



Integrated Sustainable Waste Management for Santiago de Chile



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Introduction

Chile has been experiencing an important economic growth in the past decade, growth that brings a constant increase in waste generation. The need to manage municipal solid waste (MSW) in a sustainable manner is becoming more evident. Part of the problem for developing countries is the need for planning, policy and funding for adequate infrastructure. Besides, the lack of information related to waste generation and disposal hinder the development of a proper waste management system. As a consequence, more greenfield are constantly been converted into landfills.

Methodology

- Research was conducted to determine waste generation for the Metropolitan Region of Santiago (RMS) and several adjustment to the data where needed to reduce discrepancy.
- The Bogner and Matthews correlation (2003).
- National Instituted of Statistics (INE) provided information on final disposal of MSW and population.
- The national target of 30% of recycling rate by 2020 was assumed as recycling rate.

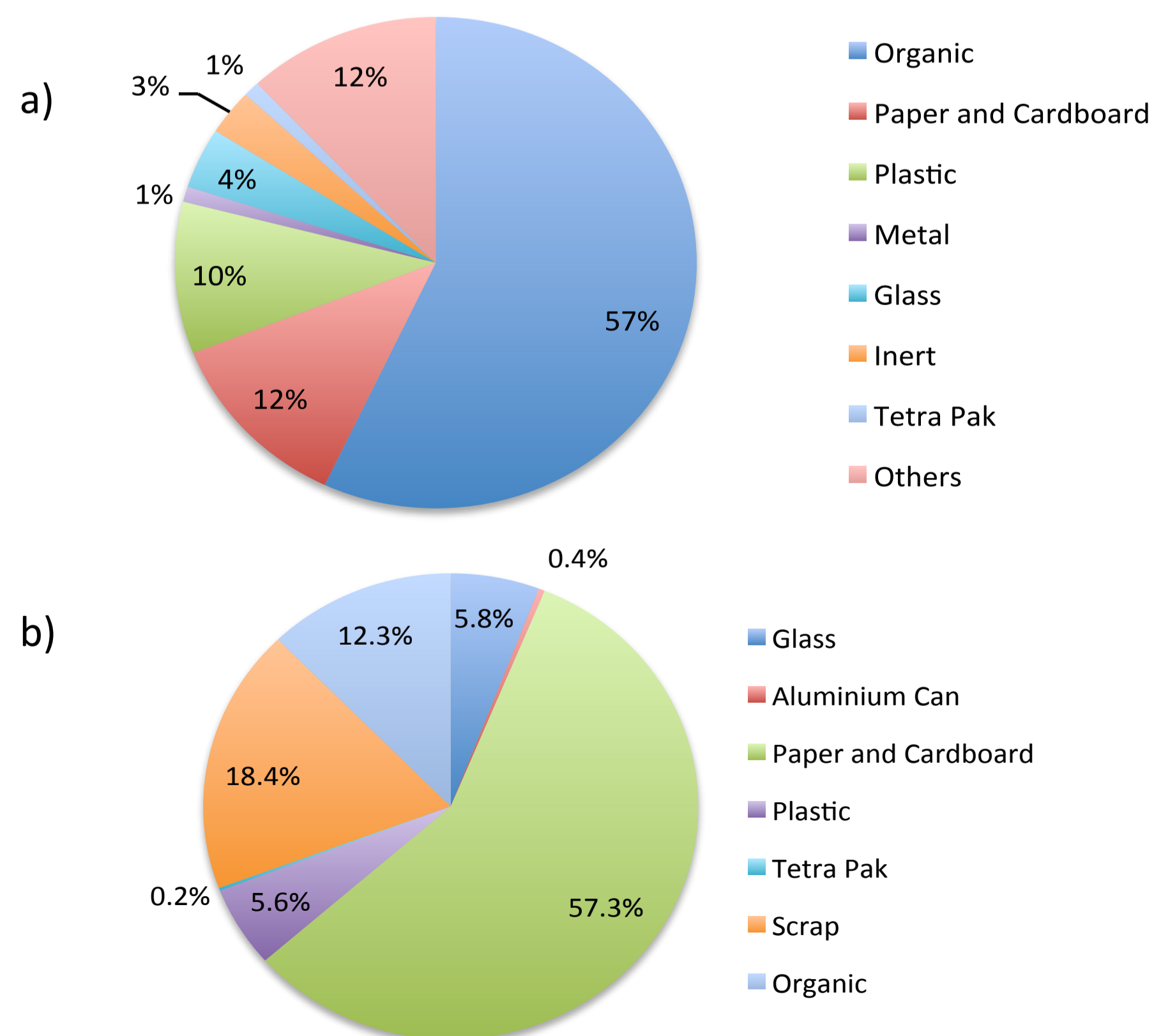


Figure 1. Characterization of MSW: a) generated, b) recycled
a. Ministry of environment, 2010. b. CONAMA, 2005

Results

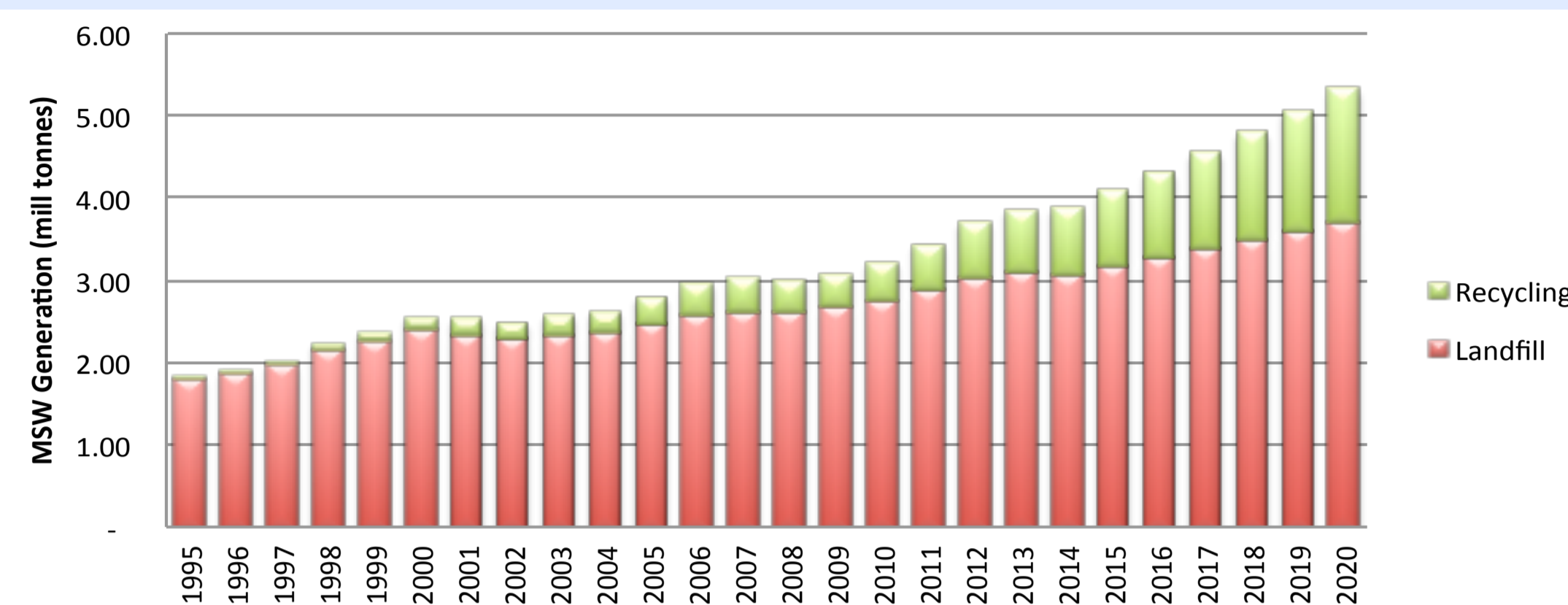


Figure 2. Generation and destination of MSW in RMS

By 2007 the per capita generation was 1.25 kg/cap/day and it is expected to increase to 1.75 kg/cap/day by 2020. The upper level of 2kg/person/day would be achieved by 2023.

The yearly increase of waste generation averaged 3.3%

To achieve the recycling target, the country will have to triple the recycling capacity that presented on 2010.

Collection of recyclables

By 2013, 10% of the MSW generated in Chile was recycled. From it, 8.6% was contribution of the informal recyclers, 1% of NGOs and less than 1% by municipal initiatives. Currently the capacity is expanding mostly through the installation of drop off system.

The implementation of different actions involving 8 stakeholders will accelerate the inclusion of the IR.

Table 1. Role of governmental institution on the inclusion of the IR

Ministry of Economy	To enhance competitiveness on micro and small companies Capacitation in business management
FOSIS	Strengthening of social organizations, entrepreneurship, credits and funding
Ministry on Environment	Recognition of waste pickers as "waste managers" under the new Extended Producer Responsibility law Promote valorization of the waste and environmental education
Ministry of Health	Health policy and inclusion of informal recyclers in health programs
Ministry of Labor and Social Prevision	Capacitation and certification to give the more recognition and motivation
Ministry of Housing and Urban Development	Waste management in communities Housing programs for waste pickers
Municipalities	Inclusion of waste pickets into the waste management of the city monitoring the progress
Ministry of Social Development	Integration and social protection of people Development of cadaster

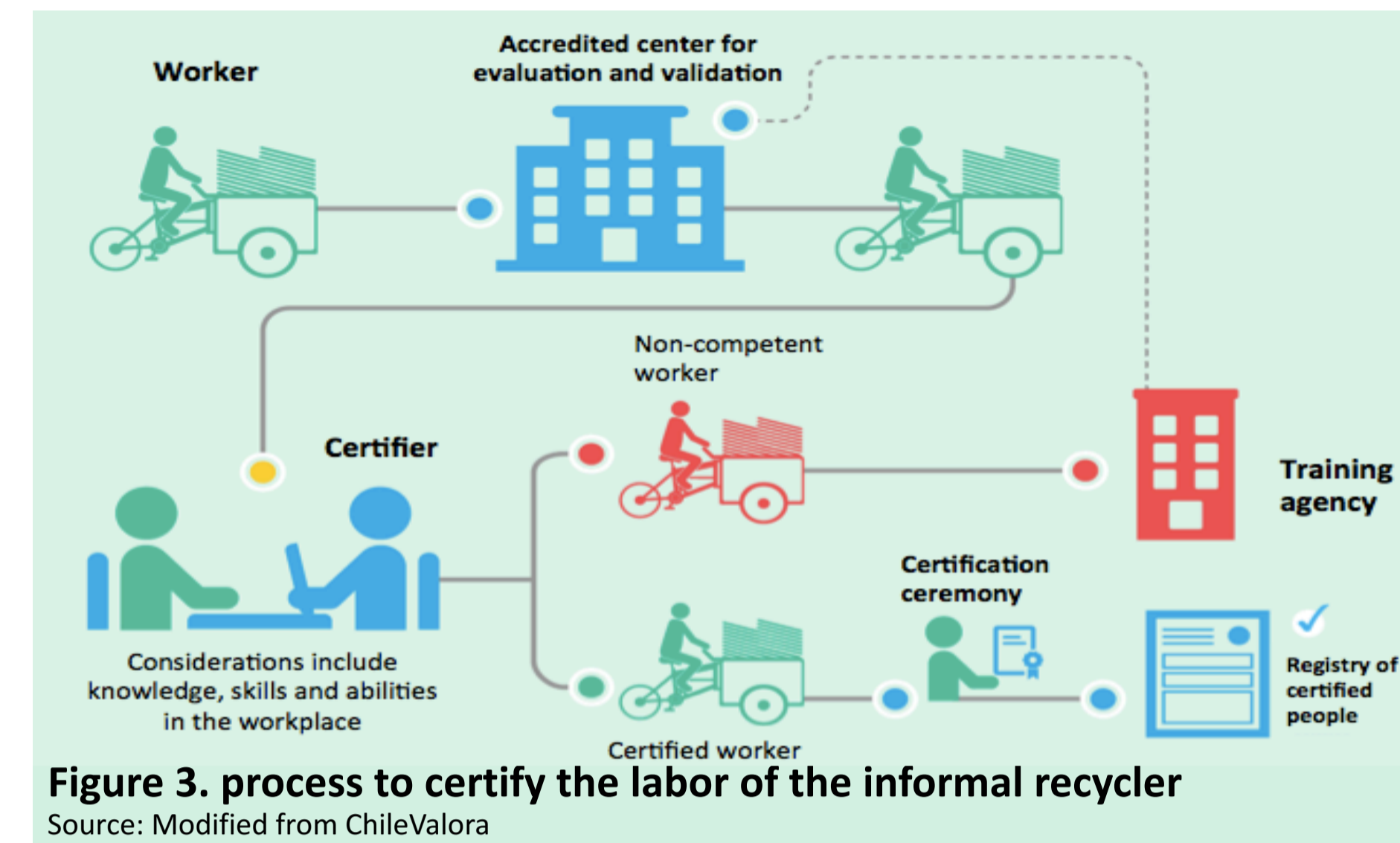


Figure 3. process to certify the labor of the informal recycler

Source: Modified from ChileValora

Post-recycled waste

Landfilling is the dominant method for waste disposal, often associated with open dumping. If all the post-recycled waste produced on 2020 on the RMS were to be combusted in a Waste-to-Energy plant, the electricity produced would be enough to cover demand of more than 480,000 people, or about the energy produced by 880,000 tonnes of coal. Furthermore, it could save more than 28 mill USD on landfill gate fee.

Conclusions

Discrepancy on official data is a major concern for the understanding of waste management in Chile.

What is clear is that national target of 30% recycling rate for the year 2020 will require several actions form different sectors to increase the capacity; from the inclusion of the waste pickers to the expansion of the drop off system and awareness campaigns.

Still under an ambitious 30% of recycling rate by 2020, the RMS will be landfilling about 3.5 million tonnes of post-recycling waste, converting more greenfield into landfill. This highlights the need for other methods such as WTE.

Considering that Informal recyclers are responsible for 86% of the recycled material on Chile, their formalization is fundamental to increase capacity and improve their working conditions.

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References

- MMA, 2013. *Working table for the Inclusion of the Informal Recyclers*
CONAMA, 2009. *Plan de acción de reciclaje*