Amazon Assessment Report 2021

Chapter 17

Globalization, extractivism, and social exclusion: Threats and opportunities to Amazon governance in Brazil

Desmatamento em áreas protegidas, Beruri, Amazonas, 2010 (Foto: Alberto César Araújo/Amazônia Real)

THE AMAZON WE WANT
Science Panel for the Amazon

SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

About the Science Panel for the Amazon (SPA)

The Science Panel for the Amazon is an unprecedented initiative convened under the auspices of the United Nations Sustainable Development Solutions Network (SDSN). The SPA is composed of over 200 preeminent scientists and researchers from the eight Amazonian countries, French Guiana, and global partners. These experts came together to debate, analyze, and assemble the accumulated knowledge of the scientific community, Indigenous peoples, and other stakeholders that live and work in the Amazon.

The Panel is inspired by the Leticia Pact for the Amazon. This is a first-of-its-kind Report which provides a comprehensive, objective, open, transparent, systematic, and rigorous scientific assessment of the state of the Amazon's ecosystems, current trends, and their implications for the long-term well-being of the region, as well as opportunities and policy relevant options for conservation and sustainable development.

 ISBN: 9781734808001

Suggested Citation

Larrea C, Murais, Azevedo T, Nunes F, Rajão R. Capobianco JPR, Rodriguez Garavito C, Soares-Filho B, von der Hoff R. 2021. Chapter 17: Globalization, Extractivism and Social Exclusion: Threats and Opportunities to Amazon Governance in Brazil. In: Nobre C, Encalada A, Anderson E, Roca Alcazar FH, Bustamante M, Mena C, Peña-Claros M, Poveda G, Rodriguez JP, Saleska S, Trumbore S, Val AL, Villa Nova L, Abramovay R, Alencar A, Rodríguez Alzza C, Armenteras D, Artaxo P, Athayde S, Barretto Filho HT, Barlow J, Berenguer E, Bortolotto F, Costa FA, Costa MH, Cuvi N, Fearnside PM, Ferreira J, Flores BM, Frieri S, Gatti LV, Guayasamin JM, Hecht S, Hirota M, Hoorn C, Josse C, Lapola DM, Larrea C, Larrea-Alcazar DM, Lehm Ardaya Z, Malhi Y, Marengo JA, Melack J, Moraes R M, Moutinho P, Murmis MR, Neves EG, Paez B, Painter L, Ramos A, Rosero-Peña MC, Schmink M, Sist P, ter Steege H, Val P, van der Voort H, Varese M, Zapata-Ríos G (Eds). Amazon Assessment Report 2021. United Nations Sustainable Development Solutions Network, New York, USA. Available from https://www.theamazonwewant.org/spa-reports/. DOI: 10.55161/YIZM8714

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Graphical Abstract

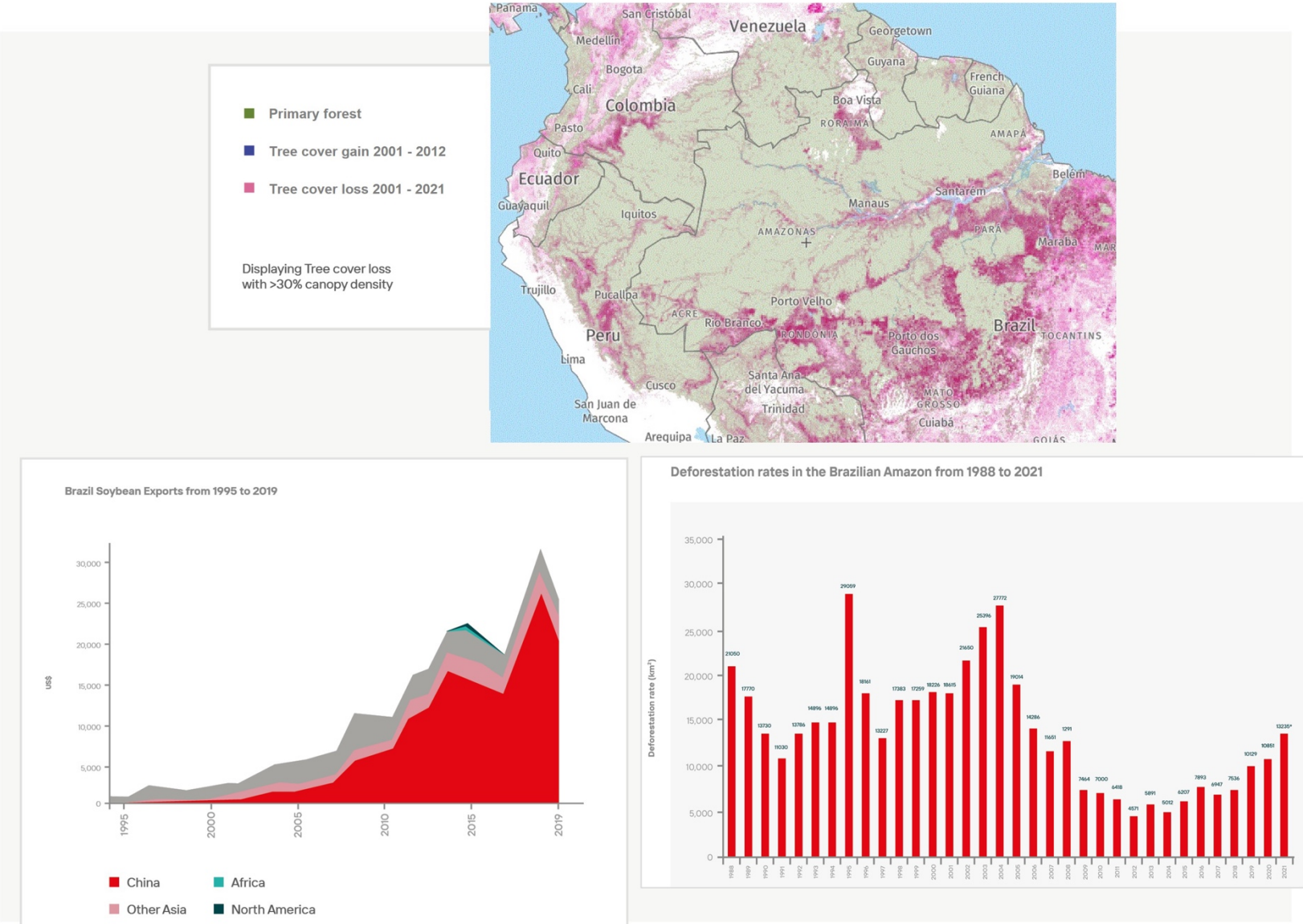

Figure 17A. Graphical Abstract

Globalization, Extractivism and Social Exclusion: Threats and Opportunities to Amazon Governance in Brazil

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Key Messages

- Globalization and widespread changes in consumption have drastically altered the type and scale of human intervention in the Amazon, generating social and environmental impacts of unprecedented magnitude and gravity. Together with countries from the Global North, China is an increasingly dominant actor in this process.
- Brazil provided a strong example of how deforestation control, implemented through strategic state policy involving the commitment and coordinated involvement of multiple government areas, can contribute to significantly reducing deforestation.
- Deforestation reduction and forest conservation policies are vulnerable to changing governments and political priorities.
- Initiatives to reverse deforestation must involve the participation of all stakeholders (different levels of government, multiple sectors of the economy, civil society actors, Indigenous peoples and local communities (IPLCs), international organizations, etc.), including the cross-cutting perspectives of gender and youth.

Abstract

From the 1970s onwards, the Amazon experienced the deepest social and environmental transformation in its history. In the context of changing global political hegemony and deep regional integration into the world economy, the majority of countries that make up the Amazon region have become a commodity and energy provider for both domestic and international markets, while being afflicted by detrimental social and environmental effects in the process of uneven regional development.

Large investments by international corporations, often in association with local partners, have led to a dramatic expansion of cattle ranching, soy cultivation, large-scale mining, mega-infrastructure projects, oil and gas extraction, illegal gold mining, and drug trafficking. These activities are associated with deforestation, environmental degradation, and biodiversity loss, reshaping the region. The living conditions of local peoples have barely improved, while social conflict and violence have become widespread, particularly affecting Indigenous peoples.

In a new multipolar international order, China has led globalization, becoming the most significant commodity importer, a large credit provider, and a partner of oil, mining, and infrastructure investments in most countries. A rapid expansion of agricultural and extractive activities, mostly for export but also for domestic markets, driven by urbanization and increases in income, have led to serious deforestation and

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environmental degradation. The extractive development model has generally prevailed, despite the globalization of conservation efforts.

The Brazilian experience between 2005 and 2012 was the only exception to the unchecked developmentalist model, during which environmental degradation was successfully reduced and an 84% decline in deforestation was achieved. This experience reveals the conditions required to make such results possible: an integrated, multisectoral, and consistent set of policies with efficient monitoring, effective law enforcement, conservation incentives, expansion of protected areas (PAs) and Indigenous territories (ITs), and strong international support. It portrays a different picture to that associated with the mainstream, short-term extractive model and has the potential to be replicated either at a pan-Amazon or national level. Despite recent setbacks, the Brazilian case constitutes a lesson on what is possible and a stepping-stone for improvement so that such policies can last over time, transcending changes in political preferences and administrations.

The prevailing extractivist commodity-oriented model of unequal development poses a serious risk to the integrity of the rainforest and local, regional, and global sustainability. Sustainable pathways in the Amazon require a shift towards new practices that are no longer associated with conventional economic thinking. A sustainable Amazon implies substituting the current system with a new and equitable development strategy that maintains the provision of environmental benefits from a standing rainforest and flowing rivers, while respecting the integrity of Indigenous cultures, promoting the participation of local populations in decision making, considering gender issues, and improving the living conditions of Amazonian peoples in general.

Keywords: Conservation policies, deforestation, extractive development model, law enforcement

17.1 Introduction

At first glance, the fires that raged in the Amazon in mid-2019 and mid-2020 (NASA Earth Observatory 2021) may have seemed like random events. For a concerned viewer helplessly watching the images streamed live on social media around the world, fires may appear as the quintessential "natural" disaster: an uncontrollable cascading event spark-ed and fueled by forces of nature that recur every season.

However, when seen from a natural and social sciences perspective, fires and other extreme events affecting the Amazon are anything but random. As Chapters 19–21 show, the natural sciences offer robust evidence about the role of environmental deterioration—stemming from economic drivers such as mining, oil extraction, soybean cultivation, cattle ranching, and large energy and infrastructure projects—on patterns that compromise the stability and survival of the Amazon, including the disruption of the water cycle, increasing temperatures and hydrometeorological extreme events, and biodiversity loss (see also Chapters 22–24; 27-29).

This chapter and the next examine these and other drivers and processes from the viewpoint of the social sciences. A wealth of studies in political economy, sociology, economics, anthropology, and other fields have documented the social determinants and impacts of environmental deterioration in the Amazon. Importantly, they have shown that those socioeconomic forces operate not only at the local and national levels, but also at the transnational scale.

This chapter examines the drivers of deforestation in the region and explores the conditions necessary for its successful reduction—although, as history would confirm, the latter proved to be vulnerable to changing political environments. The exploration of such conditions is done through an in-

depth analysis of the only experience in the region leading to a significant decrease in deforestation, the case of Brazil between 2005 to 2012, and the factors influencing its subsequent dismantling. Brazil's strategy during those years reveals a different and contrasting picture to that of the predominant extractive model. It is indicative of what can be done, improved, and replicated, by individual countries or, better yet, at a pan-Amazon scale, with genuine local and international commitment and multilateral support.

The chapter presents a long-term view of the urgent challenges in the Amazon brought about by global and regional transformations, along with opportunities revealed by a concrete, large-scale experience within the region, showing the possibility of and suggesting the way to finding effective solutions, as seen from a broader socioeconomic perspective.

17.1.1 The Political Economy of the Amazon: An Overview

Two epochal processes have marked the political economy of the Amazon over the last three decades. The first one is the global commodity boom at the turn of the twenty-first century and the entrenchment of a development model in Latin America that relied on the production of commodities for export—from fossil fuels to metals to beef and soybeans (see also Chapters 14 and 15). Driven by increasing demand from China and continued demand from Europe and North America, the Amazon became the new frontier for extractive economies embraced by governments throughout the subcontinent as oil, minerals, and other goods reached record prices in what has been called a "super-cycle" that took off in the early 1990s and ebbed in the mid-2010s (Erten and Ocampo 2012; The Economist 2013; Erdem and Ünalmış 2016; Ocampo 2017). The impact on Latin American economies, which had been highly dependent on commodity production, was considerable. For instance, mineral extraction in the region increased by 400% in the 1990s, reaching unprecedented growth in countries such as Peru (where it went up by 2,000%) (Bebbington 2011).

As one of the last mineral and agricultural frontiers, the Amazon has experienced drastic social and ecological pressures from the re-commodification of Latin American economies, both directly and indirectly (Verburg *et al.* 2014). Directly, the Amazon has been affected by a flurry of new extractive projects, both legal and illegal; governments have opened or slated large swaths of the Peruvian and Ecuadorian Amazon for oil exploitation, legal and illegal logging and gold mining have proliferated across the region, and land clearing for cattle ranching has been a major source of deforestation in Brazil, Colombia, and more recently Bolivia, as have monocultures such as soybean production in countries across the region (Charity *et al.* 2016). The Amazon has also experienced heavy pressure from rapid transformations to its ecosystems and societies, which are indirectly associated with the extractive boom. Increased demand for energy and transportation for mining and other extractive economies is one of the drivers behind new infrastructure projects, including large hydroelectric dams such as Belo Monte in Brazil (Ioris 2021) and major waterway and road construction projects, largely associated with the China-backed Initiative for Regional Infrastructure Integration in South America (IIRSA) (Van Dijck 2013), all of which have further fragmented Amazonian ecosystems.

From a societal perspective, the extractive boom has had a significant impact on local communities and economies. Rapid population influx, disorderly urbanization, weak governance, and a long history of violence have made for a volatile mix that has turned the region into an active hub of socio-environmental conflict (EJAtlas 2021). The growth of extractive economies relies on the continuous expansion of areas for resource extraction, which has amounted to a model of "accumulation by dispossession" (Harvey 2003) that creates immense pressure on Amazonian IPLCs (Dagicour 2020).

The second process with regional and global implications that has impacted social life in the Amazon

runs in the opposite direction. Just as economic globalization (including the model of production of commodities for export) expanded over the last three decades, growing awareness about climate change, environmental deterioration, and existential threats to IPLCs' lives have spurred a countermovement. Led by Indigenous peoples in alliance with segments of governments, civil society, and the private sector, a series of actions—from legislation to protests, from litigation to consumer boycotts—have exerted countervailing pressure to implement existing legislation protecting the Amazon, enforce IPLCs' rights as recognized by national constitutions and international law, and set limits to the aforementioned social and ecological impacts (Garavito and Diaz 2020). The Sarayacu case in Ecuador is a successful example of a local oil conflict that achieved international significance when the Interamerican Human Rights Court ruled accepting Indigenous demands in 2012 (Rodríguez-Garavito 2020), showing how socioenvironmental movements are often strengthened by a strategic integration of local, national, and international actions. This countermovement has received different names in different countries, such as socio-environmentalism in Brazil and the aspiration to "Buen Vivir" in Ecuadorian constitutional law and Bolivian legislation and has been accompanied by broad social mobilization (Estupiñán Achury *et al*. 2019). The notion of "good living" (*Buen Vivir* or *Sumak Kausay*), inspired by the cosmovision of Indigenous cultures and other contributions from critical and green perspectives, emphasizes community values, participation, interculturality, and harmony with nature as alternative social principles (Larrea 2015; Larrea *et al*. 2017; Chassagne 2019; Kothari *et al*. 2019).

Similar to the commodities boom, the political economy of this countermovement is global in nature. Starting with the International Labour Organization's Convention 169 (1989) and continuing with the United Nations Declaration on Indigenous Peoples' Rights (2007), the rise of the contemporary Indigenous peoples' movement has translated into a new global legal framework with direct impact on Latin America in general, and the Amazon in particular. Indeed, 14 out of the 23 states that have ratified ILO 169 are Latin American (ILO 2021), and many of them have incorporated Indigenous peoples' right to free, prior, and informed consultation and consent (FPIC) about extractive activities in their lands into their national constitutions (see Chapters 16 and 31). The language and the rules of FPIC figure prominently in legislation, litigation, social movement campaigns, and public debates on the Amazon, as Indigenous peoples and their allies increasingly demand that governments and corporations interested in extractive projects in the Amazon respect Indigenous peoples' right to have a voice in decision making and veto such projects when they endanger their physical or cultural survival (Rodríguez-Garavito 2011).

Advances in climate change science, policy, and public debates have provided an additional impetus for this countermovement. The adoption of the 2015 Paris Agreement by Amazonian countries, youth mobilization for climate action, and increased evidence of massive human rights impacts attributed to climate change have gradually converged with the aforementioned political and legal mobilization by Indigenous peoples (EJAtlas 2021), as shown by the 2019 summit of representatives from those movements in the Brazilian Amazon and its resulting declaration[h]. Given the central role of the Amazon in any scientific and regulatory efforts that aim to avoid the most catastrophic climate change scenarios (Salles and Esteves 2019), this convergence is likely to be a key source of bottom-up pressure for the protection of people and ecosystems in the region.

The opposition between globalized extractive forces and environmentalist and human rights networks with international support has led to

[h] See "Declaration of Civil Society Organizations on the Crisis of Deforestation and Burning in the Brazilian Amazon," available at https://www.inesc.org.br/wp-content/uploads/2019/12/Declaration-CSOs_deforestation_Amazon_ENG-Final.pdf

complex struggles in different countries, resulting in varied outcomes. However, the former has generally prevailed, and many public policies have promoted an extractivist-development approach that merely included certain environmental checks and balances but did not substantially change the prevailing model (Baletti 2014).

This chapter, as well as the broader social science literature on the present and future of the Amazon, bears out the actors, mechanisms, volatile interactions, and impact of the two aforementioned processes. In turn, country studies help exemplify the form that these prevailing processes took in different countries (see Chapter 18).

17.2 Effects of Global and Domestic Economic Changes on the Amazon (1970–2020)

Human presence has influenced the Amazon for at least 12,000 years (see Chapter 8). However, the changes brought about by modern globalization, and a set of transformations from the 1970s onwards have been unprecedented in both speed and magnitude of their social and environmental effects. In a context of changing global political hegemony—described below—and deep expansion of regional integration into the global economy, the Amazon is becoming a commodity and energy provider for both domestic and international markets and is being affected by detrimental social and environmental effects caused by uneven regional de-

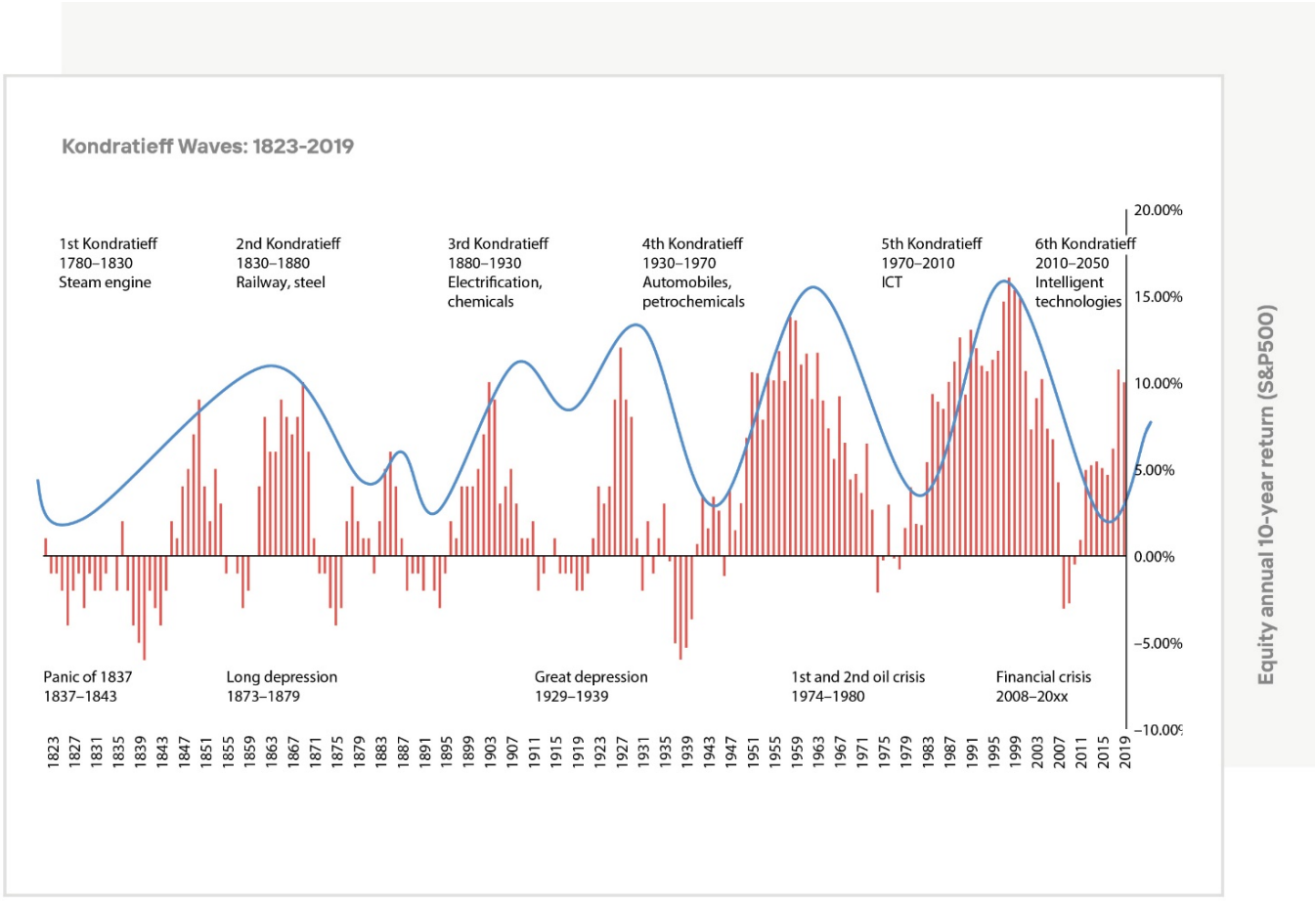

Figure 17.1 The Ages of Globalization. Columbia University Press. Source: adapted from Sachs, J. D. (2020).

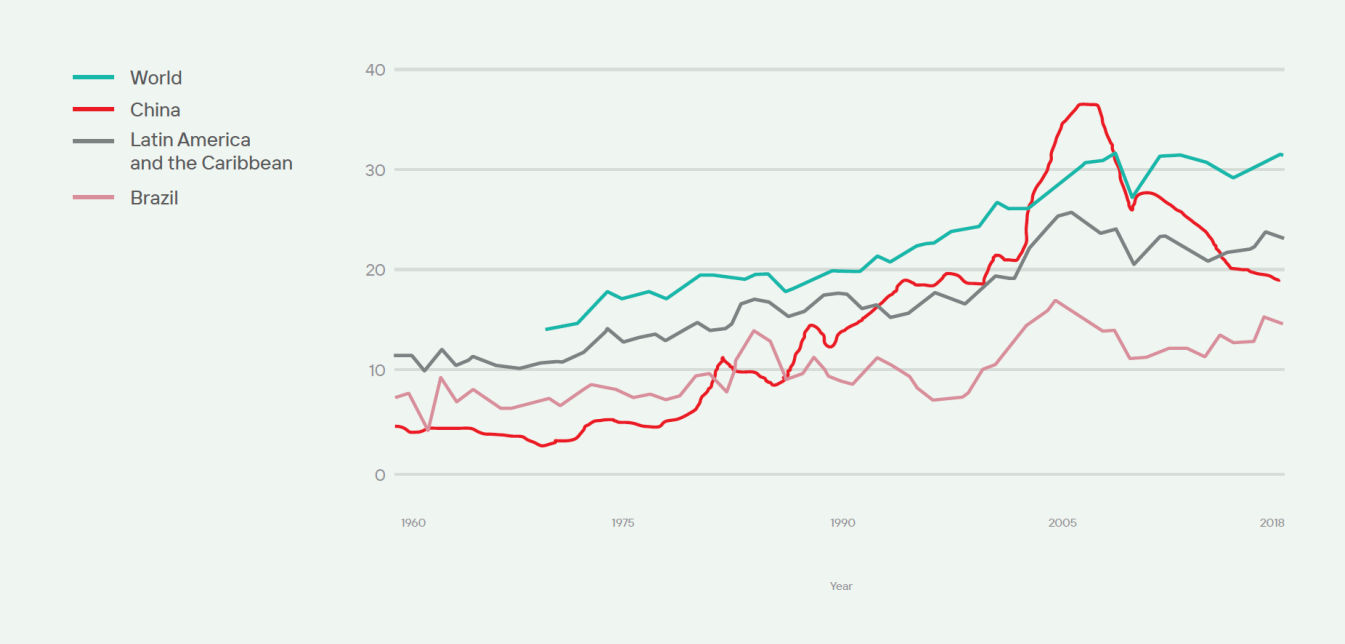

Figure 17.2 Exports/GDP (%). Source: World Bank. World Development Indicators, 2020. https://databank.worldbank.org/source/world-development-indicators.

velopment processes (Harvey 2019). Human intervention, which generated positive effects on biodiversity before the Iberian conquest (Chapter 8), is currently the main threat to rainforest integrity.

The expansion of the world economy, rather than being a continuous linear process, evolves in the form of long-term cycles (Figure 17.1). In the late 1970s, the Fordism model (Harvey 1989) of accumulation became exhausted and a new global development paradigm, based on neoliberal concepts, emerged (Cox 1987; Harvey 1989, 2005).

Latin America shifted from import-substituting industrialization towards an export-oriented and market-friendly model (Thorp and others 1998, see Chapter 14). Exports, led by commodities, grew faster than gross domestic product (GDP), (Figure 17.2). Regional commodity exports expanded, and the Amazon progressively became a significant provider of raw materials, such as oil (Peru, Ecuador, Colombia), gas (Bolivia, Peru), iron ore, soybeans, and beef (Brazil), gold (Peru, Venezuela, Suriname), timber, and hydroelectric power. A complex process of infrastructure expansion, migration,[i] and urbanization occured without substantially improving living conditions. The model accelerated deforestation, degradation, and biodiversity loss. This process has taken different forms over time, according to dominant products and local social and environmental conditions.

Sachs (2020) differentiated two recent long-term cycles in the global economy using Kondratieff waves (Figure 17.1). The first one, between 1970 and 2010, was mostly driven by information and communication technologies, whereas the current cycle is based on intelligent technologies and robotics (Sachs 2020). Each global economic wave, sparked by technological innovation, generates its own way of reshaping the world order and the role of different regions. As the Chinese economy expanded until the 2008 crisis, Latin America took advantage of soaring commodity prices and became a raw material provider, with strong effects

[i] In addition to internal migrations from densely populated region to the Amazon, current human mobility includes massive international flows (e.g., from Venezuela to other Amazon countries), circular and temporary migration (Chapter 14).

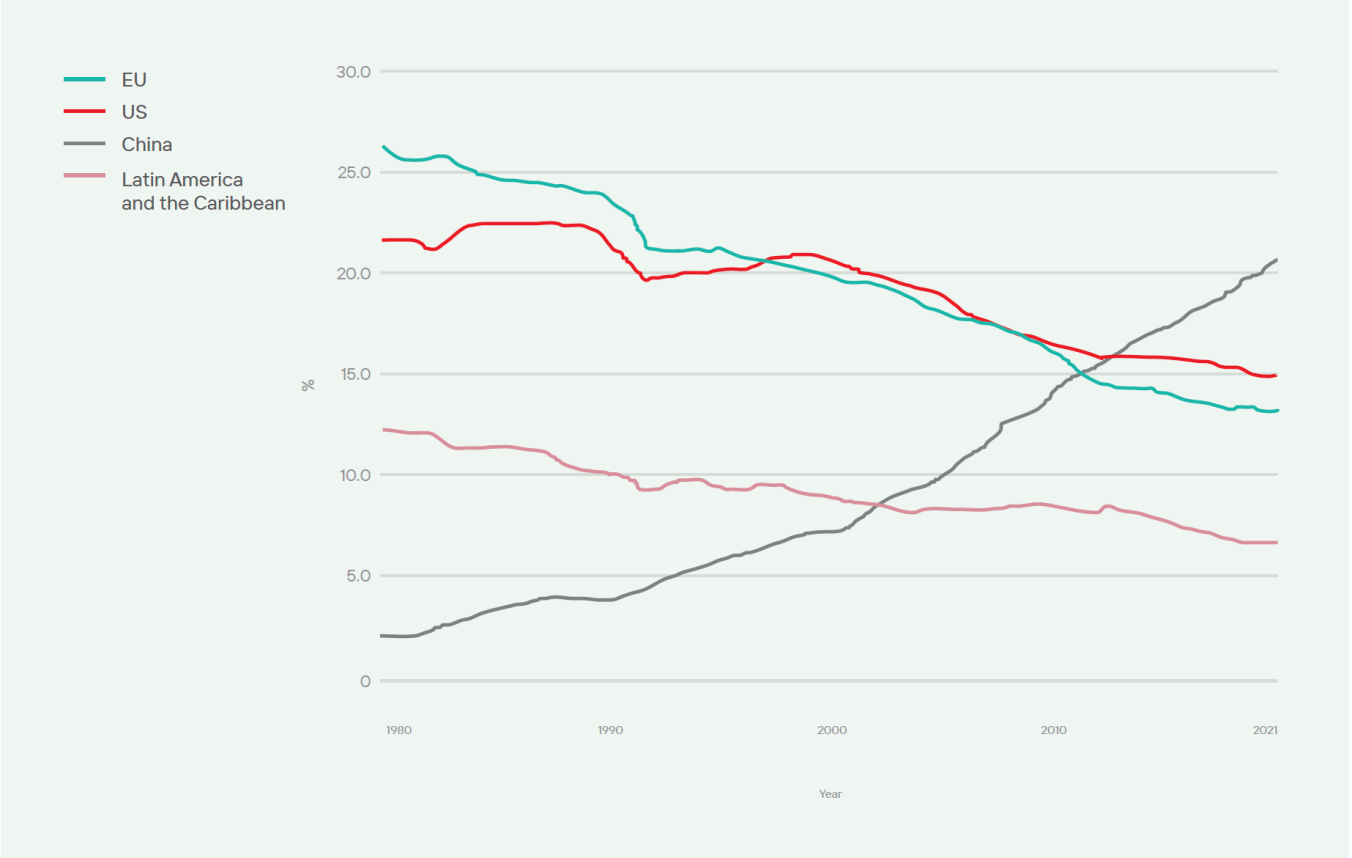

Figure 17.3 Shares of World GDP, Selected Regions and Countries: 1980 – 2020. Source: IMF 2020. World Economic Output, April 2020. https://www.imf.org/external/pubs/ft/weo/2020/01/weodata/download.aspx.

on the Amazon. After 2014, China adopted a different model, reducing its growth, shifting towards the expansion of its internal market, and fostering certain environmental protection measures. The decline in commodity prices affected Latin America and the Amazon (Ocampo 2017).

From a political economy perspective, a significant change was the transition from the bipolar world of the Cold War, and the strong influence of the United States (US) on Latin America, to the current multipolar scenario dominated by the emergence of China, and a complex equilibrium between the dominant powers of the US, the European Union (EU), and China (Sachs 2020; Ray 2021). China's share of global GDP increased from a marginal 2.3% in 1980 to 20% in 2020, surpassing the US in 2013 to become the largest economy on the planet (Figure 17.3).

China became the largest importer of several commodities extracted from the Amazon. In 2018, Brazil was the leading world exporter of soybeans (56% share)—cultivated in the Cerrado and the Amazon—and China the largest importer (57% share) (OEC 2021). Shares for iron ore are lower but significant (Figures 17.4 and 17.5), and beef exports from Brazil to China increased from almost zero early in the century to approximately 46% in 2019 (Meat & Livestock Australia 2020). In 2018, Brazil became the world's largest beef exporter, led by growing Chinese demand. Other important destinations were the Middle East and North Africa, Singapore, Russia, and the EU. Ecuador began exporting oil from the Amazon in 1972, and oil has been the single largest export and backbone of Ecuador's economy ever since. Colombia's main export also became Amazonian oil recently (OEC 2021).

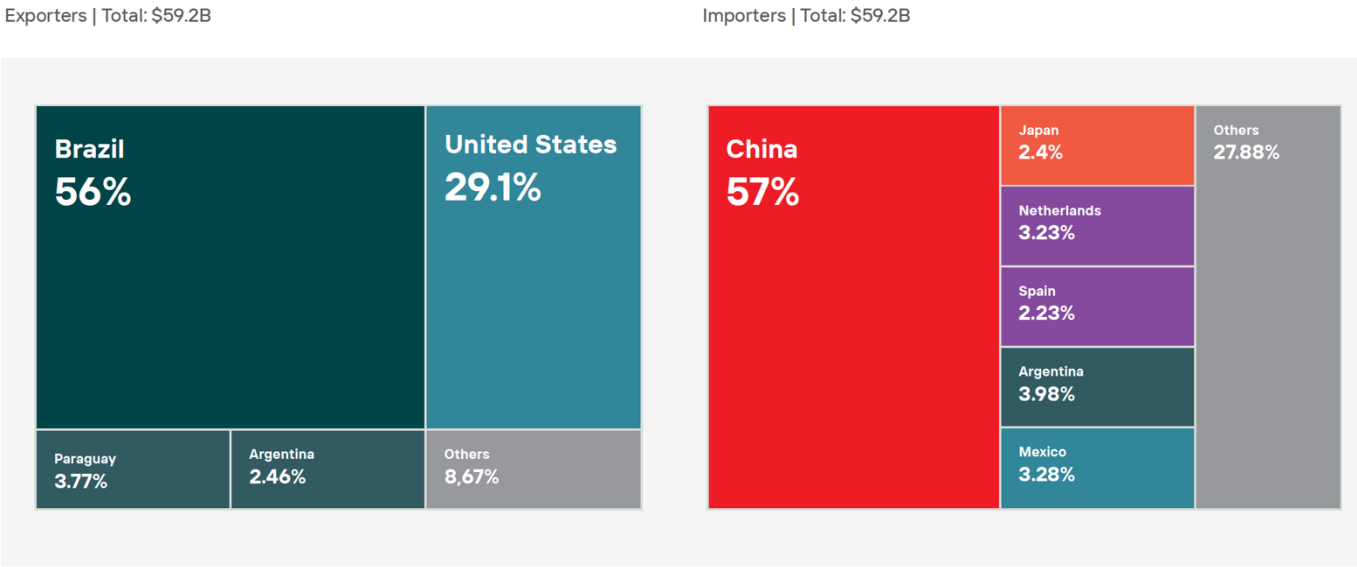

Figure 17.4 Exporters and Importers of Soybeans. Source: OEC, 2020. https://oec.world/en/profile/hs92/21201

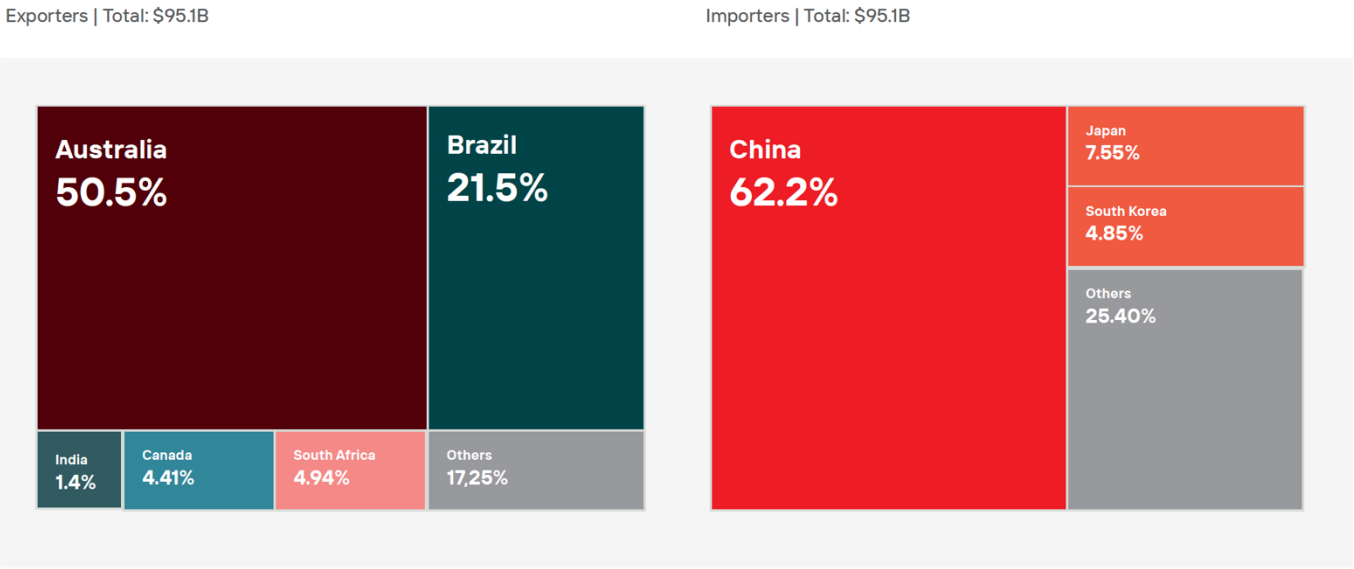

Figure 17.5 Exporters and Importers of Iron Ore. Source: OEC, 2020. https://oec.world/en/profile/hs92/52601 .

As China became one of the largest trade partners in Latin America, regional exports were concentrated in a small group of commodities, with several coming from the Amazon. In Brazil and Peru, China became the top export destination and outpaced the US. In 2018, soybeans were the main export product of Brazil, and iron ore was the third; Colombia and Ecuador share a similar pattern of increasing participation of China as a trade partner in a small number of commodities, predominantly from the Amazon (Table 1). In Ecuador, Chinese companies (Sinopec and Petrochina) recently became the most significant foreign partners in the oil industry. These cases reflect China's fundamental interest in securing access to commodities. In return, China contributes needed infrastructure and investments to the host countries.

Table 17.1 Export structure in several Amazon countries in 2019

Country	Main products			Main Partners	
	Order	Name	Share (% total)	Name	Share
Brazil	First	**Soybeans ***	11.4	China	27.6
	Second	Crude oil	10.6	US	13.2
	Third	**Iron ore ***	10.0	Argentina	4.3
Colombia	First	**Crude oil ***	32.2	US	30.7
	Second	Coal	15.9	China	11.3
	Third	Coffee	5.9	Panama	5.8
Ecuador	First	**Crude oil ***	34.3	US	29.5
	Second	Bananas	15.0	China	12.5
	Third	Crustaceans	17.0	Chile	6.6
Suriname	First	**Gold ***	78.4	Switzerland	38.5

(*) Products from the Amazon.

Source: The Observatory of Economic Complexity (OEC) 2020. https://oec.world/.

China was not only a commodity importer, but it also financed large infrastructure projects in the Amazon (such as the Coca-Codo Sinclair dam in Ecuador and the Belo Monte–Rio de Janeiro Second Transmission Line in Brazil), and invested in oil, mining, agribusiness, energy, finance, and communications (Ray 2021). It became one of the region's main financial partners. In 2020, cumulative Chinese loans reached US $62.2 billion in Venezuela, US $28.9 billion in Brazil, and US $18.4 billion in Ecuador (The Inter-American Dialogue 2020). Chinese involvement in the Amazon is not only the result of increasing demand, but has also been guided by the long-term geopolitical strategy of an emerging world power (Ray 2021). Canadian companies also played a significant role in large-scale mining investment in the Amazon (Deonandan and Dougherty 2016). Financing and financial institutions have a significant role in leveraging and profiting from activities that drive deforestation and the associated infrastructure that enables them. A mix of international incentives and local drivers are frequently the main immediate forces of environmental deterioration, as illustrated by the promotion of IIRSA by Brazilian companies and the expansion of oil extraction by Ecuadorian state companies with Chinese support (European Commission 2010).

Since the early 1990s, Latin American exports have become more dependent on primary products, reversing a long trend towards diversification with the expansion of manufactures (Figure 17.6). As a result, the Economic Complexity Index of Exports declined in Amazonian countries between 1995 and 2019.[j] Brazil, Bolivia, Peru, and Venezuela present a negative and statistically significant trend, whereas in Ecuador and Colombia the decline is not significant (Figure 17.7). The Latin American profile in international trade was reshaped, with a new role as commodity provider to China.

Commodity-export expansion depends on international prices, which have been very unstable during the past decades (International Monetary Fund 2020a), with two ascending periods (the 1970s and the 2004–2014 decade) and two depressed phases (from early 1980 to the turn of the century and after 2014) (Figure 17.8). During periods of low prices, extractive activities do not necessarily decline.

[j] The Index of Economic Complexity of a country is an indicator of the economic diversification and technological sophistication of its exports (Hidalgo and Hausmann 2009).

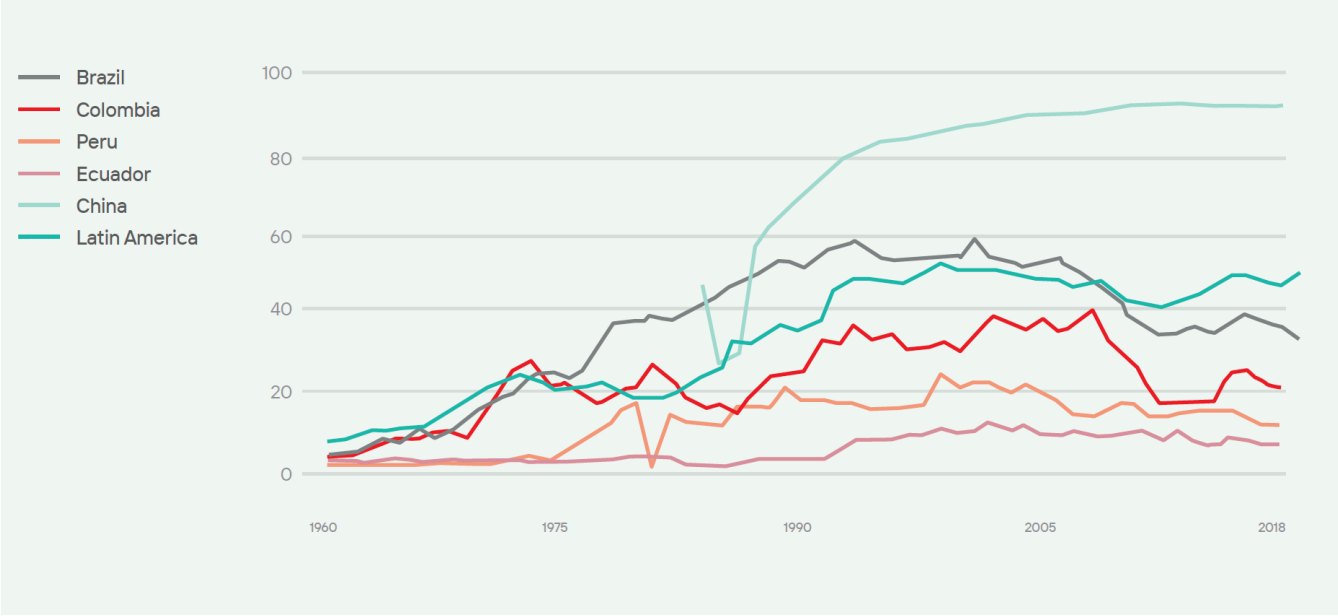

Figure 17.6 Manufactures share in Exports (%). Source: World Bank, World Development Indicators, 2020. https://data-bank.worldbank.org/source/world-development-indicators

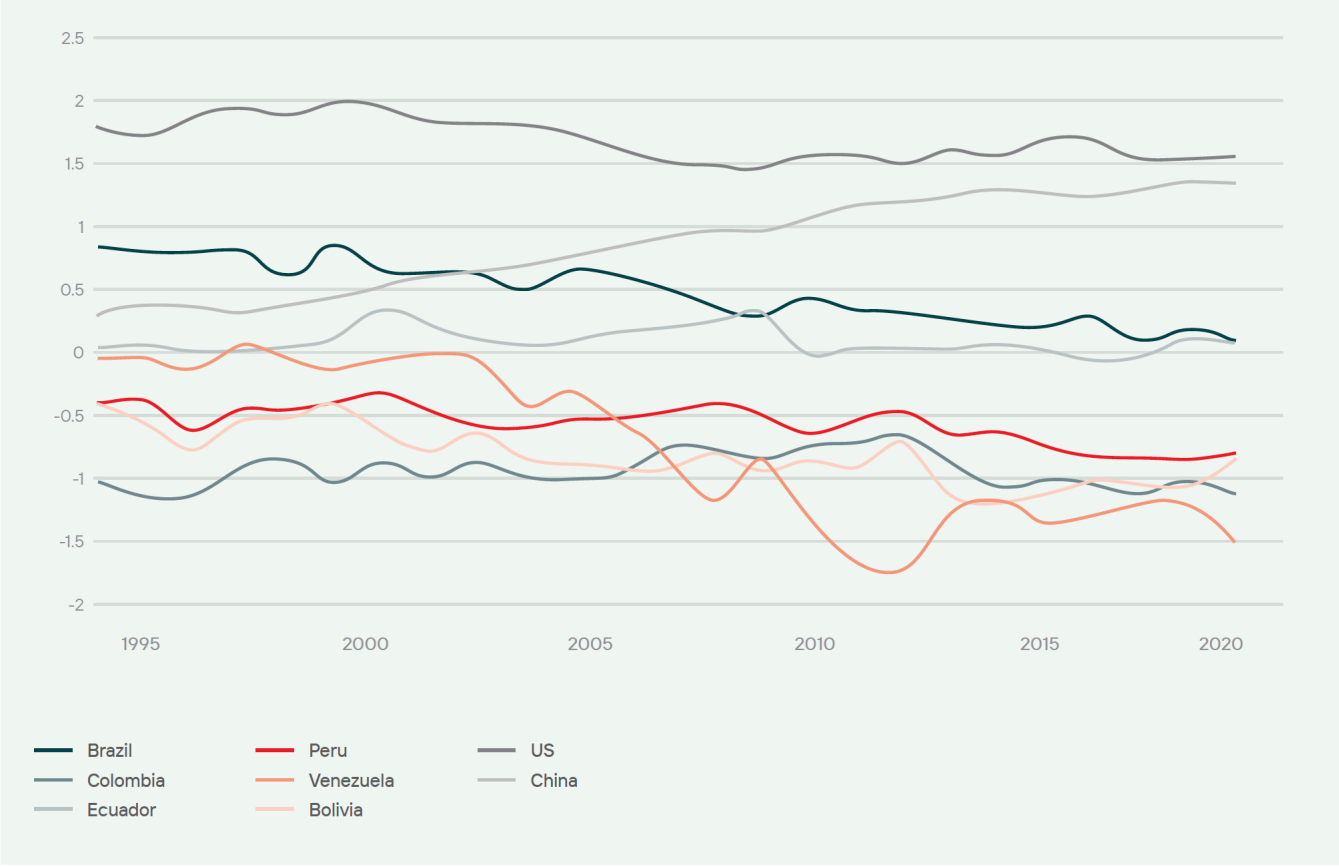

Figure 17.7 Economic complexity Indices: 1995-2019. Source: OED 2021. https://oec.world/

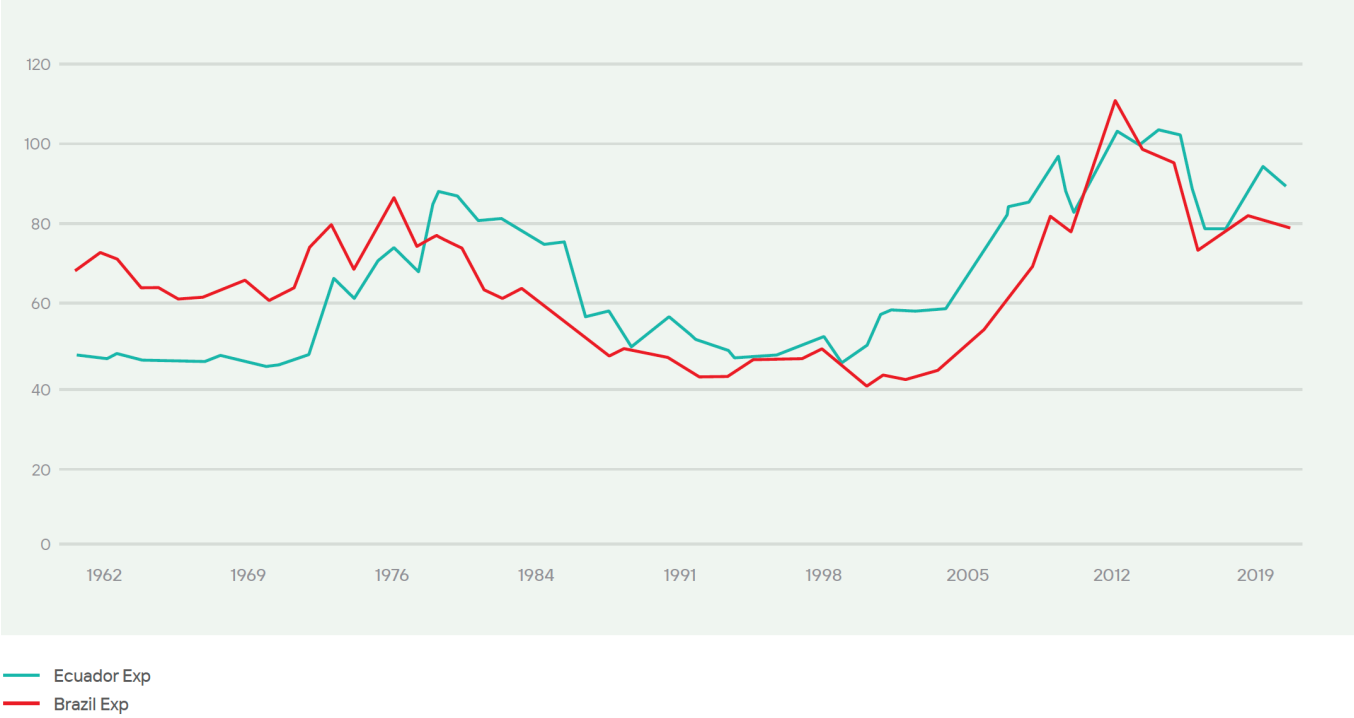

Figure 17.8 Commodity Export Price Indices for Brazil and Ecuador: 1962-2019. Source: IMF 2000. IMF Primary Commodity Prices.

Conversely, in a context of scarcity and fiscal crisis, countries may opt to expand extraction to overcome short-term problems, having been "locked into" path dependence resulting from previous investment and the interwoven social, political, and technical conditions associated with them (Braun 1973). In the context of heavy debt burden and economic crisis, expansion of extractive activities, such as oil in Ecuador, is a way to alleviate short-term economic pressures. In addition, interconnections in global commodity markets may lead domestic policies to have cross-product and cross-country effects, which can result in changes in land use. For example, the 2006 US corn subsidies for ethanol production resulted in higher soy prices, stimulating deforestation in the Amazon (Laurance 2007). Biofuel production, being highly influenced by government policy and subsidies, by feedstock cost (soybeans, sugarcane, corn, palm-oil), and by oil prices (IEA 2019), has long been a subject of concern, given the possible effects of policy and price changes on deforestation (Laurance 2007; (Ferrante and Fearnside 2020).

Illegal activities linked to international markets also played a key role in extractive outcomes, as in the case of coca production and drug trafficking, mostly in Colombia and Peru. An important part of coca cultivation comes from the Amazon, and drug trafficking activities can be important shapers of the social and physical landscape. Drug trafficking provides large amounts of (laundered) money to purchase land for monocultures and cattle ranching, particularly in Colombia. Illegal activities can be stimulated by lawful international markets, such as cases of illegal timber extraction and gold mining, occurring in all Amazon countries (Reyes-Hernandez 2010).

Commodity-driven deforestation has become the main driver of forest loss both globally and in Latin America, accounting for about 64% in the region (Curtis *et al.* 2018). Pressure comes not only from international forces but also from domestic market expansion. For example, in Brazil, cattle ranching is responsible for more than three-quarters of deforestation, with internal demand four times larger

than exports (Skidmore *et al*, 2020; Ermgassen *et al*, 2020). The existence of a beef production and commercialization value chain and sector driven by domestic demand, and the availability of land in the vast Cerrado and Amazon biomes, provided a platform from which export-oriented beef production was able to take off, by taking advantage of opportunities emerging from international markets. In turn, soy and beef dynamics are closely interconnected, as beef production makes way for more profitable soy for export and moves deeper into the Amazon, resulting in more deforestation (see Chapter 15). As intensive soy cultivation in the Cerrado expands, extensive cattle ranching is displaced to the Amazon. Soybean production is also a direct driver of deforestation, albeit second to the beef industry (Da Silva and Guerreiro 2017). Development and infrastructure policies, different capabilities and time horizons of actors involved in deforestation driving activities, expectations about changing markets, and relative prices and costs are leading to land speculation and relay-type land use, where the activity that originated the clearing is soon replaced by another. This process sometimes obscures the true motivation behind the visible cause of deforestation (Gao *et al*. 2011, Margulis 2003).

International agricultural drivers are not only on the demand side. Supply has become increasingly concentrated in large-scale multinational actors. A technological package spearheaded by global chemical and trading companies and based on GMO seeds, agrochemicals, no-till cultivation, and new machinery emerged alongside modes of organization in which landowners are replaced by production firms and operating capital is often provided by seed and agrochemical companies or trading firms (Bianchi and Szpak 2017). These predominantly consist of international companies such as Monsanto and Bayer Cropscience (merged in 2016), Syngenta, Dow - DuPont - Pioneer (since 2016 Corteva Agriscience), Nidera, Cargill, Bunge, Dreyfus, AGD, ADM, Noble, Toepfer, among others (Bianchi and Szpak 2017). Therefore, the current export-oriented model introduces strong international interests as direct determinants of land-use change and property size. In line with China's policy of securing access to agricultural commodities, Chinese companies have acquired some of the leading firms in the market: Syngenta, Noble Agri, and Nidera.

The complex alliance between international and domestic actors has created strong political pressure for the expansion of extractive use of the Amazon (European Commission 2010). The case of Brazil has become the paragon of how the combination of international market conditions and domestic policies can have long-lasting and substantial impacts on the environment. Brazil's growth became increasingly linked to exports as the country responded to opportunities arising from international markets (Müller 2020). At the origin of these opportunities is a secular and global process of rising income and increasing demand for food, improved income distribution, and urbanization in emerging economies led by China (Boanada 2020; Fearnside 2015; European Commission 2010; WWF 2018). Brazil has succeeded in taking advantage of this process and has positioned itself as a leading world supplier of commodities and a major emerging economy, driving large-scale land-use change that has generated dramatic socioenvironmental impacts. Therefore, the fate of the Amazon is tied to the demands and functioning of international markets.

According to Sachs (2020), current globalization has aggravated not only global environmental problems but also social inequality. Deep ecological impacts and uneven social and economic development are crystalized in the Amazon. This is reflected in a recently published poverty map of Brazilian municipalities, which shows the Amazon and the Northeast regions as the most deprived in the country (Ottoni *et al*. 2017). The situation is similar in other Amazon countries (World Inequality Database 2021), including Ecuador (Larrea *et al*. 2013).

In addition to social and ethnic inequality, exclusion has a gender dimension. Women generally have lower access to education and suffer labor

discrimination and violence. Oil and mining activities usually involve gender-related inequalities. Formal employment in oil and mining camps is almost exclusively for men, with a marked underrepresentation of women in the workforce, the burgeoning of induced prostitution, and gender-based violence. Women are more likely to experience involuntary resettlement, socioeconomic displacement, pollution, environmental degradation, loss of access to water and land, and generally increased vulnerability and food insecurity, often being or becoming primary caretakers within their families (Addison and Roe 2018). Taking an example from Ecuador, women in the rural Amazon have, on average, fewer years of schooling, higher illiteracy rates, and lower labor income compared with men (UASB 2021). Women are also more vulnerable to the effects of floods and other climatic disasters.

The COVID-19 pandemic has evidenced the region's fragility in the face of globalization. As COVID-19 disproportionally hit the Amazon, it also demonstrated the aggravated effects of globalization on social inequality. By October 2021, Brazil was the second most affected country in the world in terms of absolute number of deaths, with 600,000 (Worldometer 2020). Subnational data in Brazil and Ecuador evidenced that the Amazon region had higher infection rates than national averages. In Brazil, Manaus, with a population of over two million inhabitants, was one of the most devastated cities in the world, and the mortality rate per million inhabitants was well above the Brazilian average in all Amazonian states except Tocantins, Pará, and Acre[k] (Worldometer 2020; Conass 2020; FVS 2020; Ministerio de Salud Pública 2020; Turkewitz and Andreoni 2020). The rapid spread of COVID-19 among dispersed communities in the Amazon was a result of a weak prevention network and the complex dynamics of circular migration, multi-sited households, and strong rural–urban interaction and dependence, as presented in Chapters 14 and 34. It also showed the inadequacy of basic health services in the region and the low priority given to social services and infrastructure.

The COVID-19 pandemic also brought to the fore the impacts of deforestation and biodiversity loss on the emergence and spread of infectious diseases, underscoring the importance of the conservation of nature for pandemic prevention and the relationship between pandemic prevention and economic well-being (IPBES 2020). Therefore, the processes driving deforestation and forest degradation can also be considered drivers of disease crossover from wildlife to humans, and of pandemics (see Chapter 21). Habitat loss and fragmentation caused by new land uses — mining, oil and gas, modern agriculture, livestock, wildlife trade, infrastructure development, and urbanization (Tollefson 2020; Dobson 2020; The Guardian 2020; UNEP 2020) — increase the probability of contact between humans and wildlife and are "a major launch-pad for novel human viruses" (Dobson 2020; Kondouri *et al*. 2021).

In summary, since the 1982 Mexican debt crisis, Latin America has shifted from an inward-oriented, import-substituting industrialization model towards a market-friendly strategy of export promotion. Soaring commodity prices during the 2004–2014 period, and Chinese economic expansion have helped redefine the main role of the region as a commodity provider, pushing a neo-extractivist development strategy based on a small group of products (Burchardt/Dietz 2014; Svampa 2019). The Amazon was deeply affected by a dramatic expansion of oil, gas, and mineral extraction, as well as soybean cultivation, large-scale cattle ranching, and drug trafficking, coupled with energy and infrastructure projects, such as hydroelectric dams. The neo-extractivist development model deepened social exclusion and severe environmental deterioration in the Amazon (see Chapters 14 and 15).

[k] On December 26, 2020, Manaus had a mortality rate of 15.1 per million inhabitants, the Brazilian Amazon had 9.6, and the Brazilian average was 9.1. In Ecuador, the confirmed cases in the Amazon region were 150 per million inhabitants, while the national average was 119. In January 2021, Manaus was hit by a new wave of COVID-19, sparked by a new variant of the virus.

Stricto sensu, extractive activities are only the exploitation of non-renewable resources or the overexploitation of renewable ones. Extensive cattle ranching, with low land productivity and often declining yields, may lead to a non-reversible reduction of soil fertility. Capital-intensive soybean cultivation may also lead to long-term soil deterioration. Soybean and beef production, although not necessarily extractive activities, imply a deterioration of natural endowment. In the broad sense of the term, the neo-extractivist development strategy refers to a development model, adopted by most Latin American countries from the 1980s onwards, that is dependent on commodity export expansion, frequently under dominant market-friendly strategies. Although the "pink tide" of nationalistic governments in several Latin American countries in the early twenty-first century promoted a stronger state role in development policies, partially departing from market-friendly strategies, this change did not reduce the strong dependence on commodities (Svampa 2019).

In contrast, some positive contributions to conservation have come from the international arena. With force since the 1980s, there have been progressively louder and more influential voices expressing concern about conservation. They have prompted local initiatives and global events, such as the United Nations Conference on Environment and Development (UNCED), also known as the 1992 Rio Earth Summit, which aimed to "reconcile worldwide economic development with protection of the environment". It resulted in the Convention of Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC), and paved the way to subsequent accords such as the Sustainable Development Goals (SDGs, see also Chapter 26) and the Paris Agreement. Stronger government policies started to appear, and environmental and social safeguards began to be introduced by multilateral agencies, financial institutions, and the private sector. Conservation financing increased and consumers, local and global social movements, and environmental activism was empowered (IEA 2021; Teske 2021). Positive examples described in this chapter emerged from these transformations or were supported by them.

Although extractivism prevailed over conservation, and the net result has been the advance of deforestation, ecosystem degradation, and pollution in the region, the expansion of protected areas and recognized Indigenous territories, which currently cover approximately 50% of the Amazon Basin (Chapter 16), was a significant achievement and demonstrated the strength of balancing regulatory policies. Social resistance to unsustainable extractivism and several successful experiences leading to economic diversification coupled with biodiversity conservation can also be mentioned (see Part III).

The most significant (albeit later reversed) experience in countering the prevailing extractivist model has been Brazil's success in reducing deforestation rates by 84% between 2005 and 2012. Brazilian policy under the Workers Party (Partido dos Trabalhadores, or PT, in Portuguese) government was also an important departure from the market-friendly paradigm, which minimizes the state's role in development. Public policies played a leading role in deforestation reduction.

The Brazilian model resulted from a combination of smart national policies, private sector involvement, foreign sector support, and domestic and international pressures. The experience may also provide elements for its possible replication at a Pan-Amazon scale in the future.

The current reversal of environmental policies in Brazil, particularly during the present federal administration, shows the power of the prevailing extractive paradigm. The next section of this chapter analyzes both the implementation and reversal of Brazil's counter-hegemonic policy, focused on the design and implementation of specific public policies.

17.3 Rise and Fall of Conservation Policies: Combating Deforestation in the Brazilian Amazon in the 2000s

Despite the importance of the socio-environmental heritage of the Amazon (see Chapters 8 and 10), its contribution to climate processes and stability at the local, national, and global levels (see Chapters 5–7; 22-24), and its enormous potential for economic development (see Chapter 30), deforestation has already compromised a significant portion of the Basin (see Chapter 19), and land uses other than forest have not generated perennial socioeconomic benefits with regional importance (Almeida 1996; Becker 2000; Andersen 2002). The most recent official data on deforestation increase in the Brazilian Legal Amazon[1], verified from August 1, 2020, to July 31, 2021, estimates an area of 13,235,00 km² (INPE 2020) (Figure 17.9), increasing the accumulated total deforestation to 806,862.735 km² (INPE 2021b). As a result, 19.1% of the original forest has been converted to other uses, an area greater than the sum of the territories of Germany, Italy, and Greece. This loss occurred in just two decades, since the first survey carried out based on LANDSAT images, from 1976 to 1978, showed only 1.8% of forest cover loss (Tardin *et al.* 1980). This is a direct result of regional development programs and projects, which stimulate regional occupation and advance an economy primarily based on agricultural production (Hecht and Cockburn 1988).

From the Getúlio Vargas government in the 1950s until today, and especially during 2019 when deforestation accelerated, the only period in which there was a consistent reduction in deforestation in the Brazilian Amazon was between 2004 and 2012, when rates declined from 27,722 km²/year to 4,571 km²/year (Figure 17.9). The groundwork for this monumental achievement was laid in the 1980s and 1990s through the increasing political influence of counter-hegemonic environmental movements, embodied for example in the 'ecological action caucus' in the National Congress (Viola 1988, 2004). Early victories included the 1998 environmental crimes law (Law 9.605/98) and the National System of Conservation Units (SNUC) created in 2000, but advances in environmental policymaking mainly took off in the 2000s, a period marked by the implementation of the Plan for the Prevention and Control of Deforestation in the Amazon (PPCDAm), determined by the Federal Decree of July 3, 2003. This section details how this plan (and environmental politics, in general) fostered synergetic impacts on deforestation dynamics in the Brazilian Amazon.

17.3.1 Integrating Public Policies to Combat Deforestation

The early 2000s were marked by the strong impact of data showing increasing deforestation in the Brazilian Amazon, proving control initiatives adopted by previous governments ineffective. To face this problem, the Ministry of the Environment (Ministério do Meio Ambiente, or MMA) proposed a reorganization of the Federal Government's activities in the region to the Presidential administration elected in 2002, with the fundamental objective of overcoming disconnected actions, considered the main reason for the advance of social inequality and environmental degradation, with deforestation being its most visible feature. The goal was to establish a new economic development model for the Amazon, capable of promoting economic growth, meeting the demands of the local population, and breaking with previous models through the structured incorporation of sustainability (MMA 2007).

The MMA, as recorded by Capobianco (2017), operated on three integrated and complementary fronts: a sustainable development program for the

[1] The Brazilian Legal Amazon comprises the Brazilian states of Acre, Pará, Amazonas, Roraima, Rondônia, Amapá and Mato Grosso, as well as the northern regions of Tocantins and Goiás and the western regions of Maranhão (law nº 12.651/2012, art. 3-I). The microregion was created by Law to better plan the social and economic development of the Amazon, forming a surface of approximately 5,020,000 km², larger than the area of the Amazon Biome, which has 4,196,943 km².

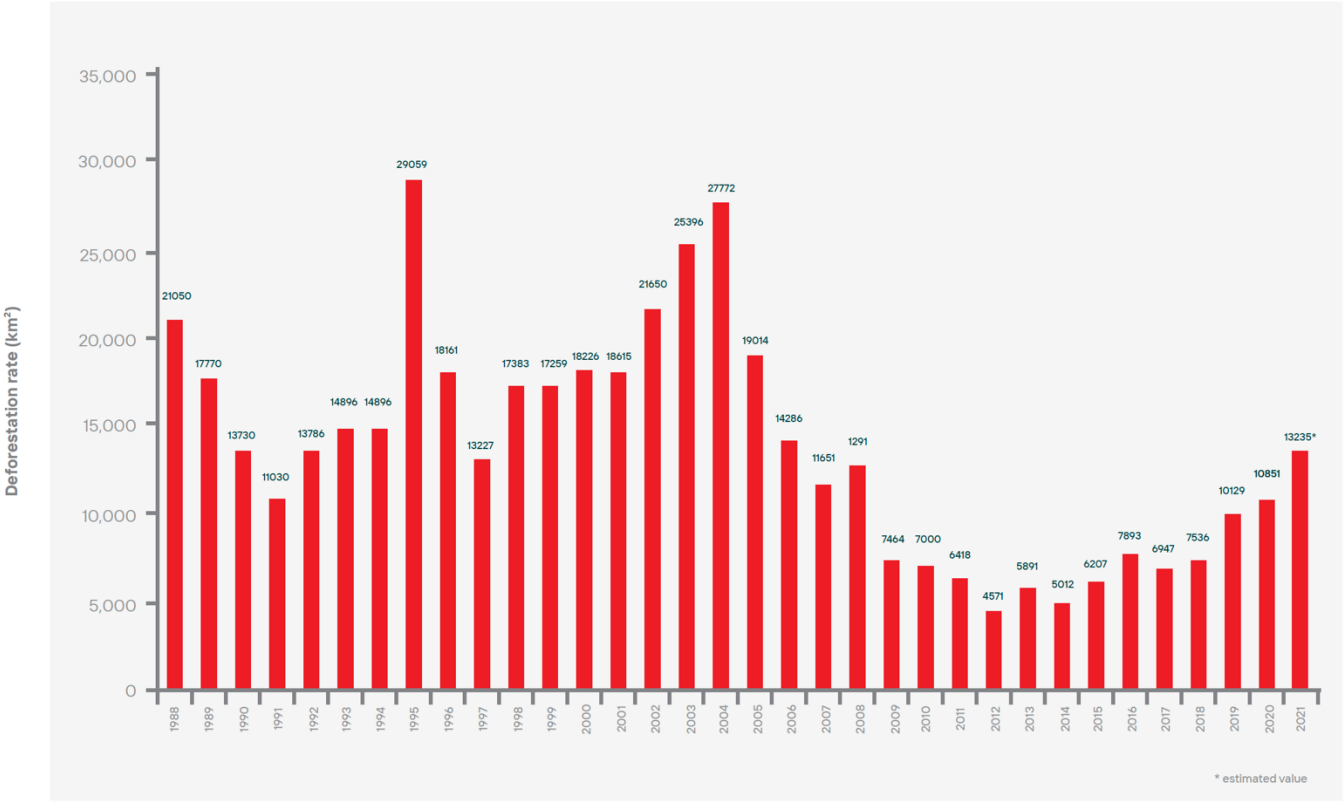

Figure 17.9 Annual evolution of deforestation rates in the Legal Amazon (km2). Source: PRODES/INPE 2021.

macro-region that committed Federal and State funds to Brazil's Sustainable Amazon Program (Programa Amazônia Sustentável or PAS); an action plan for immediate interventions to reverse deforestation rates (PPCDAm); and a local development plan for those regions most threatened by the expanding deforestation frontier, built on multi-actor, multi-sector, and multi-level governance strategies (e.g., Plano BR-163 Sustentável). These initiatives were presented and discussed as early as 2003. The first two (PAS and PPCDAm) were approved and started in the same year, whereas the latter was formally launched in 2004. All three had the strong and broad involvement of different ministries and related agencies instead of being solely in the hands of MMA.

Strategies for action on these three fronts were based on five premises considered essential for the success of the initiatives: (1) to convert the sustainability issue in the Amazon into a government matter by leaving the sectorial sphere of the MMA and obtaining the direct endorsement of the Presidency of the Republic for its articulation; (2) to guarantee political solidity and internal summoning power in the government apparatus; (3) to make actions intersectoral, committing all the ministries and related bodies of the Federal Government that, directly or indirectly, were related to the problem or had capacities and/or institutional expertise to solve it; (4) to establish a permanent evaluation system for implemented policies, generating high-quality and credible periodic feedback; and (5) to consolidate an external support community for the definition, implementation, and pressure for continuity (MMA 2008a).

Part of the strategy adopted in the period consisted of strengthening environmental governance capacity. One action was to significantly increase the number of public servants in federal environmental agencies, including the Brazilian Institute of

Environment and Renewable Natural Resources (IBAMA), through public tender. In addition, the Chico Mendes Institute for Biodiversity Conservation (ICMBio) was established in 2007 to manage protected areas (PAs). That same year, MMA's organizational structure was updated, creating *inter-alia* the Climate Change Secretariat and the Directorate for Climate Control Deforestation in the Amazon (MMA 2008b).

17.3.2 PPCDAm

PPCDAm is emblematic of the synergetic and intersectoral approach to environmental governance in Brazil. In June 2003, preparations for the PPCDAm mobilized an unprecedented 54 members from 12 ministries to define strategies and priorities for public policy formulation in the Amazon (Capobianco 2017). The structuring of the Plan was led by the Civil House of the Presidency, responsible for summoning the technical and political staff of the public agencies involved and for demanding that the necessary subsidies to support the work were provided; and by MMA teams, responsible for systematizing proposals and contributions received and the overall structuring of the Plan.

In addition, PPCDAm sought to foster policy synergies by focusing on three axes: (i) land and territorial planning; (ii) environmental monitoring and control; and (iii) fostering sustainable and productive activities. This plan propelled institutional ownership of the deforestation issue in two specific ways. The first was the establishment of a detailed plan of 149 activities, each with explicitly assigned institutional responsibilities, an execution period, and objective indicators for implementation evaluation. The second was linking the necessary resources for the development of the plan (USD 394 million in total) to budgets already approved in the Pluriannual Plans (PPA) of the participating ministries. This guaranteed the financial conditions for the immediate start of the actions without depending on complex negotiations to obtain additional resources from the Federal Budget (MMA 2008).

PPCDAm's three axes made significant contributions to environmental governance in complementary ways. One of the cornerstones of the monitoring and control axis was the development of a Deforestation Detection System in Real Time (DETER) by the Brazilian Institute for Space Research (INPE) in 2004. DETER represented a technological innovation for monitoring deforestation in the Amazon at very short intervals (weekly to monthly), and became a powerful and efficient surveillance tool (Rajão *et al*. 2017; Trancoso 2021; Kalamandeen 2018; Börner *et al*. 2015). Conceived as an open Internet platform, DETER allowed the press and society to follow the evolution of deforestation, stimulating permanent public debate on the results of control policies.

DETER is one of the best examples of how technology can reduce costs in obtaining vital information to guide actions to control deforestation and plan public policies in a region of continental proportions such as the Amazon. With images produced by the MODIS sensor of the Terra satellite and the WFI sensor of the Sino-Brazilian satellite CBERS, which had a spatial resolution of 250 m, DETER enabled the constant monitoring of areas under pressure at negligible costs. It also reduced the likelihood of corruption within IBAMA and other inspection bodies by providing auditable information.

Another innovation was the involvement of the Federal Police in criminal investigations and in operations carried out by IBAMA and state environmental police, following a strategic plan that considered technical criteria and territorial priorities. As a result, approximately 1,500 clandestine timber companies were closed, and more than 1 million cubic meters of wood were confiscated. Organizations promoting illegal logging were also dismantled, leading to the imprisonment of 659 people, including federal and state government officials.

Within the land and territorial planning axis, the creation of PAs was central to combating deforestation, particularly in the early phases (West and Fearnside 2021). Between 2004 and 2009, 40 PAs were created in the Amazon, totaling 26 million

hectares. In six years, the PPCDAm expanded the territorial extension of these areas by more than 76% compared with everything that had been created since the establishment of the Caxiuanã National Forest in 1961 (the first UC of the region).

Early Amazonian PAs (established prior to 2003) were mostly located in remote regions, far from agricultural expansion areas, with some exceptions in the federal states of Rondônia and Acre. However, since 2003, PAs have been actively integrated into the regional land tenure strategy. More specifically, the designation of protected areas, both as PAs and as ITs, strongly discourages land grabbing, as it makes land titles more difficult to obtain, and therefore land speculation more difficult, reducing the likelihood of deforestation. As a result, new PAs were primarily located in areas with strong anthropic pressure (IPEA 2011). Together with the demarcation of approximately 10 million hectares of ITs, many of which are recognized and approved under the PPCDAm, PAs have become a 'green barrier' against deforestation, protecting extensive areas that were still highly conserved but showed an intense increase in deforestation rates in southern Pará, northern Mato Grosso, and southern Amazonas. According to Soares-Filho *et al.* (2010), the creation of PAs was responsible for 37% of the reduction in deforestation between 2004 and 2006.

In addition to the establishment of PAs, the fight against land grabbing was intensified by canceling approximately 66,000 claims for land titles that had no proven legal origin in the registers of the National Institute of Colonization and Agrarian Reform (INCRA), and profoundly modifying the mechanisms and procedures for tenure registration (MMA 2007).

Although the third axis, sustainable productive activities, was less prominent during the first phase (2004–2008) (West and Fearnside 2021), it contained the proposal, approval, and regulation of the public forest management system by Law 11.482/06 in 2006 and the regulation of wood circulation control by CONAMA (National Council on Environment) Resolution 379/06. PPCDAm's three axes became the template for distributing financial resources from the Amazon Fund, which received (and later disbursed) over US $1.2 billion between 2008 and 2017 from international (Norway and Germany) and domestic (Petrobrás) sources (Correa *et al.* 2019).

The strengthening of environmental governance reached far beyond the PPCDAm, which complemented its actions and strengthened its impact. Punishment for illicit deforestation activities was increased in 2008 via decree 6.321/07, which established, among other measures, concentrated and priority action in municipalities that together were responsible for 50% of deforestation in the Amazon, with mandatory re-registration of land and limitation of new authorizations for forest removal above 5 ha, while decree 6.514/08 tightened law enforcement. Illegality also received economic disincentives through the conditional obtainment of rural credit (Assunção *et al.* 2020) from the Brazilian Central Bank (resolution 3.545/08), adoption of the soy moratorium in 2006 (Heilmayr *et al.* 2020; see also Chapter 15), and preparations for a beef moratorium in 2012 (Gibbs *et al.* 2016). Amazonian federal states also increased their creation of PAs, even surpassing the area of those created by the federal government, while the state of Pará initiated the creation of its Green Municipality Program (PMV) (Soares-Filho and Rajão 2018; Assunção and Rocha 2019; Cisneros *et al.* 2015).

17.3.3 Policy Impacts on Deforestation Dynamics

There is extensive literature that provides a rigorous assessment of key PPCDAm policy efforts, offering insights on direct policy impacts, externalities, and mechanisms, which are crucial for strengthening Amazon conservation (e.g., the causal evidence of the effectiveness of monitoring and law enforcement efforts, the conditioning of rural credit, and the definition of priority municipalities for action). A summary of this literature and links to individual studies is available on the "Evidence-Based Forest Protection Platform" (CPI 2021).

PPCDAm obtained significant results in the first 10 years of its implementation. The main indicator of success was the consistent decline of deforestation rates in the Amazon, from 27,423 km² in 2004 — the second highest in PRODES[m] (Amazon Deforestation Monitoring System, by INPE) records — to 4,571 km² in 2012 — the lowest ever recorded (Figure 16.1). This period was marked by an unprecedented increase in initiatives implemented by the Federal Government aimed at halting deforestation. During this period, seven federal laws, three provisional measures, six CONAMA resolutions, 156 decrees, and 16 normative acts of government agencies were approved. There were also 29 major surveillance operations involving the Federal Police. In total, there were 232 initiatives, of which 134 were directly aimed at controlling and combating deforestation, over nine years. This is significantly higher than the 77 actions undertaken over a 13-year period from 1990 to 2002 (Capobianco 2017). Furthermore, during the early stages of the PPCDAm the emphasis was on the strict enforcement of socio-environmental legislation, which increased local actors' perception of the risks associated with illegal and predatory deforestation. This stimulated initiatives by state and municipal governments, as well as by society in general, which contributed to the program's success. In a way, it represents a tangible legacy of the increasing political power of environmental movements in the 1990s.

It is important to highlight that this unprecedented reduction in deforestation occurred in a period of high valuation of the two main commodities, soy and beef, produced in the Amazon (see section 17.1). Until 2005 there was a clear correlation between the growth of these two economic activities and deforestation (Capobianco 2017). As of 2007, a gradual decoupling between these variables began and, despite the return of growth in soy production and an increase in cattle herding in response to rising commodity prices, Brazil saw a decline in deforestation rates.

According to Koch *et al*. (2019), the greater risk of criminal sanctions for illegal deforestation makes illegal land expansion more expensive and less profitable, and induces farmers in a growing agricultural market to reinvest in capital instead of land, leading to increased land productivity per hectare. When analyzing data on livestock production in the state of Mato Grosso, Macedo *et al*. (2012) identified that large-scale deforestation for pasture declined more than 70% from 2005 to 2006. According to these authors, the growing risks and costs of expanding pastures through illegal land occupation, combined with the implementation of techniques to intensify production, turn into a movement to replace extensive grazing (less than one head of cattle per hectare) with animal confinement, a practice that grew 286% between 2005 and 2008.

This demonstrates that the constant and consistent deforestation reduction in the Legal Amazon in the 2000s was not directly related to the advancement of the main commodities of the region. Concurrently, the economic conjuncture on national and international agricultural markets was favorable to reduce pressure to open new areas at the beginning of the first phase of the program (2004 to 2006). Brazil's experience in combating deforestation in the 2000s shows that it is possible, through coordinated actions, strong commitment from the bodies that formulate and implement public policies, and in partnership with society, to establish a governance process capable of promo-

[m] PRODES is the first monitoring tool (currently one of several) designed to calculate annual deforestation rates in the Brazilian Amazon. The Amazon Deforestation Monitoring System, created in 1989 by Inpe, measures the annual clear cut in polygons larger than 6.25 hectares in the Brazilian Amazon. These measurements are carried out in periods with good observation conditions in the Amazon region, which generally take place from July to September, when 90% of the region can be seen due to reduced cloud cover. The analysis period comprises the beginning of August to the end of July of the following year. As it is more detailed than other systems and depends on weather conditions for capturing images, its analysis is carried out only once a year. Its first estimate is released until December of the current year and the consolidated data are made available at the end of the first semester of the following year. For a broader discussion, see Rajão *et al.* (2017) and Richards *et al.* (2017).

ting a fast and significant decrease in deforestation rates in the Amazon.

17.4 The Fall of Brazil's Forest Conservation Policies

The systematic construction of environmental governance in Brazil, as described in the previous section, did not last long. With the turn of the decade, hegemonic movements that advanced the neoliberal development agenda in Brazil, premised on soybean and beef production, regained control of the environmental agenda. At the same time, counter-hegemonic movements represented by professionalized and politicized environmental organizations were losing traction (e.g., Sauer and França 2012). This shift in political dynamics is symbolized by steadily rising deforestation rates, from 4,571 km²/year in 2012 to approximately 11,000 km²/year in 2020. This section presents the key factors that explain what has been notoriously called a 'systematic dismantling' of Brazil's forest conservation policies (Abessa *et al*. 2019).

17.4.1 Weakening Environmental Law Enforcement in Brazil

The changing tides of environmental politics in Brazil started with revisions to the Forest Code proposed by the rural caucus. According to Sauer and França (2012), the reorganization of rural Brazil and the rural caucus started in the late 2000s as a response to tightening law enforcement and increasingly difficult access to rural credit. Although the original bill proposing revisions since 1999 did not pass through congress during most of the 2000s, its legislative process was accelerated in 2009 with the establishment of a special commission. The outcome of this protracted debate was the approval of a new legislative text on the protection of native vegetation by the Brazilian Congress in 2012 (Law 12.651/12) that substantially changed — mostly negatively — the previous Forest Code (Law 4.771/65). The revised Forest Code had two major detrimental effects: most significantly, it granted amnesty to past deforesters, exempting them from recovering the 58% vegetation of all illegally deforested areas prior to 2008 (Soares-Filho *et al*. 2014). This severely changed the perceived risks of illegality, mostly because it denoted a reward rather than a punishment, thereby disadvantaging law-abiding landowners.

The second negative effect relates to the Rural Environmental Registry System (CAR), a national, obligatory, and fully-transparent self-registration system for rural landowners, which could have significantly strengthened law enforcement institutions (e.g., IBAMA) to remotely monitor and punish illegal deforesters (Soares-Filho *et al*. 2014). The CAR registration process was a success, with the number of properties growing from less than 1 million in 2014 to approximately 6.3 million nationwide (1 million in the Legal Amazon) by September 2021 (SICAR 2021), mostly because landowners need to register to have access to bank loans and notary transactions. Nevertheless, information available in the system has not been used for law enforcement, as initially anticipated. Except for a few hundred fines issued through operation "Controle Remoto" by IBAMA between 2016 and 2020, most law enforcement still occurs through local field inspections rather than through the CAR dataset combined, with the official PRODES deforestation monitoring system. This contributes to a high level of perceived impunity for illegal deforestation within properties registered in CAR. For instance, Rajão *et al*. (2020) observed that only 23% of the properties with evidence of illegal deforestation in the state of Mato Grosso had been embargoed between 2009 and 2018. The waning effect of CAR as a deterrent to illegal deforestation was also observed in the state-level initiatives that preceded the national registry. In 2008–2009, the properties registered in CAR deforested less than the properties outside the registry, whereas by 2012 landowners inside and outside the registry had similar behavior (Azevedo *et al*. 2017).

The negative effects of the Forest Code reflected a broader trend of substantially weakening environmental law enforcement in Brazil and, in particular, concerns about the institutional capacity of IBAMA and ICMBio, the two federal agencies

responsible for enforcing the environmental legislation on private and public lands, respectively. The number of staff has declined since 2010 in the two institutions owing to the lack of replacement of retirees. The total number of IBAMA staff dedicated to law enforcement plummeted from 1,311 people in 2010 to 591 in 2020 (Borges 2020). Under the federal administration that started in January 2019, the MMA has also systematically replaced experienced managers from IBAMA and ICMBio with military police officers from São Paulo with little knowledge of the federal environmental agenda. Moreover, this administration has controversially discouraged field inspectors from destroying equipment used in illegal deforestation operations as an administrative punishment, an effective environmental sanction permitted by law and highly recommended for remote regions. The decreased capacity of these environmental law enforcement institutions is reflected in the falling number of fines issued in 2019 and 2020 to a historical low (Muniz *et al*. 2020; Lopes and Chiavari 2021).

The weak conservation status of protected areas in the Amazon is another challenge. Since the 2010 presidential election, the creation of new PAs has nearly ground to a halt, and following the impeachment of the president in May 2016, the new federal administration actively tried to dismantle existing protected areas in exchange for political support. Some of these attempts were thwarted, but others, such as in the case of the National Forest of Jamanxin, succeeded and were approved in congress. With the new federal administration starting in January 2019, suspension of PAs' designation became an explicit federal policy. Furthermore, both the President and the Minister of the Environment threatened to review the sizes of 59 PAs and to pass new legislation that would allow highways and hydroelectric dams to be developed in protected areas (Borges 2019). Consequently, deforestation inside protected areas has risen from 640 km^2 in 2017 to more than 1,100 km^2 in 2020, as land grabbers expect to benefit from future downgrading, downsizing, and degazettement of those areas. Combined threats to environmental law enforcement — lenient conservation requirements on private lands (Sauer and França 2012), CAR ineffectiveness (Azevedo *et al*. 2017), diminishing institutional capacity (Lopes and Chiavari 2021), and weakened protected areas (Borges 2019) — send a strong signal to deforesters that theirs is a favorable legislative and political climate for increasing deforestation.

17.4.2 Pro-deforestation Discourse from Political and Business Leaders

Although concrete law enforcement actions and territorial restrictions play a key role in reducing deforestation, the rhetoric of political and business leaders constitutes a powerful factor in shaping potential deforesters' perception of risk. Brazilian presidents and ministers of the environment, between 2003 and 2010, used strong language against deforestation, but the reverse is true in the years that followed. Environmental politics became less potent during the term of the administration elected in 2010. Following the impeachment of the president in 2016, the executive branch became even more exposed to the ruralist lobby and pro-deforestation interests, with the federal administration issuing several decrees that weakened the status of PAs and provided amnesty to land grabbers, as described above. Although some attempts to dismantle environmental policies were reverted, such as the relaxation of environmental licensing rules and the end of the Reserva Nacional de Cobre e Associados (RENCA, a large mining reserve), there was a strong signal that the political context was now becoming more lenient to illegal deforestation, resulting in increasing deforestation rates between 2015 and 2018, despite a rise in the number of environmental fines and the continuation of the PPCDAm (West and Fearnside 2021).

Although pro-deforestation clamor from rural political leaders has become increasingly louder since 2012, it has accelerated substantially since 2019. During the 2018 presidential campaign, commitments to halt the creation of PAs and to hamper IBAMA's "industry of fines" were made, and often landowners were portrayed as victims of

biased environmental legislation. The administration that started in 2019 favored environmental deregulation and mild inspection of the sector. The effectiveness of law enforcement was questioned, and threats were made to reduce the autonomy of field inspectors. The current administration also proposed to decommission PAs, threatened to punish IBAMA personnel in charge of environmental sanctions (Brandford 2019; Watts 2019a), and senior administration officials challenged the veracity of deforestation and fire occurrence reports from the Brazilian Institute of Space Research. They also accused NGOs of setting fires in the Amazon, without evidence (Watts 2019b; Maisonnave 2019).

Politicians from the rural caucus were not alone in overtly supporting a pro-deforestation discourse in recent years. A video from an official cabinet meeting was released in which senior officials suggested taking advantage of the COVID-19 pandemic to "pass the herd", hinting at the approval of an array of bills to reduce bureaucratic processes supporting environmental legislation (Vale *et al*. 2021). Changes introduced by the current administration include reductions in the protection of wetlands and the further reduction of civil society participation in policy fora. In response to outrage from civil society, the scientific community, and some politicians, several business associations in Brazil acquired full-page ads in *Estado de São Paulo*, one of the country's main newspapers, to advertise their support for measures adopted by the current administration. Other business associations went even further by recommending further ways to relax environmental requirements. For instance, APROSOJA (Mato Grosso Soybean Producers Association) is calling for an end to the soy moratorium in the Amazon under the pretext of free trade principles (Samora 2019), whereas UNICA (the Brazilian Sugarcane Industry Association) has drastically changed its position on ban on growing sugarcane in the Amazon. In 2018, when a senator proposed to lift the ban, UNICA strongly defended it, particularly as 98% of its sugarcane is grown outside of the Amazon. They also emphasized the importance of reducing the risk of deforestation to promote exports of sugar and ethanol to the EU. However, under a new administration, UNICA changed its position and successfully helped terminate the ban (Follador 2019; Girardi 2019).

Counter-movements have not been silent. Some agribusiness associations; NGOs; and researchers from the Brazilian Coalition on Climate, Forests, and Agriculture have played an important role contesting the pro-deforestation narrative. At the end of 2019, the Coalition carried out a campaign ("Be Legal with the Amazon") promoting legal, sustainable agricultural practices in the Amazon, calling for a halt to land grabbing and further weakening of the Forest Code. In reaction, SRB, UNICA, and Abiove (the Brazilian Association of Vegetable Oil Industries) left the Coalition. As of March 2020, ABAG (the Brazilian Agribusiness Association), IBA (the Brazilian Tree Industry Association), and ABIEC (the Brazilian Beef Exporters Association) were the only major associations still participating in the Coalition, indicating the limited ability of sustainability-oriented agribusinesses to influence the growing pro-deforestation discourse.

17.4.3. Lost Opportunities Owing to Deforestation

The pro-deforestation discourse and actions carried out by the current administration in Brazil, endorsed by the rural lobbies and some agribusiness associations, undermine opportunities towards a sustainable development agenda. This has cost Brazil its global reputation and halted Amazon Fund financing from Norway and Germany, owing both to disappointing deforestation reduction results (van der Hoff *et al*. 2018) and the dismantling of environmental institutions. International investment funds concerned about the direct or indirect support of activities that further degrade our planet have already warned Brazil about its detrimental policies, threatening to divest in the country. The European Union is already developing mechanisms to halt the import of products linked to deforestation, including soy and beef, as well as programs to phase out their agricultural dependence on Brazil in the long run, which may increase

the chances that the Mercosur trade agreement is not ratified by the EU. China may soon follow suit (Wachholz and Dutra 2021). In not fulfilling its commitment to curb deforestation, Brazil and its agricultural sector may suffer severe consequences and miss opportunities in new environmental markets (e.g., PES, green bonds, regulated in Law 14.119/21).

17.5. Conclusions

Dominant elites in South America have predominantly perceived the Amazon as an empty space with almost unlimited raw materials to be exploited, ignoring IPLCs and the crucial services provided by the Amazon. Before the 1970s, the Amazon was affected by a series of booms in the extractive sector, searching for rubber, gold, minerals, quinine, and other commodities, leaving behind deep disruptions. The expansion of the extractive sector during the past five decades has been unprecedented by its magnitude, widespread diffusion, and adverse social and environmental effects.

During the mid-1970s, Latin America began a shift from an inward-oriented and state-led model of import-substituting industrialization towards an internationally open and market-friendly development strategy of export promotion, following neoliberal principles. This transformation was part of the emergence of a new global model of a world economy based on a paradigm of flexible accumulation (Harvey 1989). Latin America became progressively integrated into the international economy, mostly as a commodity provider, in a new multipolar world with the increasing relevance of China. As a result, the Amazon experienced an accelerated expansion of the extractive sectors and agri-business, mostly soybean cultivation, cattle ranching, iron and other metal mining, and oil and gas, coupled with the building of large infrastructure and energy projects. Between 1990 and 2011, Brazilian soybean, iron ore, and beef exports increased more than 18 times, with a cumulative annual growth rate of 15% (CEPAL 2020). The expansion of oil and gas exploration was particularly relevant in Colombia, Ecuador, and Peru. Illegal drugs played a significant role in Colombia and Peru, often coupled with violence and land grabbing. Domestic markets also contributed to expanding demand, particularly in the case of beef. China is not only the main commodity importer from the Amazon region but is also a credit provider and a direct investor in extractive and infrastructure projects. Different transnational corporations in agribusiness, mining, and oil participate in the expansion of the extractive sector, often in alliance with national public and private companies.

This process has taken different forms depending on the distribution of natural endowments and mineral reserves, national policies, foreign investment, and social conflicts. Shifting commodity prices have defined periods of accelerated expansion, stabilization, or even decline in extractive activities.

The current prominence of agricultural commodity interests fails to see broader opportunities for economic development, as embodied in green finance, sustainability trends in the financial sector, international trade requirements, and related geopolitics. It also fails to perceive standing forests as the bedrock for developing conventional commodities such as soy and beef, since these depend on steady rainfall patterns and pollination services. They also need to satisfy an increasingly conscious market in terms of sustainability.

Conservation policies have also become globalized, receiving significant support from international institutions and even governments in developed societies. They have achieved important results, such as the expansion of PAs and ITs, which currently cover approximately 50% of the Amazon Basin (Chapter 16), and an 84% reduction in deforestation rates in Brazil during the 2005–2012 period. The expansion of protected areas and Indigenous territories has been a rather continuous trend in almost all Amazon countries since the 1960s, intensified during the last two decades, and has been a cornerstone for conservation in the Amazon.

Although PAs and ITs have significantly lower deforestation rates relative to other areas, the Amazon in general still suffers from high levels of deforestation and degradation.

The successful — albeit currently reversed — conservation policy implemented in Brazil from 2005 to 2012 is the most important national departure from state policies that promote, and to some extent regulate, extractive development in the region (section 17.3). It serves as evidence that deforestation and forest degradation can be controlled and reduced when the political will exists. Its success is the result of conservation being placed as a high political priority at the national level, with the participation of government, local authorities, business, and civil society, and strategic international cooperation. Its significance lies in the potential replicability of the experience at a Pan-Amazonian level or through coordinated national strategies, and in its role as a basis for stronger institutional arrangements and long-lasting results.

Brazil achieved important outcomes in curbing deforestation and expanding protected areas and Indigenous lands. However, sustainable economic diversification and improvement in living conditions while respecting environmental limits are still limited in the whole Amazon region. Achieving a sustainable Amazon implies substituting the limited commodity-dependent economy through economic diversification, increasing productive linkages, expanding biodiversity-based services, and improving the living conditions of Amazonian peoples. Sustainable pathways for the Amazon will be further analyzed in Part III of this Report.

The conservation paradigm has not been strong enough to control or detain the main adverse environmental and social impacts of the extractive development model. As a result, unsustainable extractivism remains the leading paradigm guiding public policies and private investment. The Brazilian case highlights complex politics linked to the 'epochal processes' of hegemonic and counter-hegemonic movements. On the one hand, the challenges posed by environmentalism to the extractive development hegemony provoked strong reactions in the latter's advocates, reversing many of the advances made in the 2000s (section 17.4). On the other hand, the subjugation of environmental policies by these hegemonic processes jeopardizes its resilience to changes in the natural environment (e.g., Lovejoy and Nobre 2017) or broader geopolitical and economic preferences (section 17.4). A middle ground needs to be found.

Despite important environmental achievements, policies and private strategies in the Amazon remain linked to a dominant extractive paradigm. Although the region was deeply transformed by a sustained expansion of commodity production both for international markets and domestic demand, and a rapid process of migration and urbanization reshaped the region's demographic profile, the transformation failed to bring about sustained and equitable improvement in living conditions. Instead, social exclusion, poverty, and lack of political participation of Indigenous peoples and other marginalized groups prevail. Moreover, deforestation, degradation, and biodiversity loss are close to a tipping point, which could unleash a self-sustained process of permanent degradation, jeopardizing not only rainforest integrity but also critical climate services to South America and the world (Lovejoy and Nobre 2017). Social inequality and unsustainable activities are critical failures of the current extractive development strategy in the Amazon, which leads the region to an unequal development process, as rents and profits are frequently appropriated and reinvested elsewhere, and labor remuneration remains at subsistence levels.

The current development model has not only failed to generate a sustainable, participatory, and equitable improvement in human capabilities, but also lacks solid theoretical basis. There is strong criticism that neoclassical economic theory cannot be applied to current development problems. Conventional economic theory does not have an adequate framework to explain interactions between the economy and the environment, nor market distortions generated by monopolies and transnation-

al corporations (Lefeber 1991; Stiglitz 1998, 2002, 2013; Stiglitz *et al*. 2008).

A new, sustainable, and equitable development strategy is necessary for the Amazon, to maintain the provision of environmental benefits from rainforests, the integrity of Indigenous cultures, and improve living conditions for most of the population. Such a strategy should also maintain cultural diversity, provide decent employment, eliminate poverty, and reduce social inequality.

Building new paradigmatic strategies may also need a departure from conventional economic thinking towards more comprehensive and integrated approaches, such as the emerging framework of ecological economics (Brown and Timmerman 2015; Common and Stagl 2005; Martínez Alier and Roca 2000; Daly 2010).

17.6 Recommendations

1. Globalization and widespread changes in consumption have drastically altered the type and scale of human intervention in the Amazon, generating social and environmental impacts of unprecedented magnitude and gravity. Together with countries from the Global North, China is an increasingly dominant actor in this process. Environmental and social sustainability must be embedded and mainstreamed into global and local political decision-making and business incentives. Non-Amazonian countries, particularly developed countries and China, are important actors in mounting an effective response and must be part of the solution.

2. Brazil provides a strong example of how deforestation control, implemented through strategic state policy involving the commitment and coordinated involvement of multiple government actors, can contribute to significantly reducing deforestation. The involvement should not be exclusively restricted to environmental authorities and should include genuine international commitment and support. Brazil's experience can be replicated in other Amazonian countries, adapted to local conditions and realities. Country by country strategies may be complemented by trans-Amazonian coordinated policies within the framework of the Leticia Pact.

3. Deforestation reduction and forest conservation policies are vulnerable to changing governments and political priorities. Institutional agreements that transcend changing political cycles must be implemented to ensure continuity of policies for forest conservation, as the international climate-change strategy suggests.

4. Initiatives to reverse deforestation must involve the participation of all stakeholders (different levels of government, multiple sectors of the economy, civil society actors, Indigenous peoples and local communities (IPLCs), and international organizations), and including cross-cutting voices of gender and youth. IPLCs' participation is essential for sustainable forest and river management, and must include a socio-environmental perspective, where sustainable, healthy livelihoods and conservation are coupled.

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