

# Chapter 11

## Green Growth in Mexico, Brazil, and Chile: Policy Strategies and Future Prospects

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### ABSTRACT

*This research focuses on identifying the main policy strategies that could potentially contribute to the advance of three Latin American economies, namely Brazil, Chile and Mexico towards a green growth model that is social and inclusive, given the actual patterns of development of those economies. With this aim, we first identify and describe past and current policies in each country in terms of economic, social and environmental indicators. A detailed analysis follows for Brazil, Chile and Mexico, in which we propose a series of green growth indicators and choose a definition and classification of green growth sectors. We estimate an empirical model to explain the determinants of greenhouse gas emissions and deforestation in Latin American countries. We broadly identify the sectors that contribute to its increase and describe the main green policies applied in each country. In turn we identify the sectors with higher potential for the future. Finally, we present policy recommendations and reflections for the future.*

### 1. INTRODUCTION

There is a vast interest for countries in achieving green growth not only as it is related to lower energy intensities but also as it is related to a higher quality of life. This interest has also led to a growing proliferation of studies and scientific research, whose main objective has been to identify the factors that contribute to green growth and the policies that should be implemented in different countries to enter the path of green growth. The main objective of this research is to analyze from a socio-economic and environmental perspective recent developments in three Latin American countries, namely Brazil, Chile and Mexico, concerning green growth and social inclusion. Past and current environmental as well as

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social policies are compared between the countries and are related to a selection of indicators. We analyze in particular developments of greenhouse gas emissions, deforestation and social indicators.

According to The United Nations Environment Program (UNEP), a green economy should aim at improving human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. Green growth in income and employment should in turn be driven by investments that reduce carbon emissions and pollution, improve resources and energy efficiency and avoid the loss of biodiversity (UNEP 2013). The main greenhouse gas is carbon dioxide (CO<sub>2</sub>) and therefore CO<sub>2</sub> will be used as the main global environmental-degradation indicator. Other greenhouse gases considered are CH<sub>4</sub> and N<sub>2</sub>O. In order to account for biodiversity losses, we rely on the measure of forest area in each country.

This research has four complementary objectives. First, a detailed description of the most relevant economic and socio-economic indicators in the three countries under study is presented in order to identify the main environmental challenges. As economic indicators we present the sectoral distribution of GDP (agriculture, services, manufactures) as well as GDP and trade growth figures. The socio-economic indicators considered are GDP per capita, population, life expectancy and education (World Bank 2013; World Economic Forum 2013; FAOSTAT 2013), poverty and social inequality (poverty rate, Gini coefficient, gender inequality), as well as the different dimensions of the Human Development Index and the Human Opportunity Index, both developed by the World Bank and the Global Gender Gap Index, published by the World Economic Forum since 2006. We further study what are the main industries/sub-sectors in each country in terms of production and employment and identify how much each sector contributes to pollution in terms of greenhouse gas emissions in order to describe and analyze the impacts these sectors have on green growth. Second, we analyze a number of green growth indicators classified according to international criteria for Brazil, Chile and Mexico and select four of them, namely CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O and deforestation to analyze how sectoral changes have contributed to the development of the four green growth indicators. Third, a detailed description of the institutional structure and the measures and strategies related to environmental policy and its impact on poverty, social and gender inequality is outlined. Based on the results obtained, the most successful economic activities in terms of green growth and inclusion are identified for each country, and are studied in comparative terms using an economic model. Finally, the study provides policy recommendations concerning social, economic and sectoral issues to draw specific action lines for each country to improve the results in terms of social inclusion and green growth.

The methodology is based on secondary data collection, graphical and descriptive analysis of the data and specification and estimation of an economic model to draw policy implication based on the results. A comparative analysis of country data in terms of polluting effects of the most important sectors and industries in each country is presented. We also analyze the data collected for LA countries by specifying and estimating an economic model, which explains the determinants of three greenhouse gases and deforestation. The model, which is used to identify the contribution of each economic sector to green growth, is derived from the identity IPAT identity:

$$Impact = Population * Affluence * Technology .$$

This identity states that the level of pollution, impact (I), depends on three factors: population (P), gross domestic product (A) and the state of technology (T) in a country. Marin and Mazzanti (2009)

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