13116, 13117, 13118,	Santiago, Cerrillos, Cerro Navia, Conchalí, El Bosque, Estación Central, Huechuraba, Independencia, La Cisterna, La Florida, La Granja, La Pintana, La Reina, Las Condes, Lo Barnechea, Lo Espejo, Lo Prado,	Santiago

		13119, 13120, 13121, 13122, 13123, 13124, 13125, 13126, 13127, 13128, 13129, 13130, 13131, 13132, 13201, 13202, 13203, 13301, 13302, 13303, 13401, 13402, 13403, 13404, 13501, 13502, 13503, 13504, 13505, 13601, 13602, 13603, 13604, 13605	Macul, Maipú, Ñuñoa, Pedro Aguirre Cerda, Peñalolén, Providencia, Pudahuel, Quilicura, Quinta Normal, Recoleta, Renca, San Joaquín, San Miguel, San Ramón, Vitacura, Puente Alto, Pirque, San José de Maipo, Colina, Lampa, Tiltil, San Bernardo, Buin, Calera de Tango, Paine, Melipilla, Alhué, Curacaví, María Pinto, San Pedro, Talagante, El Monte, Isla de Maipo, Padre Hurtado, Peñaflor	
VI	Libertador General Bernardo O'Higgins	6101, 6102, 6103, 6104, 6105, 6106, 6107, 6108, 6109, 6110, 6111, 6112, 6113, 6114, 6115, 6116, 6117, 6201, 6202, 6203, 6204, 6205, 6206, 6301, 6302, 6303, 6304, 6305, 6306, 6307, 6308, 6309, 6310	Rancagua, Codegua, Coinco, Coltauco, Doñihue, Graneros, Las Cabras, Machalí, Malloa, Mostazal, Olivar, Peumo, Pichidegua, Quinta de Tilcoco, Rengo, Requínoa, San Vicente, Pichilemu, La Estrella, Litueche, Marchigüe, Navidad, Paredones, San Fernando, Chépica, Chimbarongo, Lolol, Nancagua, Palmilla, Peralillo, Placilla, Pumanque, Santa Cruz	Rancagua
VII	Maule	7101, 7102, 7103, 7104, 7105, 7106, 7107, 7108, 7109, 7110, 7201, 7202, 7203, 7301, 7302, 7303, 7304, 7305, 7306, 7307, 7308, 7309, 7401, 7402, 7403, 7404, 7405, 7406, 7407, 7408	Talca, Constitución, Curepto, Empedrado, Maule, Pelarco, Pencahue, Río Claro, San Clemente, San Rafael, Cauquenes, Chanco, Pelluhue, Curicó, Hualañé, Licantén, Molina, Rauco, Romeral, Sagrada Familia, Teno, Vichuquén, Linares, Colbún, Longaví, Parral, Retiro, San Javier, Villa Alegre, Yerbas Buenas	Talca
XVI	Ñuble	16101, 16102, 16103, 16104, 16105, 16106, 16107, 16108, 16109, 16201, 16202, 16203, 16204, 16205, 16206, 16207, 16301, 16302, 16303, 16304, 16305	Chillán, Bulnes, Chillán Viejo, El Carmen, Pemuco, Pinto, Quillón, San Ignacio, Yungay, Quirihue, Cobquecura, Coelemu, Ninhue, Portezuelo, Ránquil, Treguaco, San Carlos, Coihueco, Ñiquén, San Fabián, San Nicolás	Chillán
VIII	Biobío	8101, 8102, 8103, 8104, 8105, 8106, 8107, 8108, 8109, 8110, 8111, 8112, 8201, 8202, 8203, 8204, 8205, 8206, 8207, 8301, 8302, 8303, 8304, 8305, 8306, 8307, 8308, 8309, 8310, 8311, 8312, 8313, 8314	Concepción, Coronel, Chiguayante, Florida, Hualqui, Lota, Penco, San Pedro de la Paz, Santa Juana, Talcahuano, Tomé, Hualpén, Lebu, Arauco, Cañete, Contulmo, Curanilahue, Los Álamos, Tirúa, Los Ángeles, Antuco, Cabrero, Laja, Mulchén, Nacimiento, Negrete, Quilaco, Quilleco, San Rosendo, Santa Bárbara, Tucapel, Yumbel, Alto Biobío	Concepción
IV	La Araucanía	9101, 9102, 9103, 9104, 9105, 9106, 9107, 9108, 9109, 9110, 9111, 9112,	Temuco, Carahue, Cunco, Curarrehue, Freire, Galvarino, Gorbea, Lautaro, Loncoche,	Temuco

		9113, 9114, 9115, 9116, 9117, 9118, 9119, 9120, 9121, 9201, 9202, 9203, 9204, 9205, 9206, 9207, 9208, 9209, 9210, 9211	Melipeuco, Nueva Imperial, Padre Las Casas, Perquenco, Pitrufquén, Pucón, Saavedra, Teodoro Schmidt, Toltén, Vilcún, Villarrica, Cholchol, Angol, Collipulli, Curacautín, Ercilla, Lonquimay, Los Sauces, Lumaco, Purén, Renaico, Traiguén, Victoria	
XIV	Los Ríos	14101, 14102, 14103, 14104, 14105, 14106, 14107, 14108, 14201, 14202, 14203, 14204	Valdivia, Corral, Lanco, Los Lagos, Máfil, Mariquina, Paillaco, Panguipulli, La Unión, Futrono, Lago Ranco, Río Bueno	Valdivia
X	Los Lagos	10101, 10102, 10103, 10104, 10105, 10106, 10107, 10108, 10109, 10201, 10202, 10203, 10204, 10205, 10206, 10207, 10208, 10209, 10210, 10301, 10302, 10303, 10304, 10305, 10306, 10307, 10401, 10402, 10403, 10404	Puerto Montt, Calbuco, Cochamó, Fresia, Frutillar, Los Muermos, Llanquihue, Maullín, Puerto Varas, Castro, Ancud, Chonchi, Curaco de Vélez, Dalcahue, Puqueldón, Queilén, Quellón, Quemchi, Quinchao, Osorno, Puerto Octay, Purranque, Puyehue, Río Negro, San Juan de la Costa, San Pablo, Chaitén, Futaleufú, Hualaihué, Palena	Puerto Montt
XI	Aysén del General Carlos Ibáñez del Campo	11101, 11102, 11201, 11202, 11203, 11301, 11302, 11303, 11401, 11402	Coyhaique, Lago Verde, Aysén, Cisnes, Guaitecas, Cochrane, O'Higgins, Tortel, Chile Chico, Río Ibáñez	Coyhaique
XII	Magallanes y de la Antártica Chilena	12101, 12102, 12103, 12104, 12201, 12202, 12301, 12302, 12303, 12401, 12402	Punta Arenas, Laguna Blanca, Río Verde, San Gregorio, Cabo de Hornos, Antártica, Porvenir, Primavera, Timaukel, Natales, Torres del Paine	Punta Arenas

Table 10: Municipalities excluded from CASEN survey

Region	Municipality Code	Municipality Name
XV	15202	General Lagos
I	1403	Colchane
II	2202	Ollagüe
V	5104, 5201	Juan Fernández, Isla de Pascua
X	10103, 10401, 10402, 10403, 10404	Cochamó, Chaitén, Futaleufú, Hualaihué, Palena
XI	11102, 11203, 11302, 11303	Lago Verde, Guaitecas, O'Higgins, Tortel
XII	12102, 12103, 12104, 12201, 12202, 12302, 12303, 12402	Laguna Blanca, Río Verde, San Gregorio, Cabo de Hornos, Antártica, Primavera, Timaukel, Torres del Paine

B. Metadata

Table 11: International SDG metadata sources

Indicator	Institution	Date	Comments
1.2.2	n/a	n/a	
2.2.2	UN Children's Fund (UNICEF) World Health Organization (WHO) World Bank (WB)	12/2016	
3.2.1	UN Children's Fund (UNICEF)	09/2019	
4.c.1	UNESCO Institute for Statistics (UNESCO-UIS)	07/2016	
5.5.1	UN-Women	01/2018	
6.1.1	World Health Organization (WHO) UN Children's Fund (UNICEF)	09/2017	
7.1.1	World Bank (WB)	07/2016	
10.2.1	World Bank (WB)	11/2018	
11.2.1	UN Human Settlements Programme (UN-Habitat)	07/2016	
12.5.1	Environment Statistics Section (UNSD) UN Environment Programme (UNEP)	08/2018	Work plan for Tier III indicator
16.1.1	UN Office on Drugs and Crime (UNODC)	07/2016	

Table 12: Data sources for SDG indicators

Indicator	Description	Data Source(s)	Institution(s)
1.2.2	Proportion of people living in poverty in all its dimensions according to national definitions	CASEN	MDS
2.2.2	Prevalence of malnutrition among children under 5 years of age, by type (wasting and overweight)	REM	MINSAL
3.2.1	Under-5 mortality rate	EEVV	INE / SRCel / MINSAL
4.c.1	Proportion of teachers who have received at least the minimum organized teacher training for teaching at the relevant level in a given country	Base de datos administrativa de docentes	MINEDUC
5.5.1	Proportion of seats held by women in local governments	2016 municipal elections	SERVEL
6.1.1	Proportion of population using safely managed drinking water services	CASEN	MDS
7.1.1	Proportion of population with access to electricity	CASEN	MDE
10.2.1	Proportion of people living below 50 per cent of median income	CASEN	MDS

11.2.1	Proportion of population that has convenient access to public transport	CASEN	MDS
12.5.1	National recycling rate, tons of material recycled	RETC	MMA
16.1.1	Number of victims of intentional homicide per 100,000 population	Casos Policiales de Delitos de Mayor Connotación Social	SPV

Table 13: Data sources for characterizing variables

Variable	Data Source(s)	Institution(s)
Proportion of rural population	SINIM	SUBDERE
Population density	Proyecciones de Población / SINIM	INE / SUBDERE
Distance to national capital	Área Urbana Consolidada, División Política Administrativa	MINVU /SUBDERE
Distance to regional capital	Área Urbana Consolidada, División Política Administrativa	MINVU / SUBDERE
Population	Proyecciones de Población	INE
Road density	División Política Administrativa Red Vial Nacional	MINVU / MOP
Proportion of rural area	Área Urbana Consolidada, División Política Administrativa	MINVU / SUBDERE
Municipal budget per capita	Proyecciones de Población / SINIM	INE / SUBDERE
FCM proportion	SINIM	SUBDERE
Average sales per company	Estadísticas de Empresa	SII

C. Performance categories

Table 14: List of municipalities by performance category

Category	Municipality Code	Municipality Name
Very low performance	1402, 1404, 3103, 3303, 4202, 4302, 4304, 7103, 7202, 7302, 7309, 7405, 8204, 8207, 8314, 9102, 9103, 9104, 9106, 9110, 9116, 9117, 9121, 9202, 9204, 9205, 9206, 9207, 9208, 10106, 10108, 10207, 10208, 10210, 10306, 14102, 14108, 16106, 16201, 16202, 16304	Camiña, Huara, Tierra Amarilla, Freirina, Canela, Combarbalá, Punitaqui, Curepto, Chanco, Hualañé, Vichuquén, Retiro, Contulmo, Tirúa, Alto Biobío, Carahue, Cunco, Curarrehue, Galvarino, Melipeuco, Saavedra, Teodoro Schmidt, Cholchol, Collipulli, Ercilla, Lonquimay, Los Sauces, Lumaco, Purén, Los Muermos, Maullín, Queilén, Quellón, Quinchao, San Juan de la Costa, Corral, Panguipulli, Pinto, Quirihue, Cobquecura, San Fabián
Low performance	2301, 6206, 6303, 7201, 7203, 7303, 7402, 7403, 8109, 8306, 8309, 8313, 9105, 9111, 9112, 9113, 9118, 9120, 9210, 9211, 10102, 10201, 10203, 11301, 14104, 14105, 14203, 14204, 16102, 16105, 16107, 16207, 16303, 16305	Tocopilla, Paredones, Chimbarongo, Cauquenes, Pelluhue, Licantén, Colbún, Longaví, Santa Juana, Nacimiento, Quilleco, Yumbel, Freire, Nueva Imperial, Padre Las Casas, Perquenco, Toltén, Villarrica, Traiguén, Victoria, Calbuco, Castro, Chonchi, Cochrane, Los Lagos, Máfil, Lago Ranco, Río Bueno, Bulnes, Pemuco, Quillón, Treguaco, Ñiquén, San Nicolás
Medium performance	2102, 1107, 1401, 2104, 3301, 4101, 4102, 4103, 4104, 4106, 4201, 4203, 4204, 4301, 4303, 5101, 5107, 5303, 5402, 5502, 5503, 5601, 5603, 5701, 5703, 5802, 5803, 6103, 6104, 6107, 6112, 6116, 6203, 6204, 6205, 6301, 6302, 6308, 7101, 7104, 7107, 7108, 7109, 7110, 7305, 7306, 7307, 7401, 7406, 7407, 7408, 8104, 8105, 8107, 8201, 8202, 8203, 8205, 8206, 8301, 8302, 8304, 8305, 8307, 8308, 8311, 8312, 9101, 9109, 9114, 9115, 9119, 9201, 9203, 9209, 10101, 10104, 10105, 10109, 10202, 10204, 10205, 10206, 10301, 10302, 10304, 10307, 11101, 11401, 11402, 13116, 13303, 13401, 13402, 13501, 13505, 13604, 14103, 14106, 14107, 14201, 14202, 15101, 15201, 16104, 16108, 16109, 16203, 16204, 16205, 16301, 16302	Iquique, Alto Hospicio, Pozo Almonte, Taltal, Vallenar, La Serena, Coquimbo, Andacollo, La Higuera, Vicuña, Illapel, Los Vilos, Salamanca, Ovalle, Monte Patria, Valparaíso, Quintero, Rinconada, Cabildo, Calera, Hijuelas, San Antonio, Cartagena, San Felipe, Llaillay, Limache, Olmué, Coinco, Coltauco, Las Cabras, Peumo, Requínoa, Litueche, Marchigüe, Navidad, San Fernando, Chépica, Placilla, Talca, Empedrado, Pencahue, Río Claro, San Clemente, San Rafael, Rauco, Romeral, Sagrada Familia, Linares, San Javier, Villa Alegre, Yerbas Buenas, Florida, Hualqui, Penco, Lebu, Arauco, Cañete, Curanilahue, Los Álamos, Los Ángeles, Antuco, Laja, Mulchén, Negrete, Quilaco, Santa Bárbara, Tucapel, Temuco, Loncoche, Pitrufquén, Pucón, Vilcún, Angol, Curacautín, Renaico, Puerto Montt, Fresia, Frutillar, Puerto Varas, Ancud, Curaco de Vélez, Dalcahue, Puqueldón, Osorno, Puerto Octay, Puyehue, San Pablo, Coyhaique, Chile Chico, Río Ibáñez, Lo Espejo, Tiltil, San Bernardo, Buin, Melipilla, San Pedro, Padre Hurtado, Lanco, Mariquina, Paillaco, La Unión, Futrono, Arica, Putre, El Carmen, San

		Ignacio, Yungay, Coelemu, Ninhue, Portezuelo, San Carlos, Coihueco
High performance	1405, 2101, 2201, 2203, 3101, 3102, 3201, 3202, 3302, 3304, 4305, 5105, 5109, 5302, 5401, 5404, 5501, 5506, 5602, 5604, 5606, 5702, 5704, 5705, 5804, 6101, 6105, 6108, 6110, 6111, 6113, 6114, 6115, 6117, 6201, 6304, 6305, 6309, 6310, 7102, 7105, 7106, 7301, 7304, 7308, 7404, 8101, 8102, 8103, 8106, 8108, 8111, 8112, 8303, 8310, 9107, 9108, 10107, 10303, 10305, 11201, 12101, 12301, 12401, 13102, 13103, 13105, 13106, 13110, 13111, 13112, 13117, 13122, 13123, 13124, 13127, 13129, 13131, 13201, 13203, 13301, 13302, 13403, 13404, 13503, 13504, 13601, 13602, 13603, 13605, 14101, 16101, 16103	Pica, Antofagasta, Calama, San Pedro de Atacama, Copiapó, Caldera, Chañaral, Diego de Almagro, Alto del Carmen, Huasco, Río Hurtado, Puchuncaví, Viña del Mar, Calle Larga, La Ligua, Petorca, Quillota, Nogales, Algarrobo, El Quisco, Santo Domingo, Catemu, Panquehue, Putaendo, Villa Alemana, Rancagua, Doñihue, Machalí, Mostazal, Olivar, Pichidegua, Quinta de Tilcoco, Rengo, San Vicente, Pichilemu, Lolol, Nancagua, Pumanque, Santa Cruz, Constitución, Maule, Pelarco, Curicó, Molina, Teno, Parral, Concepción, Coronel, Chiguayante, Lota, San Pedro de la Paz, Tomé, Hualpén, Cabrero, San Rosendo, Gorbea, Lautaro, Llanquihue, Purranque, Río Negro, Aysén, Punta Arenas, Porvenir, Natales, Cerrillos, Cerro Navia, El Bosque, Estación Central, La Florida, La Granja, La Pintana, Lo Prado, Peñalolén, Providencia, Pudahuel, Recoleta, San Joaquín, San Ramón, Puente Alto, San José de Maipo, Colina, Lampa, Calera de Tango, Paine, Curacaví, María Pinto, Talagante, El Monte, Isla de Maipo, Peñaflor, Valdivia, Chillán, Chillán Viejo
Very high performance	2102, 2103, 2302, 4105, 5102, 5103, 5301, 5304, 5403, 5405, 5504, 5605, 5706, 5801, 6102, 6106, 6109, 6202, 6306, 6307, 8110, 10209, 11202, 13101, 13104, 13107, 13108, 13109, 13113, 13114, 13115, 13118, 13119, 13120, 13121, 13125, 13126, 13128, 13130, 13132, 13202, 13502, 15102, 16206	Mejillones, Sierra Gorda, María Elena, Paihuano, Casablanca, Concón, Los Andes, San Esteban, Papudo, Zapallar, La Cruz, El Tabo, Santa María, Quilpué, Codegua, Graneros, Malloa, La Estrella, Palmilla, Peralillo, Talcahuano, Quemchi, Cisnes, Santiago, Conchalí, Huechuraba, Independencia, La Cisterna, La Reina, Las Condes, Lo Barnechea, Macul, Maipú, Ñuñoa, Pedro Aguirre Cerda, Quilicura, Quinta Normal, Renca, San Miguel, Vitacura, Pirque, Alhué, Camarones, Ránquil

D. Correlations

Figure 8: Correlation between SDG indicators and proportion of rural population

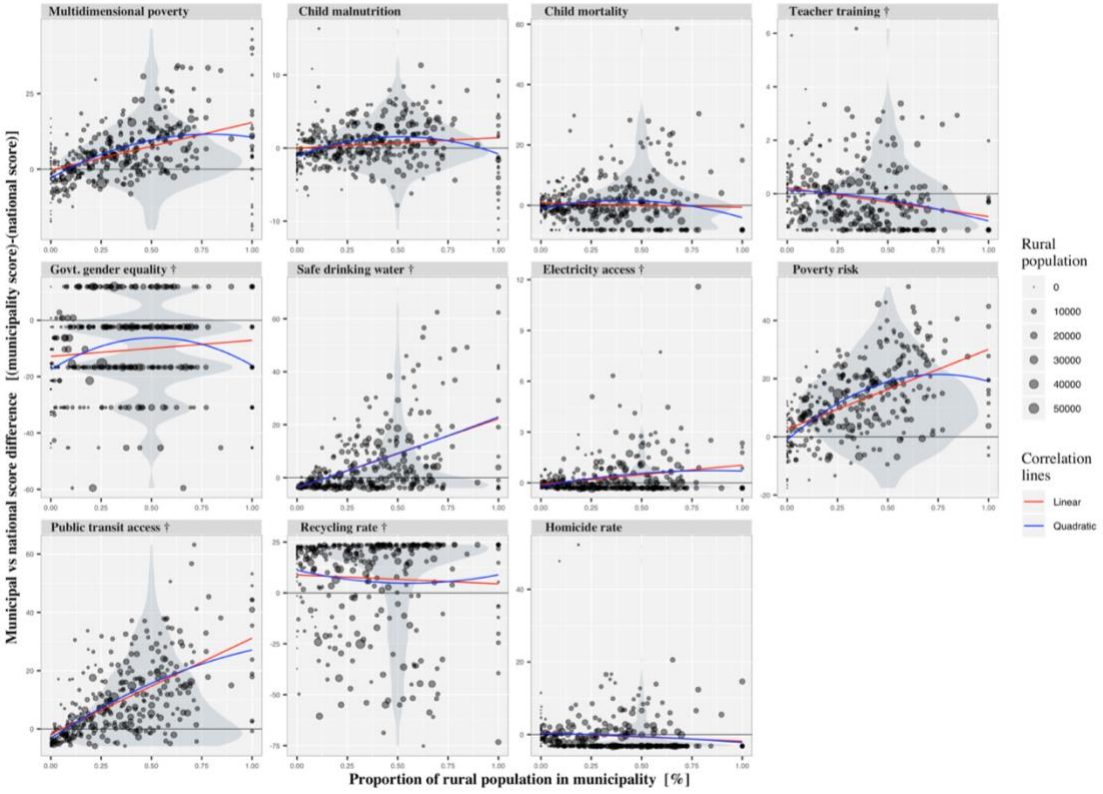


Figure 9: Correlation between SDG indicators and population density

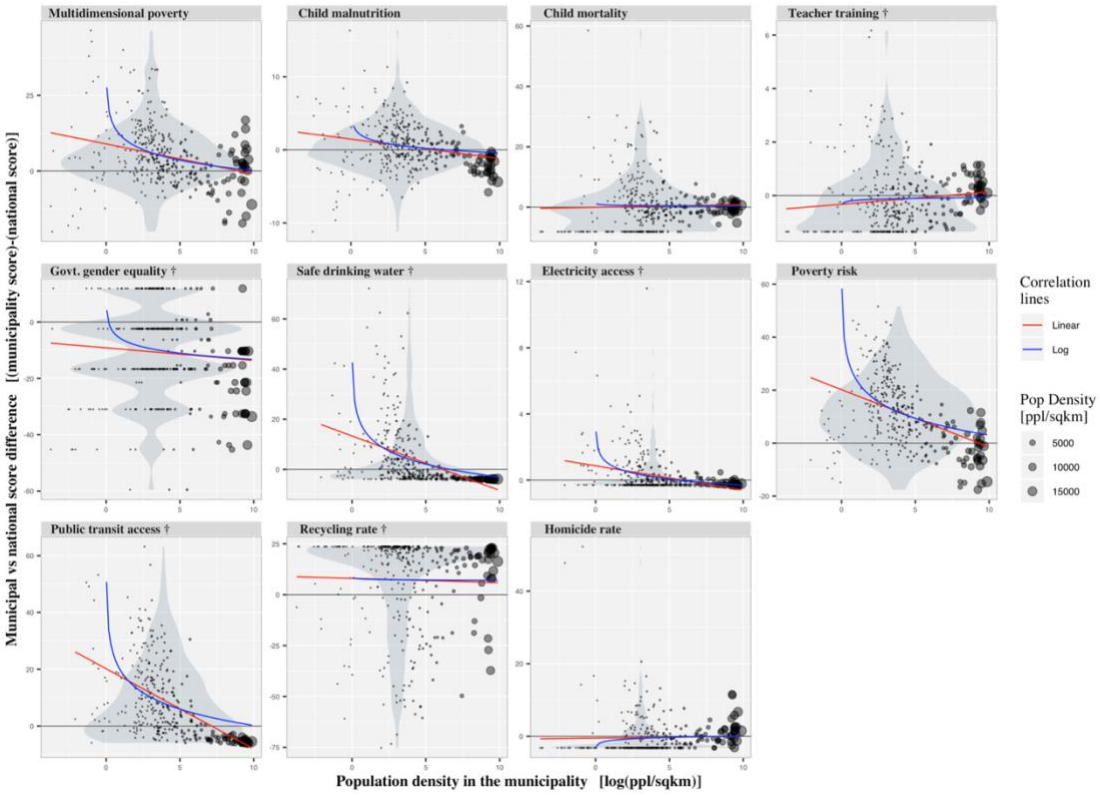


Figure 10: Correlation between SDG indicators and distance to Santiago

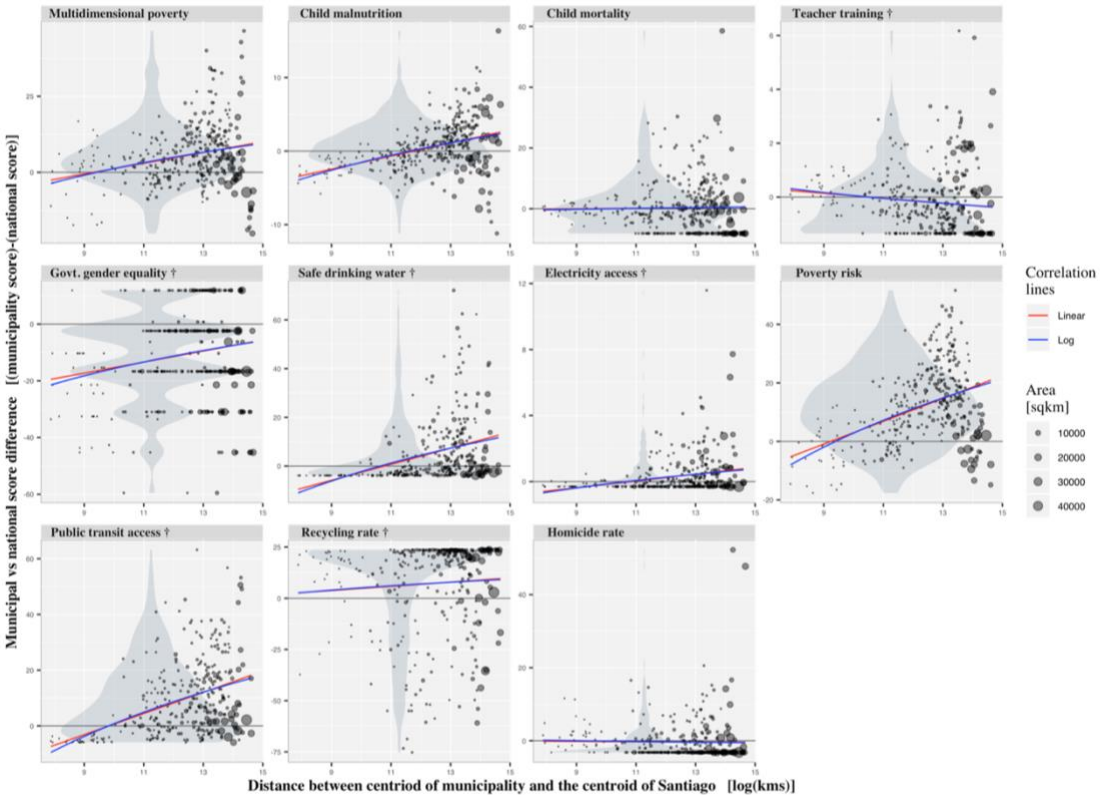


Figure 11: Correlation between SDG indicators and distance with regional capital

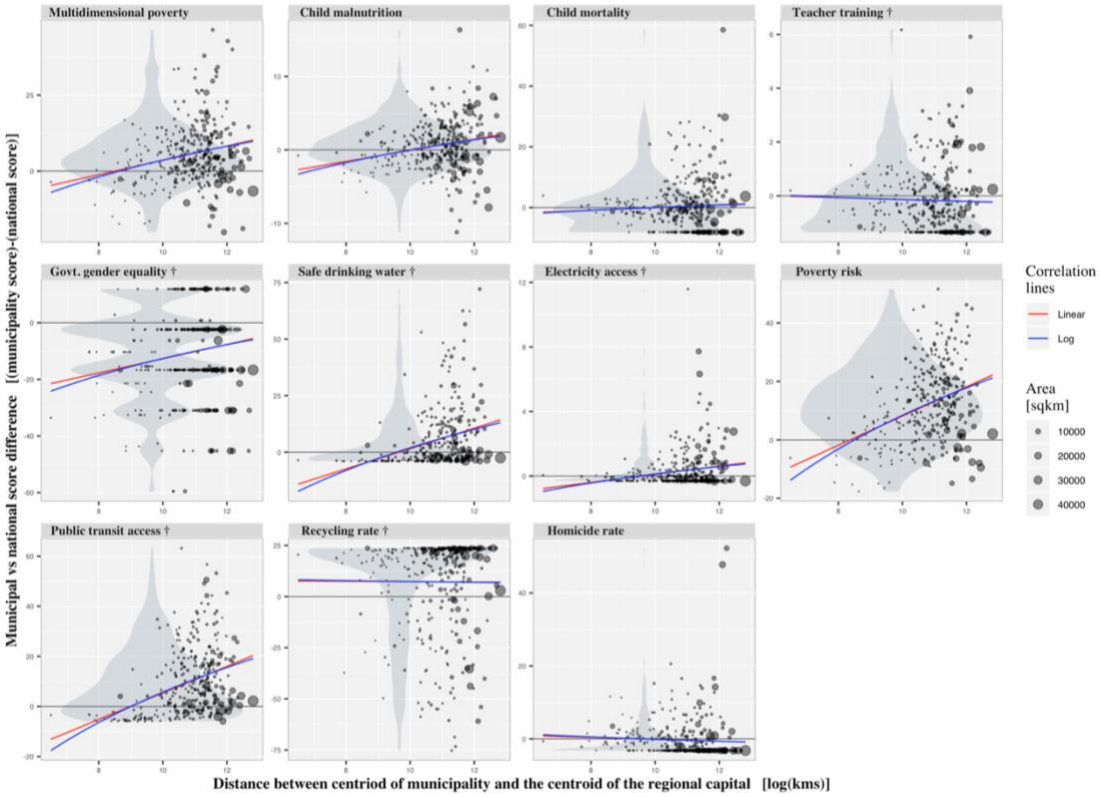


Figure 12: Correlation between SDG indicators and total population

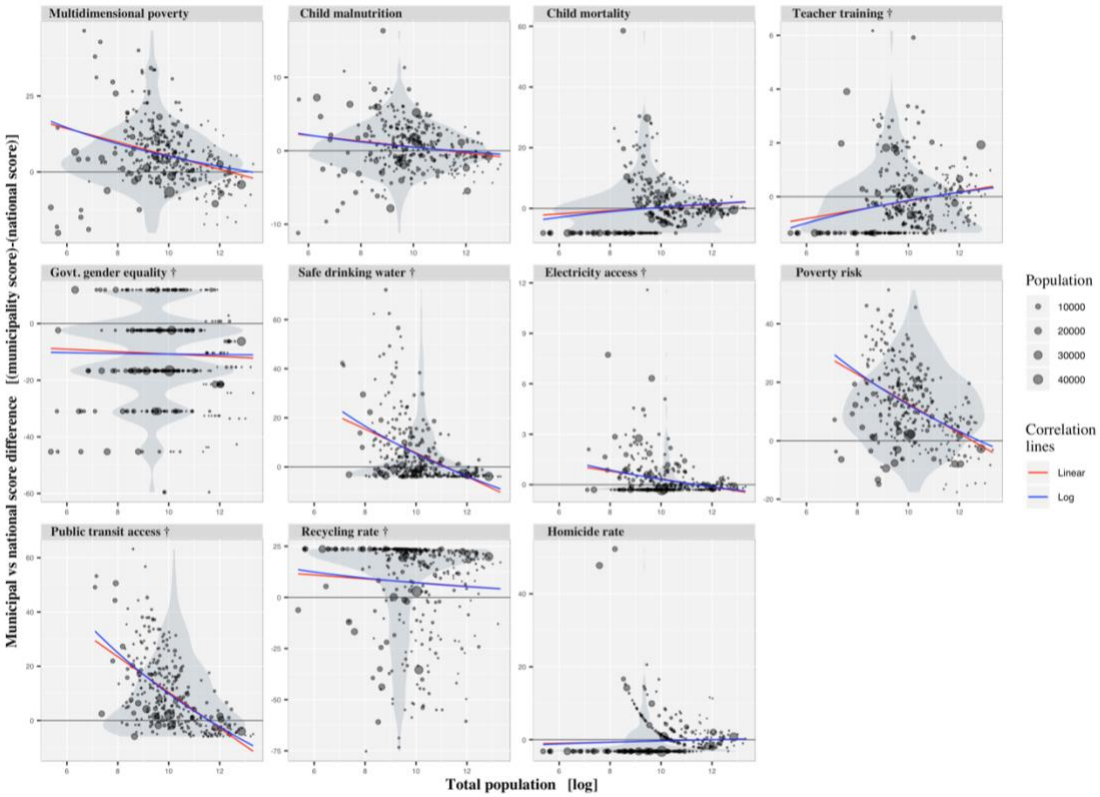


Figure 13: Correlation between SDG indicators and road density

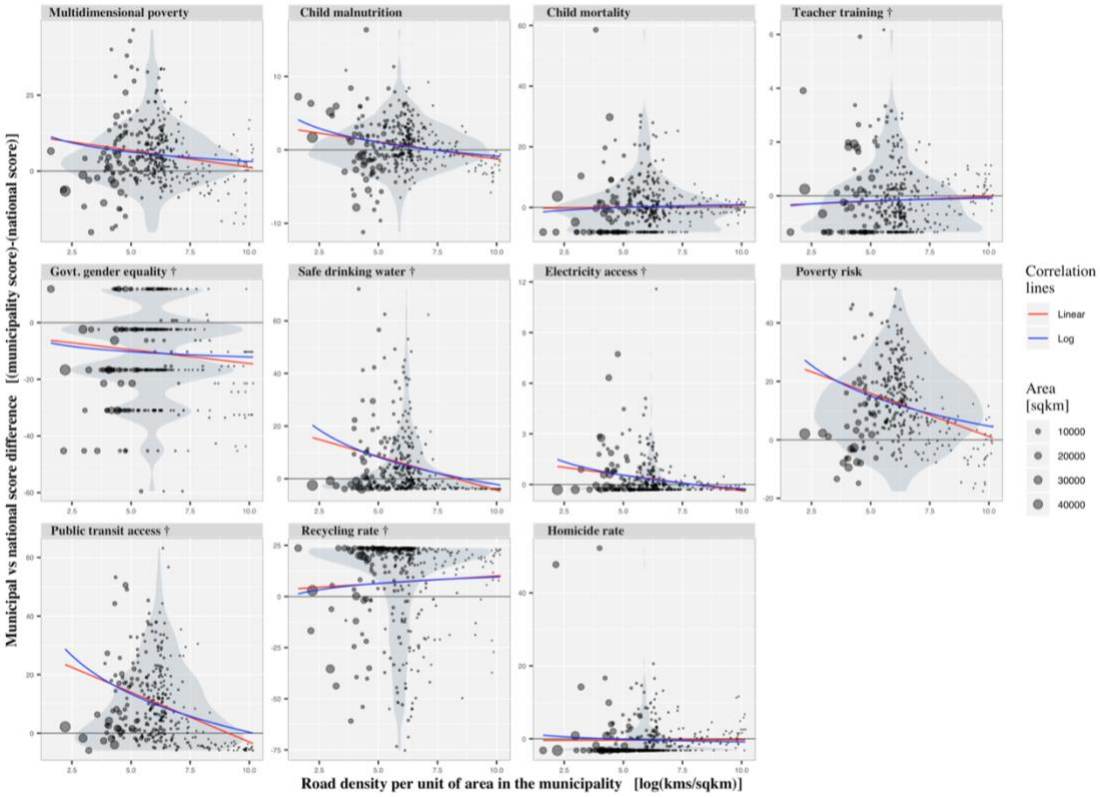


Figure 14: Correlation between SDG indicators and proportion of rural area

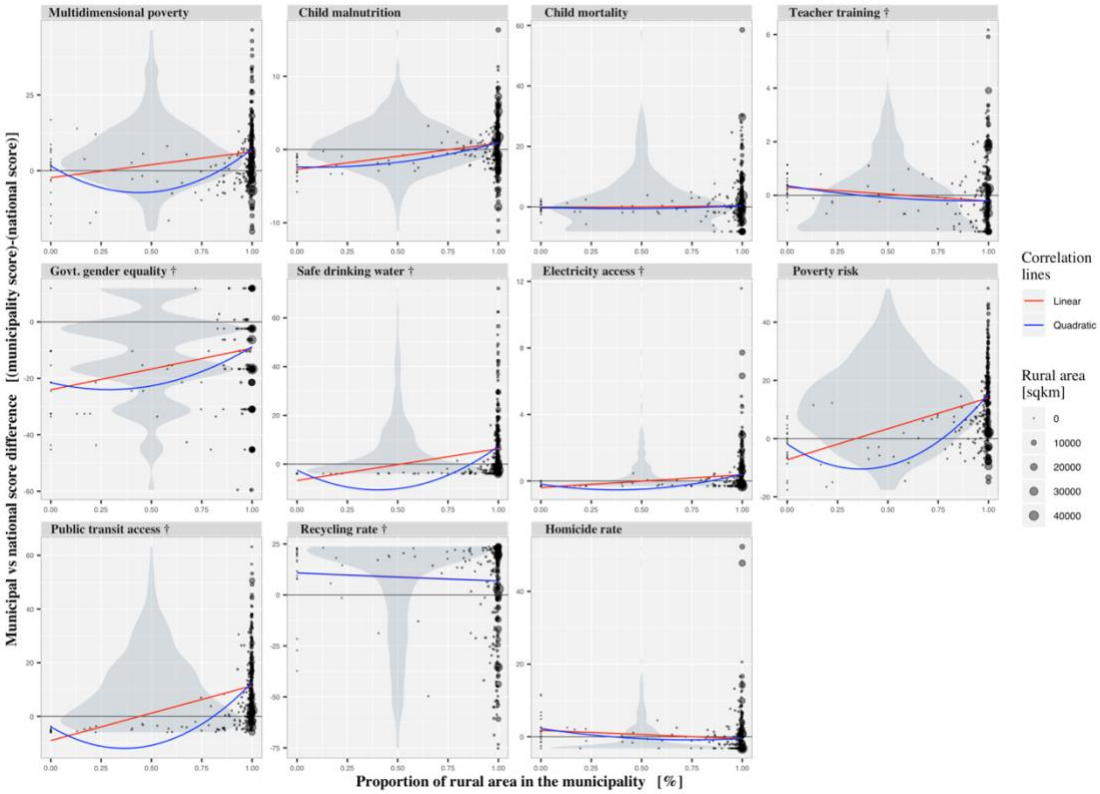


Figure 15: Correlation between SDG indicators and municipal budget per capita

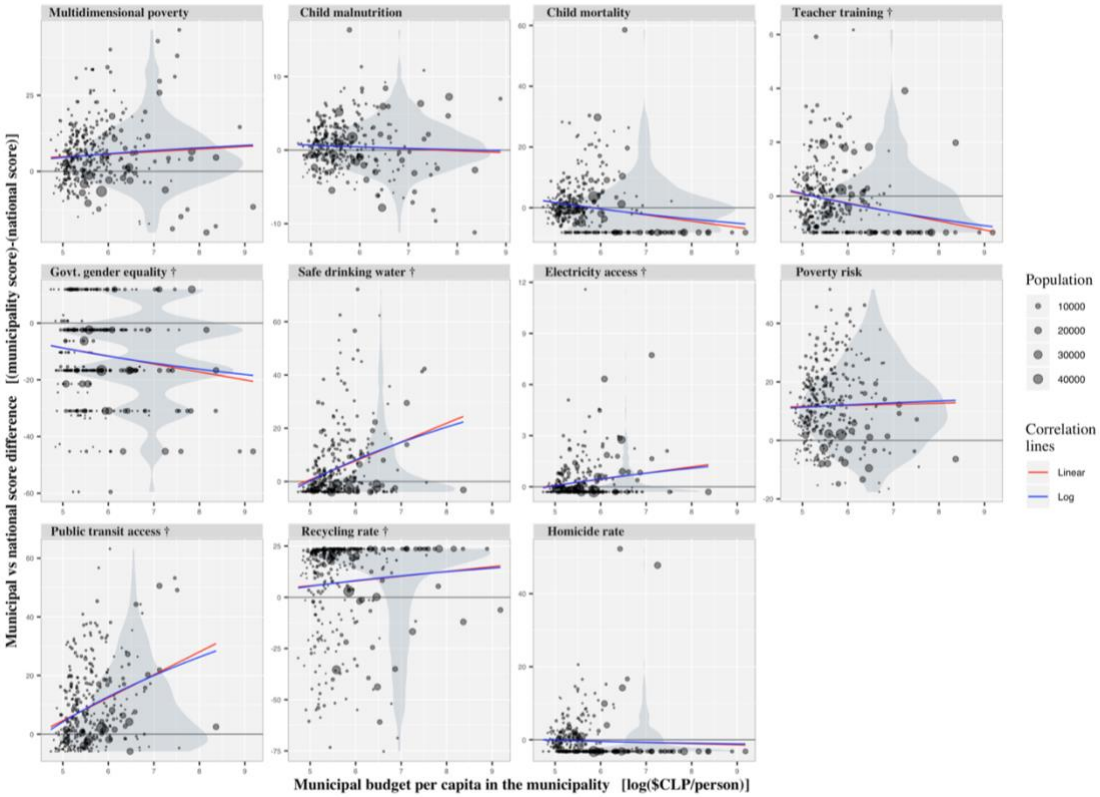


Figure 16: Correlation between SDG indicators and proportion of FCM

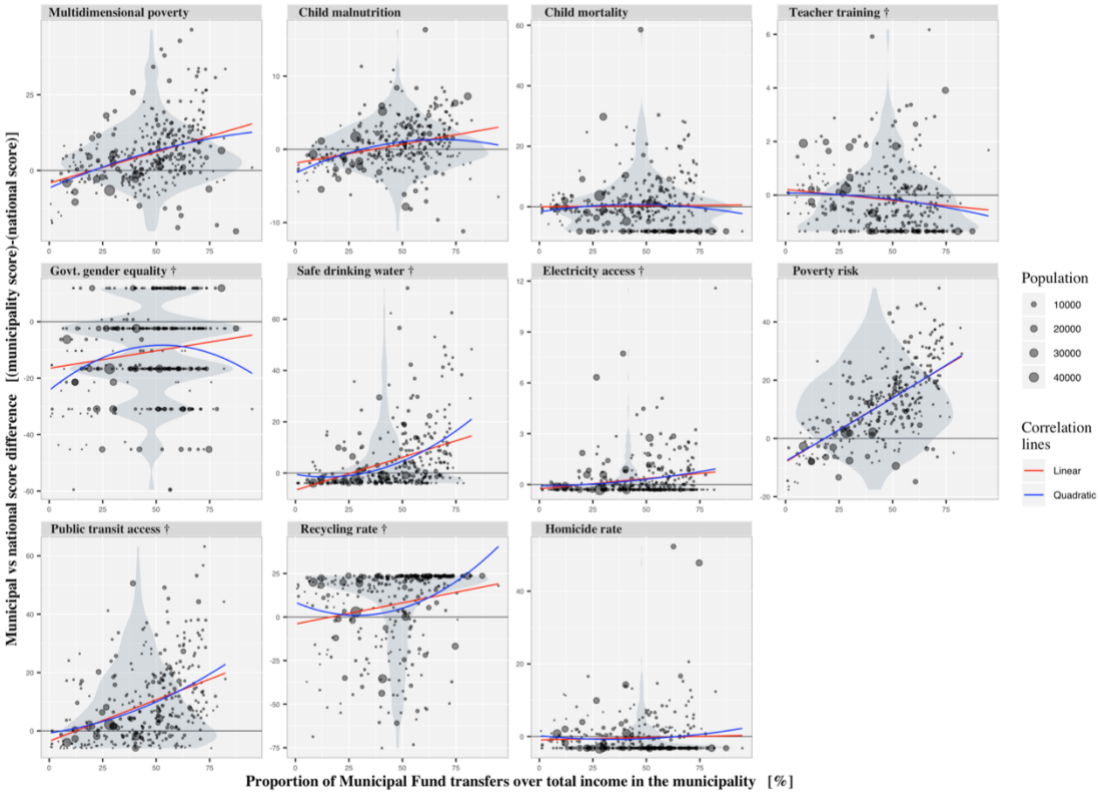


Figure 17: Correlation between SDG indicators and average company sales

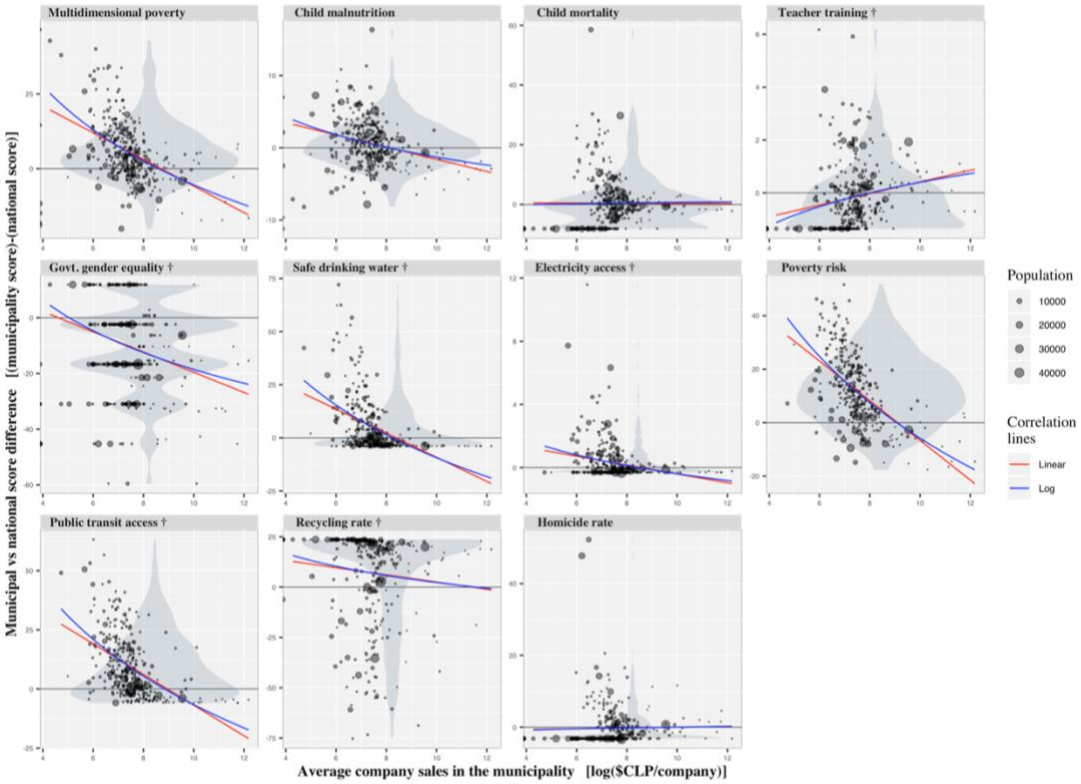


Table 15: Spearman's (ρ) correlation coefficients

Indicator	Prop. rural pop.	Pop. dens.	Dist. cap.	Dist. reg. cap.	Pop.	Road dens.	Prop. rural area	Mun. budget pc.	Prop. FCM	Avg. sales comp.
1.2.2	0.50	-0.32	0.23	0.17	-0.37	-0.16	-0.36	0.15	0.43	-0.47
2.2.2	0.25	-0.23	0.43	0.20	-0.20	-0.16	-0.26	0.00	0.37	-0.30
3.2.1	-0.17	0.11	-0.05	-0.05	0.23	0.12	0.10	-0.23	-0.05	0.18
4.c.1	-0.36	0.21	-0.22	-0.13	0.33	0.12	0.22	-0.28	-0.22	0.38
5.5.1	0.17	-0.08	0.10	0.12	-0.08	-0.03	-0.09	-0.05	0.13	-0.16
6.1.1	0.58	-0.57	0.53	0.45	-0.52	-0.42	-0.58	0.31	0.47	-0.57
7.1.1	0.16	-0.23	0.28	0.14	-0.08	-0.21	-0.25	0.01	0.18	-0.15
10.2.1	0.58	-0.41	0.35	0.32	-0.46	-0.27	-0.44	0.10	0.64	-0.62
11.2.1	0.69	-0.56	0.42	0.43	-0.62	-0.41	-0.56	0.33	0.44	-0.58
12.5.1	0.16	-0.24	0.18	0.15	-0.31	-0.10	-0.23	0.23	0.41	-0.40
16.1.1	-0.34	0.33	-0.16	-0.29	0.43	0.27	0.29	-0.32	-0.14	0.32

Table 16: Pearson's (*r*) correlation coefficients

Indicator	Prop. rural pop.	Pop. dens.	Dist. cap.	Dist. reg. cap.	Pop.	Road dens.	Prop. rural area	Mun. budget pc.	Prop. FCM	Avg. sales comp.
1.2.2	0.44	-0.16	0.08	0.00	-0.34	-0.18	-0.21	-0.06	0.40	-0.19
2.2.2	0.12	-0.25	0.20	-0.06	-0.22	-0.25	-0.27	-0.06	0.31	-0.18
3.2.1	-0.05	-0.02	-0.09	-0.05	-0.02	-0.02	-0.02	-0.18	0.02	-0.02
4.c.1	-0.25	0.10	-0.02	0.06	0.12	0.10	0.11	-0.15	-0.13	0.06
5.5.1	0.10	-0.20	-0.06	-0.06	-0.14	-0.21	-0.24	-0.18	0.15	-0.16
6.1.1	0.52	-0.22	0.29	0.30	-0.31	-0.24	-0.26	0.17	0.38	-0.15
7.1.1	0.24	-0.14	0.23	0.17	-0.16	-0.16	-0.16	0.09	0.19	-0.09
10.2.1	0.54	-0.36	0.10	0.20	-0.43	-0.38	-0.42	-0.09	0.64	-0.28
11.2.1	0.63	-0.34	0.31	0.24	-0.44	-0.37	-0.39	0.20	0.40	-0.21
12.5.1	-0.05	0.05	0.06	0.03	0.02	0.06	0.04	0.04	0.21	0.01
16.1.1	-0.12	0.11	0.09	-0.03	0.04	0.11	0.10	-0.06	0.04	0.01

E. Interviews

Table 17: List of interviewed organizations

Date	Organization	Department /Unit	Location
12/19/2019	United Nations (UN)	Data and Monitoring	Phone call
01/16/2020	Ministerio de Desarrollo Social y Familia (MDSF)	División Cooperación Público-Privada División de Observatorio Social	MDSF's offices
01/22/2020	Asociación Chilena de Municipalidades (AChM)	Unidad de Estudios Asuntos Internacionales y Estudios Observatorio de Datos	AChM's offices

References

Alaimo, L. S., & Maggino, F. (2020). Sustainable Development Goals indicators at territorial level: Conceptual and methodological issues—The Italian perspective. *Social Indicators Research, 147*(2), 383–419. https://doi.org/10.1007/s11205-019-02162-4

Albert, C., & Miranda, B. (2019, January 11). Luz, agua, GES, Metro, TAG, arriendos y contribuciones: El tren de alzas que asfixió a los chilenos. *CIPER Chile*. https://ciperchile.cl/2019/11/01/luz-agua-ges-metro-tag-arriendos-y-contribuciones-el-tren-de-alzas-que-asfixio-a-los-chilenos/

Alkire, S., & Deneulin, S. (2009). The human development and capability approach. In S. Deneulin & L. Shahani (Eds.), *An introduction to the human development and capability approach* (pp. 22–48). London; Sterling, VA: Earthscan.

Annan, K. (2003). The role of the state in the Age of Globalisation. In F. J. Lechner & J. Boli (Eds.), *The Globalization Reader* (2nd ed., pp. 240–243). Blackwell Publishnig.

Asociación Chilena de Municipalidades. (2015). *Manual "Conociendo al Estado."* Santiago: AChM, SUBDERE.

Aylwin, P. (1993, May 21). *Mensaje Presidencial*. Cuenta Pública del Presidente de la República, Congreso Nacional, Valparaíso. https://www.bcn.cl/historiapolitica/corporaciones/cuentas_publicas/detalle?tipo=presidentes

Badia-Miró, M. (2015). The evolution of the location of economic activity in Chile in the long run: A paradox of extreme concentration in absence of agglomeration economies. *Estudios de Economía, 42*(2), 143–167. https://doi.org/10.4067/S0718-52862015000200007

Bamberger, M., Vaessen, J., & Raimondo, E. (2016). Comlpexity in development evaluation: The framework of the book. In *Dealing with complexity in development evaluation: A practical approach*. Thousand Oaks, CA: SAGE Publications.

Banco Central de Chile. (2018). *PIB Regional*. [data set]. https://www.bcentral.cl/areas/estadisticas/pib-regional

Baster, N. (1972). Development indicators: An introduction. In N. Baster (Ed.), *Measuring development: The role and adequacy of development indicators*. London: Frank Cass.

Bell, S., & Morse, S. (2008). *Sustainability indicators: Measuring the immeasurable?* (2nd ed.). London; Sterling, VA: Earthscan.

Benítez, M. (2019, December 19). Social outburst in Chile: The impact on investment. *Diario Financiero*. https://www.df.cl/noticias/opinion/columnistas/conexion-a-china-estallido-social-impacto-en-inversion/2020-01-06/170217.html#vtxt_cuerpo_T0

Bessert, T. J., Larrañaga, O., Giedion, U., Arbelaez, J. J., & Bowser, D. M. (2003). Decentralization and equity of resource allocation: Evidence from Colombia and Chile. *Bulletin of the World Health Organization, 81*(2), 95–100.

Black, K. (2018). Latin America's pursuit of perfection: How the region's efforts to achieve UN's 2030 sustainable agenda is quickly becoming the new standard other countries should follow. *North Carolina Journal of International Law & Commercial Regulation*, *44*(1), 191–216.

Blanco, H., Wautiez, F., Llavero, A., & Riveros, C. (2001). Indicadores regionales de desarrollo sustentable en Chile: ¿Hasta qué punto son útiles y necesarios? *Revista EURE*, *27*(81), 85–95. https://doi.org/10.4067/s0250-71612001008100005

Borcoski, I. (2018). Políticas Territoriales y Descentralización: Aportes al debate desde la AChM. *Asociación Chilena de Municipalidades.* Cuadernos de Trabajo.

Candia, D., & Hurtado, J. (2012). Objetivos de Desarrollo del Milenio: Un diagnóstico a nivel municipal. El caso del Brasil, Chile y México. In CEPAL, *Desarrollo regional en América Latina: El lugar importa: Vol. LC/L.3454* (pp. 179–205). Santiago: Naciones Unidas.

Carolini, G. Y., Hess, S. L., Quezada, J., & Thomasz, E. O. (2019). *Panorama de la descentralización fiscal y la ruralidad en América Latina y el Caribe: Limitaciones y oportunidades para resolver el desarrollo desigual* [Documentos de Proyectos]. Comisión Económica para América Latina y el Caribe (CEPAL); LC/TS.2019/109.

Casas-Cordero, C., Encina, J., & Lahiri, P. (2016). Poverty mapping for the Chilean comunas. In M. Pratesi (Ed.), *Analysis of poverty data by small area estimation* (pp. 379–404). Chichester: John Wiley & Sons. http://doi.wiley.com/10.1002/9781118814963.ch20

Castelletti, B. (2013). How redistributive is fiscal policy in Latin America? The case of Chile and Mexico. *OECD Development Centre*. Working Paper no. 318. https://doi.org/10.1787/5k424rnjl424-en

Castillo, V., & Razmilic, S. (2020). Evolución de la segregación de los inmigrantes en Santiago. *Puntos de Referencia, 527.* Centro de Estudios Públicos.

Castro, E. (2015). Panorama regional del desarrollo sostenible en América Latina. *Luna Azul*, *40*, 195–212. https://doi.org/10.17151/luaz.2015.40.13

Constitución Política de la República de Chile, Capítulos I & XIV (2005). http://bcn.cl/1uva9

Cuéllar, Ó., & Moreno, F. (2009). Del crecimiento económico al desarrollo humano: Los cambiantes usos del concepto de desarrollo en América Latina, 1950-2000. *Sociológica*, *24*(70), 83–114. a9h.

Daher, A. (2003). Regiones-commodities: Crisis y contagio en Chile. *Revista EURE*, *29*(86), 89–108. https://doi.org/10.4067/s0250-71612003008600005

Daly, H. (1990). Sustainable growth: A bad oxymoron. *Journal of Environmental Science & Health, C8*(2), 401–407.

Daly, H. (2005). Economics in a full world. *Scientific American*, *293*(3), 100–107.

Dang, H.-A. H., & Serajuddin, U. (2020). Tracking the sustainable development goals: Emerging measurement challenges and further reflections. *World Development*, *127*, 104570. https://doi.org/10.1016/j.worlddev.2019.05.024

Díaz, G., & Rivera, C. (2014). Capacidades subnacionales para procesos de descentralización: El caso de cuatro regiones en Chile. *Reforma y Democracia*, *60*, 161–192. CLAD.

Dworkin, R. (2000). *Sovereign virtue: The theory and practice of equality*. Cambridge, MA: Harvard University Press.

Easterly, W. (2013). *The tyranny of experts: Economists, dictators, and the forgotten rights of the poor*. New York: Basic Books.

Easterly, W. (2015). The trouble with the Sustainable Development Goals. *Current History, 114*(775), 322–324.

Ehrlich, P. R., & Ehrlich, A. H. (2013). Can a collapse of global civilization be avoided? *Proc. R. Soc. Biological Sciences*, *280*(1754), 1–9. https://doi.org/10.1098/rspb.2012.2845

Escobar, A. (1995). *Encountering development: The making and unmaking of the Third World*. Princeton, NJ: Princeton University Press.

Esteva, G. (2010). Development. In W. Sachs (Ed.), *The development dictionary: A guide to knowledge as power* (2nd ed., pp. 1–23). London, New York: Zed Books.

Ffrench-Davis, R. (2010). *Economic reforms in Chile: From dictatorship to democracy* (2nd ed.). New York: Palgrave Macmillan.

Foxley, A. (2004). *Successes and failures in poverty eradication: Chile* (No. 30806). Washington, DC: The World Bank; Case Studies in Scaling Up Poverty Reduction. http://documents.worldbank.org/curated/en/292491468743165841/Successes-and-failures-in-poverty-eradication-Chile

Frank, A. G. (1969). *Capitalism and underdevelopment in Latin America: Historical studies of Chile and Brazil*. New York: Modern Reader Paperbacks.

Frank, A. G. (1971). The development of underdevelopment. In R. I. Rhodes (Ed.), *Imperialism and underdevelopment: A reader* (1st ed., pp. 4–17). New York, London: Monthly Review Press.

Frei, E. (1994, May 21). *Mensaje Presidencial*. Cuenta Pública del Presidente de la República, Congreso Nacional, Valparaíso. https://www.bcn.cl/historiapolitica/corporaciones/cuentas_publicas/detalle?tipo=presidentes

Frei, E. (1999, May 21). *Mensaje Presidencial*. Cuenta Pública del Presidente de la República, Congreso Nacional, Valparaíso. https://www.bcn.cl/historiapolitica/corporaciones/cuentas_publicas/detalle?tipo=presidentes

Fukuda-Parr, S. (2012). The right to development: Reframing a new discourse for the twenty-first century. *Social Research, 79*(4), 839–864.

Fukuda-Parr, S. (2016). From the Millennium Development Goals to the Sustainable Development Goals: Shifts in purpose, concept, and politics of global goal setting for development. *Gender & Development, 24*(1), 43–52. https://doi.org/10.1080/13552074.2016.1145895

Fukuda-Parr, S., Yamin, A. E., & Greenstein, J. (2014). The Power of Numbers: A critical review of Millennium Development Goal targets for human development and human rights. *Journal of Human Development & Capabilities*, *15*(2–3), 105–117. https://doi.org/10.1080/19452829.2013.864622

Garcés, M. (2019). October 2019: Social uprising in neoliberal Chile. *Journal of Latin American Cultural Studies, 28*(3), 483–491. https://doi.org/10.1080/13569325.2019.1696289

Global Taskforce of Local and Regional Governments. (2016). *Roadmap for localizing the SDGs: Implementation and monitoring at subnational level*. GTF, UNDP, UN-Habitat.

Global Taskforce of Local and Regional Governments. (2019). *Towards the Localization of the SDGs* (Local and Regional Government's Report to the 2019 HLPF: 3rd Report). GTF, United Cities and Local Governments (UCLG).

Goodland, R., & Daly, H. (1993). Poverty alleviation—A must for environmental sustainability. *Sustainable Development, 1*(3), 8–22. https://doi.org/10.1002/sd.3460010305

Goodland, R., & Daly, H. (1996). Environmental sustainability: Universal and non-negotiable. *Ecological Applications, 6*(4), 1002–1017. https://doi.org/10.2307/2269583

Gücümengil, A. (2017). Monitoring and evaluation: Development indicators. *Sarajevo Business and Economics Review*, *2017*(35), 104–118.

Guimarães, R. P. (1994). El desarrollo sustentable: ¿Propuesta alternativa o retórica neoliberal? *Revista EURE*, *20*(61), 41–56.

Gurría, A. (2009, December 15). *Invitation to Chile to join the OECD*. OECD-Secretary General, OECD Headquarters, Paris. https://www.oecd.org/about/secretary-general/invitationtochiletojointheoecd.htm

Halperin-Donghi, T. (1982). "Dependency Theory" and Latin American historiography. *Latin American Research Review*, *17*(1), 115–130.

High-level Group for Partnership, Coordination and Capacity-Building for Statistics for the 2030 Agenda for Sustainable Development. (2017). *Cape Town Global Action Plan for sustainable development data*. United Nations Statistical Commission. https://unstats.un.org/sdgs/hlg/Cape_Town_Global_Action_Plan_for_Sustainable_Development_Data.pdf

High-Level Panel of Eminent Persons on the Post-2015 Development Agenda. (2013). *A new global partnership: Eradicate poverty and transform economies through sustainable development*. New York: United Nations. https://doi.org/10.1891/9780826190123.ap02

Instituto Nacional de Estadísticas. (2017). *CENSO 2017*. [data set]. https://www.censo2017.cl

Inter-agency and Expert Group on SDG Indicators. (2018). *Overview of Standards for Data Disaggregation*. United Nations Statistical Commission; Working Document. https://unstats.un.org/sdgs/files/Overview%20of%20Standards%20for%20Data%20Disaggregation.pdf

Kalter, E., Phillips, S., Espinosa-Vega, M. A., Luzio, R., Villafuerte, M., & Singh, M. (2004). *Chile: Institutions and policies underpinning stability and growth* (Ocassional Papers). Washington, DC: International Monetary Fund.

Kenny, C., & Williams, D. (2001). What do we know about economic growth? Or, why don't we know very much? *World Development*, *29*(1), 1–22. https://doi.org/10.1016/s0305-750x(00)00088-7

Lagos, R. (2000, May 21). *Mensaje Presidencial*. Cuenta Pública del Presidente de la República, Congreso Nacional, Valparaíso. https://www.bcn.cl/historiapolitica/corporaciones/cuentas_publicas/detalle?tipo=presidentes

Lagos, R. (2006, May 21). *Mensaje Presidencial*. Cuenta Pública del Presidente de la República, Congreso Nacional, Valparaíso. https://www.bcn.cl/historiapolitica/corporaciones/cuentas_publicas/detalle?tipo=presidentes

Le Blanc, D. (2015). Towards integration at last? The sustainable development goals as a network of targets. *Sustainable Development*, *23*(3), 176– 187. https://doi.org/10.1002/sd.1582

Lele, S. (2017). Sustainable Development Goal 6: Watering down justice concerns. *WIREs Water*, *4*(e1224), 1–7. https://doi.org/10.1002/wat2.1224

Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *The Manchester School*, *22*(2), 139–191. https://doi.org/10.1111/j.1467-9957.1954.tb00021.x

Local 2030. (2019). *Voluntary local reviews* [Website]. https://www.local2030.org/vlrs

Lucci, P. (2015). *'Localising' the Post-2015 agenda: What does it mean in practice?* Overseas Development Institute (ODI). http://www.delog.org/cms/upload/teaser/ODI_Localising_Post-2015_What_does_it_mean_in_practice.pdf

Lummis, C. D. (2010). Equality. In W. Sachs (Ed.), *The development dictionary: A guide to knowledge as power* (2nd ed., pp. 38–54). London, New York: Zed Books.

McCarthy, D. (2017). The priority view. *Economics and Philosophy*, *33*(2), 215–257. https://doi.org/10.1017/s0266267116000225

Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. (1972). *The limits to growth: A report for the Club of Rome's project on the predicament of mankind.* (1st ed.). New York: Universe Books.

MercoPress. (2020, January 25). *Chile's business community anticipates an ailing economy during 2020*. https://en.mercopress.com/2020/01/25/chile-s-business-community-anticipates-an-ailing-economy-during-2020

Miller, D. (2009). Justice and boundaries. *Politics, Philosophy & Economics*, *8*(3), 291–309. https://doi.org/10.1177/1470594x09105390

Ministerio de Desarrollo Social. (2017). *Informe nacional voluntario* (Consejo Nacional para la implementación de la Agenda 2030 de desarrollo sostenible). Santiago: Gobierno de Chile. https://sustainabledevelopment.un.org/content/documents/15776Chile.pdf

Ministerio de Desarrollo Social y Familia. (2019). *2º Informe nacional voluntario* (Consejo Nacional para la implementación de la Agenda 2030 de desarrollo sostenible). Santiago: Gobierno de Chile. https://sustainabledevelopment.un.org/content/documents/23507Informe_Nacional_Voluntario_CHILE_Junio_2019_final_1.pdf

Ministerio de Planificación. (2005). *Los Objetivos de Desarrollo del Milenio: Primer informe del Gobierno de Chile*. Santiago: Gobierno de Chile, Programa de la Naciones Unidas para el Desarrollo (PNUD). https://www.undp.org/content/dam/undp/library/MDG/english/MDG%20Country%20Reports/Chile/Chile_MDGReport_2005_SP.pdf

Ministerio de Planificación. (2010). *Los Objetivos de Desarrollo del Milenio: Tercer informe del Gobierno de Chile*. Santiago: Gobierno de Chile, Programa de la Naciones Unidas para el Desarrollo (PNUD). https://www.undp.org/content/dam/undp/library/MDG/english/MDG%20Country%20Reports/Chile/Tercer%20Informe%20Nacional%20ODM%20Chile%202010.pdf

Mohan, G., & Stokke, K. (2000). Participatory development and empowerment: The dangers of localism. *Third World Quarterly*, *21*(2), 247–268. https://doi.org/10.1080/01436590050004346

Mori, K., & Christodoulou, A. (2012). Review of sustainability indices and indicators: Towards a new City Sustainability Index (CSI). *Environmental Impact Assessment Review*, *32*(1), 94–106. https://doi.org/10.1016/j.eiar.2011.06.001

Morse, S., & Fraser, E. D. G. (2005). Making 'dirty' nations look clean? The nation state and the problem of selecting and weighting indices as tools for measuring progress towards sustainability. *Geoforum*, *36*(5), 625–640. https://doi.org/10.1016/j.geoforum.2004.10.005

Nagel, T. (1997). Justice and nature. *Oxford Journal of Legal Studies*, *17*(2), 303–322. https://doi.org/10.1093/ojls/17.2.303

Nederveen Pieterse, J. (1998). My paradigm or yours? Alternative development, post-development, reflexive development. *Development & Change*, *29*(2), 343–373. https://doi.org/10.1111/1467-7660.00081

Neumayer, E. (2003). *Weak versus strong sustainability: Exploring the limits of two opposing paradigms.* Cheltenham, UK; Northampton, MA: Edward Elgar.

Norström, A. V., Dannenberg, A., McCarney, G., Milkoreit, M., Diekert, F., Engström, G., Fishman, R., Gars, J., Kyriakopoolou, E., Manoussi, V., Meng, K., Metian, M., Sanctuary, M., Schlüter, M., Schoon, M., Schultz, L., & Sjöstedt, M. (2014). Three necessary conditions for establishing effective Sustainable Development Goals in the Anthropocene. *Ecology and Society*, *19*(3), 1–8. https://doi.org/10.5751/es-06602-190308

Nussbaum, M. C. (2011). *Creating capabilities: The human development approach*. Cambridge, MA: Belknap Press of Harvard University Press.

Observatorio Social. (2017a). *Estimaciones de la tasa de pobreza por ingresos y multidimensional a nivel comunal, año 2017: Aplicación de metodología de estimación para áreas pequeñas (SAE)*. Santiago: Gobierno de Chile, Ministerio de Desarrollo Social.

Observatorio Social. (2017b). *Manual del Investigador: Guía práctica para el uso y análisi de infromación*. Santiago: Gobierno de Chile, Ministerio de Desarrollo Social.

ODEPLAN. (1980). *Chilean economic and social development, 1973-1979*. Santiago: Gobierno de Chile, Oficina de Planificación Nacional.

OECD. (2007). *OECD Economic Surveys: Chile 2007*. Paris: OECD Publishing. https://doi.org/10.1787/eco_surveys-chl-2007-en

OECD. (2009). *Estudios territoriales de la OCDE: Chile 2009*. Santiago, Chile: Gobierno de Chile, Ministerio del Interior. https://doi.org/10.1787/9789568468187-es

OECD. (2017). *Making decentralization work in Chile: Towards stronger municipalities*. Paris: OECD Publishing. https://dx.doi.org/10.1787/9789264279049-en

OECD. (2018). *OECD Economic Surveys: Chile 2018*. Paris: OECD Publishing. https://doi.org/10.1787/eco_surveys-chl-2018-en

OECD. (2020a). *Income inequality*. [dataset]. 10.1787/459aa7f1-en

OECD. (2020b). *National accounts statistics*. [dataset]. https://doi.org/10.1787/na-data-en

OECD, ECLAC, CAF Development Bank of Latin America, & European Union. (2019). *Latin American economic outlook 2019: Development in transition*. Paris: OECD Publishing. https://doi.org/10.1787/g2g9ff18-en

Olsaretti, S. (2018). Introduction: The idea of distributive justice. In S. Olsaretti (Ed.), *The Oxford handbook of distributive justice* (1st ed., pp. 1–11). Oxford: Oxford University Press.

Ossandón, J. (2019, November 8). ¡Abajo el Neoliberalismo! Pero ¿qué es el neoliberalismo? *CIPER Chile*. https://ciperchile.cl/2019/11/08/abajo-el-neoliberalismo-pero-que-es-el-neoliberalismo/

Paredes, D., Iturra, V., & Lufin, M. (2016). A spatial decomposition of income inequality in Chile. *Regional Studies*, *50*(5), 771–789. https://doi.org/10.1080/00343404.2014.933798

Parris, T. M., & Kates, R. W. (2003). Characterizing and measuring sustainable development. *Annual Review of Environment & Resources*, *28*(1), 559–586. https://doi.org/10.1146/annurev.energy.28.050302.105551

Patole, M. (2018). Localization of SDGs through disaggregation of KPIs. *Economies*, *6*(15). https://doi.org/10.3390/economies6010015

Picciotto, R. (2007). The new environment for development evaluation. *American Journal of Evaluation*, *28*(4), 509–521. https://doi.org/10.1177/1098214007306371

Piñera, S. (2013, May 21). *Mensaje Presidencial*. Cuenta Pública del Presidente de la República, Congreso Nacional, Valparaíso. https://www.bcn.cl/historiapolitica/corporaciones/cuentas_publicas/detalle?tipo=presidentes

Piñera, S. (2018, June 1). *Mensaje Presidencial*. Cuenta Pública del Presidente de la República, Congreso Nacional, Valparaíso. https://www.bcn.cl/historiapolitica/corporaciones/cuentas_publicas/detalle?tipo=presidentes

Piñera, S. (2019, June 1). *Mensaje Presidencial*. Cuenta Pública del Presidente de la República, Congreso Nacional, Valparaíso. https://www.bcn.cl/historiapolitica/corporaciones/cuentas_publicas/detalle?tipo=presidentes

Prebisch, R. (1963). *Hacia una dinámica del desarrollo latinoamericano: Con un apéndice sobre el falso dilema entre desarrollo económico y estabilidad monetaria*. Mexico, DF: Fondo de Cultura Económica; E/CN.12/680.

Ramanujam, N., Caivano, N., & Agnello, A. (2019). Distributive Justice and the Sustainable Development Goals: Delivering Agenda 2030 in India. *Law and Development Review*, *12*(2), 495–536. https://doi.org/10.1515/ldr-2019-0020

Rawls, J. (1971). *A theory of justice*. Cambridge, MA: Belknap Press of Harvard University Press.

Razmilic, S. (2014). Impuesto territorial y financiamiento municipal. *Centro de Estudios Públicos, Propuesta de Polítical Pública*(4).

Red Colombiana de Ciudades Cómo Vamos. (2020). *Dashboard de seguimiento de los Objetivos de Desarrollo Sostenible* [Website]. Territorializando Los ODS En Las Ciudades de Colombia.

https://public.tableau.com/views/ODS-definitiva/ODS?:display_count=y&publish=yes&:origin=viz_share_link&:showVizHome=no

Reddy, S., & Heuty, A. (2008). Global development goals: The folly of technocratic pretensions. *Development Policy Review*, *26*(1), 5–28. https://doi.org/10.1111/j.1467-7679.2008.00396.x

Reid, A. J., Brooks, J. L., Dolgova, L., Laurich, B., Sullivan, B. G., Szekeres, P., Wood, S. L. R., Bennett, J. R., & Cooke, S. J. (2017). Post-2015 Sustainable Development Goals still neglecting their environmental roots in the Anthropocene. *Environmental Science and Policy*, *77*, 179–184. https://doi.org/10.1016/j.envsci.2017.07.006

Rodríguez, C. (2010). *Asimetrías de la descentralización*. Universidad Católica del Norte.

Rodríguez, I., & Sanhueza, P. (2019). Diversificación productiva y especializaciones sectoriales en Chile. *Estudios Regionales de Economía, Población y Desarrollo*, *50*, 3–35. Cuadernos de Trabajo, Universidad Autónoma de Ciudad Juárez.

Rowland, F. (2017). Definición y caracterización de regiones económicas en Chile. *Horizontes Empresariales*, *2*, 4–23.

Rueda, M. (2019). Cooperación internacional para el desarrollo y estrategias nacionales para el cumplimiento de los ODS. Aproximaciones a los casos de Colombia y Chile. *Revista Internacinoal de Cooperación y Desarrollo*, *6*(1), 179–195. https://doi.org/10.21500/23825014.3770

Ruiz-Tagle, J., & López, E. (2014). El estudio de la segregación residencial en Santiago de Chile: Revisión crítica de algunos problemas metodológicos y conceptuales. *EURE*, *40*(119), 25–48. https://doi.org/10.4067/s0250-71612014000100002

Sabatini, F., & Rasse, A. (2017). Segregación espacial de hogares indígenas en ciudades chilenas. *Andamios*, *14*(35), 309–333. https://doi.org/10.29092/uacm.v14i35.581

Sabatini, F., Rasse, A., Cáceres, G., Robles, M. S., & Trebilcock, M. P. (2017). Promotores inmobiliarios, gentrificación y segregación residencial en Santiago de Chile. *Revista Mexicana de Sociología*, *79*(2), 229–260.

Sachs, J., Kroll, C., Schmidt-Traub, G., Lafortune, G., & Fuller, G. (2019). *Sustainable Development Report 2019*. New York: Bertelsmann Stiftung and Sustainable Development Solutions Network (SDSN).

Sachs, W. (2010). Introduction. In W. Sachs (Ed.), *The development dictionary: A guide to knowledge as power* (2nd ed., pp. xv–xx). London, New York: Zed Books.

Secretaría Técnica ODS. (2018a). *Acciones* [Website]. Chile Agenda 2030 Para El Desarrollo Sostenible. http://www.chileagenda2030.gob.cl/documentos/acciones

Secretaría Técnica ODS. (2018b). *Documentos metodológicos* [Website]. Chile Agenda 2030 Para El Desarrollo Sostenible. http://www.chileagenda2030.gob.cl/documentos/documentos-metodologicos

Sen, A. (1999). *Development as freedom.* Oxford, New York: Oxford University Press.

Sengupta, A. (2000). Realizing the right to development. *Development & Change*, *31*(3), 553–578. https://doi.org/10.1111/1467-7660.00167

Singer, H. W. (1952). The mechanics of economic development: A quantitative model approach. *Indian Economic Review*, *1*(2), 1–18.

Slater, D. (1993). The geopolitical imagination and the enframing of development theory. *Transactions of the Institute of British Geographers*, *18*(4), 419–437. https://doi.org/10.2307/622559

Solimano, A. (2012). *Chile and the neoliberal trap: The post-Pinochet era* (1st ed.). New York: Cambridge University Press.

Solimano, A., & Schaper, M. (2014). The paradoxes of Chilean economic development: Growth, inequality, deindustrialisation and sustainability risks. In A. Hansen & U. Wethal (Eds.), *Emerging economies and challenges to sustainability: Theories, strategies and local realities* (1st ed.). London: Routledge. https://doi.org/10.4324/9781317752547

Solimano, A., & Torche, A. (2007). La distribución del ingreso en Chile 1987-2006: Análisis y consideraciones de política. *Centro Internacional de Globalización y Desarrollo*. Working Paper #04. https://www.ciglob.org/wp-content/uploads/2016/09/WP04-Solimano-Torche-Desigualdad-en-Chile.pdf

Stafford-Smith, M., Griggs, D., Gaffney, O., Ullah, F., Reyers, B., Kanie, N., Stigson, B., Shrivastava, P., Leach, M., & O'Connell, D. (2017). Integration: The key to implementing the Sustainable Development Goals. *Sustainability Science*, *12*, 911–919. https://doi.org/10.1007/s11625-016-0383-3

Stockholm Resilience Centre. (2016, June 14). *How food connects all the SDGs* [Blog post]. https://www.stockholmresilience.org/research/research-news/2016-06-14-how-food-connects-all-the-sdgs.html

Sultana, F. (2018). An(Other) geographical critique of development and SDGs. *Dialogues in Human Geography*, *8*(2), 186–190. https://doi.org/10.1177/2043820618780788

The Cocoyoc Declaration. (1975). *International Organization*, *29*(3), 893–901. Cambridge Core. https://doi.org/10.1017/S0020818300031805

Toro, D. (2016). Hacia un nuevo modelo de desarrollo rural en Chile. *Revista Eltopo, 7*, 92–121.

Uitto, J. (2019). Sustainable development evaluation: Understanding the nexus of natural and human systems. *New Directions for Evaluation*, *2019*(162), 49–67. https://doi.org/10.1002/ev.20364

UNDP, Instituto de Pesquisa Econômica Aplicada, & Fundação João Pinheiro. (2020). *Atlas do Desenvolvimento Humano no Brasil* [Website]. http://www.atlasbrasil.org.br/2013/pt/home/

UNDP, & ITAIPU Binacional. (2020). *Agenda 2030 Oeste do Paraná* [Website]. https://oestepr2030.org.br

United Nations. (1973). *Report of the United Nations Conference on the Human Environment, Stockholm, 5-16 June 1972*. New York: United Nations.

United Nations Conference on Environment and Development. (1992). *Agenda 21: The United Nations programme of action from Rio*. New York: United Nations Department of Public Information.

United Nations General Assembly. (1986). *Declaration on the Right to Development* (41/128).

United Nations General Assembly. (2000). *United Nations Millenium Declaration* (A/RES/55/2). https://doi.org/10.1891/9780826190123.ap02

United Nations General Assembly. (2015a). *Addis Ababa Action Agenda of the Third International Conference on Financing for Development* (A/RES/69/313). https://doi.org/10.1891/9780826190123.ap02

United Nations General Assembly. (2015b). *Transforming Our World: The 2030 Agenda for Sustainable Development* (A/RES/70/1). https://doi.org/10.1891/9780826190123.ap02

United Nations Statistics Division. (n.d.-a). *Inter-agency and Expert Group on SDG Indicators* [Website]. Retrieved March 18, 2020, from https://unstats.un.org/sdgs/iaeg-sdgs/

United Nations Statistics Division. (n.d.-b). *SDG Indicators Metadata repository* [Website]. Retrieved March 18, 2020, from https://unstats.un.org/sdgs/metadata/

Valenzuela, E., & Rojas, P. (2017). La movilización por ser región en Chile: Rebelión provincial contra la regionalización autoritaria. 2000-2015. *Revista Enfoques*, *XV*(26), 113–135.

Wackernagel, M., Hanscom, L., & Lin, D. (2017). Making the Sustainable Development Goals consistent with sustainability. *Frontiers in Energy Research*, *5*(18), 1–5. https://doi.org/10.3389/fenrg.2017.00018

Weber, H. (2017). Politics of 'leaving no one behind': Contesting the 2030 Sustainable Development Goals agenda. *Globalizations*, *14*(3), 399–414. https://doi.org/10.1080/14747731.2016.1275404

World Commission on Environment and Development. (1987). *Our common future*. Oxford: Oxford University Press.