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4 *Science Panel for the Amazon (SPA)*

5
6 **WG 5: Living, Moving and Working in the Amazon**

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8 **Amazonia in Motion: Changing politics, development strategies, peoples,**
9 **landscapes and livelihoods**

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16 **TECHNICAL SUMMARY**

17 The chapters contributed by Working Group 5 to this report were designed to portray the current
18 situation of the diverse people who live, move, and work in the Amazon region. This discussion
19 builds on previous sections of the report that described the complex and changing biological,
20 climatic and biogeochemical systems and cycles of the region. Chapters 14 and 15 bring the
21 discussion of Amazonian peoples up to the present day – who they are, how they live and move,
22 and how they make a living, and how these patterns are changing rapidly over the past few
23 decades in ways that threaten the sustainable future that Amazonian peoples’ desire, as well as
24 planetary integrity.

25 Explaining the identities, movements and ways of producing livelihoods of such diverse peoples

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1 across multiple national and regional boundaries is challenging, not least because they are
2 frequently *invisibilized* by outsiders who fail to see them, or to include them in plans for the
3 region. Amazonia's diverse peoples and landscapes are often hidden in plain sight, largely urban
4 residents in a region often assumed to be untouched natural forests, but also making their living
5 in remote villages, farms, ranches and mining camps, and often depending on complex mixed
6 livelihoods --waged as well informal ---and living in multi-sited households that bridge rural and
7 urban. Some are lifelong residents of the Amazon region, and have inherited valuable cultural
8 knowledge about its land, waters and animals and their complex interactions, while many others
9 are outsiders who have moved into the region to make their homes or to seek their fortunes.

10 In addition to the invisibility of many Amazonian inhabitants, powerful processes that drive the
11 rapid changes in their conditions are also largely *invisible*, reaching beyond the Amazon region
12 into the murky realms of ideology, geopolitics, policy, commerce, and politics that have driven
13 the rapid evolution of Amazonian change. Nation-building efforts, development policy
14 frameworks, corruption, global economic trade and finance powerfully shape the conditions for
15 land tenure and settlement, land use, and socio-economic and environmental changes on the
16 ground in Amazonia, in ways that unleash complex interactions between large scale
17 agroindustry, livestock and mining and fossil fuels, and small-scale farming, as well as the
18 clandestine and illicit economies of land grabbing, gold, coca and timber. Over the past half-
19 century, large commercial interests have rapidly expanded their power and presence in Pan-
20 Amazonia, bending policies to their interests and commandeering large areas of public lands for
21 their cattle ranches, commercial farms, palm oil plantations as well as mining operations, with
22 alarming social as well as environmental impacts that will be the focus of the next section of this
23 report. Amazonian peoples and their social movements have continually sought to adapt to these
24 changing circumstances, while fighting to support their own proposals for alternative forms of
25 Amazon conservation and development.

26 The WG5 team that worked together to tell this crucial part of the Amazonian story consisted of
27 fifteen co-authors from the U.S., Brazil, Peru, and Ecuador, with training and experience in
28 diverse fields: agricultural engineering, anthropology, architecture, biology, development,
29 ecology, political science, economics, environment, forest science, geography, history and
30 planning. Our combined expertise included long term research in the Amazon regions of Brazil,

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1 Peru, Ecuador, Bolivia, Colombia. We worked together to craft two chapters that would,
2 together, provide a vivid picture of these large-scale processes, as well as their impacts on the
3 ground with the real people who live, work and move across the Amazonian landscapes.

4 Chapter 14 was designed to explore the “big picture” of how the multitude of ideas, actors, and
5 practices, including powerful outside forces--- new forms of finance, new Asian markets, new
6 conservation ideas, new commodities, new institutions, and an explosion in clandestine
7 economies -- are reconfiguring the spatial organization and institutional realms that hold sway
8 over the region, and how these have changed with political and ideological shifts. These all
9 interact in complex and often cascading ways with diverse, regional economies, varying
10 histories, ethnic processes and other conditions in the vast reaches of the Amazon to shape the
11 multiplicity of Amazonian peoples, how and where they live and work, and how that is changing
12 in profound, yet often unperceived ways. These impacts threaten the conditions of possibilities
13 for sustainable and resilient livelihoods in agriculture and natural resource use in Amazonia, and
14 often foreclose more viable alternatives.

15 The analysis in Chapter 15 takes a deeper look at the changing nature of key agrarian systems of
16 production and livelihood in the region: agroforestry, fisheries, forest product harvesting,
17 agriculture, livestock, and tree plantations. Systematic data from Brazil’s agricultural census
18 provide a valuable means to analyze the concrete, measurable impacts of changes over the past
19 few decades on both agribusinesses and family-based establishments, showing the marked
20 expansion of the former, favored by subsidies, institutional support and other policies, at the
21 expense of the smallholder sector. The analysis also shows that these trends are associated with
22 forest loss and degradation, increased greenhouse gas emissions and other negative
23 environmental impacts, while also undermining local rural employment and the family-based
24 farms that are needed for local and regional communities to thrive.

25 Many of the main trends found in the systematic analysis of Brazilian data (which is not
26 available for the other Amazonian countries), hold true across national borders, as agrarian
27 economies have been expanding rapidly in recent decades, with important impacts limiting
28 access to public lands. Qualitative empirical discussions in Chapter 15 provide more in-depth
29 insights into the changes and impacts of these different activities, and how they differ across

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1 Amazonian countries. The chapter ends with examples and recommendations for a transition to
2 sustainable production and resource use that can facilitate Amazonian countries achieving the
3 Sustainable Development Goals, a challenge that will be addressed in more detail in Part III of
4 this Report.

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1 Amazonia in Motion: Changing politics, development strategies, 2 peoples, landscapes and livelihoods

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1 ACRONYMS AND ABBREVIATIONS

2	AIDSESP	Asociación Interétnica de Desarrollo de la Selva Peruana
3	ASGM	Artisanal and small-scale gold mining
4	BNDES	Brazil's National Economic and Social Development Bank
5	CAR	Brazil's Rural Areas Registry
6	CEB	Ecclesiastic Base Communities
7	CIDOB	Confederación Indígena del Oriente Boliviano
8	CIMI	Indigenist Missionary Council, Brazil
9	COFCO	China's leading agribusiness trading company
10	COIAB	Coordenação das Organizações Indígenas da Amazonia
11	CONFENIAIE	Confederación de Nacionalidades Indígenas de la Amazonía Ecuatoriana
12	CORDECruz	Corporacion de Desarrollo de Santa Cruz, Bolivia
13	COSIPLAN	Consejo Suramericano de Infraestructura y Planeamiento
14	CPT	Pastoral Land Commission, Brazil
15	ECO-92	1992 UN Conference on the Environment in Rio de Janeiro
16	EIA	Environmental Impact Assessment
17	ELN	National Liberation Army, Colombia
18	EMBRAPA	Brazilian Agricultural Research Corporation
19	ELETRORAS	Brazil's electricity holding group
20	ELETRONORTE	Brazil's Hydropower Program for the Amazon region
21	FARC	Revolutionary Armed Forces of Colombia—People's Army
22	FAO	Food and Agriculture Organization
23	G20	Group of Twenty: International forum for the governments and central
24		bank governors from 19 countries and the European Union (EU).
25	GDP	Gross Domestic Product
26	IDB	Inter-American Development Bank
27	IIRSA	Iniciativa para la Integración de la Infraestructura Regional Suramericana
28	ILO	International Labour Organization

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1	INCRA	Brazilian National Institute for Agrarian Reform
2	INPE	Brazilian National Institute for Space Research
3	IPCC	Intergovernmental Panel on Climate Change
4	ISI	Import-Substitution Industrialization
5	KfW	German development agency
6	LBA	Large-scale Biosphere Atmosphere project
7	MERCOSUR	Southern Common Market
8	MST	Movimento dos Trabalhadores Rurais Sem Terra, Brazil
9	NGO	Non-governmental organization
10	PAC	Brazil's Programa de Aceleração do Crescimento
11	PAD	Directed settlement projects
12	PAE	Agro-Extractivist Settlement Projects
13	PAF	Forest Settlement Projects
14	PDS	Sustainable Development Projects
15	PIC	Integrated colonization projects
16	PDRXS	Regional Development Plan for the Xingu, Brazil
17	POLONOROESTE	Programa de Desarrollo Integrado do Nordeste, Brazil
18	PPCDAM	Action Plan for Prevention and control of deforestation in the Legal
19		Amazon
20	PT	Workers Party, Brazil
21	REDD	Reduced Emissions from deforestation and forest Degradation
22	REDD+	Reduced Emissions from Deforestation and forest Degradation, plus the
23		sustainable management of forests, and the conservation and enhancement
24		of forest carbon stocks
25	SEMOSF	Secretaria Municipal de Organização Social e Fundiária, Manaus, Brazil
26	SUDAM	Superintendência do Desenvolvimento da Amazônia
27	TIPNIS	Isobore Sécore National Park and Indigenous Territory
28	TVA	Tennessee Valley Authority
29	United States	US

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- | | | |
|---|-------|---|
| 1 | USAID | U.S. Agency for International Development |
| 2 | WB | World Bank |
| 3 | WWII | World War II |
| 4 | | |
| 5 | | |

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1 **KEY MESSAGES**

- 2 • The Amazon has been treated as an experimental laboratory for modernization and
3 development policies and politics since World War II. The undifferentiated green on
4 maps belies the complexity of regional economies, accelerated dynamics of land use
5 change, rapid urbanization, and structural changes that have accompanied Amazonian
6 integration into national and international politics and economies. The current context
7 includes accelerated globalization and international commodity demand, expanding
8 environmental concerns, and planetary change.
- 9 • Modernization policies and large-scale regional planning initially unfolded under mostly
10 authoritarian Pan-Amazonian regimes, emphasizing national integration as well as Cold
11 War politics. This stimulated early infrastructure investment (1960s) as well as state and
12 private colonization programs to physically occupy the Amazon and serve as alternatives
13 to agrarian reform in more settled and contested areas. In addition, a series of targeted
14 and highly subsidized regional corporate economic programs and growth poles were
15 advanced to promote mining, hydrocarbons, energy, agroindustry, and livestock. These
16 settlements often impinged on Indigenous peoples and local communities (IPLCs)
17 territories.
- 18 • The idea of “modernization” emphasized deep structural change supported by an
19 understanding of nature as an inert platform or as an obstacle to development, largely
20 lacking in value. This was the basis for development policies and planning in the
21 Amazon, that were largely indifferent to its ecologies, and perceived the Amazon as a
22 demographic void.
- 23 • Yet, the Amazon was not empty. It has been inhabited for at least 12,000 years and is
24 currently occupied by a diversity of people with multiple livelihood strategies. However,
25 land-use in the Amazon is increasingly dominated by simplified monocultural systems,
26 and mineral, hydrocarbon, and timber extraction, largely export-oriented.
- 27 • Amazonians live in ranches, farms, mining camps, Indigenous and traditional territories,
28 forests, and villages, but most live in the region’s cities. Complex dynamics of circular
29 migration, multi-sited households, and polyvalent income strategies including state

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1 transfers and intra-family remittances underlie strong rural-urban interactions and
2 widespread forest/river dependence in the Amazon.

3 • Erratic public policy, limited technical support, uncertain tenure, and violence, combined
4 with the volatility of small farm prices, have contributed to the emergence of multiple
5 forms of clandestine economies (Gootenberg 2021). Rural instabilities and contested land
6 rights have also been instrumental in fueling migration throughout the region.

7 • The insights and interests of local people, both urban and rural, native and migrant, are
8 often overlooked. But these groups are generating alternative approaches to manage and
9 restore landscapes, elaborating new marketing systems, and forms of governance. These
10 systems can serve as the models for a necessary shift in the approach to and practices of
11 sustainable development in the Amazon.

12

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1 ABSTRACT

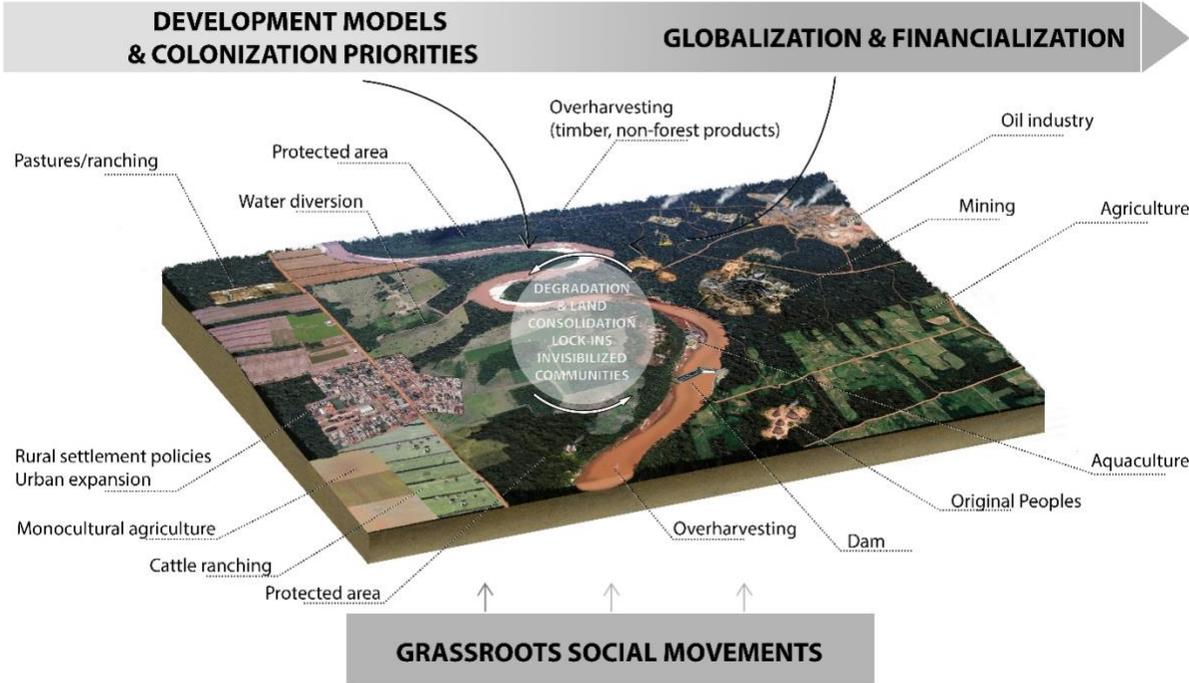
2 This chapter reviews the often-invisible powerful processes that drive social and ecological
3 change in Amazonia, and the diverse peoples who inhabit its landscapes. It explores the large-
4 scale development ideologies of modernization, and the policy tools that were deployed to carry
5 them out. Outlining general periods of macro policy shifts, it shows the evolution of the
6 framework for today's complex interactions between large-scale agroindustry, mining, and
7 hydrocarbons, and diverse small-scale livelihoods, as well as the clandestine and illicit
8 economies of land grabbing, gold, coca and timber, and their operation in globalized and
9 regional economies. While Pan-Amazonian governments have oscillated between authoritarian
10 and more or less democratic forms of governance since the mid 20th century, more democratic
11 transformations and trade opening have led to interactions among a wide array of new civil
12 society actors---NGOs, social movements, rural syndicates -- as well as powerful actors such as
13 national and international technical, financial and corporate groups and international
14 conservation organizations. New international sources of funding expanded well beyond
15 multilateral or traditional United States (US) bilateral aid to new sources of financing: China,
16 hedge funds, and new forms of both informal and corporate production lending. Integration into
17 numerous globalized markets and finance have had enormous effects on Amazonian politics and
18 economies at all scales. These dynamics have generated new kinds of policies, political
19 framings, institutions, and economies, and restructured old ones, reshaped forms of urbanization,
20 settlements, and land regimes, and stimulated extensive and controversial infrastructure
21 development. On the ground, diverse Amazonian peoples have largely suffered the impacts of
22 these processes, and have continued to adapt to changing circumstances while fighting to
23 advance their own proposals for alternative forms of Amazon conservation and development.

24 *Keywords:* Development policy; globalization; urbanization; settlement; clandestine economy;
25 deforestation; roads; dams; social movements

26

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1 GRAPHICAL ABSTRACT



2
3 **Figure 14.0** Amazonian landscapes are shaped by development policies, globalization, financialization,
4 and grassroots social movements.

5

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1. BIG PROCESSES AND INVISIBLE AMAZONIAN PEOPLES AND LANDSCAPES

Far from being a homogenous forested river basin, the Amazon is full of diverse peoples and landscapes, often hidden from the outside perspective that tends to see the region as a vast forest devoid of human inhabitants. People on the ground make a living from the forests, rivers and lakes, wildlife and trees, crops they grow and animals they raise after clearing the forest, and minerals and oil they dig from under the ground. They live in ranches, farms, mining camps, Indigenous territories, and villages – but mostly in the region’s cities and towns, invisible in the public’s imagination of the Amazon as an untouched forest. Meanwhile, politicians, businesses, environmentalists, researchers, and financiers exert their influence over the region, hidden from sight in cities and countries far removed from the forest itself. Unnoticed, Amazonian people’s ways of living, the places they live, and their quality of life have been transformed, swept up in nation-building projects and global development in recent decades.

Powerful outside forces and their impacts interact in complicated ways with the complex circumstances in each different corner of the Amazon, where particular histories have evolved over millennia. To see Amazonian people, how and where they live, and how that is changing under the impact of large-scale deforestation, land degradation, massive fires and rapid urbanization, and rapidly changing regional politics and to clarify what forces and actors turned Amazonia into a place in crisis in terms of climate, species extinctions, and development inequalities and contradictions, this chapter sheds light on the major ideas, actors, and practices that have shaped its current dynamics.

We begin the chapter by discussing, in Section 2, the ideas of development and the politics that from the 1940s to the end of the 1980s actively shaped theoretical and political approaches to Amazonian transformation. Subsection 2.1 introduces theories of development and modernization that have shaped recent Amazonian history, their emergent properties and large processes, as well as problems which remain “off the radar” - poorly studied and somewhat invisible - but which are major features of Amazonia’s socio-economic and socio-environmental dynamics. Subsection 2.2 focuses on large-scale development policy approaches that have changed Amazonian regional economies since the 1960s and via large-scale infrastructure programs help define the current development trajectory. They establish the preconditions for the

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1 economic, ecological and social dynamics that have shaped new and continuing processes of
2 settlement, urbanization, infrastructure, state expansion, globalization, new forms of investment
3 and finance, and rising social movements.

4 In Section 3 the chapter deals with more recent dynamics evolving since the 1990s. The structure
5 of regional economies in different parts of Amazonia varies a great deal, as will be discussed
6 later in this chapter, and in Chapters 15 and 17. What most country data suggest, however, is that
7 there have been significant structural changes in agricultural and regional economies since the
8 accelerated integration of Amazonia into regional, national and global economies; privatization
9 of public lands and expropriation of commons; and deforestation of protected areas and lands of
10 Indigenous peoples and local communities (IPLCs), as will be discussed in Subsection 3.1.
11 While human development indices have improved in many areas (schooling, access to water and
12 health care) through the extension of national programs as well as the basic income programs,
13 like Bolsa Familia, inequality has also increased (Richards and VanWey 2015) a situation
14 brought to the fore during the COVID-19 pandemic.

15 The differing national contexts and politics reflect a wider role of Amazonia and its commodities
16 in planetary politics and national economies. To understand this, in Subsections 3.2 and 3.3 we
17 focus on emergent drivers, such as new forms of globalization, new types of financing for
18 projects and commodities, new kinds of export dependency and clandestine economies,
19 highlighting the hidden properties that are inherent in the current transformations (Box 14.1). We
20 also discuss urbanization, settlement patterns, and infrastructure development as emergent
21 processes, both as new drivers and outcomes of change. We end in Subsection 3.4 with a
22 discussion of changing patterns of urbanization and settlement, the complex livelihood systems
23 Amazonian people have developed in response to the massive transformations underway in the
24 region, and the social movements these people have organized to push back against current
25 conservation and development policies to propose promising alternative paradigms for Amazon
26 governance and sustainability.

2. MODERNIZATION AND ITS DISCONTENTS

2.1. Development and modernization paradigm

29 Amazonia, like much of the tropical world in the 1950s, was the object of “meta” thinking about

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1 development. The post-World War II (WWII) world seemed malleable to transformation from its
2 existing systems of wealth and poverty into the modern world. The idea of “development” or, as
3 a more colonial idiom had it, “improvement,” as applied to the tropical world, implied a
4 transformation via “modernization,” meaning, the pathway to change from under-developed or
5 traditional societies into a uniform kind of modernity, essentially urban, industrial, largely
6 secular, and organized by laws, institutions and markets. This paradigm required modern
7 bureaucratic states framed by nationalist identity rather than colonial administrations or societies
8 structured by bonds of kinship, identity, patronage or tradition, and many policies were put into
9 place to disrupt them. Modernization was also seen as a mechanism to counter the unevenness of
10 regional economies within nations, since the sleek modernism of Latin America’s urban capitals
11 was regularly contrasted with imagery of depressing poverty in its rural societies (Albuquerque,
12 1999; Buckley, 2017).

13 The modernization paradigm involved a shift from relatively non-capitalist or traditional forms
14 of society and institutions into modern economic social and political structures: non-waged labor
15 to waged and monetized forms; emphasis on private property regimes and institutions over
16 collective property; shifts in structures and economic “engines” from rural to urban; cultural
17 change in terms of individualization, secularization and new values and forms of consumption;
18 monetization and privatization of what had been collective resources; and industrialization. This
19 modernization process depended on strong state intervention in the economy and many other
20 social structures.

21 At least until the early 1990s this modernization paradigm was seen as the dominant way that the
22 issues of so-called Third World poverty, understood to be expressions of underdevelopment,
23 could be resolved through the powers of technocratic science and planning (Rostow 1971).
24 Regional inequalities and poverty could be overcome by constructive means through accelerating
25 economic growth and structural change. These would be part of *national projects* rather than
26 colonial programs, with revenues accruing to national coffers rather than foreign metropolises,
27 thus developing state capacity as well as the economy, and moving beyond natural resource
28 dependency as central economic drivers.

29

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1 *2.2. Modernization imperative and its toolbox: Development planning, programs and* 2 *processes*

3 To put into practice this modernization vision involved using an array of instruments that had
4 worked in rebuilding Europe via the Marshall Plan, and for poverty alleviation in the United
5 States (The Tennessee Valley Authority – TVA – and New Deal) which very specifically
6 focused on natural resources zoning and hydropower development (Miller and Reidinger, 1998;
7 Ekbladh, 2002; Ekbladh, 2011; McMahon et al., 2017). This fit well with both authoritarian and
8 civil governments in the region because of the luster of technocratic approaches compared to the
9 more personalist trajectories that had characterized the first half of the 20th century (Burns,
10 Skidmore et al. 1979, Skidmore 1986). The large-scale plans promulgated throughout the
11 Andean and Brazilian Amazon mimicked the more general five-year planning models of Europe
12 and the communist bloc. The bureaucratic states would expand their territorial powers, with
13 Amazonia as a development planning “laboratory,” and a bulwark against communism, a key
14 concern in the Cold War period.

15 The forms of intervention involved the coordination of banking, investment, and infrastructure
16 through regional planning agencies that would override coteries in favor of a national project and
17 national political control. These regional frameworks would provide a kind of geographical
18 coherence to the development enterprise and remove control from local actors and their
19 patronage circles (León, Araújo et al. 2015, Sudério 2020). A second important strategy was
20 “growth poles” inspired by the ideas of French economist Henri Perroux, the sites of specialized
21 investment and supporting infrastructure for Amazonia, accompanied by development corridors
22 between specific poles and regions (Perroux, 1955; Mønsted, 1974). Scientific assessment of
23 natural resources and land suitability served as guiding mechanisms in the development of
24 resource and land capability zoning inspired by the large-scale resource planning of the TVA.
25 Targeted social investment (agro-industrial and mining development, and later agrarian reform
26 or its kindred programs) would be used to ameliorate uneven development, as well as state
27 legitimating social programs such as agrarian reform efforts.

28 Facing Amazonia, regional planners focused on the idea of national integration as the first step of
29 what would become a larger concern with river basin planning. Brazilian military and US

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1 planners dreamed of similar transformations of Amazonia by means of a kind of tropical TVA
2 (Hecht and Rajão, 2020; Garfield, 2013; Buckley, 2017). The integration of the TVA approach
3 with its basin-wide scale and organizing, and centralized management agencies for regional
4 growth poles, became the model for much of the river-basin planning in Latin America, best
5 exemplified by Ciudad Guyana and the huge Macagua Dam in Venezuela, as well as broadly
6 inspirational for tropical planning and agricultural development more generally, as in Bolivia
7 with the planning agency Cordecruz, in Colombia with the Corporacion Araraquara, as well as in
8 Ecuador and Peru. In Brazil, the powerful agency SUDAM (Superintendência do
9 Desenvolvimento da Amazônia) - in many ways the model for the rest of Pan Amazonia, was the
10 coordinating agency.

11 In these modernization approaches, ecosystem was simply classed as natural resources - a
12 platform on which the development visions of modernity were gridded out. Ecological simplicity
13 was created through land transformation, as diverse ecological and livelihood systems, mostly
14 illegible to the state as well as outsiders, were mapped into large scale grids and planning spaces
15 to be occupied by ranching and colonist monocultures. This kind of modification depended on
16 what anthropologist James Scott has called the “drive for legibility” by authoritarian modernist
17 states (Scott, 1998).

18 The technocratic strategy, however, as was the case for the TVA, involved resource assessment
19 for new development planning. While there had been some cartographic endeavors during World
20 War II by US and Brazilian aircraft, the scale and the frequent cloud cover required a different
21 technology, one which, in the end, would become the main means through which Amazonia was
22 apprehended by the states that claimed its territories. This new technology of remote sensing,
23 which begun with Projeto RADAM culminating in reports in the early 1970s, represented a
24 fundamental shift in Amazonian studies and resources assessment via remote sensing, a central
25 technology change whose impact is apparent throughout this report.

26 *2.2.1. Resource assessment, remote sensing, and modernization: the rise of land use suitability*
27 *zoning, and conservation set-asides*

28 Environmental degradation was of limited relevance in modernization discourse, except insofar
29 as it related to issues of efficiency and to regional planning, and a few remote National Parks.

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1 Resource assessments, such as *Projeto RADAM* (1972), were carried out to provide a
2 comprehensive survey, largely focused on minerals, soils and forest types, and to examine the
3 physical geography in order to upgrade the regional cartography of resources and boundaries
4 (Herrera Celemin, 1975). Remote sensing was employed by the Brazilian military government as
5 a strategic input to the national integration project, and also followed TVA practices. The rich
6 information provided set the stage for the massive remote sensing enterprise upon which all of
7 the Amazon countries embarked, especially when satellite remote sensing and computational
8 capacities expanded. These produced the development of national remote sensing and land use
9 change monitoring laboratories such as Brazil's world-class INPE (National Institute for Space
10 Research) as well as the Amazon Large-scale Biosphere Atmosphere project (LBA) that was
11 instrumental in deciphering the dynamics of Amazonian climate (Nobre et al., 2009). Remote
12 sensing, and the models developed from satellite data, have become key in understanding the
13 spatial dynamics of land-use change and its implications (e.g., fragmentation, carbon dynamics).
14 The powerful remote sensing and computational technologies meant that significant analyses
15 would take place remotely, with some ground truthing, displacing what had previously been the
16 *sine qua non* of Amazonian research: fieldwork. While many scholars continued to explore
17 Amazonia from the ground up, and continued to contribute to understanding of the historical
18 importance of people's co-evolution with Amazonian natural systems, much of the
19 environmental research continued to focus on "pristine" Amazonian nature, without humans.

20 Remote sensing projects like *Projeto RADAM* were unable to capture many aspects of human
21 occupation, especially those traditional populations whose livelihood was based on trees, tubers,
22 bushmeat, and fish, until much later in the development of remote sensing technologies. The
23 images of a vast agglomeration of resources underscored the idea of a demographic void and,
24 fundamentally, of an experimental space that could be transformed into something more
25 scientific, uniform, and ordered, according to a centralized vision (Silva, 1957; da Costa Freitas,
26 2004; Silva, 1967; Silva, 2003). This dynamic set into play a continuing contest for control of
27 regional resources management between existing populations, the state, and immigrants, and
28 new regional aspirations by both local inhabitants through claims for land, rights and citizenship,
29 along with the ambitions of more distant coteries.

30

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1 2.2.2. *ISI and military modernizations in Amazonia (1960-1990): Geopolitics, agro-industry and* 2 *agrarian reform alternatives*

3 Import Substitution Industrialization (ISI) was the main meta-policy framing for much of the
4 mid-century period in the Pan-Amazon.ⁱ The initial phase, exemplified by Brazilian president
5 Kubitschek's promise to modernize "50 years in five," included the first major Amazon
6 infrastructure project: the Belém-Brasília highway, built between 1958-60, becoming the
7 prototype for the Trans-Amazon highway which was also part of the system of "highways of
8 integration" that formed part of the long strategic plans elaborated by the military. These
9 infrastructure ambitions continued after the period of military rule in Brazil (1964-1985), when
10 integration ceased to be for national integration, but rather integration of Amazonia into large-
11 scale export corridors, as we discuss further on.

12 Military developmentalism unfolded in a series of five-year plans across Brazilian Amazonia
13 that stressed integration through road building, and supported large-scale rural enterprises (the
14 key investment sectors of minerals, and ranching with significant subsidies), ramped up the
15 technical/scientific institutions for agriculture and tropical research (Dalmarco et al. 2015, Klein
16 and Luna 2018), developed growth pole hubs and regional development coordination, and
17 provided significant but also erratic credit lines for regional occupation and a highly subsidized
18 export assembly and duty free hub in Manaus (Kanai 2014). For reasons of legitimation, regional
19 food supply, and geopolitical occupation, and also to deflect the demands for agrarian reform,
20 significant colonization projects were implemented in Brazil, Peru, Columbia Ecuador and
21 Bolivia, engaging state-run, private and spontaneous colonization, which we expand on later
22 (Brazil 1976; Barbira-Scazzocchio - 1980; Becker 1982; Kohlhepp 2001; Intrator 2011).
23 Supported by bilateral international funding from Europe and the US, as well as multinational
24 funding, the early interventions development process also produced extensive deforestation,

ⁱ Evolving from a critique of natural resource exports which we discussed earlier, it was argued that such economies condemned countries to a skewed role in the international division of labor and underdevelopment. ISI promoted policies that were meant to expand the national industrial base through four main stages: (1) domestic production of previously imported simple nondurable consumer goods; (2) the extension of domestic production to a wider range of consumer durables and more complex manufactured products; (3) the export of manufactured goods and continued industrial diversification as part of a modernization strategy; and 4) modernization of agriculture to free up labor for the emerging industrial sectors. A range of policies around fiscal incentives, floating currency rates, and new infrastructure that favored industries and sectors guided by growth poles would drive the economy and its linkages forward, shifting development from its heavy emphasis on natural resources and international markets, to industrialized goods for local consumption, and manufactures in its export mix.

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1 environmental degradation, human rights abuses, and invasion of traditional and Indigenous
2 people's lands, as the Brazilian Amazon exploded into land conflicts (Almeida, 1992; Hecht and
3 Cockburn, 1989; Schmink, 1982; Schmink and Wood, 1992; Jepson, 2006; Osorio, 1992;
4 Fearnside, 1986a). This period, from the mid 1960's until the 1990s—a generation--- evolved
5 with minimal environmental regulations and minimal enforcement of the few laws there were.

6 The colonist agricultural systems, in general initially based on rice production, were also
7 problematic: plagued by production and marketing problems, labor issues, and agronomic
8 failure, with problems of soil decline and low yields, using varieties and practices not adapted to
9 local conditions. All these issues were exacerbated by titling insecurities, rural violence, and
10 very high colonist attrition rates and lot of turnover (Fearnside 1986b; Hall 2000; Murphy 2001;
11 Etter et al. 2008; Fearnside 2009, Fearnside 2001b; Pacheco 2009; Acker 2014; Carrero et al.
12 2020).

13 Large-scale deforestation was increasingly becoming an international issue throughout
14 Amazonian terrains from the 1990s forward, as scientific literatures explored in greater detail the
15 dynamics of standing forests, and the consequences of clearing at the local, regional, and
16 increasingly, planetary level. This linking of social issues of development with environmental
17 concerns became increasingly acute and internationalized in the controversies associated with
18 the development of Brazil's *Polonoroeste* program, the paving of the Cuiaba-Porto Velho
19 highway (BR-365), and the continuing problems on the Transamazon highway and in Ecuador,
20 Peru and Bolivia's active colonization zones. These controversies allied international
21 environmental groups, human and Indigenous rights organizations with national environmental
22 and social movements that, along with urban industrial unrest and the corruption within the
23 military, as well as the distress over torture and political killings, and the clamor for democracy,
24 eventually undermined authoritarian regimes as democratization spread more widely (Luciak
25 2001; Hagopian and Mainwaring 2005; Hecht 2006; Zimmerer 2006; Hochstetler and Keck
26 2007; Hecht, 2011). Military developmentalism in Pan-Amazonia had many different variations,
27 but similar approaches in other countries also were based on ideas of territorial
28 integration/occupation via early infrastructure development, large-scale transfers of public land
29 to private owners (discussed in Chapter 15), promotion of colonization programs, a leading
30 sector (oil, mines, sugar, livestock), Cold War politics, and supporting massive land use changes

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1 and highly conflictual regional processes of territorial expropriation and local repression
2 (Alvarez-Berrios et al., 2013, Bebbington, 1993; Brondizio et al., 2009; Andersson and Gibson,
3 2007; Arrueta Rodríguez, 1994; Assies, 2002; Blanes Jiménez and Flores Céspedes, 1983;
4 Bottos, 2008). In most cases the environmental problems, human rights abuses, other forms of
5 repression and serious corruption problems stimulated national mobilizations and alliances with
6 other parts of civil society including labor unions, and were instrumental in the region's rise to
7 democracy and writing of new constitutions (Hecht and Cockburn 1989; Schmink and Wood
8 1992; Kingstone and Power 2000; Hagopian and Mainwaring 2005; Hochstetler and Keck
9 2007).

10 There was also a military environmentalism, as far as it went. Generally indifferent to
11 deforestation *per se*, the Brazilian military regime was sensitive to international pressure, and to
12 the issues raised by rising conditionality in international loans starting in the mid-1980s, that
13 raised concerns about human rights, Indigenous territorial rights, traditional people's resource
14 rights, and environmental concerns associated with species extinction and climate change. In part
15 this was reflected in the creation of National Parks during the 1970s, so that until the early 2000s
16 and Brazil's President Inácio Lula da Silva (Lula) administration, the military period had been
17 considered the golden age of Amazonian National Park creation (Padua and Quintao, 1982).
18 Indigenous lands also had to be demarcated, although at a leisurely pace, in order to diminish the
19 concerns about human rights abuses during the period of military developmentalism.

20 Our review of political economies of the 20th century and political ecologies of different
21 Amazon interventions helps us understand what we might call "Amazon Ascendency (Box
22 14.2): how a region that had been seen as a backwater has become a crucial economic presence
23 in national accounts, and was increasingly a driver of national social, economic and
24 environmental policy issues beyond gross domestic product (GDP). New concerns with
25 legitimacy, social inequalities, and uneven patterns of development could be attenuated by
26 intervening with Amazonian programs of multiple types, paving the way for both large and
27 small-scale producers.

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1 2.3. Transition, constitutionalism and early neoliberalism

2 The 1980s are often used as a marker of the shift from authoritarian to nominally democratic
3 politics and regimes in Latin America, although modernization ideas did not actually recede.
4 Instead, new approaches were augmented by new scientific framings of environment, history,
5 ethnography, and social movements that challenged the technocratic orientation and planning
6 models that had dominated Amazonian interventions for a generation. This meant the end of the
7 Import Substitution Industrialization model of development, which had been highly centralized,
8 focused on internal markets, urbanization and industrial expansion, and tariff and currency
9 controls. The problems of cronyism, human-rights violations and the marginalization of an
10 emerging new entrepreneurial class undermined the legitimacy of these kinds of rules and rulers
11 (Guidry et al. 2000; Hochstetler and Keck 2007). This shift produced Constitutional Conventions
12 and an emphasis on the more market-oriented, decentralized, privatized economic exigencies of
13 the Washington Consensus - a necessity for international finance - and early neoliberalism
14 throughout the Amazon countries.

15 During the 1988 Brazilian Constitutional Convention, the articulation of inhabited landscapes as
16 conservation spaces, and the idea of forest peoples as forest guardians and defenders, gained
17 salience, and were incorporated into land laws and the creation of legislative frameworks and
18 institutional development for agro-extractivist reserves, sustainable development settlements,
19 historical communities and their territorial claims, and better recognition of Indigenous land
20 rights.

21 Indigenous people and local communities successfully pushed for conservation approaches, laws,
22 and institutions that recognized the important role of historical Amazonian populations in both
23 creating the Amazon's ecological complexity as well in protecting forested landscapes (Balée
24 and Erickson 2006; Nepstad et al. 2006; Vogt et al. 2015; Levis et al. 2018; Maezumi et al. 2018;
25 Brondizio et al. 2021). New ways of thinking about the role of Amazonian forests focused on
26 global and regional climate dynamics, environmental services, expanded ecological economics,
27 recognition of the rights of nature, and concerns over environmental justice (Conklin and
28 Graham 1995; Nogueira et al. 2018). In addition to new constitutions, this period saw the
29 creation of new national environmental agencies, the emergence and institutionalization of the

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1 idea of socio-environmentalism, and radically reconfigured Amazonian conservation strategies,
2 as discussed in Chapter 19. Socio-environmental politics are now part of every constitution of
3 every Amazonian country since the early 1990's, articulated through concepts like the rights of
4 nature, and a substantive recognition of the conservation value of inhabited landscapes.

5 **3. RECENT DEVELOPMENT AND POLITICS**

6 *3.1. The influence of political opening, mobilizations and environmental politics, and the fall* 7 *and rise of deforestation*

8 The politics of the 2000-2020 period reflected the integration of many emergent factors that
9 stimulated new social, institutional and political structuring. The response to these complex
10 pressures and changes was not uniform in Pan-Amazonia, but it produced new ideologies and
11 strategies that moved beyond both the traditional conservation modes and standard development
12 frameworks. As mentioned in Box 14.5, the importance of new forms of land rights for
13 Indigenous peoples and local communities, especially Afro-descendants, forest product
14 extractors, river and lake communities, and others legitimized by long historical occupation,
15 created both cultural and political spaces, a kind of forest citizenship. In Bolivia and Ecuador,
16 when writing their constitutions, ideas of the Rights of Nature (the Pachamama) and ways of
17 living not focused on accumulation but rather, living well, Buen viver, were incorporated into
18 the constitutional and political language.

19 Yet, while socio-environmentalism increasingly influenced Amazonian policy, macro-
20 development economic policies associated with the “Washington consensus” or neoliberalism
21 worked counter to these approaches through their deregulatory stances, limitations on state
22 actions, privatization, extensive national opening to international investment, political
23 decentralization, and tariff-free trade. The neoliberal period in Amazonia coincided roughly with
24 an increasing rise of Chinese and European engagement and investments in the economy,
25 including as well a “China /Asia shock,” as inexpensive high-quality Chinese and other Asian
26 manufactured imports undermined many national industries, and China and the EU became more
27 involved in the economies of the Amazonian countries. This was also reflected in accelerated
28 demand for raw materials, especially soy and beef (de Waroux et al. 2019). The 1990s and post-
29 authoritarian transition period reflected the institutional weakness of civil society that had been

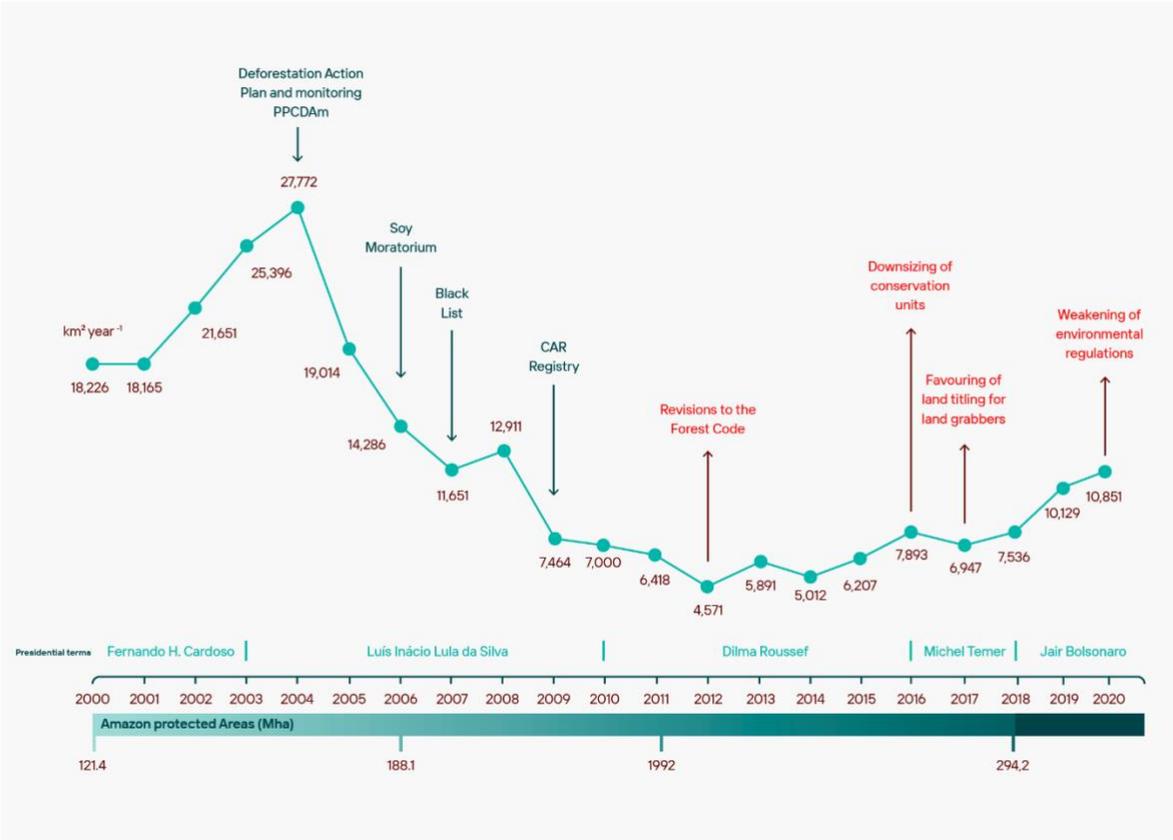
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1 repressed during the authoritarian times, and the undermining of the state as part of
2 macropolicies, which more or less left markets as the central organizing institution.

3 Instability in the manufacturing sectors triggered a more erratic policy context, and shifted the
4 ideas of the economy away from what had been import-substitution thinking, to export-led
5 development based on raw or minimally processed materials - what was later called the
6 “commodity consensus” (Svampa 2019), or “extractivism”. This expansion coincided with a
7 commodity boom largely led by demand from Asia, and also a dynamic of increased national
8 and global environmental concern, as environmental justice issues animated local politics (IPLC,
9 including Afro-descendent communities, whose lands and livelihoods were increasingly
10 threatened). These dynamics were reflected in greater activism in both rural and urban domains,
11 and pressure for social investments and new institutions for socio-environmental support. This
12 produced a shift into a development regime now called “Neo-Extractivism” which involved
13 continuing to expand exports while engaging fiscal transfers to be used as a means of poverty
14 alleviation. These included state transfers such as Bolsa Familia in Brazil, conditional cash
15 transfers found throughout Latin America---a social transfer that provides a guaranteed income
16 to mothers conditioned on children’s schooling and child vaccination, as well as funded
17 retirements, increased minimum wages and expanded social services.

18 In this context “Socio-environmentalism” represented a rethinking of the nature of conservation,
19 which could include inhabited environments of many kinds oriented to sustainable and resilient
20 forms of development. Because of its environmental and social justice components, as well as
21 the increased international concerns over climate change and deforestation, international
22 conservation and environmental activists began large scale investments oriented to addressing
23 the idea of maintaining standing forests, ~~seen~~ as social as well as biotic places. This represented
24 novel forms of rural investment that went well beyond the production credits previously
25 provided for small farmers. These macro-changes in the development models had significant
26 policy impacts throughout Amazonia, but perhaps the most closely studied has been the
27 Brazilian case. Fig 14.1 illustrates these dynamics.

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1

2 **Figure 14.1** Deforestation in Brazilian Amazon in response to policy changes, 2000-2018.

3 Adapted from: PRODES 2020, Soares-Filho and Rajão 2018.

4 Figure 14.1 shows how important policy changes in Brazil led to dramatic declines in

5 deforestation after a peak in 2004, and how subsequent policy reversals since 2016 have been

6 accompanied by rising deforestation. Annual deforestation rates in the Amazon dropped by 80%

7 from 2005 to 2012, due to commodity price decreases and unfavorable currency exchange rates,

8 policy interventions, significant institution development at local and national levels, wide

9 participation of civil society in sustainable development initiatives, voluntary market agreements,

10 expansion of protected areas, international support for forest based initiatives such as the Pilot

11 Project for the Amazon, much better monitoring of deforestation, and significant “leakage”

12 (displacement of major deforestation processes to Cerrado zones in Brazil, and to Bolivia and the

13 Chaco of Argentina), which all aligned to reduce Amazonian clearing in Brazil (Fearnside 2007;

14 Hecht 2012; Hecht 2014; de Waroux et al. 2016; Davenport et al. 2017; Duchelle et al. 2017;

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1 Lambin et al. 2018; Nogueira et al. 2018; de Waroux et al. 2019; Silva et al. 2020). Nevertheless,
2 by 2014, with the impeachment of President Dilma Rousseff, and the emergence of a powerful
3 agribusiness coterie (the *Bancada Ruralista*), deforestation began to climb. By 2019 the annual
4 deforestation rate in Brazilian Amazon had increased by 122% since the low point in 2012
5 (Carrero et al., 2020), and the numbers were continuing to increase throughout 2020 and 2021.

6 The current development model---Neo-extractivism--- under the Amazonian situation's minimal
7 diversification within the main export sectors has been usefully summarized by McKay (2017):
8 (1) large volumes of materials extracted, destined for export with little or no processing; (2)
9 value-chain concentration and sectoral disarticulation (3) high intensity of environmental
10 degradation; and (4) the deterioration of labor opportunities and/or conditions. McKay and other
11 argue that "agrarian extractivism" is a politically and analytically useful concept for
12 understanding new landed dynamics and trajectories of agrarian change. "Rather than a form of
13 industrial agricultural development which implies value-added processing, sectoral linkages, and
14 employment generation, agrarian extractivism challenges this dominant discourse, revealing...its
15 negative implications for rural development" (McKay 2017).

16 Pan-Amazonian deforestation is volatile for a number of reasons, both intrinsic to the region, as
17 well as reflecting interactions with broader national ambitions and international processes. It
18 clearly responds to policy and to national and international economic and political pressures, but
19 it also reflects how these unfold on the natural resource base and through socio-environmental
20 systems at different scales. While deforestation is the central concern now, it cannot be addressed
21 without understanding the larger frameworks that justify and drive forest clearing and that
22 contribute to larger instabilities. We emphasize the variation in Amazonian regional economies,
23 structures, logics and production systems, the political coteries that have benefited, and the forms
24 of resistance and economic alternatives that have emerged, both legal and illegal, in the
25 construction of the current Amazon, as old pathways have given way to multiple new drivers of
26 change.

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1 3.2. *Old pathways, new drivers*

2 3.2.1. *New Circuits of Globalization*

3 Globalization refers to the integration and movement of multiple commodities, capital, people,
4 technologies, ideas and ideologies, discourses and forms of representation that can structure and
5 transform localities and economies, but also hybridize with local, regional and national spaces.
6 At the current moment, the expansion of soy, oil palm, beef, exotic pasture grasses and
7 eucalyptus, new mining concessions and the large number of oil and gas blocks that have
8 proliferated in the Andean Amazon are forms of modern “ecological imperialism” into
9 Amazonia, transforming national and global ecologies, commodities and economic transfers.ⁱⁱ
10 Amazonia, however, has been integrated into large-scale circuits in the movement of goods for
11 thousands of years, with the transfer of Amazonian germplasm, feathers, medicinal plants,
12 stones, gold artifacts, metals and technologies throughout Latin America (Whitehead, 1994;
13 Whitehead, 1990; Whitten et al., 1997).

14 Since the 2000s, global markets, rather than internal development strategies, have increasingly
15 driven land-use processes in the Amazon. In particular, global markets for timber, pulp and
16 paper, meat, drugs, oil, gold and oilseeds have driven larger and faster transformations of the
17 Amazonian basin than in any other period. More industrialized countries have “off-shored” their
18 environmental footprints toward the Amazonian region, as with the expansion of oil palm for
19 Dutch biofuels, soy for China, and beef in Asia, choosing to exploit the Amazonian region in
20 place of further degrading their own resources (See for example Rajao et al., 2020; Austin, 2010;
21 Rudel, 2007; Penderill, 2019; Klinger, 2018).

22 While certain forms of agro-industrial production can generate development where they involve
23 value-added processes (Garrett and Rausch, 2016; Richards et al. 2015; Richards and VanWey
24 2015), they generally perform poorly in terms of generating increased employment and
25 improved access to services, and tend to exacerbate inequality (Weinhold et al., 2013). In this
26 same vein, ‘model municipalities’ emerged as nodes in the evolution of a governance frontier in

ⁱⁱ Ecological imperialism is a concept developed by Alfred Crosby (2004), who argued that settlers were successful in colonizing other regions because of their accidental or deliberate introduction of plants, animals and diseases that deeply shifted local ecologies.

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1 the Amazon, advancing a neoliberal paradigm that replaced more direct democratic measures
2 (such as participatory budgeting) with municipal governance that regulated and stabilized
3 ‘green’ agro-industrial development (Schmink et al., 2017; Thaler et al., 2019). The re-
4 democratizing “wave” of governments of Amazonian countries, and the ascension of socio-
5 environmental policies protecting IPLCs and the region’s natural resources, appears to have been
6 largely played out by 2020, with clear signs of political setbacks as the region as a whole has
7 become more integrated into global economies and national politics drifted into more coterie
8 dynamics.

9 While new forms of financialization and globalization were unfolding in the context of powerful
10 economic forces shaping export markets in agricultural commodities, failures in other
11 development arenas, especially as regards employment, as occurred so broadly elsewhere in
12 Latin America, caused clandestine economies to surge forward. Further new forms of
13 financialization linked to more international resources have come more strongly into play.

14 3.2.2. Amazonian Financialization

15 An important new aspect of Pan-Amazonian dynamics has been the transformation of the
16 financial sector in the Amazon. The role of South American development banks and state-owned
17 commercial banks has decreased in providing loans and investment capital for agriculture,
18 agroforestry, timber and other forest product extraction, mineral extraction, and even
19 infrastructure construction. New private financial actors have started to play an increasingly
20 larger role in production, consumption, and conservation practices. This includes not only
21 greater participation of private commercial bank lending in the region, but also, and even more
22 importantly, the role of new financial actors, such as hedge funds, sovereign wealth funds and
23 pension funds, and new financial instruments, in shaping the development trajectories and
24 historical geography of the Amazon. By 2021, illegal Amazonian lands were being sold on
25 Facebook, and digital technologies had come to play an important role in facilitating illegal
26 market transactions.

27 In agricultural production and ranching, state-owned commercial banks (such as *Banco do*
28 *Brasil*) were the most important financiers of agriculture and ranching in the Amazon until the
29 1980s (Torres, 1996). But as soy monocultures expanded in the southern Brazilian Amazon

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1 during the 1990s (see Chapter 15), particularly over the degraded pastures cleared from the
2 Amazon forest in the states of Mato Grosso, Rondônia, and Pará, farmers started to rely
3 increasingly upon seed and agrochemical trading companies such as Monsanto, Bunge and
4 others for credit – often pre-negotiating a third or more of their future harvests at the moment of
5 purchasing their inputs for the year (Wesz Jr., 2016). In turn, this financialization of agribusiness
6 trading companies provided them with more dynamism in generating profits, and even making
7 speculative gains from commodity trading and farmland investment (Salerno, 2017). This
8 process unfolded alongside the deregulation of the banking sector in South American economies
9 since the 1990s (Stuart, 2000), and the rise of private equity funds, hedge funds, local
10 investment circles and investment banking worldwide (Wójcik et al., 2018), which began to see
11 natural resources and agribusiness in developing countries (particularly those with potential for
12 growth, such as Brazil) as ideal targets for investment (Visser et al., 2015). Consequently, when
13 soy displaced ranching in the Southern fringes of the Amazon (especially in Mato Grosso state),
14 private equity funds, pension funds, and other new financial actors became the leading providers
15 of capital (both from South America and beyond the region) to large-scale “land development”
16 and farm management companies (Oliveira and Hecht, 2016).

17 Similar transformations have taken place with regard to finance for infrastructure construction,
18 including not only roads and ports, but also, very significantly, hydroelectric dams in the
19 Western Amazon (Ecuador, Peru, and Bolivia) and southern Amazon (Brazil’s Tapajós and
20 Xingu basins) (Bárcena, 2016). Many of these infrastructure projects involving Brazilian
21 construction companies, especially the transnational giant Odebrecht, were recently swept up in
22 corruption scandals that reached into other Amazonian countries, toppling governments in Peru,
23 Bolivia, Ecuador and Brazil (Branford, 2016). Historically, large-scale infrastructure projects
24 have been financed by state-owned or multilateral development banks, among which Brazil’s
25 National Economic and Social Development Bank (BNDES) has played an outsized role in the
26 region, including in neighboring Pan-Amazonian countries such as Peru, Ecuador, Colombia,
27 and Venezuela (Rivasplata Cabrera et al., 2015; Hochstetler 2014).

28 There has been a notable shift in international development finance away from the Inter-
29 American Development Bank (IDB) and the World Bank (WB) towards the China Development
30 Bank and the China Export-Import Bank (Ray et al., 2019), in part because of the limited

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1 environmental or social conditionality on their loans. The latter are newcomers not only to the
2 Amazon, but also to the realm of international development finance, and so there has been
3 concern that the entrance of Chinese development banks may destabilize perceived gains in the
4 best practices for environmental protection and social responsibility adopted by the BNDES,
5 IDB, and WB (BankTrack and Friends of the Earth, 2012; Dussel Peters et al., 2018).ⁱⁱⁱ

6 Chinese finance is more responsive to government-to-government articulations and national-
7 level policies than to bottom-up social movement and non-governmental organization (NGO)
8 interventions (Ray et al., 2019). Consequently, this shift in an important origin of development
9 finance for large-scale infrastructure construction transformed the power balance among
10 Amazonian actors, empowering national elites and other actors outside the Amazonian region
11 who might benefit from those infrastructure construction projects, while avoiding the direct
12 negative effect of these projects, and weakening the relative strength of Amazonian Indigenous
13 peoples, social movements, and NGOs in the face of such mega-projects. In this way, China is
14 becoming a major force in Amazonian deforestation and environmental degradation (Fearnside
15 et al., 2013; Fearnside and Figueiredo, 2016), and is now the main trading and lending partner in
16 Amazonian Latin America.

17 Perhaps the most notable change regards the creation of new instruments for generating financial
18 dividends from conservation itself. In 2003, the FAO calculated the economic contribution to
19 greenhouse gas sequestration in the Brazilian Amazon rainforest to be worth \$US21 billion
20 annually, which motivated both Brazilian and international actors to “further invest” in
21 conservation for carbon sequestration. At the 2006 United Nations Framework Convention on
22 Climate Change Conference of Parties, the Brazilian government was able to launch a
23 partnership with European donors to establish (in 2008) the Amazon Fund (*Fundo Amazonia*), a
24 US\$1.1 billion financial vehicle for sustainable development and conservation. The Norwegian

ⁱⁱⁱ This is somewhat ironic given the troubled history of BNDES sustainable development lending in the Amazon (Bergamini Junior, 2003; Fearnside, 2017d; Gallagher and Yuan, 2017), even as recently as the 2000s, with the high-profile disputes about the Belo Monte dam on the Xingu River (Fearnside 2006, 2017b, c, e; Diamond and Poirier, 2010; Jaichand and Sampaio, 2013; Bratman, 2014). The rise of Chinese development finance has been accused of provoking a “race to the bottom” in international standards and perceived best practices (Gerlak et al., 2020). The lack of concern for impacts is illustrated by the 2014 Chinese purchase of a 33% interest in the notorious São Manoel Dam in Mato Grosso, located only 700 m from the Kayabí Indigenous Land, where the Indigenous people were not consulted (in violation of Brazilian law and International Labour Organization (ILO) Convention 169). The São Manoel reservoir was filled in 2017, despite multiple licensing irregularities, and it is the scene of continuing tensions with the Indigenous people it impacts (Fearnside, 2017b, 2020).

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1 government was the main contributor, while the German development agency KfW and
2 Brazilian state-owned oil company Petrobras made smaller contributions. The crux of the project
3 is that financial transfers from the Amazon Fund are conditional upon reducing deforestation and
4 greenhouse gas emissions.

5 The Amazon Fund has become the world's largest deforestation control financial instrument,
6 and a lynchpin of the strategy of mobilizing finance and trade mechanisms for reducing
7 emissions from deforestation and forest degradation (i.e., REDD or REDD+). Nonetheless, the
8 implementation of REDD+, and the activities of the Amazon Fund more broadly (including
9 mechanisms for monitoring and calculating deforestation and emissions), and the economic
10 quantification of these processes, have fallen under intense scrutiny and heated debate (van der
11 Hoff et al., 2018; Correa et al., 2019; Pinsky et al., 2019; West et al., 2020). Beyond technical
12 questions about how to monitor and measure deforestation, degradation, and carbon
13 emissions/sequestration, and how to calculate these phenomena in economic terms (Fearnside,
14 2012a,b), the most important debates pertain to the political struggle over *who* sets the terms for
15 and benefits from development in the Amazon (McAfee, 2012; Corbera, 2012; Mahanty et al.,
16 2013; Klinger, 2018). These political tensions have become especially clear in 2020 as European
17 donors withheld funds for the Amazon Fund due to the rising deforestation under Brazil's
18 federal government, who publicly rejected the idea of other nations imposing conditions on
19 Brazilian Amazon policy, and the increased tensions over Mercosul agreements as a function of
20 rising deforestation.

21 3.2.3. *Clandestine Economies*

22 Clandestine economies emerge alongside, and converge with, regulated, lawful and formalized
23 economies. Working in the economies of gold, timber, and coca is often part of a livelihood
24 strategy for many people in Amazonia. These economies form part of a portfolio strategy that
25 works in tandem with larger household livelihood approaches in agriculture, urban or rural
26 waged labor, petty commerce and non-timber forest products, coupled with family cash income
27 from formal sources like conditional cash transfers, retirements, and remittances. As we will
28 discuss below, both rural and urban incomes exhibit a high degree of precarity, and this is also
29 reflected in the relatively high number of workers in these illegal activities, at least periodically.

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1 However, all these types of income formation “subsidize” the relatively low wages paid in all
2 the livelihood sectors for relatively unskilled labor. The expansion of clandestine economies
3 reflects new technologies, expanded transport infrastructure, new geolocation technologies, new
4 or expanding markets, as well as failed national development policies that produce few other
5 income opportunities.

6 Legal and illegal systems often operate side by side, melding into each other in both space and
7 products, as in the timber industry. Illegal land acquisition can be laundered through livestock,
8 fake title, and land clearing amnesties or, as we mentioned, even sold on the internet. Traditional
9 land tenure and access regimes were held by communities often had limited legal standing if not
10 demarcated under new laws, and hence community lands frequently are legally appropriated in
11 spite of their new constitutional legal status. The long history of fraudulent land grabbing in
12 Amazonia often depended on simple forged documents, or failing that, setting fire to land
13 registry offices, or simply using violence to intimidate or kill occupants (Schmink and Wood,
14 1992).

15 The revenue generated from clandestine economies is substantial -- for example, the U.N.
16 estimates the coca economy at about half a billion globally (UNODC 2015) -- but returns often
17 carry severe environmental damages and social costs, and may or may not produce much by way
18 of local development linkages over time. A recent study by the policy Institute Escolhas
19 comparing gold-mining municipalities with those without, showed that the economic impacts
20 and well-being were highly ephemeral, since for many of these goods the processing, other forms
21 of elaboration, and main lucrative markets occurred elsewhere. The commodity value increases
22 with the distance from the site of production, as is so typical of Amazonian commodities.

23 3.2.3.1. *Gold*

24 Peru is the largest gold producer in Latin America and the seventh largest in the world. Yet, over
25 half of Peruvian gold is extracted by unregulated artisanal and small-scale gold mining (ASGM)
26 operations (Caballero et al., 2018; Rodrigues, 2019), and significant proportions of the gold
27 extracted in Amazonian countries are extracted illegally (Table 14.1). Virtually all the gold
28 mining in the Madre de Dios region of Peruvian Amazonia is “informal,” in violation of state
29 environmental and labor regulations, a situation that essentially criminalizes all small-scale

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1 mining, despite its importance for livelihoods in the region (Bird and Kauer 2017). Efforts to
2 formalize small-scale miners and induce them to shift to alternative agricultural activities have
3 largely failed, because alternatives cannot match the higher incomes available through gold
4 mining, due to high global prices for gold (now about \$US2000/ounce).

5 Mining is responsible for about 10% of deforestation in the Brazilian Amazon (Soares-Filho and
6 Rajão, 2018). Mineral soils that underlie tropical forests of the Amazon basin contain diffusely
7 distributed gold deposits. Extracting this gold, which requires a combination of forest removal,
8 soil pit mining, and the use of liquid mercury, poses a major threat to Amazonian biodiversity,
9 water quality, forest carbon stocks, and human health (Diringer et al., 2019). Pan Amazonia’s
10 major rivers are subject sediment mining on tributaries, which affects the aquatic systems.
11 Further, regional roads for one product (like timber or other kinds of connecting roads) permit
12 broader access to formerly more isolated environments, although a great deal of gold moves in
13 small planes and on the rivers.

14 Relatively limited and controlled exits points, such as gold through Lima, have now been
15 reconfigured to move almost entirely through Amazonia. This regionalization of the Peruvian
16 ASGM trade reveals the flexibility of the gold production system, and particularly ASGM, in
17 reacting to pressures emanating from the Peruvian state to eradicate illegal mining. This leakage
18 mimics in many ways the shift of soy to less regulated venues. The Global Initiative Against
19 Transnational Organized Crime (2016) notes that illegal gold mining is rapidly spreading across
20 the Pan-Amazon.

21 **Table 14.1.** Percentages of gold production considered ‘extracted illegally,’ by country.

Country	%
Brazil	36
Peru	28
Bolivia	30
Ecuador	77
Colombia	80

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Venezuela	80-90
-----------	-------

1 Source: Escolhas 2020.

2 These mining systems are organized in multiple ways, including cooperatives or semi-
3 cooperatives in the “Garimpeiro Reserve” in Pará and Mato Grosso, Brazil, mines managed by
4 Maroons in Surinam or elsewhere by Indigenous groups, and through debt peonage and other
5 forms of forced labor as well as waged or product payment (Asner et al., 2013; Caballero et al.,
6 2018; Cortés-McPherson, 2019). Gold mining provides an important complement to people’s
7 livelihood systems, and has also provided a form of economic upward mobility for some
8 (Cleary, 1990; Escolhas, 2020). Miners often become politically active in defense of the
9 practices, and have in some cases made arguments in favor of informality and its redistributive
10 and access features, compared with large scale formal mining which often involves large
11 international mining companies and state subsidies (Bebbington and Bebbington, 2018;
12 Bebbington and Bury, 2013; Schmink and Wood, 1992).

13 In the realm of precarious states and illegal extraction, Venezuela deserves special mention. The
14 Orinoco Mining Arc (Arco Minero) is the product of national policy established in 2012, and
15 initiated operations in 2016 (Rendon et al., 2020). El Callao, an historical gold mine (begun in
16 1853) was exploited by the formal mining company Minerven since the 1970s. With the
17 economic crisis, the mine stopped working, and was taken over by informal armed groups as
18 well as the Venezuelan military. Armed forces controlled the Arco Minero; they extorted illegal
19 miners and controlled commercial routes. Planes took minerals to international markets
20 (Caribbean via Curaçao, taking advantage of the free trade zone). Indigenous communities were
21 forced into labor (mining or prostitution), but the mine itself was also the attractor for a
22 desperate diaspora from other parts of Venezuela. While the Yanomami were periodically given
23 respite and Brazilian miners expelled from their lands, the Venezuelan situation remained
24 complicated, especially in light of the precarity of the state itself. Illegal mining can affect
25 Indigenous groups through direct land invasion, but also through the contamination of fish and
26 aquatic birds, a main source of protein in many Amazonian communities.

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1 3.2.3.2. Land grabbing

2 In Brazil “land grabbing” is known as “*grilagem*,” involving land claiming through showing
3 effective use (see also Box 15.3, Chapter 15).^{iv} For centuries it has been a major part of Brazil’s
4 land-tenure practice by large actors, as well as invasion and later legalization by small
5 homesteaders (*posseiros*) through various system of traditional land recognition (Benatti et al.
6 2006; Moreno 1999; Schmink and Wood 1992). The 54 to 65 million hectares of “undesigned
7 lands” (*terras devolutas*) of Brazil are the major targets, but substantial unclassified lands also
8 exist in Loreto in Peru, and in the former FARC territories (Azevedo-Ramos and
9 Moutinho 2018; Reydon et al. 2017). Indigenous lands and other forms of land claiming, such as
10 Afro-descendent communities as well as other traditionally recognized, but not yet demarcated,
11 lands also are increasingly under threat, apparently encouraged by the current administration’s
12 discourse (HRW 2019).

13 In Colombia, various dynamics associated with the interactions of paramilitaries and shifts in
14 FARC (Revolutionary Armed Forces of Colombia) governance have also stimulated land grabs
15 in the absence of mediating authorities. Maroon lands in the Chaco have become target of
16 expropriation as well (Armenteras et al. 2013; Ballve 2013; Gomez et al. 2015; Grajales 2011;
17 Grajales 2015). It is exactly at these zones of shifting territoriality where deforestation is most
18 likely to occur as a “hot spot,” since land clearing works to help establish definitive land claims
19 in places where these are in contest. The situations in Peru, Ecuador and Bolivia are complicated
20 by the hydrocarbon industry, which works in the contexts of subterranean concessions, even as
21 above ground land or resource concessions accrue to others. The hydrocarbon sector, like the
22 infrastructure sector more generally, provides access roads into extensive areas that can become
23 sites of land appropriation.

24 While the legal dynamics for all the counties in Amazonia vary, the dynamics of land claiming

^{iv} The use of the term “land grabbing” in Amazonia is different from the way it is commonly used in other contexts. Particularly since 2008, this term usually refers to the purchase of large areas by outsiders, such that the local population is excluded, especially small farmers producing for local consumption (Borras et al., 2011). More recently, however, more complex notions of “land grabbing” have come to the foreground that do not necessarily amount to “foreignization” as the process was characterized in Brazil, such that it can encompass more clearly the historical and ongoing processes of *grilagem* in the Amazon (Oliveira, 2013; Oliveira et al., 2021).

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1 can be quite similar.^v Land grabbing involves deforestation, because clearing land for cattle
2 pasture is the best way to demonstrate “productive use” in justifying a land title. Clearing also
3 discourages other potential claimants from invading the area and eliminates forest resources for
4 those who might depend on them (Fearnside, 2008). This kind of “conjuring property”
5 (Campbell, 2015a) is critical for understanding the expansion of livestock (discussed in Chapter
6 15), as well as the continuing private expansion of roads which facilitate forest conversion.

7 3.2.3.3. Logging

8 In the highly biodiverse forests of Amazonia, logging is always selective, taking only the species
9 that are commercially valuable, in contrast to the practice in temperate and boreal forests where
10 logging often involves clearcutting. Illegal logging has been and still is rampant in Brazilian
11 Amazonia, and supplies more timber to the market than legal logging (Brindis, 2014; Butler,
12 2013; Greenpeace, 2003; Keating, 2018; IMAZON, 2017). Much of the timber that appears in
13 official statistics as coming from areas being deforested legally or from legal forest management
14 projects is actually being “laundered” from illegal logging: Brancalion et al. (2018) show that
15 the volume of high-value species declared in supposedly legal timber sales far exceeds the
16 volumes of these species originally present in the forest areas from which the timber supposedly
17 came. An estimated 47% of wood sold in Colombia is illegal (EIA, 2019); in the Peruvian
18 Amazon, illegal wood is extracted in Loreto, Ucayali, Madre de Dios, the Marañon River,
19 Yurimaguas, Ucayali River, and Ucayali/Contamana, and is legalized in Colombia and sold in

^v The *Terra do Meio* is an area in the Brazilian Amazonian state of Pará the size of Switzerland, that has long been essentially outside of the control of the Brazilian government, dominated by land grabbers, drug traffickers and others (e.g., Fearnside, 2008). The southern part of the state of Amazonas is now also an active land-grabbing frontier, including the claiming and clearing of Brazil nut groves used by traditional extractivists in the municipality of Boca do Acre, as well as other vulnerable regions (Maisonave and de Almeida, 2020).

Beginning in 2009, Brazil enacted a series of laws that allowed “legalization” or “regularization” of illegal land claims larger than 100 ha, which had been the maximum that could be legalized in practice (despite a 2005 law allowing legalization of up to 500 ha that was not put into practice by the Brazilian National Institute for Agrarian Reform - INCRA) (Barreto et al., 2008). Law No. 11,952, known as the first “land-grabbers’ law” (*lei da grilagem*), increased the area that could be legalized to 1500 ha (Brazil, PR, 2009). In 2017, the second “land-grabbers’ law” (Law No. 3465) increased this to 2500 ha. (Brazil, PR, 2017). In December 2019 Brazil’s federal government issued MP-910, a temporary executive order (*medida provisória*) valid for 120 days, allowing 2500-ha land claims to be legalized based on a mere “self-declaration” without requiring any onsite inspection (Fearnside, 2020a). This measure was allowed to expire and was transformed into a proposed law (PL N°. 2633/2020), which is currently passing through the committee process in the Chamber of Deputies (Brazil, Câmara dos Deputados, 2020). Note that all of these laws apply to each claimant or taxpayer identification number (CPF), making it possible to legalize substantial areas either by a family with various members or by a land grabber using “*laranjas*” (literally “oranges,” or people whose identities are used by others, either with or without consent). This means that land grabbers and squatters assume that they can illegally occupy other areas, and eventually a new law will grant yet another “amnesty,” pardoning the violations and granting land titles.

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1 Tabatinga, Brazil (Praeli, 2019).

2 Licensed forest management systems can be unsustainable due to various loopholes that have
3 been created, as well as frequent violation of regulations both by government licensers and by
4 those who receive the licenses. More fundamentally, economic contradictions make
5 unsustainable behavior financially rational due to the widespread availability of wood from
6 predatory and unsustainable sources. Moreover, because forest trees grow at rates up to around
7 3% per year, while other investments can produce returns on the order of 10% per year (in real
8 terms, independent of inflation), it makes financial sense to cut and sell the potentially
9 sustainable forest resource as fast as possible, and invest the proceeds elsewhere. This
10 fundamental contradiction has been shown to lead to unsustainable harvesting of potentially
11 renewable biological resources throughout the world (Clark, 1973, 1990), and it applies strongly
12 to Amazonian forest management (de Jong et al., 2014; Fearnside, 1989, 1995).

13 3.2.3.4. *Coca*

14 Coca leaf chewing can alleviate hunger, cold and fatigue, and coca is also a psychotropic with a
15 vast international market, estimated at over US\$100 billion per year. It is a crop that can be
16 flexibly produced; it is processed to paste locally, and the production can shift very easily from
17 one area to the other in the current coca producing zones, as political pressure or state repression
18 increase, as has occurred with frequency (Gootenberg 2017; Gootenberg and Dávalos 2018).^{vi}

19 Over four million Peruvians continue to practice traditional use of the coca leaf (Rospigliosi et
20 al., 2004) as they have done for perhaps as long as 5,000 years (Piperno and Pearsall 1998).

21 Coca has been an object of international harassment since Richard Nixon's War on Drugs, and
22 Clinton's Plan Colombia, which invested billions in coca eradication, to limited success (Bradley

^{vi} The sources of all cultivated coca are two closely related South American shrub species *Erythroxylum coca* and *Erythroxylum novogranatense* (Plowman, 1984), adapted to environmentally distinct regions in Colombia, Bolivia, Peru (Ehleringer et al., 2000) and, more recently, Brazil (Duffy, 2008). Each species has an additional variety, *E. coca var. ipadu* and *E. novogranatense var. truxillense*, with the former known for its traditional use by lowland Amazonian groups (Plowman, 1981, 1984) and the latter a drought-resistant variety grown largely for commercial purposes in arid to semi-arid inter-Andean valleys. Although *E. coca var. ipadu* has been cultivated in lowland Amazonia for many centuries, historically its low alkaloid content has made it a poor choice for cocaine production; nevertheless, recent research on coca cultivated illegally in the Colombian Amazon indicates farmers are increasingly cultivating high producing hybrids of *E. coca var. ipadu* (Johnson et al., 2003), in part as a response to climate change. These hybrids would be well-adapted and easily diffused to other parts of the Amazon (Duffy, 2008).

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1 and Mellington, 2008). The justifications for coca eradication programs have also included
2 political discourses on anti-insurgency, anti-communism, and the War on Terror.

3 A highly valuable traditional crop, coca is an ideal product for small farmers, since it generates
4 considerable employment as well as revenue, is locally processed, and integrates well into
5 agroforestry systems. United Nations data from coca cultivation on the Ucayali river indicated
6 that one hectare could conservatively produce approximately 860 kg of sun-dried coca leaf at an
7 average farm gate price of US \$ 2.8 per kg in 2004 (UNODC 2005b) or US\$ 2,350 per hectare,
8 without the farmer even having to leave his farm. This estimate dwarfs the income potential of
9 alternative crops farmed close to the regional market city of Pucallpa (even as the US \$2,350 per
10 hectare accounts for as little as 2% of the US street value for the same amount of leaf in cocaine
11 form) (Salisbury and Fagan 2011).

12 The indirect impact of coca production on deforestation is considered to be much larger than the
13 actual area used for cultivation, since abandoned plots tend to convert to sites used for small-
14 scale agriculture, cattle ranching and further land clearing in the surrounding area (Dávalos et
15 al., 2014). As a means of money laundering, investment, and land speculation, coca often works
16 in tandem with livestock, land claiming, and speculation in coca zones (Gootenberg 2017;
17 Negret et al. 2019). While for a considerable time coca was eradicated manually, the expansion
18 of the use of herbicides (glyphosate) has resulted in it drifting onto legal household and
19 subsistence croplands, where it is quite toxic to small stock, has marginalized producers, and
20 often exacerbated political tensions, and threatening Indigenous areas (Arenas-Mendoza, 2019).
21 However, repressive measures have not succeeded in eliminating coca plantations in the region:
22 the area from the southern Andean-Amazonian foothills to the Ecuadorian border is still one of
23 the major coca-producing regions in Colombia (UNODC, 2015). Current hotspots of cultivation
24 include the Ucayali, the Putumayo, Caquetá, the border areas between Bolivia and Peru, and
25 more generally in the fluid tri-border region (Cuesta Zapata and Trujillo Montalvo, 2009).

26 *3.2.4. Infrastructure*

27 Rising global demand for commodities, particularly grains and beef but also minerals and fossil
28 fuels, and the seemingly unquenchable imperative of regional and global integration, are driving
29 large scale land use change and dramatically reshaping the physical and human environment of

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1 the Amazon region. Access and energy infrastructure projects dominate the investment
2 portfolios of all Amazonian governments and are the projects whose spillovers generate the most
3 environmental and social impacts. Lands are cleared to build transoceanic multi-modal transport
4 networks to support agro-industrial expansion, to construct hydro-electric dams and transmission
5 networks, and to develop mega-mining projects and enable the extraction and transport of
6 hydrocarbons. These investments interact and support each other enabling each project's
7 financial viability. However, the significant environmental and social impacts unleashed by
8 multiple projects across are rarely if ever assessed for their potential cumulative and synergistic
9 effects (Bebbington et. al, 2020; Pitou 2008).

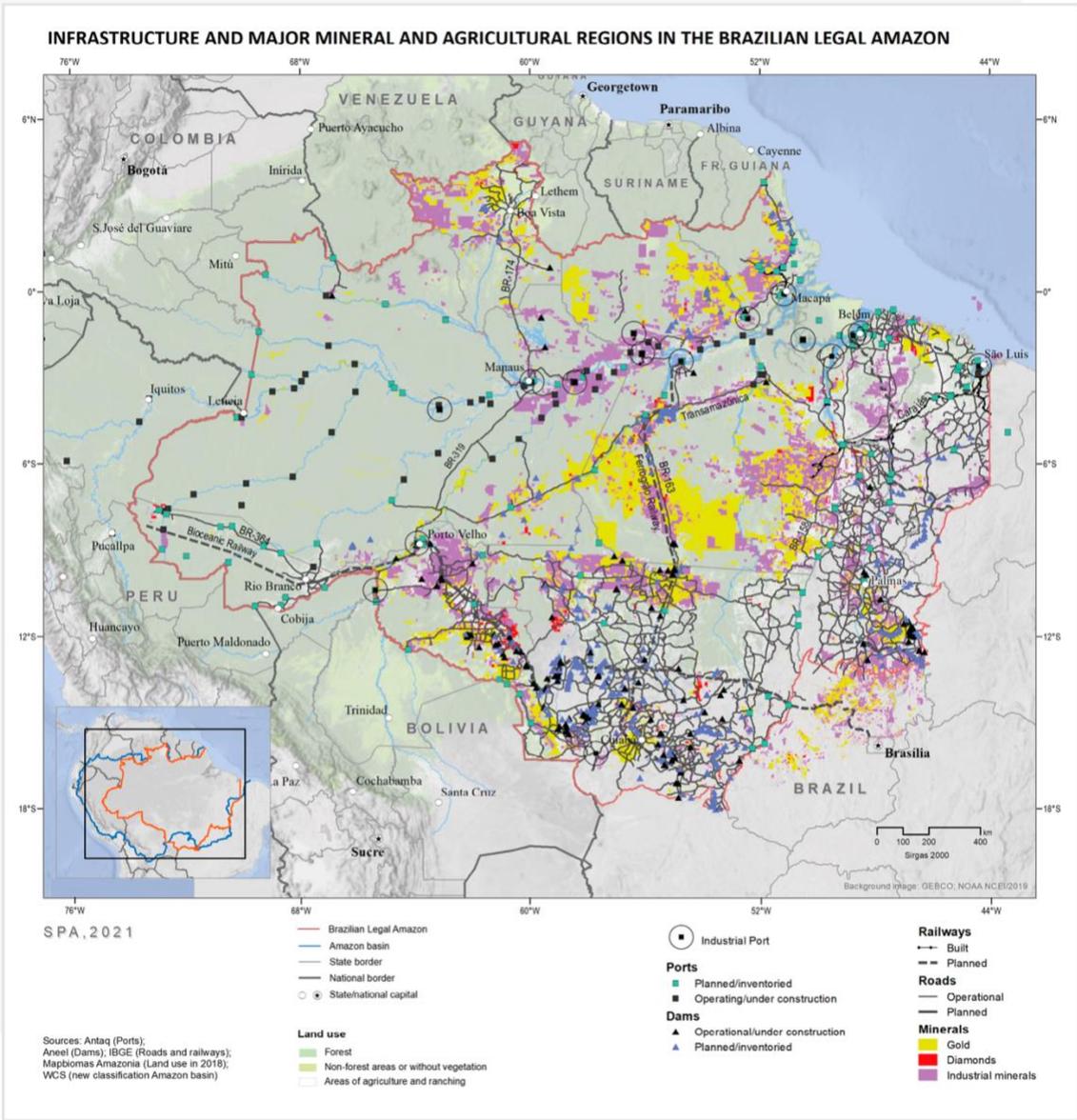
10 Governments across Pan Amazonia, and from across the political spectrum, pursue export-
11 oriented economic policies that prioritize large-scale infrastructure projects in support of natural
12 resource extraction and agroindustry expansion, and also because they are increasingly a form of
13 employment program in light of the contraction of small-scale agriculture and stable urban
14 employment. Such investments both attract large amounts of foreign investment, and fuel bursts
15 in employment and economic activity in more remote geographies. They form part of a
16 longstanding development paradigm that promotes urbanization, connectivity and economic
17 growth over more local, resilient and participatory strategies. These investments are also
18 important for the support of the mineral and fossil fuel extraction that finance social policy and
19 other expenditures that give viability to their “Neoextractivist” political projects (Bebbington et
20 al. 2018a).

21 Large-scale infrastructure projects are justified on the grounds of job creation and economic
22 benefits for priority sectors of the economy (soy, livestock, mining, oil and gas), but
23 smallholders can be equally eager for better transportation access. Throughout the Pan-Amazon,
24 roads became primary sites of land speculation. Construction companies saw lucrative
25 infrastructure as key sites for contracts awarded through the dynamics of corruption. One
26 Brazilian company, Odebrecht, became famous for corrupting almost every national government
27 in Pan-Amazonia (Campos, Engel et al. 2019; Morales and Morales 2019; Lagunes and Svejnar
28 2020).

29 One of the truisms of infrastructure could be the axiom: have road, have deforestation. There are

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1 numerous scientific articles that have documented this dynamic everywhere in Amazonia for
2 decades (Arima et al., 2008; Armenteras et al., 2006; Baraloto et al., 2015), usually accompanied
3 by the images of deforestation flanking the road. A recent article reviewing road-associated
4 clearing (Vilela et al., 2020) found the rapidly-expanding Amazon network to be permanently
5 altering the world's largest tropical forest through forest fragmentation and sub-canopy processes
6 (selective logging, hunting, and increased fire vulnerability) and sub-canopy cutting in
7 preparation for more extensive clearing for eventual land claiming. Most proposed road projects
8 lack rigorous impact assessments or even basic economic justification, reflecting the habits of
9 bureaucratic practice. Vilela et al. (2020) study cited above analyzed the expected environmental,
10 social and economic impacts of 75 road projects, totaling 12 thousand kilometers of planned
11 roads. All projects, although in different magnitudes, would negatively impact the environment,
12 and involved deforestation of some 2.4 million ha. Forty-five percent would also generate
13 economic losses, even without accounting for social and environmental externalities. Canceling
14 economically unjustified projects would avoid 1.1 million hectares of deforestation and US\$ 7.6
15 billion in wasted funding for development projects (Vilela et al. 2020). The fragmentation,
16 ecological loss of connectivity, degradation of landscapes used mainly for speculation, and the
17 constant threat to protected areas of many types, threatening the integrity of significant areas and
18 ecologically important landscapes, remain part of the massive externalities associated with roads.
19 Chapters 19 and 20 recount the environmental effects in more detail.



1

2 **Figure 14.2.** Map of infrastructure and major mineral and agricultural regions.

3 Beginning in 2000, and led by Brazil, an ambitious, coordinated infrastructure initiative, IIRSA
4 (*Initiative for the Integration of the Regional Infrastructure of South America*), now managed by
5 COSIPLAN (*South American Council on Infrastructure and Planning*), has prioritized and
6 promoted select sectors and geographies to receive infrastructure investment (Box 14.3).
7 IIRSA/COSIPLAN’s proposed hubs traversing the Amazon basin are especially contentious
8 given their high costs in terms of human rights, threats to Indigenous peoples and local

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1 communities, land expropriation, and forest clearance and forest degradation (Bebbington et al.
2 2018; Bebbington, 2020; Ferrante, 2020; Ferrante et al. 2020).

3 3.2.4.1. Roads

4 In recent decades, significant investment has been directed to building new and upgrading
5 existing highways that form part of a series of strategic transport corridors promoted under
6 IIRSA/COSIPLAN. These plans echo the large-scale road building projects of previous eras
7 such and the construction of the Belem-Brasilia highway (1960) and the *Carretera Marginal de*
8 *la Selva* (1963) which was intended to connect the Amazon regions of Bolivia, Peru, Ecuador,
9 Colombia and the Venezuelan *llanos*.

10 In subsequent decades the Trans-Amazon highway was started in the early 1970s, followed by
11 the Cuiaba-Porto Velho road in the 1980s, and a burgeoning set of formal and informal road
12 building since the opening of the major trunk roads (Fearnside 2015). Current formal and
13 informal roads are discussed further in Chapter 19. One outcome of this dynamic has been
14 continuing deforestation and forest degradation, except in periods of deep civil strife, as in Peru
15 with Shining Path, and in Colombia with various occupying rebel groups (Negret et al. 2019,
16 Clerici et al. 2020), only to increase deforestation afterwards.

17 Most of the environmental impacts of infrastructure development are elaborated in more detail in
18 Chapter 19. Both the construction of new roads and the paving of existing secondary roads also
19 have dramatic effects on the human population of the area along the route. When a new road is
20 built in an area of Amazonia that previously lacked road access, the residents of the area are
21 likely to be traditional groups such as Indigenous peoples, riverside dwellers (*ribeirinhos*) or
22 forest extractivists collecting non-timber forest products. The advantages of the road in allowing
23 more rapid access to hospitals and other urban services can often be far outweighed by the
24 negative effects, as new migrants, loggers and land grabbers move into the area, often displacing
25 earlier populations (Schmink and Wood, 1992).

26 New roads attract actors of various types. Individual families can migrate to the area to occupy
27 land (*posseiros*) (e.g., Simmons et al. 2010). With the passage of time, these migrants may be
28 expelled violently by more powerful actors who convert the area into large ranches, as occurred

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1 along the Belém-Brasília Highway (Foweraker, 1981; Valverde and Dias 1967). The initial
2 settlers may also either be “regularized” by the National Institute for Colonization and Agrarian
3 Reform (INCRA), or be granted lots elsewhere in official settlement projects (Fearnside, 2001b;
4 Schmink and Wood 1992). Brazil’s “*Terra Legal*” (Legal Land) program, which was intended to
5 curtail advancement of the agricultural frontier into the Amazon, actually consolidated
6 agribusiness and extractivism in the Amazon-Cerrado transition zones (Oliveira, 2013).

7 The initial occupants along a new road are soon replaced by other actors, usually by selling their
8 holdings to wealthier newcomers (sometimes under threat of violent expulsion). A parallel
9 process occurs in government settlement projects, where, even if not legally permitted, the
10 original settlers sell their lots to others who concentrate them into medium and large ranches
11 (e.g., Carrero and Fearnside, 2011; Yanai et al., 2020). Initial occupation can also occur as large
12 areas are appropriated by landgrabbers (*grileiros*), who then subdivide the claims and sell the
13 land in smaller parcels, or alternative land consolidators may use multiple names to acquire
14 larger holdings.

15 Road paving, or the mere announcement of plans for paving, causes an immediate increase in the
16 price of land along a highway (Schmink and Wood 1992). Land is more valuable both because
17 of the actual increase in the profitability of agriculture and ranching with better transportation
18 markets, and because of the expectation of further increases in land prices, yielding speculative
19 profits from reselling the land; this is one of the oldest stories about land and land use change in
20 Amazonian development. Land speculation provides a significant motive for deforestation
21 because clearing forest secures the claim to the land and counts as an “improvement”
22 (*benfeitoria*) in justifying a future land title (Fearnside, 1979, 2008, 2015; Hecht, 1985; Hecht et
23 al., 1988; Schmink and Wood 1992). Further, the deforested land use makes use of the land by
24 its forest-based occupants largely impossible, since valuable tree resources, animal habitats and
25 waterways are destroyed or seriously damaged. All of these processes lead to more
26 deforestation, regardless of whether intensive agriculture eventually follows, because of the
27 displacement of extensive activities to more remote areas along a deforestation/road front.

28 3.2.4.2. Ports

29 Nearly 100 major industrial river ports have been built on the Brazilian Amazon’s major rivers

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1 over the past two decades. Many of the projects have been internationally financed and built by
2 commodities companies with little government oversight, such as former Minister of Agriculture
3 Blairo Maggi's port in Porto Velho, Brazil. These ports have transformed the region, opening it
4 to agribusiness and reducing transport costs for export commodities, especially soy, to China and
5 the rest of the world. However, this boom in port infrastructure often came at the expense of the
6 environment and traditional riverine communities. Today, more than 40 additional major river
7 ports are planned in the Amazon biome on the Tapajós, Tocantins, and Madeira rivers as well as
8 proposed port development related to the Amazon waterway project in Peru and the Ichilo-
9 Mamoré-Madeira-Amazonas waterway in Bolivia, projects again being pursued largely without
10 taking into account cumulative socio-environmental impacts (Silva et al. 2008, Leal et al. 2012,
11 Alves et al. 2015, Barbosa and Moreira 2017).

12 3.2.4.3. Dams

13 The construction of dams and hydro-electric plants remains a major development strategy across
14 the region. Decisions on logistical infrastructure, such as roads, dams, railways, ports and
15 waterways, are critical both because they represent major government investments and because
16 their social and environmental consequences are enormous (see Chapters 19 and 20).

17 How infrastructure decisions are made, in practice, does not necessarily reflect the magnitude of
18 these consequences, but in many cases reflects the political power of coterries, especially in the
19 absence of more participatory forms of planning, and better “full cost accounting.” These
20 pressure groups can include the military, economic interests, grassroots social movements, and
21 other actors, as well as the influence of corruption, and personal interests of political leaders.
22 Decisions are not taken in the manner that one might imagine, but rather reflect a great deal of
23 political expediency and largely follow the autocratic practices of the military period.^{viii} In Brazil
24 the information on broader impacts is not even gathered before the critical decisions are made –

^{viii} In Brazil, as in the other Amazonian countries, infrastructure projects are normally part of “pluriannual plans” (PPAs), which are sets of projects (including many investments in addition to infrastructure) that are proposed for implementation over a four- or five-year period (Fearnside and Laurance, 2012). The president collects suggestions from the different ministries and is responsible for submitting a proposal for the PPA to the congress, where there is plenty of room for lobbying by interested parties, and “horse trading” among political groups. The 2020-2023 PPA was approved by the Senate with 326 amendments (*Senado Notícias*, 2019). High-level plans such as IIRSA (see Killeen, 2007; Zibechi, 2015) have little influence, although they can be used as arguments for justifying projects wanted for other reasons. In Ecuador for example, projects that had remained on the books were taken off the COSIPLAN system, mainly to assure more national autonomy. Once included in the PPA, further political struggles determine the priority a project receives for inclusion in the annual budget.

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1 this comes later during the licensing process that serves to justify the decisions that have already
2 been made for political reasons (Fearnside, 2012). Even when involving the Chinese government
3 and state-owned companies, the latter often display distinct interests and priorities, and compete
4 for capital and political support for divergent infrastructure projects, such as the north-south
5 *Ferrogrão* railroad connecting Mato Grosso state to the Amazon basin ports on the Tapajós, the
6 east-west Bi-Oceanic railroad crossing the Amazon and the Andes (Oliveira and Myers 2020), or
7 the recent *Ferro-Pará*.

8 Availability of funds and expertise from outside sources can be important in determining which
9 projects get priority. In the past this has included major projects financed from multinational
10 development banks (Fearnside, 1987), Korea, and especially financing from China, which is now
11 critical for various planned railways, dams and waterways (Ascensão et al. 2018; Branford and
12 Torres 2018; Fearnside and Figueiredo 2016; Serrano Moreno et al. 2020; Zhang 2019; Oliveira
13 and Myers 2021; Oliveira 2021).

14 State-owned companies, and their managerial agencies, can be significant influencers of
15 decisions on major infrastructure projects. Examples include the Carajás railway, which was
16 completed in 1984 by Companhia Vale do Rio Doce, a Brazilian government mining company
17 that was later privatized and is now called “Vale.” The railway carries iron ore 890 km from the
18 Carajás mine to a port near São Luis, Maranhão. State-owned oil companies in Ecuador
19 (PetroEcuador) Colombia and Brazil (Petrobrás) have significant pressure and financing over
20 forms of regional development and extraction. Another example is the Tucuruí Dam, which
21 blocked the Tocantins River in 1984. The dam was built by ELETRONORTE (the government
22 electricity company for northern Brazil) to supply aluminum factories in Barcarena, Pará and
23 São Luis, Maranhão (Fearnside, 1999, 2001a, 2016). Construction companies have been famous
24 for pressuring for access and energy infrastructure development. The soy transport corridor from
25 the interior of Mato Grosso to the Cargill Terminal in Santarem was promoted by soy growers
26 and infrastructure firms (Torres and Branford 2018). The effect of corruption on infrastructure
27 decisions can also help explain why expensive projects can gain priority as the Odebrecht story
28 has so clearly indicated.

29 While the social impacts of dams vary from site to site, some of the major and well documented

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1 social effects include displacement of population, loss of livelihoods from fisheries, downstream
2 effects, impacts on Indigenous populations, as well as impacts on health and migration
3 (Fearnside 2016; Andrade 2021; Box 14.4).

4 **3.3. Export dependency and precarious states**

5 As the previous sections have shown, the Pan Amazonian states have become increasingly
6 dependent on global exports of the enormously valuable natural resources from Amazonian
7 forests, waters, lands and sub-soils, part of a wave of Latin American “neoextractivism” that
8 combines a focus on commodity exports with the deployment of social welfare programs to
9 address persistent poverty in the face of limited economic opportunity and virtually no structural
10 change (Baletti 2014; McKay 2017, Svampa 2019). Some writers have labeled this current phase
11 of development a new incarnation of dependent development (Svampa 2019).^{ix} At the same
12 time, however, there are new innovative economies based on traditional Amazonian crops like
13 *açaí*, *guarana*, and other traditional Amazonian goods, animal products and medicines.

14 Industrial ores and hydrocarbons extraction and agroindustry are not especially labor-absorbing
15 activities, and most products leave Amazonia as raw or minimally refined products. Other
16 systems of capital accumulation include multiple forms of resource capture that take place
17 through direct appropriation (land grabbing; wild animal commerce; resource theft), as well as a
18 variety of institutional rents that depend on political positioning (credit lines; speculation;
19 corruption), regulatory and institutional capture, as well as illegality and violence. That is, a great
20 deal of economic activity is related to positioning, access, and to a degree, on impunity.

21 The soy complex is increasingly referred to as “agrarian extractivism” based on four interlinked
22 dimensions: (1) the large volumes of materials extracted from sites, destined for export with
23 little or no processing; (2) value-chain concentration and sectoral disarticulation (3) high
24 intensity of environmental degradation (deforestation, extensive use of biocides, problem soft

^{ix} Dependency theory argued that over-reliance on natural resources made economies vulnerable to volatilities in global markets for reasons of price and politics, global competition and technical change in the sectors, as well as declining terms of trade of raw materials versus industrialized products. This actually “underdeveloped” countries rather than developing them, by structuring institutions and infrastructure around these sectors which were often, (and still are) largely dominated by large international corporations who garnered most of the benefits, as well as the national coteries allied to them. This idea was elaborated further by Bunker who placed environmental degradation as another element in the “development of underdevelopment” Bunker, S. (1985). *Underdeveloping the Amazon*. Chicago, University of Chicago Press.

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1 drift and non-target species mortalities; and (4) the deterioration of labor opportunities and/or
2 conditions (McKay and Colque 2016; McKay 2017). In addition, environmental impacts—
3 toxification of soils and landscapes, contamination, pollution, deforestation -- associated with
4 this model, involve, so far, almost no remediation, and thus represent serious bio-socio-
5 environmental costs. Rather than a form of “industrial” agricultural development, which implies
6 value-added (Gudynas 2012) processing, sectoral linkages, and employment generation,
7 according to McKay (2017), Gudynas (2012) and Oliveira and Hecht (2018), agrarian
8 extractivisms rest on various dimensions of social, economic and environmental exploitation,
9 with negative implications for rural development in terms of employment and ecological harm.
10 These employment and land changes are described in more detail in the next Chapter 15.

11 While GDP has increased in all of Pan-Amazonia, inequality and precarity remain central issues,
12 and the COVID-19 events have ratcheted poverty inequality and vulnerability to new heights, as
13 Peru, Colombia, Bolivia, Ecuador and Brazil have some of the highest per capita infection, death
14 rates and caseloads. The COVID-19 crisis has diverted some attention away from forest
15 destruction and protection, and made illegal incursions easier by paralyzing state actions to
16 control clearing (Silva Junior et al. 2021) and in some cases gave states what seemed to be a
17 *carte blanche* to go forward with support for semi legal and destructive practices.

18 Amazonian states suffer from continuing issues of political instability regardless of political
19 format (authoritarian, illiberal or democratic), which has given a “stop-start” quality to
20 Amazonian development initiatives, with frequent policy reversals or shifts in emphasis that
21 increase volatility in process, prices and policy implementation. Most current Amazonian
22 nations are young states with new constitutions only a few decades old that emerged after
23 authoritarian regimes or illiberal democracies collapsed, and remain characterized by intense
24 factionalisms if not insurgencies (such as in Colombia and Peru), succession movements
25 (Bolivia, Ecuador), and the complex political scenarios in the “Caribbean Amazon” of Guyana,
26 Suriname and French Guyana.

27 All Amazonian governments have had serious corruption scandals - most recently associated
28 with the Brazilian infrastructure company Odebrecht, which triggered impeachments in Brazil,
29 Peru, Bolivia, and Ecuador but this was just one among a continuing process of ruling through

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1 corruption (Fogel 2019). Six of the last Peruvian presidents have been indicted for corruption.
2 associated with cronyism, personal payoffs, etc., with Peru cycling three presidents in the period
3 of a month. Corruption concerns also emerge around the concession systems for hydrocarbons,
4 minerals and timber. The lack of transparency and favoritism in many contracts and bidding
5 processes have underpinned distrust of the national state, and supported a dynamic of illegality
6 in land acquisition, infrastructure concessions, production certifications, clearing moratoriums
7 and forms of bribery, as well as political patronage. All these add distorting elements to regional
8 dynamics, and foster distrust of government as well as broader lower-level societal corruptions
9 (Bulte et al. 2007; Campos et al. 2019; Fogel 2019).

10 In spite of the current “commodity consensus” framework, there are new innovative economies
11 based on traditional Amazonian crops like *açaí*, *guarana*, cacao and coffee and other traditional
12 Amazonian goods and medicines, but these remain largely niche crops, whose value and value
13 chains are quite different from the large-scale commodity dynamics. Coca, coca varietal
14 differentiation and gold go through significant processing in Amazonian localities, and so might
15 be considered more “industrialized exports” than most export commodities such as agroindustrial
16 products (Gootenberg and Campos 2015; Gootenberg 2017; Hilson and Laing 2017; McKay
17 2017; Betancur-Corredor et al. 2018) even though the regional results are often ephemeral
18 (Escolhas 2021). More promising because, of the diversity of livelihood possibilities are the
19 close in interactions between smaller scale and spatially linked urban/regional rural and urban
20 economies.

21 In the midst of these powerful and often hidden forces and processes shaping Amazonian
22 development and conservation, the diverse people who live there continue to respond as best
23 they can to the increasingly precarious options for making their living in the forests, rivers, and
24 lands of the Amazon. They draw on Indigenous cosmologies and practices dating back
25 millennia, as well as the unique cultural identities and systems of management of natural
26 resources that have evolved in each Amazonian country and locality, while adapting to the
27 rapidly-changing new drivers and processes that increasingly constrain their possibilities
28 (Athayde et al. 2017; Vadjunec and Schmink 2012). Far from passive and invisible, these
29 Amazonian people in motion have continued to mobilize to protect their territories, livelihoods,
30 and cultural identities by defending their own proposals for the future with new forms of

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1 governance, social innovation, land uses and goods. This is done through traditional national
2 political channels, as well as seeking cross basin partners, and international allies.

3 4. AMAZONIAN PEOPLE ON THE GROUND

4 The settlement patterns of Amazonian populations are highly complex and dynamic, including
5 diverse patterns of migration, both by peoples internal and external to the region, as well as
6 between urban and rural areas. Contrary to the general understanding of the Amazon region as a
7 large natural forest, the population of the region is highly concentrated in urban areas, including
8 large numbers of Indigenous peoples (Sobreiro 2014; Campbell 2015b) with complex links to
9 the rural hinterland, a pattern that dates to antiquity. We first examine urbanization as a
10 settlement form of significant antiquity in Amazonia, and the historically-rooted complex
11 linkages between rural livelihoods and urban settlements. Finally, we examine broader
12 settlement and migration patterns.

13 4.1. Antiquity of Amazonian Urbanization

14 Although Amazonia is perceived as a wild place with a biotic rather than human history, earlier
15 sections of this report (Chapter 8) have shown that humans have occupied Amazonia for at least
16 12,000 years with very large populations -- in many places much greater than they are today.
17 Extensive areas of ring ditch construction, numerous mounds and extensive engineering works,
18 widespread anthropogenic soils, humanized biogeographies, celestial observatories, and
19 extensive mastery of long-distance water-based travel as well as artistic masterpieces, gold
20 metallurgy, ceremonial burial sites and a complex suite of domesticated plants and the residue of
21 a complex pharmacopeia are evidence of complex civilizations. The populations declined by
22 more than 90% due to epidemic diseases after contact with Europeans, obliterating knowledge
23 systems and tropical ways of being that also included complex polities and urban life
24 (Whitehead 1994; Heckenberger 2009; Rostain 2009).

25 During the colonial period Amazonian urban settlements included a mix of Indigenous,
26 religious, military and commercial models, reflecting geopolitical and economic strategies-
27 Missions towns stretched from the mouth of the La Plata river up through much of the Amazon
28 territories, especially the areas of the Bolivian Amazonia, to the mouth of the Amazon and the

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1 Orinoco (Block 1994). The missions often built on the ruins of past villages and towns to bring
2 together native populations. Trading centers established at river conjunctures became
3 commercial entrepôts, multiethnic urban sites that often included substantial Indigenous
4 populations (Roller 2014). Many Indigenous populations never left these enclaves, and native,
5 traditional populations continued to move back and forth between towns and cities and into
6 hinterlands and home villages.

7 Later, at the end of the 18th and beginning of the 19th century, the Amazonian trade in enslaved
8 people through the ports of Belém and Sao Luis that rivaled the slave trade in Bahia and Rio de
9 Janeiro (Salles 1971; Hawthorne 2010). Fugitive slave communities sprang up deep in forests,
10 the *Quilombos* that stretched throughout the lower Amazon, and all the way up into the Guyanas
11 (Agostini 2002; Cavalcante 2011; De la Torre 2012; Florentino and Amantino 2012; Florentino
12 and Amantino 2012; Hecht 2013, dos Santos Gomes 2015; see also Chapter 13). The mercantile
13 system (and the military outposts that attended it), and ethnically complex towns and villages
14 made up a network of “informal” trading networks, especially in the lower Amazon (La Torre
15 López and Huertas 1999; De la Torre 2012). This provided the framework for the rubber-boom
16 period economic expansion that, for some decades, built on and expanded these settlements,
17 which continued to dominate mostly riparian settlement patterns until the post-World War II-war
18 period and the shift to terrestrial transport.

19 The extractive cycles that sustained frontier development in the Amazon after the 19th century
20 contributed to a characteristic “disarticulated urbanism” (Godfrey and Browder 1997), with
21 multiple urban centers dispersed within a shifting frontier economy. This focus on the global
22 (Gootenberg 2017) system in the modern form may obscure the more articulated pre-existing
23 Amazonian systems of livelihoods. Many Amazonian cities have undergone periodic cycles of
24 expansion and contraction, export versus local orientations reflecting population movements into
25 and from the countryside, following fluxes in the global demand for particular forest products as
26 well as the emergence of new local types of demand for local construction woods, Amazon
27 foods, as well as new export systems for products like *açaí* (Sears et al. 2007; Uriarte et al. 2012
28 Brondizio 2009). The durability of household and individual engagement within commercial,
29 waged and subsistence frameworks of the older pattern of urban-rural livelihoods, with
30 traditional circular migration or multi-sited households is a model of urbanism that differs from

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1 much of the temperate zone patterns of urbanization, although this poly valance is also
2 widespread in tropical Africa and Asia.

3 After WWII, the dynamic relationships between urban and rural spaces became increasingly
4 shaped by the influence of nation-building and state-driven formalist planning, involving new
5 “showcase cities” like Ciudad Guyana (in Venezuela) and, after 1989, the towns of Palmas and
6 the redo Goiania (Correa 2018) as agro-industrial service towns. These corporate planned cities
7 complemented the planned agrarian reform village settlements in Bolivia, Colombia (Caqueta),
8 Peru (San Martin). A largely bifurcated Amazonian model of new settlement unfolded in which
9 large-scale capital was encouraged by extensive subsidies, largely following the growth pole
10 spatial planning ideas for areas of mineral extraction and specific urban areas like Manaus (Hite
11 2004), while spatially extensive agrarian reform using a different territorial settlement model was
12 expanding, linking poles through settlement corridors with road infrastructure. A fantasy of
13 planned urbanization as part of infrastructure arrangements and the idea of orderly settlement has
14 been attended by massive spontaneous settlement, and a striking fluidity in boom towns, and
15 their abandonment after resources are depleted or the speculative cycle in land runs its course.
16 Rural settlement has gone hand in hand with new urbanizations, expansion of illegal side roads,
17 and the increased importance and growth of medium-sized towns that can permit interaction with
18 rural resources, while continuing access to banking, health and education systems, and periodic
19 employments that reflect the changing rural economies. The spatial land transformations
20 associated with expanding road infrastructure has been associated with massive expansion of
21 unauthorized road building for logging and other resources, and has contributed to the expansion
22 of the “fishbone” patterns of clearing so widely seen in Amazonia (Aldrich et al. 2020).

23 Migration flows nowadays in the region are largely characterized by the rural-urban shift of
24 population (Gori Maia and Buainain 2015). With nearly two thirds of the population living in
25 urban areas, the region presents one of the highest rates of internal migration in Brazil: roughly
26 10% of the population migrated between 2005 and 2010 (IBGE 2018). Amazonia’s emergence as
27 the next energy frontier also changed the social and spatial composition of the space in Andean
28 Amazonia, as northern Peru and Bolivia have become sources of employment and speculation
29 based on hydrocarbons.

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1 4.2. The Rural Urban Continuum

2 In spite of its image as a vast forest, Amazonia is highly urbanized. Of its roughly three million
3 Brazilian inhabitants in 1960, only about 36% resided in urban areas, but by 2010, 74%, nearly
4 three fourths of the Amazonian population resided in towns and cities. A similar pattern is found
5 in Peru (Menton and Cronkleton 2019), Colombia and Ecuador. Current urban transitions in the
6 developing world have several features that differ from the Euro-American pattern: 1) they have
7 occurred extremely quickly in a decade or two--- as opposed to Northern processes that often
8 took centuries, and may be underpinned by different kinds of urban, rural or forest
9 functionalities; 2) they reflect strong exogenous pressures at least as much as endogenous
10 dynamics, that is: land wars, economic displacement, globalization, political violence, and in
11 some cases, climate change (Brondizio et al. 2011; Hecht 2014; Hecht et al. 2014; Kanai 2014;
12 Mansur et al. 2018); 3) rural areas, even when forested, often have high population densities,
13 strong relations to historical and current forms of family or small scale agriculture and forest
14 livelihoods, and deep regional histories although this is largely historically determined (Sears et
15 al. 2007; Brondizio 2008; Brondizio 2009;Pinedo-Vasquez and Padoch 2009; Brondizio et al.
16 2011 Hecht 2014); 4) the current urbanization processes are generally more globalized in terms
17 of commodities, financial flows, and often, labor (or its lack), and shaped by new production
18 ideologies; urban export corridors and mega project labor depot construction sites such as
19 Maraba, Carajás in Pará, Ciudad Guyana, Jari, are examples of the spontaneous expansion that
20 accompanies planned cities with unplanned satellite cities or peri urban expansion. These
21 settlements are labor depots and informal service centers.

22 Urbanization that builds on older livelihood mobilities involves newer forms of transport and
23 communication (although Amazonian towns often still engage their aquatic systems), while
24 engaging an increased dependency on state services for cash transfers, pensions, health and
25 education services, as well as periodic work, local markets and a complex platform for livelihood
26 construction, in a context of an often “wageless world” with high degrees of precarity. About
27 40% of Amazonian residents now fall below the World Bank poverty lines. This in turn has
28 contributed to a need for enhanced levels of mobility and migration, a regular re-engagement
29 with cities and markets, and to intensified rural–urban links and exchanges, often through the use
30 of complex informal social networks of kinship, clientelism and patronage (Peluso and Alexiades

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1 2005; Pinedo-Vasquez et al. 2001; Brondizio et al. 2011; Eloy et al. 2014, Tritsch and Le
2 Tourneau 2016). Rural conflict, violence and in some cases, climate change also contribute to
3 this complex reengagement with a new kind of urbanism and new rurality, where both city and
4 country engage in forms of production that may mimic each other, with increasing similarities in
5 production and consumption patterns. The urban growth of *açaí* palms and other foods, and the
6 complex of products generated in the dooryard garden, a kind of “open-air laboratory,” often
7 mimic rural household subsistence patterns (Leite-Barboza et al. 2021; WinklerPrins 2002;
8 WinklerPrins and de Souza 2005; Lewis 2008).

9 **4.3. Living and livelihoods in the urban-rural matrix**

10 Amazonian urban studies are in their infancy, especially compared to the mass of research on
11 Latin American coastal cities and capitals, but urban processes clearly have profound
12 implications for regional development, conservation, and livelihoods. The complex dynamics of
13 circular migration, multi-sited households and strong rural-urban interaction and dependence are
14 widespread in Amazonia and throughout the tropics, as depicted in Figure 14.3 based on a study
15 in Iquitos, Peru.

16 [Figure 14.3. will be inserted here]

17 **Figure 14.3. Remittances and Gift Flows Between Iquitos, Peru and Rural Communities**

18 Several insights help characterize the current dynamics we see in “embedded urbanization” –
19 towns and cities historically rooted in their regional livelihood systems -- versus “export cities”
20 those linked to construction sites, oil camps, and export enterprises. First, the increase in multi-
21 sited households has blurred distinctions between rural-urban areas, making peri-urban areas and
22 peripheries the intersection of new forms of livelihood construction. This includes forest,
23 agricultural, urban and rural waged livelihoods, and petty commerce as well as state transfers.
24 When observed from the perspective of families, the Amazon region is indeed a ‘rural-urban
25 continuum.’ Family networks shape the urban and rural landscapes of the region, supporting
26 intense patterns of circulation and exchanges across short and long distances. However,
27 interactions between people/families in rural and urban areas vary significantly in the region, as a
28 function of geography and transportation, with high-density and frequency of interactions

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1 proportional to proximity to cities and the type of transportation available (Padoch et al. 2008;
2 Parry et al. 2010; Eloy et al. 2014; Nasuti et al. 2015). Independently, rural/resource economies
3 are intrinsically connected to urban hubs, involving social networks between extended families,
4 intermediaries and market brokers, and corporations (such as *açaí* or Brazil nut exporters); these
5 interactions, depicted in Figure 14.3, are behind large segments of the regional economy and
6 social life, generating high-value regional economic chains in fishing, fruit, and regional and
7 international non-timber forest products.

8 Rural-based extractive activities such as logging, gold mining and fisheries are now important
9 sources of employment and income for urban residents. Life in most rural communities has
10 become a reflection of life in low-income urban neighborhoods and vice-versa. Seasonal
11 economies are especially important to families (e.g., *açaí* and fish commercialization along the
12 floodplains, mining, harvesting, construction work); seasonal mobile economies tend to be
13 highly gendered, predominantly dominated by men. Almeida (2011) has documented the
14 dependence of Brazilian urban populations on resource configurations for Belém and Manaus,
15 showing the extent of travel, the seasonality, and the gender division in these systems.

16 Several factors have affected rural-urban interactions and urbanization in different parts of the
17 region: increasing availability of inter-municipal transportation and personal transportation
18 (motorcycles, small boats, cars); developed kinship networks, access to market opportunities and
19 market niches; access to cellphones and communication; availability of public services and
20 education, as well as life-style. A continuing dynamic is the marginalization of small farm
21 agriculture in Amazonia except in peri-urban areas, areas with traditional tenurial regimes, more
22 traditional regional settlements and those close to historic urbanizations. More recent colonist
23 settlements have been characterized by very high levels of landownership turnover, close to 72%
24 (Yanai et al. 2012; Yanai et al. 2020), high deforestation, continuing rural violence, as well as
25 infrastructure development, such as dams, producing expulsions from rural areas (Chiavenato
26 1993; Sousa Júnior and Reid 2010; Carrero and Fearnside 2011; Fearnside 2016; Atkins 2017;
27 Ferrante et al. 2020).

28 The peri-urban and peripheries have become new, central forms of livelihood construction in
29 Amazonia's low-income urban neighborhoods, such as in Belem, Santarem, Tefe, Rio Branco,

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1 Manaus, Macapa, Coca, Leticia, Iquitos, Pucallpa, boom towns in the ambit of the oil axis of
2 Ecuador (Lago Agrio), the smuggling town of Leticia, infrastructure development hubs like
3 Marabá, and drug entrepots like San Jose de Guaviare (Cuesta Zapata and Trujillo Montalvo
4 1999; Armenteras et al. 2013) and ports on the Putumayo.. These peri-urban and household
5 agroforests are increasingly important for food security and petty commerce under conditions of
6 precarity (Emperaire et al. 2012; Madaleno 2000) and the low wages that accrue to both urban
7 and rural waged work and the volatile and generally low prices for agricultural or forest
8 products.

9 Another key finding is that local ecological knowledge and complex production systems support
10 rural and peri-urban livelihoods and agro-diversity in the Amazon. Multifunctional agroforestry,
11 forest, and aquatic management systems form both rural and peri-urban production systems.
12 These multi-strata and multi-species systems of natural resource exploitation can incorporate
13 small stock, stagger harvest times, have labor flexibility, engage local fisheries and cycle
14 materials (Pereira et al. 2015; Coomes and Barham 1994; Pinedo-Vasquez 2002; Padoch et al.
15 2008; Perrault-Archambault and Coomes 2008; Manzi and Coomes 2009; Coomes et al. 2010;
16 Coomes et al. 2015; Vogt et al. 2015; Vogt et al. 2016). The different, varied forms of rural and
17 peri-urban and urban agriculture are important providers of agro-diversity conservation, as well
18 as other forms of ecosystem services (Padoch and Pinedo-Vasquez 2010; Beyerlein and Pereira
19 2018). Under-recognized, but increasingly important, are the roles these agroforestry-urban
20 ecosystems play in the larger issues of environmental services support, and in moderating the
21 heat island effect, as well as wind and water infiltration (de Souza and Alvala 2014; Fernandez et
22 al. 2015; Livesley et al. 2016), and, increasingly, food security.

23 Historically Amazonians were given a one-dimensional occupational definition---as a farmer,
24 fisher, rubber tapper, wage worker. Rural income has become more complex, reflecting changes
25 in agricultural economies, and encompassing employment in urban areas, commerce, and various
26 forms of cash transfer/benefit programs. Amazonian incomes come from agriculture and
27 resource markets, but the role of remittances also is increasingly important, including moneys
28 sent to Amazonian kin from other cities or rural areas and, increasingly, international
29 remittances. About one fifth of Ecuador's population resides overseas, as does a similar
30 proportion of Venezuelans, and their remittances often exceed regional direct foreign investment

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1 funds (Hecht et al. 2015). Incomes come from different combinations of agricultural/resource-
2 based activities, access to urban employment and market-niche opportunities, education, health
3 services and other arrangements (Eloy et al. 2014; Padoch et al. 2008). Substantial numbers of
4 Brazilian families depend on conditional cash transfer programs such as *Bolsa Familia* and *Bolsa*
5 *Floresta*. As cash benefits have to be collected in urban centers, this has further strengthened
6 connections between rural areas and cities. These conditional cash transfers have become a
7 central poverty alleviation practice in the region, and speak to the inequality generated by the
8 billions spent in development funds, and the larger questions raised by neo-extractivist policy
9 strategies.

10 Rural populations remain stable in some parts of the region while aging in others, with different
11 patterns of gender balance in out-migration. Geography/distance make a difference in terms of
12 the frequency of rural-urban interactions and mobility. There is increasing movement from more
13 distant tributaries and roads towards peri-urban medium/larger urban centers, with growing
14 population density around peri-urban areas as sites of settlement for small scale production and
15 positioned for access to urban financial, medical, and educational services (also related to
16 accessing cash transfers programs). The extent to which these processes are leading to the aging
17 (or elder/children predominance) of rural areas is still unclear. In many rural areas, the
18 “feminization” of the rural is discussed, as women remain in rural areas (Zimmerer 2014), but
19 gendered patterns of migration require deeper analysis. In areas of Ecuador and Colombia,
20 female migration dominates into domestic service and prostitution (Barbieri and Carr 2005;
21 Massey et al. 2006; Tacoli and Mabala 2010; Abbots 2012; Paerregaard 2015). Women
22 sometimes dominate in rural-urban migration as domestic servants, and in other cases migrate
23 with their children for schooling, leaving men behind in the rural areas, or migrate to facilitate
24 government transfers (Schmink and García 2015).

25 The intersection of economic and infrastructural precarity, high rates of violence and crime, and
26 the effects of climate change are particularly impacting low-income populations in rural areas
27 and urban peripheries.

28 **4.4. Urban environmental issues**

29 Urban sanitation infrastructure in Amazonia is precarious at best (Brondizio 2016; Mansur et al.

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1 2018; De Lima et al. 2020). Vast majorities of municipalities have less than 10% sewage
2 collection (Mansur et al. 2016), and these issues are becoming more complex, with increasing
3 patterns of climate related “deluge rains” that cause extensive flooding, overwhelming the
4 infrastructure that does exist, and hammering settled areas near storm and flood-vulnerable
5 waterways. Strong droughts can undermine rural production of various kinds, and with their
6 associated high heat island temperatures make urban areas swelteringly hot, more than 5°C
7 degrees above adjacent nonurban areas (de Souza and Alvala 2014). As urban areas grow, the
8 issues of pollution are becoming more extreme, and these are reflected in increased indices of
9 waterborne disease, such as the recent Amazonian cholera and mosquito-borne illness like
10 dengue, Zika and malaria outbreaks, in addition to worrisome problems of mercury
11 contamination, oil contamination and industrial pollution, and of course, COVID-19 infection
12 (Howard et al. 2011; Bourdineaud et al. 2015; Webb et al. 2016; Arrifano et al. 2018). Air
13 quality questions are becoming more important as vast fires proliferate in the dry season. Limited
14 visibility is only part of the problem, as breathing problems and asthma hospital admissions also
15 increase (Irga et al. 2015; Butt et al. 2020). Long term impacts of prolonged forest fire smoke is
16 now a larger public health question, and again enhances vulnerability to Covid.

17 The shift into aquaculture near Peruvian towns is also raising concerns about resurgences of
18 malaria, as this form of production becomes more prevalent (Maheu-Giroux et al. 2010). Sea
19 level rise is affecting the lower Amazon estuary (Mansur et al. 2016; De Lima et al. 2020).
20 Moreover, Amazonian urban areas experience a great deal of crime and violence, reflecting the
21 dynamics of poverty, and some clandestine economies, including the presence of drug traffickers
22 or organized crime. A recent report by a Mexican-based NGO (*El Consejo Ciudadano para la*
23 *Seguridad Pública y la Justicia Penal*) places the Amazonian capitals of Manaus (23rd), Belém
24 (26th), and Macapá (48th) among the 50 most violent cities in the world (41 of which are in
25 Latin America) (Brondizio 2016).

26 This section has summarized the “embedded urban-rural Amazonia,” its livelihood dynamics and
27 some of its vulnerabilities. The complex interactions between urban waged work and natural
28 resources livelihoods in subsistence, exchange and commerce, city services, state transfers and
29 the dynamics of rural survival, are linked to multivalent forms of income and identities. These
30 dynamics suggest that there are many ways that Amazonian peoples’ resources and

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1 environmental services can be simultaneously supported to improve welfare. Recent panel
2 studies of welfare in Brazilian Amazonia in urbanizing and rapidly deforesting areas show that
3 urbanization does not lead to positive changes in human welfare, and that state agricultural
4 investments also undermine welfare (Silva et al. 2017). This information coupled to recent
5 studies on the socioeconomic impacts of gold mining (Escolhas 2021) and large-scale agro-
6 industrial development suggest a problematic set of paths of Amazonian transformation in terms
7 of their development benefits, while their environmental and social costs are high. The poor
8 infrastructure conditions of many towns, and the precarity of incomes, may make integration
9 with rural life both an economic necessity---a safety net in the formal absence of one, indicative
10 of a new kind of rurality (Rivera and Campos 2008; Hecht 2009), and also important for overall
11 health.

12 **4.5. Migration: Formal, Private, and Spontaneous**

13 To western eyes, Amazonia has stood as a kind of El Dorado to adventurers and to the state, a
14 refuge from *minifundia*, a place for new beginnings, insurgencies as well as prisons, of
15 opportunity as well as its negation. There are now literally thousands of planned and unplanned
16 settlements, ranging from formalized private colonization, corporate planned cities, and state-led
17 colonization, to informal settlement, boom town explosions, landless occupations, and do-it-
18 yourself *de facto* agrarian reform (Perz et al. 2010; Simmons et al. 2010).

19 Early phases of Amazonian colonization involved the importation or dislocation of labor at the
20 regional level through Indigenous peonage, indenture and slavery, and African slavery for forest
21 collection and plantation agriculture (MacLaughlin 1973; Acevedo Marin and Castro 1997;
22 Salles 2005; Roller 2010; Roller 2014). This instigated another form of “hidden urbanism” begun
23 initially around fugitive slave communities located deep in forests, the Quilombos that stretched
24 throughout the lower Amazon, and all the way up into the Guyanas (Agostini 2002; Cavalcante
25 2011; De la Torre 2012; Florentino and Amantino 2012; Florentino and Amantino 2012; Hecht
26 2013; dos Santos Gomes 2015). The rubber period stimulated formal state and private
27 colonization in Bolivia (Lavalle 1999), and state-organized movements into Peru’s Selva Central
28 (Santos-Granero and Barclay 1998). Colombia’s Putumayo became infamous for its Indigenous
29 slavery and the international political fallout that this occasioned (Taussig 1984; Goodman

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1 2010). Brazil, and especially the Western state of Acre, which was a key supplier of rubber for
2 the global market, relied on massive relocation from Brazil's Northeast and even the US. More
3 than a million people were resettled in Amazonia under various labor regimes, spatial
4 configurations and forms of coercion, as well as labor migration of multiple types including US
5 workers to assist with railroad construction (Weinstein 1983; Coomes and Barham 1994; Ferreira
6 2005; Neeleman et al. 2013; Hecht 2013). Similar forms of settlement and labor recruitment---
7 again from the Northeast region of Brazil--- were reanimated during WWII (Garfield 2010) for
8 rubber supply for the US after Asian supplies were no longer available.

9 Amazonia has been open to foreign settlement since the 19th century when it embraced American
10 slave holders (Guilhon 1987; Hecht 2013), and has included Japanese, Mennonites, eastern bloc
11 refugees and in the Guyanas. South Asian Indians, Hmong, among many others. Although
12 Amazonia shows a high degree of internal national migration, it also has a long history of
13 cosmopolitan migration both permanent and short term. The Korean company towns that sprung
14 up to support the construction of Korean-financed dams in Ecuador provide an example of a
15 controlled, and probably impermanent diaspora, and the recent arrival of Haitian migrants as
16 well as a Venezuelan diaspora into Brazil, Ecuador and Colombia reflect political and
17 environmental underpinnings of migration.

18 Migration can be categorized as a combination of push and pull factors. The standard discussion
19 of push factors emphasizes livelihood problems, the issues of *minifundia*, environmental issues
20 of smallholders in Andean zones and the Brazilian Northeast, political pressures from the
21 “*Violencia*” in spontaneous migrations in the Colombian massive occupation of the Guaviare
22 (Molano 2019) and more general displacements of up to 5 million people in Colombia. Rural
23 instabilities and land rights had been instrumental in fueling insurgencies in Latin America in the
24 Post-War period (Bolivia, Brazil, Colombia, Peru). Agrarian reform as frontier settlement would
25 become a key social policy initiative, as well as a territorial strategy (De Janvry 1981; Pacheco
26 2009; Hecht and Cockburn 2011).

27 Modern colonization policies have emphasized pull factors for the most part, offering land
28 availability, credits and production assistance accompanied by large scale public relations
29 campaigns. These programs have fed from a narrative that frames Amazonia as an “empty” and

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1 “uninhabited” space, echoing hundreds of years of geopolitical and settlement language. With
2 the idea of “he who has, keeps” (“*Uti Possedetis*” in Roman law), as resources became better
3 known, and as infrastructure expanded, colonization took on a geopolitical cast (“*Integrar para*
4 *não entregar*” or basically “use it or lose it”, “Integrate to avoid handing over”), as well as a
5 continuing alternative to agrarian reform in more developed areas in virtually all Amazonian
6 countries, to avoid expropriation of the terrains of landed elites in more settled areas where such
7 elites maintained significant power. Further, colonization appeared to address serious social
8 inequalities and helped frame the states as modern rather than oligarchic entities actively seeking
9 to redress inequality in access to land, which was, at mid-century, a striking feature of Latin
10 American societies. It was this “strategic” use of colonization within the different framings and
11 needs of national economies, from geopolitics to counter-insurgency to eco-settlement, that gave
12 Amazonian settlement its highly erratic quality and its terrains of shifting, and often
13 contradictory, policy. Yet, this very appealing political narrative was important, even as many
14 colonization areas became rife with conflict. Erratic public policy, combined with volatility for
15 small farm prices, and general senses of abandonment has been central in the emergence of
16 clandestine economies of multiple types (Betancur-Corredor et al. 2018; Caballero Espejo et al.
17 2018; Gootenberg and Dávalos 2018; Kolen et al. 2018).

18 The empty land narrative, which was foundational for all the other settlement arguments, ignored
19 the fundamental reality that these lands were inhabited by Indigenous populations, traditional
20 peoples, previous settlers, and *quilombos*, who made claim to their historical territories,
21 sometimes based on earlier treaties signed with defunct empires, overlapping sovereignties, and
22 to appeals to current land rights laws by previous settlers and new recognitions of territorial
23 claims.

24 Settlement policy and practice, as we mentioned, has undergone significant program shifts, and
25 this is perhaps best exemplified in Brazil, which has by far the largest number of formal
26 settlements, as well as extensive informal settlements, and settlements declared by local states
27 (Box 14.5). The geographic distribution of the various forms of settlement is shown in Figure
28 14.4.



1

2 **Figure 14.4.** Distribution of settlements by type in Brazil’s Legal Amazon region. Source: Yanai
 3 et al. 2017.

4

5 One of the most consistent outcomes in settlements has been the high degree of colonist attrition,
 6 which is marked in both formal and informal colonist settlements, with levels of turnover as high
 7 as 77% (Carrero and Fearnside 2011). Thus, because most farm lots changed hands at least once,

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1 and often many times, deforestation and farm consolidation processes do not reflect the action of
2 one single household (defying the classic Chayanovian models of household behavior), but
3 rather of successive households or landowners over time. The models of settlement currently on
4 offer suggest little by way of settler security, but fulfill important ideological functions, even as
5 they reproduce patterns of landholding inequality in most contexts.

6 ***4.6. Social movements, development paradigms, and governance***

7 Since colonial times, Amazonian social movements have struggled for rights to land, livelihood,
8 physical security and autonomy, and ultimately for more inclusive and sustainable development
9 approaches (Box 14.6). In the 20th and 21st centuries, authoritarian, illiberal governments and
10 regional elites have severely repressed social movements throughout the region, in many cases
11 denying the rights to traditional territories and assassinating their leaders, as in the iconic case of
12 rubber-tapper leader Chico Mendes in 1988 (Vadjunec et al., 2011; Hecht 1989) and a decade
13 later, activist nun Dorothy Stang who also died in a continuing patterns of assassination of forest
14 defenders (Staff 2007; May 2015). Far less noted, in the absence of international profiles, there
15 have been hundreds of assassinations of peasant, IPLCs leaders occur regularly. Brazil, and Pan
16 Amazonia more generally, lead in the frequency of murders of human rights activities,
17 Indigenous rights leaders, and forest guardians according to Amnesty International (2020).

18 Democratization in the 1980s and 1990s allowed Amazonian civil societies greater opportunity
19 to participate in policy debates in both rural and urban areas. A high point took place in Belém,
20 where, between 1997 and 2001, a vibrant participatory budgeting initiative was implemented to
21 discuss small urban infrastructure for community-determined projects (Silva 2016). This kind of
22 initiative lost space, however, with the expansion of national government support for large-scale
23 infrastructure---*Projetos Grandes*--- in the 2000s. Movements throughout Pan-Amazonia have
24 increasingly mobilized to address the destabilizing impact of these projects and to push for
25 improved environmental governance and alternative regional development models.

26 In rural areas, new kinds of land claims gained traction following Brazil's 1988 Constitution,
27 which recognized the territories of many kinds of traditional peoples, including Indigenous, afro-
28 descendent, rubber tappers, non-timber forest product extractivists of many kinds, traditional
29 fishers and communities in sustainable development units. Accompanied by better protected area

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1 legislation, this produced new conceptualizations of “socio-environmental” forms of
2 conservation in inhabited landscapes (Box 14.6). More than 70 million hectares in Brazil alone
3 were conserved with this model, and provided the legal basis for contesting the expansion of land
4 grabbing associated with soy and cattle ranching, and the expanding road system. Similar
5 language and concepts spread through Pan-Amazonia, building on the previous experiences of
6 resistance by Andean Indigenous groups, as countries shifted away from their earlier
7 authoritarian regimes.

8 While the fiscal crisis of the 1980s and 90s implied diminishing availability of funds for big
9 infrastructure (except roads), this situation started to change in the mid-2000s, especially in
10 Brazil. With the creation of the *Programa de Aceleração do Crescimento* (PAC) stimulus
11 program in 2007, major funds became available for both urban and regional large-scale
12 infrastructure. These initiatives have met with massive and highly-publicized popular resistance
13 from the lowlands to the Andes (Canessa 2014; Jerez et al. 2015). In the mid-1980s, social and
14 environmental movements joined together to protest the Cuiabá-Porto Velho road (BR-364),
15 attracting international and national attention (Hecht and Cockburn 1989; Hochstetler and Keck
16 2007; Schmink and Wood 1992). In Ecuador, the Waorani, Cofan, and members of other
17 Indigenous groups, as well as settlers (colonos), have struggled for reparations from
18 Texaco/Chevron and PetroEcuador for the devastating impacts of drilling operations (Kimerling
19 1991, 2006, 2013, 2015; Pellegrini et al. 2020). More recently grassroots groups have protested
20 the road construction in the Isobore Sécure National Park and Indigenous Territory –TIPNIS – in
21 Bolivia (McNeish 2013), the Camisea pipeline in Peru (Urteaga-Crovetto 2012), and the mega-
22 hydroelectric power plan of Belo Monte in Brazil (Fearnside 2017), to name just a few
23 contentious projects.

24 National and subnational governments in the Pan-Amazon have generally resisted attempts to
25 create more robust participatory institutions through which affected communities can engage in
26 informed consent around big infrastructure projects (Bebbington et al. 2018a, 2018b). In Brazil,
27 community participation in decision-making about such projects is almost entirely reduced to
28 environmental permitting hearings late in the process, with little practical impact on decision-
29 making (Abers 2016; Zhouri 2011; Fearnside; Fearnside 2015; Ferrante et al. 2020). Land-use
30 zoning efforts, popular in the 1990s, were an opportunity to engage community participation, but

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1 these plans were frequently overturned or approved without effective participation (Bratman
2 2019; Mahar 2000; Mahar and Ducrot 1998).

3 In the 2000s, left-leaning national governments throughout the region promised a more
4 participatory and sustainable approach to mega-projects. One example was the BR-163 road
5 paving project in Pará and Mato Grosso states in Brazil. The federal government approved a
6 Sustainable Development Plan for the region designed by civil society groups through extensive
7 consultations. Unfortunately, it was never implemented (Abers et al. 2017). This area was critical
8 due to the threat of soy expansion into smallholder, Indigenous, Extractive Reserve, and
9 *ribeirinho* lands. Similar promises were made about the Belo Monte dam, and a Regional
10 Development Plan for the Xingu (PDRSX) was modeled after the defunct BR-163 plan. Civil
11 society groups have reported continuing difficulties getting their proposals approved through the
12 participatory mechanisms created to implement the plan (Pereira and Gomide 2019), and the
13 meanings of sustainability are themselves contested (Bratman 2019).

14 In the absence of effective participatory structures, local and especially Indigenous movements
15 have sometimes made headway through protest. The Indigenous March of 1990 (*Marcha por el*
16 *Territorio y la Dignidad*) influenced Bolivia's forestry law (1996) and struggles for territorial
17 recognition and control (Barroso 2013). In Ecuador, *La Gran Marcha* of 1992 won the
18 recognition of Indigenous land rights, albeit without the right to autonomous governments.
19 Recent protest "caravans" by Indigenous populations in Europe in 2019 have focused on the
20 impacts of European consumption patterns, financial investment and their implications for the
21 encroachment on lands and violence against Amazonian Indigenous peoples, and the lack of
22 prior consent as required by international law. These mobilizations nationally and internationally
23 contributed to questions about the large-scale MERCOSUR (Southern Common Market) trade
24 agreements, in light of Amazonian destruction and human rights problems.

25 Another way that Amazonian movements have influenced political institutions is through the
26 dissemination of the concept of *Buen Vivir*, which has been included in the constitutions of
27 Ecuador, Bolivia, Colombia, and Peru. Throughout the Andes and Amazonia, Indigenous
28 cultures have concepts of a healthy life based on traditional knowledge, social reciprocity and
29 lifeways, and of caring for the environment: in Quechua (Ecuador), *Sumak Kawsay*, in Aymara

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1 (Bolivia), *Suma Qamaña*; in Guaraní, *Teke Porã*; and in Baniwa (Brazil), *Manakai* (Cruz and
2 Pereira 2017; Ihu 2010). These ideas have been translated into Spanish as *Buen Vivir*, a paradigm
3 that deprioritizes economic growth and puts people's lives, well-being, nature, and basic rights to
4 education, health, and social equity at the center of development (Alcantara and Sampaio 2017).
5 These ideas reside at the heart of many Amazonian cultures and represent different kinds of
6 "episteme," a normative and foundational principle to guide behavior. *Buen Vivir* is an important
7 example of how social movements can contribute to debates about alternative models of
8 development.

9 In addition, Indigenous groups increasingly turn to international organizations and trans-basin
10 organizing to pressure governments to respect human rights, citizenship, and territories in a
11 context of increasing violence.

12 5. CONCLUSIONS

13 The great Brazilian writer Euclides da Cunha noted that Amazon countries would never really
14 come into their own histories and identities until they began to understand the implications of
15 their Amazonias (Cunha 1907). The Amazonian transformations presented in this chapter are
16 framed by the complexity of Amazonia's environment, the antiquity of human co-existence with
17 the region's natural resources as outlined in earlier chapters, and now the powerful forces that
18 have imposed dramatic, and in many ways novel, configurations on Amazonian peoples and
19 nature, especially over the past half a century. While forms of governments have shifted among
20 authoritarian, illiberal and liberal regimes from the left and the right, the Amazonian question
21 remained essentially the same: What to do with a vast illegible national territory, infused with the
22 myths and realities of riches, inhabited by largely obscure populations? What to do with an
23 ecologically exuberant, largely incomprehensible terrain to planners, capitalists, farmers and the
24 political classes located in the capitals, along the coasts, interiors and in the mountains, who were
25 to decide its fate? And thus, was Amazonian thrust into the current world through the ideologies
26 and practices of modernization, and the massive ecological, socio-cultural and economic
27 simplifications that have attended it over the last 50 years or so. The simple answer about
28 Amazonia lay in the recipes of modernization writ everywhere in its various incarnations. In
29 Amazonia, what this meant was to shred the fabric of Amazonian lives, and turn complexity into

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1 monocultures and mines, degraded pastures, struggling smaller farms, and precarious cities. The
2 largest tropical forest on the planet became among the most urbanized places in the developing
3 world.

4 For modernization to advance, the complexity of forests had to be reduced from multiplicities, to
5 landscapes of a few species at most, and much of this devoted to animal feed of soy, corn and
6 grass. Over huge areas, lands would be freed from their diversity by a kind of hellfire that would
7 swirl their millennia of DNA and carbon bodies into choking ash, enough to darken cities
8 hundreds of kilometers away. This was done in the name of many things and contested
9 meanings: Bringing civilization to the tribal, religion to the heathen, taming the wild, national
10 sovereignty, nation building, geopolitics, poverty alleviation, national integration, agrarian
11 reform, territorial governance, market triumphalism, and transformation of the means and the
12 modes of production into a mostly capitalist idiom. It also meant that Amazonia would become
13 one of the largest planning terrains on the planet, second only to China, and in many ways, the
14 graveyard of failed regional plans. Modernization has moved Amazonia from its traditional
15 forms into a caricature of modernity---urban, secular, waged, monetized-- but largely lacking the
16 distributional structural change and the larger welfare improvements that politically and
17 economically justified ravaging Amazonian lands and waters, a failure exemplified by the
18 current astronomical COVID-19 mortality. As nation states made their mark on Amazonian
19 lands, gridding them out, creating new settlements, and punching roads through forests,
20 Amazonian countries have reinvented resource dependency as national economic strategies, key
21 elements of their foreign exchange. This has been achieved through the expansion of mining,
22 fossil fuel extraction, monoculture agriculture, and infrastructure to support the export and flight
23 of national wealth, and the creation and recreation of inequalities. Large clandestine economies
24 of plundered timber, stolen lands, illegal gold and its mercurial waters, furtive coca production,
25 and continuing streams of migration, seasonal labor, and a bricolage of urban and rural
26 livelihood tactics frame the contours of the precarity for much of the region's population. The
27 modernization development model as it is currently deployed, incarnates externalities---the
28 unaccounted for environmental costs---not as a "bug", but rather as an essential feature of the
29 process, with the true costs borne at multiple scales, from local ecological destruction and
30 extinctions, social dislocations, and emiseration to regional and global climate change. The
31 prevailing definitive forms of destruction lock out alternatives ideas and practices that regional

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1 populations advance as “multiple” and “hybrid forms” of modernities based in systems of local
2 knowledge, social innovations and equitable outcomes, that support environmental services
3 rather than the systems of almost colonial plunder which currently dominate.

4 In spite of their importance, cities, towns and villages remain more or less out of the discussion,
5 even as they are now home, at least part of the time, to the large majority of Amazonian
6 inhabitants. How these urban areas will adapt, how they shape their hinterlands, and how
7 people’s complex livelihoods will unfold under increasing social instability that increasingly
8 prevails, is still largely off the radar. Moving forward, the insights and interests of local people,
9 both urban and rural, native and migrant, and especially the region’s diverse and highly-
10 organized Indigenous peoples, must serve as the key touchstone for a dramatic shift in the
11 approach for sustainable development and conservation in the Amazon.

12

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Chapter 14

1 7. CORE GLOSSARY

2 **Agrarian** – relating to land, land tenure, or the division of landed property.

3 **Agrarian reform** - government-initiated or government-backed redistribution of
4 agricultural land.

5 **Agribusiness** – business connected to agriculture, either owning or operating larger scale farms
6 for profit.

7 **Agroforestry** – diverse forms of integrated land management, including trees on farms and in
8 agricultural landscapes, farming in forests and along forest margins, and collection of tree
9 products.

10 **Alluvial** – referring to materials such as minerals deposited by rivers.

11 **Biodiversity** – all the different kinds of life found in one area – the variety of animals, plants,
12 fungi, and microorganisms like bacteria in the natural world.

13 **Carbon emissions** – Release of CO₂ (one of the greenhouse gases that absorbs radiation and
14 prevents heat from escaping our atmosphere) from the exchange of carbon dioxide between the
15 oceans and the atmosphere, from respiration of animals and, and from organisms within the soil,
16 which creates disrupted weather patterns, higher global temperature averages, and other changes
17 in the climate.

18 **Cold War** - period of [geopolitical](#) tension between the [Soviet Union](#) and the [United States](#) and
19 their respective allies, the [Eastern Bloc](#) and the [Western Bloc](#), after [World War II](#).

20 **Colonization** – official or spontaneous occupation of an area by migrants from other regions, for
21 the purpose of land claiming and agricultural development.

22 **Conditional cash transfer** - programs that aim to reduce [poverty](#) by making [cash](#) transfers to
23 persons who meet certain criteria.

24 **Conditionality** - conditions attached to the provision of loans, debt relief, or foreign aid by the
25 provider to the recipient, which is usually a sovereign government.

Chapter 14

- 1 **Constitutionalism** - adherence to a system of constitutional government.
- 2 **Commodity** – a product for trade or commerce.
- 3 **Cosmology** - *Religious cosmology* is an explanation of the origin, evolution, and eventual fate of
4 the universe, from a *religious* perspective.
- 5 **Deforestation** – also forest conversion; the clearing of natural forests (deforestation) to use the
6 land for another purpose, often agricultural but also for mines, infrastructure or urbanization.
- 7 **Development** - a process that promotes growth or progress; may also be used to reflect and to
8 justify a variety of different agendas held by different people or organizations.
- 9 **Emergent** – properties in the process of coming into being or becoming prominent.
- 10 **Environmental Services** – the many and varied benefits to humans gifted by the natural
11 environment and from healthy ecosystems.
- 12 **Episteme** -- a normative and foundational principle that informs behavior.
- 13 **Expropriation** -- action by the state or an authority of taking property from its owner for public
14 use or benefit.
- 15 **Externalities** - side effect or consequence of an industrial or commercial activity that affects
16 other parties without this being reflected in the cost of the goods or services involved.
- 17 **Financialization** - the process by which financial institutions, markets, etc., increase in size and
18 influence.
- 19 **Forest extraction** – the collection of non-timber and other kinds of non-agricultural forest
20 products.
- 21 **Forest management** – harvesting timber from the forest in such a way that theoretically the
22 system can continue to produce indefinitely while forest cover remains intact.
- 23 **Geopolitical** - relating to politics, especially international relations, as influenced by
24 geographical factors.

Chapter 14

- 1 **Globalization** - integration and movement of multiple commodities, capital, people,
2 technologies, ideas and ideologies, discourses and forms of representation that can structure and
3 transform localities and economies, but also hybridize with local, regional and national spaces
- 4 **Governance** - the action or manner of governing, involving both governmental and non-
5 governmental actors.
- 6 **Hydrocarbons** - crude oil, natural gas, coal, and other energy sources based on carbon atoms.
- 7 **Ideology** - system of ideas and ideals, especially one which forms the basis of economic or
8 political theory and policy.
- 9 **Identity** - the characteristics determining who or what a person or thing is, including social,
10 economic, cultural, political and religious aspects.
- 11 **Illiberal** - opposed to liberal principles; restricting freedom of thought or behavior.
- 12 **Import Substitution Industrialization (ISI)** - Evolving from a critique of natural resource
13 exports, ISI promoted policies that were meant to expand the national industrial base
- 14 **Infrastructure** – basic physical systems of a region or nation, including transportation systems,
15 energy grids, communication networks, sewage, and water systems.
- 16 **Institutions** – important social entities such as the state, the church, the family, policies, and the
17 law.
- 18 **Institutional rents** - value that comes from government infrastructure and services, including
19 various fiscal incentives (credit lines, trade policy), research, and favorable policies.
- 20 **Land grabbing** – Securing land through title fraud, violence, and amnesty; also, nation states
21 selling off or allocating national areas to other nations or corporations on lands already occupied
22 by other claimants
- 23 **Land speculation** – the acquisition of real estate with the hope that the price will increase.

Chapter 14

- 1 **Land tenure** – rules that define how access is granted to rights to use, control, and transfer land,
2 as well as associated responsibilities and restraints.
- 3 **Leakage** - displacement of major deforestation processes to other locations.
- 4 **Legibility** - capable of being read or managed in predictable formats.
- 5 **Livelihood** – means of securing the basic necessities of life; a set of activities essential to
6 everyday life including securing water, food, fodder, medicine, shelter, and clothing.
- 7 **Logging** – removal of timber from the forest.
- 8 **Meta-processes** - large-scale development, land structures, international lending and policies
9 framed by specific ideas and ideologies.
- 10 **Modernization** -- the ideology that favors transformation from a traditional, rural, agrarian
11 society to a secular, urban, industrial society.
- 12 **Moratorium** – an official suspension or delay of some activity.
- 13 **Neoliberalism** – a policy model that seeks to transfer the control of economic factors from the
14 public to the private section, enhancing the workings of free-market capitalism and placing limits
15 on government spending, government regulation, and public ownership.
- 16 **Quilombos** - hinterland settlements formed by Afro-descendant escaped slaves, who have
17 specific rights to their identities, traditions, livelihoods and lands (the majority of which still to
18 be recognized).
- 19 **Path dependency** - dependence of outcomes on the path of previous actions rather than
20 decisions focused uniquely on current conditions.
- 21 **Peri-urban** – landscape interface between town and country; also, the rural-urban transition
22 zone.
- 23 **Privatization** - transfer of a business, property, or service from public to private ownership and
24 control.

Chapter 14

- 1 **Production systems** – systems by which specific actors produce economic value by combining
2 labor, resources and technology.
- 3 **Regionalization** - the coordination of banking, investment, and infrastructure through regional
4 planning agencies that would override local states and their coteries in favor of a national project
5 and national political control.
- 6 **Remote sensing** - the scanning of the earth by satellite or high-flying aircraft in order to obtain
7 information about it.
- 8 **Resilience** - capacity of a system, be it an individual, a forest, a city or an economy, to deal with
9 change and continue to develop.
- 10 **Social movements** – a group of people organized and coordinated to achieve some task or a
11 collection of goals, often focused on social change.
- 12 **Socio-ecological** – perspective that emphasizes the need to address intertwined social and
13 ecological issues and concerns in striving for sustainable development.
- 14 **Subsidy** – a direct or indirect benefit to individuals or firms, usually in the form of a cash
15 payment from the government or a targeted tax cut, or a “subsidy from nature” in the form of
16 access to natural resources at no cost.
- 17 **Supply chain** - network of all the individuals, organizations, resources, activities and technology
18 involved in the creation and sale of a product.
- 19 **Sustainable** – meeting the needs of the present without compromising the ability of future
20 generations to meet their needs.
- 21 **Urbanization** - the process by which large numbers of people become permanently concentrated
22 in relatively small areas, forming cities.
- 23 **Traditional** - local or traditional communities in Amazonia, generally descendants of migrants
24 who intermarried with local Indigenous peoples, are strongly connected with place, territory and

Chapter 14

1 biodiversity, as well as with each other, in symbolic as well as physical, economic and political
2 ways.

3 **Value-added** - the amount by which the value of an article is increased at each stage of its
4 production, exclusive of initial costs.

5

Box 1: The hidden (and not so hidden) processes of Amazonian transformation

Invisibilities

One central problem in understanding Amazonia is that of invisibilities. These include invisibilities associated with socio-economic systems: illicit economies---timber, gold and coca, and land grabbing whose economic values, social and environmental costs are enormous; and invisibilities associated with informal economies—the exchanges in kind, in informal markets; the use and subsistence value of forests and rivers to local populations; the large scale flows of populations as they travel in daily, periodic and seasonal movements in the shaping of their livelihoods, especially given the high degree of insecurity that prevails in Amazonian livelihoods; and the invisibilities of the costs of many population displacements associated with enclosures, land seizures, infrastructure development and violence (Fearnside 2006; Jaichand and Sampaio 2013; Bratman 2014; Fearnside 2014; Atkins 2017; Ioris 2017; Randell 2017; Calvi et al. 2020).

Other invisibilities are related to environmental impacts, including the environmental consequences of Amazonian land use transformations such as hydro-bio-climatic changes (discussed in Chapter 22 in this Report), and regional, national and global impacts such as changing rainfall patterns, increased ecological fragmentation and enhanced vulnerabilities to fires. Also invisible are the ecological and social costs of corruption, resource theft and speculation, and the costs of the losses of cultural diversity, knowledge systems, and value systems that have been central to maintaining ecosystems integrity and livelihoods.

Informal institutions, “tradition,” and access and tenurial regimes also operate in ways that are often invisible to outsiders but obvious and trenchant in the operation of daily lives. “New” social mapping is now being used to reveal forms of urban dependencies on ecological resources and territories (UEA 2010; de Almeida and Júnior 2013). Among the most dramatic of these has been the emergence of the importance and extent of *Quilombola* settlements (see Chapter 13), both urban and rural (refuge territories whose existence was largely unnoticed by

most development agencies until the turn of the 21st century). Other ubiquitous, but largely invisible populations are the “caboclo” river dwellers, lake-side dwellers and fisherman, forest collectors and swidden cultivators (Harris and Nugent 2004; Brondizio 2009; Silva 2009). About 25% of Indigenous populations are at least part-time urban residents (Alexiades 2009; Eloy and Lasmar 2011; Alexiades and Peluso 2015; Campbell 2015a, 2015b; Nasuti et al. 2015; Sobreiro 2014) relying on urban access for markets, communication, education, health access and political organization, in sharp contrast to the uniquely forest-based imaginary of Indigenous people.

Subsidy from nature

Another less visible factor is the importance of the “subsidy from nature.” Like fisheries, forest products are freely collected in support of both rural and urban livelihoods. In many cases this “no cost” subsidy for smallholders involves extensive resource management, knowledge and labor inputs into the reproduction of the resource. The subsidy provided by free goods amounts to about a third of people’s income, a result that for small-scale forest collectors is remarkably widespread. This means that typical ways of looking at rural and urban livelihoods often overlook the importance of collected goods in the economic portfolio.

The “subsidy from nature” also applies to externalities, through the simple extraction of value from nature with no attention to replacement costs, mediation or remediation of environmental and social effects, or of impacts on ecosystem trajectories at local, regional and planetary scales. For example, a natural product that was destructively harvested, such as simple destructive commercial logging with no remediation or replanting, involves capturing and monetizing a resource embedded in ecological processes, incarnated in wood, without incurring any costs of the reproduction of the resource. In complex systems like Amazonia, while there were costs of logging (roads, trucks, labor), the timber resource itself - the main source of value - is often collected at no or little cost to loggers, or through corrupt capture of concessions, in contrast to other kinds of forestry and land-use systems. Another key example is monocrop replacement of complex forests, collapsing their conditions and systems of recuperation, destroying their capacity to provide environmental services, and changing hydraulic, climatic, and ecological regimes (Coe et al. 2013; Laurance et al. 2018; Lovejoy

and Nobre 2018). In this case both the costs of “producing” an ecosystem product - say a mahogany tree - and the impacts of the externalities associated with its extraction, increase system vulnerabilities, causing loss of resilience, and the loss of ecosystem services that are priced at zero. Social dislocations and conflicts also are not part of the calculus.

Path Dependency

Path dependency is the *dependence* of economic outcomes on the *path* of previous actions rather than decisions focused uniquely on current conditions. With path dependency, “history matters” — it has an enduring influence on economies, livelihoods, institutions, and politics, reflecting choices made at one time that affect the conditions of possibility in another time. Path dependence involves embedded institutional, political, and economic commitments to a particular technological regime, or in the case of Pan Amazonia, particular technological landscapes, with considerable barriers to “switching regimes.” For ecological and environmental reasons, such landscapes may involve not just political/technical regimes, but may produce what might be called “quasi-irreversibility” because ecological changes can undermine ecosystem functionality and resilience. These changes can be revealed in deflection of successional pathways, soil toxins that limit re-establishment of local species, soil compaction, and the impacts of ecosystem fragmentation, local extinctions, and microclimate barriers to recuperation, to mention just a few. These can produce degraded lands that are usually very expensive to recover, and provide the background of scrubby brush visible next to every roadway in Amazonia (Laurance et al. 2018; Laurance et al. 2002). These ecological changes can align with political blockages or institutional barriers that can limit the capacity to support more resilient and/or complex social or ecological states. Land use decisions and practices can preclude other options and development paths because they are so transformative of the natural base of production and/or the institutionalities that support them, or the people involved with them.

Box 2: Amazon Ascendancy: Complex shifts in Amazonian resource conservation

The late 20th century Amazon was seen as a solution to several kinds of national problems, including some which were more or less resolved: 1) national integration; 2) geopolitical concerns over boundaries; 3) problems of political insurgencies, whether real or imagined (although Plan Colombia had reconfigured Cold War politics into the War on Drugs); 4) issues of Indigenous populations in ways that were nominally satisfying to international observers; 5) potential economic gains and exploratory resources; 6) a means of resolving agrarian issues without engaging structural reform in other, more politically delicate, regions, and where reform was vigorously resisted by national elites; 7) a means of “modernizing traditional agriculture” in new spatial contexts that would not antagonize landed oligarchs, a critical element of national political alliances; 8) the elaboration of the technologies that would fuel the agro-industrial sectors of the economies via innovations in soy/corn rotations, new pasture grasses and the introduction of oil palm; and 9) rhetorical and actual environmental policies and institutional development.

We can perhaps summarize aspects of these shifts in the following points that evolved in the post-authoritarian period, in terms of conservation, development approaches, and regulations. There were, as part of this process of economic change and increasing engagement in civil societies (which we discuss further on in more detail), a series of other kinds of shifts which, although contested, portended a new kind of politics. These can be summarized as “Epistemic Shifts” in institutional development at the level of the states and new market dynamics. These also produced emergent properties and new drivers that now shape Amazonia.

Epistemic shifts

1. In a profound shift from the set-aside conservation model, inhabited landscapes were now recognized to have conservation value, as well as economic value, and their stewards deserved rights and recognition, substantively changing land rights for traditional and Indigenous populations (Simmons et al. 2010; Fontana and Grugel 2016; BenYishay et al. 2017; Bebbington et al. 2018);

2. Agroecological and socioecological critiques of monoculture agriculture and livestock development models have been accompanied by the rise of agroecological experiments and sustainable alternatives as a response to externalities, and to enhance the subsidy from nature and support of environmental services. These have received national as well as international support, and are summarized in the projects of the Pilot Project for Amazon development (PPDAM) and figure as well in Brazil's role in formal international agreements such as the Paris Climate Accords and Aichi Biodiversity agreements, among others.
3. Nature has standing and legal rights, at least at the level of rhetoric: The *Pachamama* earth mother has legal standing in constitutions of Ecuador and Bolivia. A river has rights in Colombia.
4. Traditional tenurial regimes and territories become legally and constitutionally-recognized through historical rights and ancestral use (i.e., quilombos, Palenque or Maroon lands; traditional and extractive reserves). These also ratified Indigenous rights and autonomy.
5. Amazonia was increasingly recognized as a "socio-environment" constructed through people's historical geo-biotic transformations of forests, soils and engineering works, based on archeological, ethnographic and historical research (Balée 1998; Fausto and Heckenberger 2007; Heckenberger et al. 2007; Parssinen et al. 2009; Clement et al. 2015; Athayde et al. 2017; Watling et al. 2017; de Souza et al. 2018; Levis et al. 2018; Maezumi et al. 2018).

Emergent legislative and regulatory apparatus

1. New ministries were created in all Pan Amazon countries, allied to ideas of sustainability and resilience.
2. Existing ministries took on expanded environmental portfolios.

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3. New technologies for land demarcation such as CAR (Cadastral of Rural Areas) as well as social mapping, and historical claims (Oliveira and Hecht 2016; Arima et al. 2014; Azevedo et al. 2017; Oliveira 2013) were used to mediate and regularize land claims; However: this geolocated land required access to GIS systems that might not be available to many rural people.
4. Environmental legislation expanded, and Pan Amazon countries were integrated into international environmental agreements at national and local jurisdictional levels (Paris Climate Agreement 2015; Aichi 2017).
5. Enhanced international support emerged for alternative development models (Amazon Pilot project) and other sustainable research and practices.
6. Enhanced deforestation and land use monitoring, and modeling took place (Fearnside 2005; Fearnside 2008; Asner et al. 2010).
7. Reassessment of forest codes and rural land codes took place more generally.

Market dynamics

1. Increased integration into global market (especially China) for non-traditional Amazonian commodities (e.g., soy) as well as timber, gold, beef, and oil palm; decline in US as main trading partner.
2. Expansion of clandestine markets.
3. New attentiveness to supply chains and their pressure points (like the soy moratorium).
4. Expansion of green fair-trade markets (*Açaí*, *cacau*, rubber, Brazil nuts).
5. Increased certifications, but problems especially with timber (Clark and Kozar 2011; VanWey and Richards 2014; Brancalion et al. 2018).
6. Expanded demand for fast-growing timbers from small farms (Sears et al. 2018)

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7. Leakage into less-regulated systems triggered significant deforestation in non-Amazonian forests (Meyfroidt et al. 2020).

Box 3: IIRSA/COSIPLAN

The Initiative for Regional Infrastructure Integration in South America (IIRSA), created in 2000 and managed by the South American Council of Infrastructure and Planning (COSIPLAN) since 2009, established a framework to promote a series of coordinated strategic mega-infrastructure investments at a continental scale. The initiative breathed new life into longstanding development narratives of connectivity, integration, economic growth, but now combined with the urgency of increasing competitiveness in a globalizing world.

IIRSA/COSIPLAN proposed to support the transformation of Amazonia through a series of ten strategic integrated development corridors or hubs connecting countries in the region with each other and to global markets (Simmons et al. 2018; Walker et al. 2019). The portfolio of projects included some 544 priority investments totaling over USD 130 billion (Little 2014). The larger vision included the creation of navigable waterways, a system of ports and logistical centers, a transcontinental railway with over 15,000 km of new track, and improvements to ~2 million kilometers of roads, in addition to modernizing the telecommunications systems and standardizing and harmonizing regulations in support of the efficient flow of goods and services. The initiative also encourages private sector participation and introduces innovative financing arrangements to overcome the types of bottlenecks experienced in publicly funded infrastructure projects. The creation of integrated development corridors offers governments and financiers of infrastructure big vision projects around which they can link purported benefits (jobs and economic growth, increased access) to secure the support of subnational authorities and local populations.

One of the greatest challenges to continental integration has been the construction of terrestrial transport corridors connecting Atlantic and Pacific ports. The Southern Interoceanic Highway, spanning over 2,600 kilometers, and connecting Brazilian and Peruvian ports, was inaugurated in 2011 to great fanfare. More recently, the highway has drawn criticism for overstating the amount of commerce that would travel the highway, the lack of social and environmental safeguards, and for the significant deforestation and illegal gold mining that it has induced. In addition to the Southern Interoceanic Highway, Peru continues to develop a Northern

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Interoceanic route involving a combination of investments in road building, river navigation (the proposed Amazon waterway) and port development. Finally, a third route, the Central Interoceanic Highway has improved the road network linking Lima to Pucallpa, leaving open the possibility of a terrestrial connection to Cruzeiro do Sul in Acre.

In Brazil, national infrastructure plans complement and reinforce larger regional integration objectives. Brazil's Agenda for Priority Integration Projects earmarked nearly 70 percent of its USD 20 trillion budget to support the construction of multi-modal systems of transport (roads, rail and waterway) (Bebbington et. al. 2018). Investments in these systems of transport are attractive because they are high-value projects and create synergies with other potential investments.

The vast infrastructure network envisioned for Amazonia is intended to connect remote sites of production and extraction, reduce transport costs, and increase the efficiency of transporting commodities destined for foreign markets, but especially China. Improving access infrastructure in Pan-Amazonia is clearly a priority for both subnational and national governments; however, a recent study found that many of the proposed roads – the researchers analyzed a portfolio of 75 proposed road projects - did not include sufficient impact assessments of social and environmental impacts, nor were the projects found to be financially (Vilela et al. 2020).

Box 4: The Social Impacts of Dams

Displacement of population

Displacement of population is the most dramatic human consequence of hydroelectric dams. The full weight of this impact falls on those who have the misfortune of living in a place chosen for flooding by a dam, while the benefits of the dam go to people and industries in distant cities, making environmental justice one of the primary concerns with Amazon dams (Fearnside 2020a). The 23,000 people displaced by Brazil's Tucuruí Dam in 1984 still suffer the consequences of their displacement (Fearnside 1999, 2020b; Santos et al. 1996). Those displaced by the Madeira River dams are also suffering (Baraúna 2014; Simão and Athayde 2016). At Belo Monte a large population of riverside dwellers was displaced and moved to "urban settlements" distant from the river, with dramatic consequences both from the loss of livelihood and from the loss of their physical and social environment (Magalhães and da Cunha 2017). Meantime a massive influx of migrants moved into the region.

Loss of livelihoods from fisheries

Dams have severe impacts on natural ecosystems (see Chapter 20). These changes lead to a loss of the fisheries that sustain much of the human populations in areas flooded by reservoirs, and in the river stretches both below and above the reservoir where fisheries are also negatively impacted. In the case of Tucuruí, the fisheries below the dam declined precipitously, both for fish and for freshwater shrimp, eliminating the fishing fleet at Cametá (the main city in the lower Tocantins) (Fearnside 2001c, 1999; Odinetz-Collart 1987). Fish-landing data along the length of the Tocantins River show that the fish production in the Tucuruí reservoir never compensated for the loss of fish production in the natural river (Cintra 2009). The fish production in Amazonian reservoirs is minimal. At Balbina, commercial fishing had to be banned beginning in 1997 due to the fish population's precipitous decline (Weisser 2001). The Santo Antônio and Jirau Dams on the Madeira River destroyed one of the world's most productive fluvial fisheries that had supported large populations of fishers in Brazil, Bolivia and Peru. Impacts come from blocking fish migration, including the famous "giant catfish" of the Madeira River, from impeding the descent of fish larvae spawned in the

river's headwaters, from the reservoirs' unfavorable environment for many species, and from reduction of nutrients associated with the sediments (Fearnside 2014; Forsberg et al. 2017; Faleiros and Isensee e Sá 2019). Hydropower development can negatively affect perceptions of fishery sustainability and exacerbate existing weaknesses in fisheries governance (Doria et al. 2021).

Indigenous populations

Indigenous peoples suffer the same impacts as other dam-affected people, plus some that are unique to Indigenous groups. The loss of sacred sites is particularly serious, and this is not even considered as an impact in the environmental impact assessments (EIAs), as in the case of the proposed São Luiz do Tapajós Dam, which would flood the site where the great ancestor of the Munduruku people created the Tapajós River (Fearnside, 2015a). Most traumatic for the Munduruku was the dynamiting in 2013 and flooding in 2014 of the Sete Quedas falls to make way for the Teles Pires Dam (Branford and Torres 2017). This is the place where the spirits of deceased tribal elders reside – the equivalent of Heaven for Christians. Sacred sites were also destroyed in 2017 by the São Manoel Dam 40 km downstream, and tensions with the residents of the Kayabi Indigenous Land, located only 700 m from the dam, have resulted in Brazil's National Force still being deployed to the site to protect the dam (Fearnside 2017a; *Neo Mondo* 2018). These cases illustrate the problem of sites located outside of Indigenous lands being vital to the Indigenous groups, in this case destroying both fisheries and sacred sites.

Dam impacts can result in severe losses of Indigenous cultures. In the case of the Balbina Dam, the two largest Waimiri-Atroari villages were flooded, and the displaced population moved to the roadside of the BR-174 (Manaus-Boa Vista) Highway, where they were on their way to physical as well as cultural elimination. After a disastrous delay, the hydropower company (ELETRONORTE) financed a program that convinced the group to leave the roadside and build a new village in the forest (Fearnside 1989). The group has survived and increased in population, but has paid a heavy price in cultural loss under the influence of the power company's program (Rodrigues and Fearnside 2014).

The Belo Monte Dam did not flood Indigenous land, but it diverted 80% of the water in the Xingu River to flow to a powerhouse 100 km downstream from the main dam, leaving the “Big Bend of the Xingu” (*Volta Grande do Xingu*) with very little water. Two Indigenous lands are located along this stretch, and a third group on a tributary that joins the Xingu in this stretch also lost the fishery on which the group depends (de Oliveira and Cohn 2014; Villas-Bôas et al. 2015). As severe as these impacts were, they were dwarfed by the impact that would be caused by planned dams on the Xingu River upstream of Belo Monte (Fearnside 2006). Belo Monte is completely unviable economically without water stored in upstream dams, making it clear that official denials of the original plans for these dams represent disinformation (de Sousa Júnior et al. 2006; Fearnside 2017c). The first priority would be the Babaquara Dam (officially renamed as the “Altamira” Dam, but best known by its original name). This would flood 6140 km², twice the size of Balbina or Tucuruí, almost all of which is Indigenous land (Fearnside 2006).

Health impacts

Dams have health impacts on people who live around reservoirs or eat fish from them. Mercury is naturally present in the soils in Amazonia because the soils are millions of years old and have been receiving mercury in the rain – the result of volcanic eruptions that inject mercury into the atmosphere, where it spreads around the globe. Additions of mercury from its use in alluvial gold mining can also occur, but they are not necessary to have substantial amounts of mercury present at the bottom of reservoirs. The water in reservoirs like Tucuruí or Balbina stratifies into layers based on temperature, and the cold water at the bottom does not mix with the warm water near the surface. The result is that oxygen in the water at the bottom is soon depleted as leaves and other forms of organic matter are converted to CO₂. This provides the environment without oxygen in which mercury is converted into the highly toxic methylmercury. The methylmercury in the water is absorbed by plankton, and passes up the food chain to fish, increasing approximately ten-fold in concentration with each link in the food chain. High concentrations of mercury have been found in reservoir fish and in the hair of people who eat these fish at Tucuruí (Arrifano et al. 2018; Leino and Lodenius 1995) and Balbina (Forsberg et al. 2017; Weisser 2001).

Insects represent another health risk from reservoirs. The dramatic “mosquito plague” at Tucuruí was an enormous explosion of mosquitos of the genus *Mansonia* that were breeding in the floating macrophytes in the reservoir (Tadei et al. 1991). Mosquitos have a painful bite, but the main disease they can transmit (filariasis or “elephantiasis”) is not yet present in Brazil, although it is present in Surinam and French Guiana. Other mosquitoes, such the *Anopheles* species that spread malaria, can also breed in reservoirs (Sánchez-Ribas et al. 2012).

Downstream impacts

The river downstream of a dam changes in ways that have negative impacts for the many human residents of these areas. These include fish die-offs, as well as retention of sediments in dams that deprive the downstream river of the nutrients associated with these particles, thus jeopardizing the base of the food chain for fish production. The Madeira-River dams reduced downstream sediments (Latrubesse et al. 2017), and downstream fish catches have declined markedly (Santos et al. 2020). The sediment retention by dams planned in Peru and Bolivia would have impacts on fisheries along the entire length of the Amazon River in Brazil (Forsberg et al. 2017). Ironically, almost all of these planned dams are to be financed by BNDES and built by Brazilian construction firms. The loss of sediments affects nutrient distributions in flooded forests and floodplains which may be used for collection as well as floodplain agriculture. Another impact of dams on downstream communities occurs during construction, when the river flow is temporarily halted or reduced to near zero as the dam begins to fill. Ironically, when the spillways are first opened, the water level in the downstream river can rise far above its normal high-water mark, causing flooding damage to downstream residents.

Social effects of migration

Social effects of migration to the dam construction area are notable. While a few entrepreneurs can earn fortunes from the local economic boom during the construction phase, most of the population loses heavily. Altamira, the city nearest to the Belo Monte Dam, experienced an explosion of prices of rents for housing and of basic household expenses, making the city unaffordable for many original residents. There was also an explosion of violence, with

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Altamira being rated the most violent city in Brazil (Sales 2017). A long list of urban problems accompanied the dam construction (Miranda Neto 2015; do Nascimento 2017; Gauthier and Moran 2018).

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Box 5: Traditional and environmental settlement programs in Brazilian Amazonia

Brazil's National Institute for Colonization and Agrarian Reform (INCRA) classifies federal settlements into two groups; the "traditional" model consists basically of gridded areas divided into distinct parcels or "lotes," usually part of a plan involving an *agrovila*, a kind of service center. These involve settlement projects (PAs), Integrated colonization projects (PICs) and directed settlement projects (PADs). The last includes resettlement projects. These settlements permit colonists to receive formal title after a few years. The justification for these settlements usually involves social justice arguments, modernization arguments, and regional food production arguments. These settlements are based on private property regimes for the most part, and are dominated by annual crops and pasture. Land rights associated with spontaneous occupation usually involve clearing land for claiming and recognition of the holding by INCRA, the Brazilian land agency. The settlements are based on private property for the most part, and are dominated by annual crops and pasture.

Environmentally distinctive settlements arose more recently in Brazil due to the pressure from traditional populations to recognize historical land rights over forest-based populations and their livelihoods. These kinds of settlement are meant for traditional populations, to support activities with low deforestation impacts, such as agro-extractive activities and sustainable forest management - Agro-Extractivist Settlement Projects (PAEs, *Projetos de Assentamento Agroextrativista*), Sustainable Development Projects (PDSs, *Projetos de Desenvolvimento Sustentável*) and Forest Settlement Projects (PAFs, *Projetos de Assentamento Florestal*). These can either be new kinds of settlements or involve regularization of existing holdings, which are often characterized by collective rights or long-term access rights. Environmentally distinctive settlements can be installed in areas of primary forest, whether or not the areas have previously been inhabited by traditional populations, and may be organized around *agrovilas* (planned agricultural villages) where the families live. Lots destined for the settlers' production are located elsewhere in the settlement, in some cases far from the *agrovilas* (Silveira and Wiggers 2013). Settlements with collective land rights can be divided into individual lots if settlers request an individual area, or if division into lots is needed to avoid territorial conflicts between settlers (Guerra 2002).

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Environmentally distinctive settlements are infused with the language of sustainability, and they do deforest less than the tradition settlements, but the dynamics of deforestation follow the classic pattern: taking out the valuable timber, clearing for annual cropping and or pasture, producing the fragmentation of forest associated with colonization settlement, and over the long-term, shifting into pasture. These proximate drivers can also reflect indirect non-legal processes such as illegal logging, land grabbing through clearing to claim and other forms of land fraud, and single owners acquiring multiple lots. Recurrent problems include limited credit for activities other than livestock, poor levels of technical assistance, limited monitoring of ownership patterns and clearing sizes, as well as cutting into protected areas. The literally devastating result is that settlements contributed 17 % of the total forest clear-cutting and 20 % of the total carbon lost in Legal Amazonia (Yanai et al. 2017). Despite only 8 % (397,254 km²) of Legal Amazon being occupied by settlements, and despite most of the cumulative deforestation (83 % or 806,593 km²) being outside of the settlements analyzed, the contribution of these settlements to deforestation rates and to carbon loss were both substantial and increased over time. Most of the carbon stock loss (2.2 Pg C or 86 % of the total carbon loss in settlements) occurred in settlements situated in the arc of deforestation, where deforestation pressure is intense and the number of settlements is large (2190 settlements or 80 % of the total) (Yanai et al. 2017).

Box 6 “Insurgent citizenship” (Holston, 2007): Social movements and social change

While the fiscal crisis of the 1980s and 90s implied diminishing availability of funds for big infrastructure (except roads), this situation started to change in the mid-2000s, especially in Brazil. With the creation of the *Programa de Aceleração do Crescimento* (PAC) stimulus program in 2007, major funds became available for both urban and regional large-scale infrastructure. These initiatives have met with massive and highly-publicized popular resistance from the lowlands to the Andes (Canessa 2014; Jerez et al. 2015). In the mid-1980s, social and environmental movements joined together to protest the Cuiabá-Porto Velho road (BR-364), attracting international and national attention (Hecht and Cockburn 1989; Hochstetler and Keck 2007; Schmink and Wood 1992). In Ecuador, the Waorani people have been struggling for reparations from Texaco/Chevron and PetroEcuador for the devastating impacts of drilling operations, including a lawsuit under litigation in US court since 1993 (Pellegrini et al. 2020). More recently grassroots groups have protested the construction of a road in the Isobore Sécure National Park and Indigenous Territory –TIPNIS – in Bolivia (McNeish 2013), the Camisea pipeline in Peru (Urteaga-Crovetto 2012), and the mega-hydroelectric power plan of Belo Monte in Brazil (Fearnside 2017c), to name just a few contentious projects.

National and subnational governments in the Pan-Amazon have generally resisted attempts to create more robust participatory institutions through which affected communities can engage in informed consent around big infrastructure projects (Bebbington et al. 2018a, 2018b). In Brazil, community participation in decision-making about such projects is almost entirely reduced to environmental permitting hearings late in the process, with little practical impact on decision-making (Abers 2016; Zhouri 2011). Land-use zoning efforts, popular in the 1990s, were an opportunity to engage community participation, but these plans were frequently overturned or approved without effective participation (Bratman 2019).

In the 2000s, left-leaning national governments throughout the region promised a more participatory and sustainable approach to mega-projects. One example was the BR-163 road paving project in Pará and Mato Grosso states in Brazil. The federal government approved a

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Sustainable Development Plan for the region designed by civil society groups through extensive consultations. Unfortunately, it was never implemented (Abers et al. 2017). This area was critical due to the threat of soy expansion into smallholder, Indigenous, Extractive Reserve, and *ribeirinho* lands. Similar promises were made about the Belo Monte dam, and a Regional Development Plan for the Xingu (PDRSX) was modeled after the defunct BR-163 plan. Civil society groups, however, have reported difficulties getting their proposals approved through the participatory mechanisms created to implement the plan (Pereira and Gomide 2019: 202-22), and the meanings of sustainability are themselves contested (Bratman 2019).

In the absence of effective participatory structures, local and especially Indigenous movements have sometimes made headway through protest. The Indigenous March of 1990 (*Marcha por el Territorio y la Dignidad*) influenced Bolivia's forestry law (1996) and struggles for territorial recognition and control (Barroso, 2013). In Ecuador, *La Gran Marcha* of 1992 won the recognition of Indigenous land rights. Recent protest "caravans" by Indigenous populations in Europe have focused on the impacts of European consumption patterns, the encroachment on lands and violence against Amazonian Indigenous peoples, and the lack of prior consent. These contributed to questions about the large-scale MERCOSUR trade agreements, in light of Amazonian destruction and human rights problems.

Another way that Amazonian movements have influenced political institutions is through the dissemination of the concept of *Buen Vivir*, which has been included in the constitutions of Ecuador, Bolivia, Colombia, and Peru. Throughout the Andes and Amazonia, Indigenous cultures have concepts of a healthy life based on traditional knowledge and lifeways, and of caring for the environment: in Quechua (Ecuador), *Sumak Kawsay*, in Aymara (Bolivia), *Suma Qamaña*; in Guarani, *Teke Porã*; and in Baniwa (Brazil), *Manakai* (Cruz and Pereira 2017; Ihu 2010). These ideas have been translated into Spanish as *Buen Vivir*, a paradigm that deprioritizes economic growth and puts people's lives, nature, and basic rights to education, health, and social equity at the center of development (Alcantara and Sampaio 2017: 232). These ideas reside at the heart of many Amazonian cultures and represent different kinds of "episteme," a normative and foundational principle that informs behavior. *Buen Vivir* is an

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important example of how social movements can contribute to debates about alternative models of development.

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