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C U A D E R N O S D E L C E D L A

**The Extraction and
Conservation of
Natural Resources
in South America**

Recent Trends and Challenges

27



THE EXTRACTION AND CONSERVATION OF NATURAL RESOURCES
IN SOUTH AMERICA

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RESOURCES IN SOUTH AMERICA

RECENT TRENDS AND CHALLENGES

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Preface

As a major supplier of energy, metals, foodstuffs, wood, and other primary goods, South America is profoundly affected by the increased global demand for these materials. Since the early 2000s the region has experienced a massive rise in the volumes and value of extracted and exported goods, such as oil, iron, copper and soya. This trend of quickly expanding extraction in South America is expected to continue in the decades ahead. Fed by foreign demand and investment and supported by national policies, large-scale (industrial) extractive production is on the rise, and major parts of resource-rich countries are now under concession for exploration, while new infrastructure provides access to the most remote areas. In addition, relatively high levels of economic growth and extensive social programmes in many South American countries (in part as a result of the thriving primary sector) also boost national demand for goods such as food products, energy, and construction materials.

Evidently, such speedy natural resource exploitation for global markets has profound ecological and social consequences. This is shown most dramatically in the case of Amazonia. The Amazon rainforest and wetlands play a major role in providing global environmental services such as water, nutrients, carbon stock, biodiversity, and climate regulation. Since the 1980s a range of national and international conservation programmes have aimed not only at protecting the Amazon but also at promoting sustainable resource use among local indigenous and peasant communities. On the other hand, new road projects lead large tropical forest areas to be cleared for logging, ranching, and monocultures; oil extraction and mining drive deforestation and produce severe pollution; and hydro-electrical dams have caused to flooding in vast areas. Tensions between large-scale rural development and small-scale management by local communities instigate many social conflicts.

In this *Cuaderno del CEDLA*, we present some of our main research results on natural resource extraction and conservation in South America. This is part of CEDLA's research programme on natural and cultural resource use in contemporary South America. Our research line on partnerships and conflicts in natural resource use has focused on Amazonia and Brazil. We start by assuming that in order to understand the complex patterns in the use and management of natural resources, the interplay of changes in socio-economic, environmental, and political processes need to be considered at international, national, and local levels. New interactions and connections have emerged among local, national, and international actors, ranging from conflictive to cooperative types of interaction.

The analyses presented here are grounded in interdisciplinary approaches in economics, political science, and environmental studies, although disciplinary balances differ between the studies. We adopt a broad environmental governance perspective, in which state and non-state actors interact in shaping decision-making on natural resource use for multiple objectives, relating part of our research to the collaborative research project on Environmental Governance in Latin America and the Caribbean (ENGOV), funded by the European Union. In order to show the nature and magnitude of the recent rearrangements in the use and management of natural resources, we have included several figures, maps, and tables.

In the empirical chapters of this volume, we study three main processes of socio-environmental change that have strongly influenced prospects for sustainable development of territories in South America, particularly of the vast but rapidly shrinking territory of Amazonia. First, the expansion of extractive activities to supply global markets has resulted in a strong increase in the pressure on environmentally and socially sensitive areas. In Chapter 1, Barbara Hogenboom addresses the region-wide re-politicization of mining and the exploitation of fossil fuels. The quest for supremacy of the state over the market in these strategic sectors is a common component among the new democratic 'lefts' that have come to power since the 2000s and include spending a substantial share of the increased state revenues on social programmes. These post-neoliberal policies reflect a profound shift in management of mineral resources. While these policies have electoral support, there have also been many protests by local communities and national indigenous and environmental organizations.

Second, the development of large-scale infrastructure in South America, especially in Amazonia, is increasingly impacting land use and natural surroundings, as Pitou van Dijck examines in Chapter 2. Development of infrastructure has greatly facilitated extraction of natural resources and their transportation to world markets. Important driving forces behind this process include the regional Initiative for the Integration of Regional Infrastructure in South America (IIRSA) and the Brazilian Programme for the Acceleration of Growth (PAC). IIRSA in particular aims at promoting regional economic integration in all countries in South America and at improving global connectivity of local production platforms, including agribusinesses, mining sites, and hydro-energy facilities. Empirical studies including regional model analyses show that roads may have significant environmental impacts and jeopardize conservation strategies. To control and curtail such environmental impacts, so-called strategic environmental assessments (SEAs) have been developed in recent years. In view of the rapid development of road infrastructure and the potential of well-functioning SEAs to support conservation efforts, the final

sections of the chapter address opportunities arising from these SEAs.

Third, the expansion of protected areas that recognize local communities in order to promote historical justice, poverty alleviation, and environmental conservation has opened new channels for social inclusion of marginalized rural groups. In Chapter 3, Fábio de Castro focuses on the new priorities and approaches to environmental conservation from the past two decades, which attempt to reconcile conservation with social justice. The huge rise in agricultural production, mineral exploitation, and infrastructure development have coincided with major increases in initiatives to establish protected areas in South America. The chapter addresses the case of Brazil, covering the challenges that have arisen in introducing a designated ethnic territory to promote social inclusion and environmental justice, both nationally and locally.

Finally, the concluding chapter brings together the main findings from the three studies. It also presents final reflections on the changes rapidly taking place in South America and significantly impacting the region's present and future environmental conditions, the livelihood of its inhabitants, and the various contributions from the region to the rest of the world.

Pitou van Dijck

Fábio de Castro

Barbara Hogenboom

Amsterdam, January 2014

SOUTH AMERICAN MINERALS AT THE CROSSROADS OF GLOBAL MARKETS, NATIONAL POLITICS, AND LOCAL NEEDS

BARBARA HOGENBOOM¹

Minerals are more than non-renewable natural resources that are locally extracted, nationally regulated and taxed, and then sold to the global market: they are also highly political materials.² This seems to be even more the case in South America than in other parts of the world. While neoliberal regimes attempted to depoliticize the governance of minerals, the issue has become severely re-politicized over the past few years. Starting with the electoral victories of Hugo Chávez in 1998 and Lula da Silva in 2002, the region has experienced unprecedented electoral successes of the left and centre-left.³ While important differences exist between these various leftist regimes, to a greater or lesser extent their discourses and promises of economic reforms have revolved around restoring state control vis-à-vis foreign capital (MNCs) over the strategic sectors of minerals and then channelling the additional public revenues to social programmes. This approach to poverty alleviation, redistribution, and sovereignty has been supported by large segments of the population. As the neoliberalized relations between state, market, and civil society with regards to natural resources such as minerals, but also land and water, gave rise to multiple mobilizations in the 1990s and 2000s, these resources became a spearhead in South America's post-Washington Consensus development debate and economic policy reforms.

The quest for supremacy of the state over the market and for political control over the economy is a key feature common to the various new democratic 'lefts' in South America, and the new mineral policies are among the profoundest reforms. Increasing state control

over and the public sector's share in the extraction of oil, gas, and metals seemed fair to most South American citizens and was moreover necessary to pay for the expansion of social programmes. Evidently, however, these changes required a series of reforms. Despite international opposition to such reforms, there were beneficial external factors, including the global commodity boom and the rise of China, which drove up prices and facilitated implementation of post-neoliberal mineral policies, yielding additional social and economic benefits. As the interests of local communities and environmental concerns tend to be neglected, however, socio-environmental conflicts are increasing as well.

This chapter starts with a presentation of how global commodity shifts affect mineral extraction in South America. This is followed by an overview of the mineral policies of neoliberal regimes in the 1980s and 90s and social and political reactions to these policies. Next is an analysis of the key features of the region's mineral policy shifts since the election of leftist governments, focusing on the cases of Venezuela, Brazil, Bolivia, and Ecuador. After that comes a discussion of civil society in mineral governance and the nature of contemporary conflicts around mineral extraction. The conclusions assess the main changes and their impact on extraction and conservation of natural resources in the region.

South America and global commodity shifts

After five centuries of exploitation and plunder, the region's development continues to be determined by its mineral wealth and agricultural production, and important pockets of global mineral reserves remain. Latin America and the Caribbean hold large reserves of silver (49 per cent, with Mexico being the world's main silver producer), copper (44 per cent, with Chile leading the world in copper production), bauxite (26 per cent), tin (33 per cent), nickel (23 per cent), iron ore, zinc (both 22 per cent), and gold (18 per cent), and fully 65 per cent of the world's lithium. It also holds an estimated 15 per cent of global oil reserves, with Venezuela's 80 billion barrels, Mexico's 12 billion barrels, Ecuador's 5 billion barrels, and Brazil's 15 billion barrels of proven reserves. With the recently discovered oil fields in its deep-sea areas, Brazil could even turn out to hold the region's oil largest reserves. Although the manufacturing and service sectors have grown as well in the past few decades, South America remains economically dependent on exporting this mineral wealth. This is clearest for the countries rich in one or a few specific resources. Even prior to the commodity boom, from 2000 to 2004, oil accounted for 83 per cent of Venezuela's total exports, copper for 45 per cent of Chile's exports, and gold, copper, and zinc for 33 per cent of those of

Peru (Campodónico, 2008; CEPAL, 2010, 2012a, 2012b; UNCTAD, 2007: 87).

The global commodity boom that marked the decade of the 2000s was evidently of great importance to South America. Since few had anticipated the surge in demand for fossil fuels and metals, worldwide investments in exploration and extraction thus far have been insufficient to meet expanding needs. Increased global and especially Asian demand is so great, however, that even with the increased investments of the following years, prices remained high. So far, the boom has largely persisted despite the severe financial and economic crisis that started in 2008. Global market prices for both oil and metals have more than tripled in real terms since 2003 (see Table 1.1).

In South America this boom instigated what we could call a ‘mineral explosion’, especially in the metal ores sector. While the price index for metals more than tripled in the 2000s, the value of exports in several countries with important mining reserves increased by a substantially higher multiple (see Table 1.2), indicating that the volume of extracted metals has rapidly increased. As a result, revenues and profits increased and massive new investments were made in resource-rich countries. Copper production, for example, expanded rapidly, and from 1999 to 2006 revenues from extracted copper increased by a multiple of twelve in Chile and by a multiple no less than 46 in Peru (Campodónico, 2008). Various other indicators show that this intensified mineral extraction is a dominant element of

Table 1.1 Indices of primary commodities prices, 2003-2012 (index 2000 = 100)

	<i>Minerals and metals</i>	<i>Crude petroleum</i>
2003	98	102
2004	137	131
2005	173	184
2006	278	221
2007	313	250
2008	332	342
2009	232	221
2010	310	281
2011	352	393
2012*	313	399

*(Q1-Q3)

Source: United Nations, World Economic Situation and Prospects 2013 (Statistical Annex)

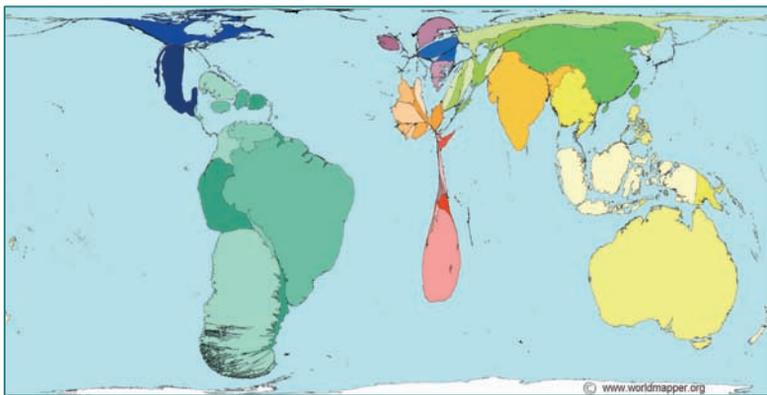
Table 1.2 Exports of mining goods from selected South American countries, 1970-2010 (in millions of US dollars)

	1970	1980	1990	2000
Argentina	4.7	33.6	187.8	3605.5
Bolivia	104.4	380.6	492.1	423.2
Brazil	277.0	1788.6	2795.6	3661.3
Chile	117.1	504.5	916.0	2868.8
Colombia	59.6	13.2	2079.0	4877.1
Ecuador	1.8	1377.1	1261.3	2144.6
Peru	204.1	1202.5	670.4	911.4

Source: CEPAL, Anuario Estadístico 2011

South America's position in the global economy. As calculated by the Economic Commission for Latin America and the Caribbean, the share of primary goods in the region's exports gradually decreased in the 1980s and 90s but increased sharply again in the 2000s, progressing from 51.5 per cent in 1981-1982 to 26.7 per cent in 1998-1999 and back up to 38.8 per cent in 2008-2009 (CEPAL, 2010). The world map on Worldmapper visualizes the relative prominence of the region for the extraction of minerals such as iron, copper, gold, silver, and zinc (see Figure 1.1).

The rise of China has been a particular factor in the so-called re-commoditization of exports from South America. This 'factory of the world' has become the second largest economy and with its rapid growth and expanding export production is a major consumer of

Figure 1.1 South America's prominence in global mineral depletion, 2005 (fall in financial value of a territory's mineral resources due to extraction rates)

Source: Worldmapper of Material Flows (<http://www.worldmapper.org/display.php?selected=313>)

Table 1.2 (continued)

2002	2004	2006	2008	2010
3328.0	4136.9	5335.8	4318.0	5505.2
528.1	1092.5	2805.5	4949.0	4792.3
5197.9	8253.9	17626.6	33131.5	47848.4
2222.6	6523.3	14271.9	16247.4	15019.3
3574.9	4823.3	7425.2	14314.0	19012.7
1839.2	3899.4	6936.0	11791.8	8993.7
1363.1	2552.3	6818.5	9189.5	11289.5

natural resources and commodities. China has turned into the world's largest energy consumer and the main importer of several important commodities, such as iron ore. The 'China effect' on global prices for oil and metals has in fact been of greater impact on South America's extra revenues from mineral exports than the direct effect of increased exports to China (Jenkins, 2011). China has become a major export destination for all resource-rich South American countries. The value of Chinese imports for the region as a whole increased more than ten times: from \$5.4 billion in 2000 to \$62.2 billion in 2009. The country is the main export destination for Brazil, Chile, and Peru and ranks second for countries like Argentina and Venezuela. As the massive exports to China are dominated by commodities like metal ores, soy, and oil (see Table 1.3), they are far from diversified (Rosales and Kuwayama, 2012).

Table 1.3 Top five export products from Latin America and the Caribbean to China, 2000 and 2009 (in millions of US dollars and percentages)

	Value		Share of annual total	
	2000	2009	2000	2009
Iron ore and concentrates	349	13273	6.5	21.3
Soy	1074	9321	20.1	15.0
Copper	761	8595	14.2	13.8
Crude oil	44	5176	0.8	8.3
Copper ore and concentrates	351	4056	6.6	6.5

Source: Rosales and Kuwayama, 2012

The rise in exports and overall growth in trade relations have coincided with intensified bilateral relations with China, including Free Trade Agreements with Chile, Peru, and Costa Rica, and Chinese rapprochement to regional organizations (Fernández Jilberto and Hogenboom, 2010). Recently, China's demand for minerals and agro-commodities started to drive Chinese investments in South America's oil and mining sectors as well. Since the onset of the global financial crisis, the Chinese government and state-owned banks and companies have stepped up the expansion of China's 'global champions' (multinationals). Especially in 2010, China invested massively in the region, particularly in Brazil (\$9.6 billion) and Argentina (\$5.5 billion). Meanwhile, the China Development Bank (CDB) and China's Export-Import Bank have become a new source of foreign loans.⁴ The CDB has provided large loans-for-oil to Brazil, Venezuela, and Ecuador. In 2009, for example, this bank and Brazil's national oil company Petrobras agreed on a \$10 billion oil-backed loan, involving a ten-year commitment from Petrobras to supply 200,000 barrels of oil daily to a subsidiary of Sinopec (Downs, 2011). While the US, Canadian and European MNCs remain the key investors in South American oil and mining, companies from China and other (emerging) countries are gradually increasing their involvement in extraction in the region.

Extractive sectors under neoliberal policies

In the context of the extreme social, economic, and also political inequalities in South America as well as in Central America and Mexico, conflicts over the concentrated pockets of mineral wealth go back a long way as well. During the nineteenth century South American governments withstood most of the popular revolutionary movements and continued to serve the interests of foreign companies and national economic elites. This changed in the twentieth century, and many countries at some point nationalized part of their minerals and set up large state companies to explore, extract, and/or refine them. This trend started with the nationalization of oil, first in Bolivia (1937) and then in Mexico (1938), and continued with other nationalizations and/or establishment of state-owned companies: the public mining company Companhia Vale do Rio Doce was formed in Brazil (1942), tin was nationalized in Bolivia (1952), Brazil's state-owned oil company Petrobras was established (1953), copper was nationalized in Peru (late 1960s) and in Chile (1971), and oil was again nationalized in Venezuela (1976). While these nationalizations were to become part of the overall development model of import substitution industrialization (ISI), in most cases they resulted from labour struggles and popular resentment toward foreign companies making huge

profits while exploiting their workers and, especially in the case of oil drilling, polluting the environment.

The tide turned in the 1980s and 90s, when governments profoundly restructured their economies, including the oil, gas, and mining sectors. Economic circumstances at this time worked against policies of state ownership. Plummeting world market prices for minerals, the global economic crisis, and the region's debt crisis all made holding state-owned enterprises and investments very costly. As global neoliberalism triumphed ideologically, politically, and economically, civil society groups and political parties that aimed at a stalal (and/or societal) counterweight against foreign capital's power were weakened. The emerging new generation of technocrats helped implement new regulations favoured by international financial institutions and national economic elites. Transforming the private sector into the predominant force for economic development was the main objective of both international and national liberalization policies, and this required a strongly reduced role of the state in the economy (cf. Fernández Jilberto and Hogenboom, 2008a).

The neoliberal approach to mining and energy entailed a reversal in policy, and the extractive industries underwent the most sweeping reforms. Previously, oil and other minerals had been regarded as strategic materials, and the central government regulated and taxed these resources more heavily than other commodities. In order to attract foreign direct investment in this sector, under the Washington Consensus the established system was rigorously dismantled through combined privatization, deregulation, and liberalization. Yet while neoliberal reforms attempted to depoliticize mining policies, depicting extractive industries as a normal instead of a strategic sector, many South American citizens that feel 'their' minerals are special. Despite the problems with large state-owned oil and mining companies, including mismanagement, corruption, debts, and low revenues, historical nationalizations of minerals had been widely perceived and were later politically represented as the epitome of independent national development, sovereignty, anti-imperialism, and patriotism. An additional reason for the popular support for these public companies was that they provided for relatively well-paid and unionized jobs and cheap commodities (e.g. low energy prices for the internal market). Neoliberalization of minerals therefore generally instigated strong social reactions. Let us very briefly review experiences from Venezuela, Bolivia and Brazil.

In Venezuela, the so-called Oil Opening was the most important element of the neoliberal policies during the second government of President Carlos Andrés Pérez (1989-1993) and the subsequent government of President of Rafael Caldera (1993-1998). The state-owned oil company PDVSA was not privatized, but private companies (mostly multinationals) were allowed to become majority shareholder

in joint ventures with PDVSA. These and other neoliberal policies, including a series of budget cuts, caused widespread popular discontent. In the beginning of 1989 the country experienced a week of massive protests, known as Caracazo, followed by years of both organized protests and spontaneous actions (Ellner, 2010).

In Bolivia, the first Sánchez de Lozada government (1993-1997) implemented a package of 'second generation' reforms, including new hydrocarbon legislation and the so-called capitalization policy. The latter was a version of privatization applied to the hydrocarbon sector as well as to other sectors, through which the state abandoned direct operations and instead assumed a regulatory role. While the state-owned gas and oil company YPFB was privatized, the new Law on Hydrocarbons reduced taxes and fees on newly discovered reserves to some 30 per cent. As Assies (2004) argues, the new system, which was extremely generous with private operators, would turn out to be a source of civic discontent in South America's poorest country, especially when large new gas reserves were discovered. In effect, in October 2003, after Sánchez de Lozada (during his second presidency, 2002-2003) had announced that his government intended to sell Bolivian liquid natural gas to the United States and Mexico (by way of Chile), a broad range of social movements took to the streets. These massive protests, known as the gas war or *guerra de octubre*, lasted a month and in the end forced Sánchez de Lozada to flee the country.

Foreign oil and also mining companies welcomed the policies that promoted private investment in exploration, exploitation, and commercialization. In addition to privatization, a range of policies such as lower taxes, freeing of capital flows, and increased labour flexibility helped attract new foreign direct investment. In addition, as an additional incentive to foreign companies to invest, these new policies were locked into fiscal stability clauses (e.g. in Chile and Peru) and in bilateral investment treaties. Such treaties *inter alia* offer foreign investors national treatment with respect to mining rights and entitle compensate them for future policies that might be less favourable for their investments.

Many citizens, however, viewed the (re-)privatization of minerals as an unfair loss of their nation's 'crown jewels'. Popular sentiment was that this natural wealth belonged to the nation and should benefit the people instead of (foreign) corporations. Especially in a period of extended economic crisis, high unemployment rates, and growing inequality, this situation fostered public resentment. While orthodox theory, which was the dominant influence on policy-makers regionally and globally at that time, held that state companies tended to be inefficient and corrupt, and that everyone would be better off with modern, competitive private companies, in reality privatization primarily caused economic concentration, increasingly rich elites, and greater inequality. This popular sense of the injustice of privatiza-

tions coloured the results of the civic plebiscite in 2007 in Brazil on Vale (Companhia Vale do Rio Doce, CVRD), which is currently one of the world's largest mining companies. This plebiscite was organized by Brazil's two largest social organizations, the movement of landless peasants MST and the central union confederation CUT, together with 200 other organizations. Ten years after Vale's privatization, 94 per cent of the 3.7 million respondents preferred renationalization. Yet President Lula (2003-2010) hardly responded to these popular sentiments. As a metallurgic worker, Lula da Silva had been one of the founders of the CUT, but as President he refused to reconsider Vale's status (*Americas Program Report*, 27 July 2007).

The way state companies were privatized increased the dissatisfaction. The often non-transparent and corrupt privatization practices and the subsequent weak supervisory institutions responsible for preventing monopolies and cartels heightened the sentiment that the new policies mainly served the political elite and 'Big Business': MNCs and national economic groups that became the new corporate owners of privatized companies (Fernández Jilberto and Hogenboom, 2008b). Due to the historically low mineral prices at that time, the bargaining position of governments vis-à-vis MNCs was weak, and 'some of the mining codes then adopted and some mining agreements negotiated may have been overgenerous to foreign investors' (UNCTAD, 2007: 161).

Since the 1990s local protests against large private mining and oil projects, in particular those employed by multinational corporations, have become increasingly frequent. With respect to mining, the Observatory of Latin American Mining Conflicts OCMAL registered 155 major socio-environmental conflicts in the region, in particular in Argentina, Brazil, Chile, Colombia, Mexico, and Peru.⁵ Various stakeholders in local communities, including landowners, *campesinos*, indigenous groups, workers, and small-scale miners, have resisted new projects. In their eyes, extractive industries give a little (few jobs and development) but take and/or damage a lot (land, water, air). Mobilizations against extractive activities focus on land and water rights, territorial claims, and the notorious environmental record of extractive industries (cf. North, Clark and Patroni, 2006; Bebbington, 2007). While part of these local protests take place in marginalized areas and receive little external support or attention, other conflicts have become well-known, such as the resistance by farmers and other locals in Peru to gold mining in Tambogrande and in Yanacocha; the mobilization of Mayan communities against silver and gold mines in Guatemala; and various instances of indigenous resistance to extractive activities in the Amazon, including the long history of the mobilization against the oil spills by Chevron/Texaco in Ecuador. Many of these local protests have been linked to or associated with the rising indigenous movements (cf. Yashar, 2005) and the increas-

ing popular resistance to neoliberalism and globalization in Latin America (cf. Harris, 2003) and vice versa. As a result, both local protests and national mobilizations against neoliberal policies, and mining practices, and oil and gas extraction ended up in the core of allied social movement struggles for participatory politics and a post-neoliberal development model.

Extractive sectors under post-neoliberal policies

The social mobilizations of the 1990s and the political changes of the 2000s in South America demonstrate that the neoliberal regimes failed in their attempts to de-politicize mining. As mineral resources and policies were a hotly contested issue, they have been a spearhead in South America's new development debate. In most countries a majority voted for parties and presidential candidates that favoured greater state control over extractive industries and a higher share of mineral revenues for the public sector. The elected leftist regimes are characterized by their non-elitist background and 'bottom-up' political development. Presidents like Lula and Morales come from poor families. Once union leaders, they went on to form a political party. Most of the leftist regimes attribute their electoral victories to strong ties with social movements, their criticism of the limited depth of democracy under neoliberal regimes, and their proposals in support of more participatory politics.⁶

Once in control, leftist regimes have indeed started and implemented some anti-neoliberal measures for the mineral sectors: after two decades of deregulation, liberalization, and privatization, new policies involved reregulation (through reforms of legal codes, laws, and constitutions), 'retaxation' and sometimes also renationalization. At least in economic policy, extraction has been the most important field of reform by leftist governments. Aside from being a crucial economic sector, reforms were deemed necessary to enable additional budgets for the expansion of social programmes since in most countries the primary sector is the main single source of public sector revenues. In Venezuela, oil revenues accounted for 66 per cent of fiscal income in 2005 (after six years of Chávez's rule), but even in Mexico 37 per cent came from oil revenues was in 2006, while in Chile copper revenues accounted for 33 per cent (CEPAL, 2008a).⁷ The high commodity prices were therefore very fortunate: in addition to being important for state revenues, increasing the state's share in this income - economically as well as politically - is feasible only when business is booming.

The first and most profound anti-neoliberal restructuring occurred in Venezuela, where Hugo Chávez claimed his objectives were a Bolivarian Revolution and Socialism of the 21st Century. Pres-

ident Chávez's new policies towards multinational oil corporations operating in Venezuela were at first viewed as radical by the international community, but later on other governments in the region introduced reforms to increase the public share of mineral revenues and increase state control in the extractive industries. In 2001, Venezuela adopted legislation on hydrocarbons that established a majority share for state-owned company PDVSA in oil extraction. In effect, 33 joint ventures with transnational corporations operating in the Orinoco basin had to be renegotiated. Somewhat surprisingly, only ENI and Total decided to end their investments, and Exxon-Mobil and ConocoPhillips protested the government's decisions and filed complaints. Venezuela also raised the royalties for foreign oil companies from 1 per cent to 30 per cent, and taxes from 34 per cent to 50 per cent. In addition, Chávez made important changes to the PDVSA management, thereby increasing his control over the company. Through a presidential decree in 2007, the share of PDVSA in joint ventures in the Orinoco basin rose further, reaching 78 per cent.

This increase of the public share of oil revenues at a time of rising oil prices on the world market and high economic growth resulted in a sharp increase in the central state's budget and spending on social programmes in Venezuela. In the first half of 2007 Venezuela's poverty rate was 28 per cent; much lower than the pre-Chávez poverty rate of 44 per cent. While this decline in the poverty rate was to be expected in the face of the very rapid economic growth from 2003 to 2007, the situation of the poor improved significantly beyond this measure of cash income, thanks to major new healthcare, education, and food programmes for the poor, called *Misiones*. From 1998 to 2006 spending by the central state increased from 21 to 30 per cent of GDP and spending on social services from 8 to 14 per cent of GDP. State spending on social services is supplemented by PDVSA, which reached 7 per cent of GDP in 2006. If the PDVSA component is included, real social spending per person in 2006 had tripled with respect to 1998 (Weisbrot and Sandoval, 2008a).

By contrast, in Brazil President Lula of the Workers Party PT opted to continue most of his predecessor's economic policies, including mineral policies. In effect, Lula changed neither the tax regulations in the oil or metal mining sector nor the status of companies such as Petrobras and Vale. In 2008, Brazil's oil company Petrobras was the region's largest company in terms of revenues. Petrobras is officially state-owned, but in the 1990s it was partly privatized by selling bonds to individuals. Private investors currently own 44 per cent of the company (UNCTAD, 2007:117). As mentioned above, in that same decade Brazil's iron company Vale was completely privatized, and although many Brazilians (especially from Lula's electorate) might have liked to see Vale and Petrobras renationalized, President Lula was unwilling to take this step. On the other hand, more than

other countries in the region, in the 1980s and 90s Brazil combined liberalization strategies with industrial policies conducive to productive linkages between MNCs and domestic firms, and this was continued under Lula.⁸ Foreign oil companies operating in Brazil, for example, are required by law to obtain 40 percent of their investments from domestic firms, and Brazil has a minimum local content requirement for offshore and onshore projects of 30 percent and 70 percent, respectively (UNCTAD, 2007: 168).

Only in October 2008, after new deep-sea oil reserves were discovered off Brazil's coast, did President Lula announce reforms that would provide for placing revenues from future deep-sea oil drilling 'in hands of the Brazilian people'. To pay off 'the debt to the poor that has existed for 500 years', Lula proposed establishing a development fund, using the resources for education, healthcare, and technological development. In addition to Petrobras, the public sector's control over these oil reserves and revenues was to be protected by forming a new state company: Petrosal. In addition, despite the overall continuity of Brazil's policies in the mineral sector under President Lula, spending on social services increased substantially, in particular through the Fome Zero and Bolsa Familia programs. Together with the effects of the growing economy, Lula's presidency achieved a reduction in the poverty rate.

In Bolivia, hydrocarbons became strongly re-politicized in the 2000s due to popular protests. The mass mobilizations in 2003 against gas policy reforms (the 'gas war' or *guerra de octubre*) forced President Gonzalo Sánchez de Lozada to leave the presidential palace and paved the way for the election of Evo Morales of the Movimiento al Socialismo (MAS) in 2005. On 1 May 2006, President Morales announced new legislation on hydrocarbons that would increase the public sector's take of profits in Bolivia's two largest natural gas fields from 18 to 82 per cent, thereby reversing the balance between public and private sector revenues. The state-owned company YPFB would resume tasks entrusted to it until it was privatized, and production-sharing contracts with multinational corporations would be converted into servicing contracts. Morales also announced a new development strategy, moving from purely extraction activities to additional production activities, such as refining. This is important, since large-scale mineral extraction is capital-intensive (requiring major public and/or private resources) but labour-extensive, while local refining activities will in fact increase the benefits for local employment, revenues, and technological development.⁹

In practice, however, Bolivia's new policies have been less radical than the impressions conveyed in the media and in political discourses, by proponents and opponents alike. Morales' decree that raised taxes and royalties for private gas companies was transitory (for six months) and was intended mainly to force private companies

to sign new contracts governed by the pre-Morales law of 2005. In the end, companies pay around 50 percent in taxes and royalties, and the new contracts tend to favour intensive extraction and export. According to Pablo Poveda (2010: 161), rather than restoring national sovereignty, ‘the transnational companies continue to control the hydrocarbons extraction in Bolivia, [and] the government’s gain is limited to spending some extra fiscal revenue from natural gas exports on social assistance, such as bonuses for elderly and children’. Negotiations on the concessions for iron mining in El Mutun and lithium mining in Uyuni have moreover shown that implementing such new, pro-development mining policies is hard and time-consuming, especially during the global economic crisis.

Increasing spending on social programmes has been an important objective of Morales’ mineral extraction policies. The development plan of the MAS (*Bolivia Digna*) stresses the need for social programmes that end poverty, exclusion, and marginalization. In 2008, the elected constitutional assembly formulated a new constitution that aims at redistribution and improved quality of life for Bolivia’s poor majority, as well as at increasing the central government’s power and granting indigenous peoples greater control over natural resources within their territories. Important social programmes have been funded from the new direct tax on hydrocarbon profits: *Bono Juancito Pinto*, which provides a bonus to poor families who enrol their children in primary school, and *Renta Dignidad*, which provides a pension to elderly poor people (Hinojosa, 2009). While Bolivia’s relatively decentralized distribution system of public mineral revenues grants the central government only part of these revenues, these cash grant programmes paid by the new gas tax have helped lower the poverty rate.¹⁰

Under President Rafael Correa (since 2007), Ecuador has made similar reforms in its mineral policies. In October 2007 Correa decreed that the state’s share of windfall oil profits would increase from 50 to 99 percent. Together with the global oil boom and Ecuador’s dollar economy, state revenues rose rapidly and allowed Correa *inter alia* to double welfare payments to poor households, to subsidize electricity for poor households and to make a range of (emergency) investments in education, healthcare, micro-credits etcetera. Furthermore, for the first time since the 1980s, the government under Correa issued a comprehensive development plan. While these policies have been labelled by some as ‘petropopulism’, President Correa has secured major electoral support for his regime: with a referendum in January 2009, the new constitution was approved by 64 per cent of the votes cast, and in April 2009 Rafael Correa was re-elected as President. In 2010, the National Assembly approved legislation for servicing contracts in the oil sector, as a result of which all contracts with MNCs operating in Ecuador had to be renegotiated. In this case,

four out of nine companies did renew their agreement with the state and therefore terminated their operations in the country. Even advocates of increased state control over oil extraction have criticized the reform and renegotiation. One is Alberto Acosta, who initially was Minister of Energy and Mining under Correa and the president of the National Constitutional Assembly that wrote the new Constitution, which holds some important parts on a new development model aiming at *sumak kawsay* (*buen vivir* or living well) and respecting the rights of indigenous peoples and the rights of nature. According to Acosta (2011), the reform and renegotiations of 2010 lacked transparency and democratic deliberation, and previous environmental damages caused by the companies were ignored. Like Chávez, Correa refers to Socialism of the 21st century, and Catherine Conaghan (2008) describes his rule as a plebiscitary presidency, in which his decrees, charisma, and ability to ‘play the media’ have rendered the National Congress irrelevant. Nevertheless, Correa has had a substantial electoral base for more state control over the strategic oil sector.

In sum, various leftist regimes in South America have used new mineral policies to achieve rapidly three important political objectives, with some additional support from higher commodity prices. First, the new policies have provided additional resources to cover increased spending on social services. Although few direct (formal budgetary) links exist between revenues from the mineral sector and spending on social services, the substantial additional income clearly facilitated decisions to increase public funding for social policies. As a result, leftist governments could rapidly fulfil their promises to increase support and programmes for the poor.

Second, the additional resources helped South American countries accelerate debt repayments to international financial institutions. All the new leftist governments in the region sought to end dependency on Washington-based institutions, in order to be liberated from their structural policy conditions and interventions motivated by US interests.¹¹ Thanks to their increased revenues, the governments of Brazil and Argentina were able to resolve their remaining IMF debts before the deadlines. Meanwhile, President Chávez allocated a share of Venezuela’s large public oil revenues toward regional support through the Bolivarian Alternative for the Americas (ALBA), but also by turning Venezuela into a new creditor and lender of last resort. Among other things, Venezuela provided a \$2.3 billion loan to Argentina, when that country paid off its remaining \$9.8 billion debt to the IMF in 2005 (Weisbrot, 2007). The onset of the international financial crisis in 2008 did not instigate another lost decade in the region. This indicates that the South American countries were generally financially healthy, especially compared to the United States and the European Union.

Third, the new mineral policies in South America have contributed to a new balance between public and private gains and control. The relatively smooth acceptance of reforms and restructurings (to some extent attributable to the mineral sector's increased profitability in the 2000s) is making still clearer that some of the neoliberal policies had been overly generous to foreign investors. Simultaneously, booming markets rendered transnational corporations more willing to negotiate about higher taxes and greater state intervention. In the context of high global demand and prices, MNCs were receptive to a lower share of the greatly increased revenues. The large majority has thus continued to operate under the new laws and tax systems, and complaints and disputes have been remarkably few. This is probably in part because in any case in the hydrocarbon sector a large share of state control and ownership is not uncommon, and direct foreign investment is in some cases even forbidden in extraction (e.g. in Mexico and Saudi Arabia). Furthermore, the newly negotiated deals proved less revolutionary in practice than depicted in the media and remained profitable for the multinational corporations.

Through these three major shifts combined, the new mineral policies were crucial in ending the Washington Consensus in South America. José Antonio Ocampo (2005: 294) has identified four profound problems with the Washington Consensus:

... its narrow view of macroeconomic stability ...; its disregard for the role that policy interventions in the productive sector can play in inducing investment and accelerating growth; its tendency to uphold a hierarchical view of the relation between economic and social policies ...; and, finally, a tendency to forget that it is citizens who should choose what economic and social institutions they prefer.

Ocampo mentions these last two problems to stress the huge social and democratic deficit of the market democracies that had emerged in the region in the 1980s and 90s. In the 2000s, leftist regimes aimed to address these problems by using revenues from mineral extraction for social expenditures and by introducing reforms in this strategic sector intended to generate positive social effects, also in the medium and long-term. Electoral support for presidents such as Chávez, Morales, and Correa derives in part from the popularity of these policies.

Conflictive national and local demands

Whereas South America's new mineral policies are more responsive to the preferences and needs of the majority of citizens than the neoliberal policies of the 1980s and 90s, many debates, tensions, and conflicts continue on extractive industries and mineral revenues. Initially, resistance came primarily from political opponents, groups

that feared a loss of previous privileges or liberties, and/or groups that feared populist (and corrupt) abuse of the additional revenues. Especially in Venezuela, in 2002 and 2003 massive anti-Chávez mobilizations followed Chávez's tightened control over PDVSA. In Bolivia, the new gas policies together with the new policies on land ownership and distribution instigated intense resentment among groups within the more developed *media luna* provinces, causing serious political conflicts from 2006 to 2008.

The high number of mobilizations and protests by communities and indigenous groups against mineral extraction is a less expected outcome of the new political and economic circumstances. Throughout South America, local resistance from civil society groups to oil drilling and mining projects in or near communities and territories has increased and seems to have become more visible in recent years. Local conflicts and violent clashes have attracted the national and international media, helped by modern media and transnational cooperation of local groups with movements and NGOs in other parts of the country, region, and world. The reactions from the leftist governments of Morales in Bolivia and Correa in Ecuador are equally surprising. They are almost as negative and (at least verbally) aggressive to these local struggles for protection of land, water, and biodiversity ecologies as those of the centrist government of Alan García (2006-2011) in Peru. All have labelled such struggles anti-patriotic and illegal (Bebbington, 2009).

Increasingly, human rights organizations report that protest has become a criminal offence, including prosecution of leaders of NGOs and social movements and anonymous (death) threats. These tendencies might seem counter-intuitive. One could imagine that increased state control vis-à-vis MNCs over extractive industries and an end to the friendly neoliberal deals between political elites and 'big business' would improve the access of local groups to information and would lead to greater respect for formal rights of prior consultation and impact assessments (on strategic environmental assessments, see Van Dijck in this volume). Similarly, the activist, syndicalist, or indigenous roots of many 'New Left' leaders might be expected to make the central government more sympathetic to local movements and to encourage to appeals for participatory decision-making and greater harmony with the natural surroundings.

What explains this new local resistance under leftist regimes and the unwillingness of these governments to accommodate local concerns about the negative environmental, economic, and social effects of mining and drilling? What we perceive is a shift of conflicts as a result of the new political constellation that has come into being under the leftist regimes. The broad alliance of popular resistance and social movements against neoliberal policies and continuing poverty and inequality that peaked in the years before and after the

turn of the century and paved the way for the electoral victories of the leftist candidates disintegrated, when the left entered the presidential palace and launched social programmes that rapidly alleviated severe poverty. Yet while this ‘institutionalization’ of the left has resulted in a certain degree of national demobilization, local discontent and mobilizations have not disappeared. This is in part due to the abovementioned expansion of mineral extraction in the region. The ongoing global commodity boom makes private companies as well as the state still more eager to explore oil wells and mines, start new extraction projects, re-open pits that had been unprofitable in previous years, and invest in the infrastructure and electricity necessary for expanding extractive activities and boosting exports (see Van Dijk in this volume on the massive land-use conversion taking place in Amazonia).

The ongoing political battle over the extractive industries is also related to the actual process or re-politicization, which has given rise to new political expectations. In their political campaigns the leftist leaders stressed poverty eradication, political participation and inclusion, and local democracy or autonomy for indigenous people. ... This resembles the conclusion by Fabio de Castro (in this volume) in his study of ethnic territories in Brazil that the implementation of the political-institutional response to the struggles of marginalized groups ‘represents the beginning of new struggles to ensure participatory processes and to avoid new inequalities’. In the case of extractive activities, such assertions have been conducive to new collaborative initiatives between local communities and state and private actors, such as free, prior, and informed consent (FPIC) and corporate social responsibility (CSR). Furthermore, countries such as Venezuela, Bolivia, and Ecuador have undergone important constitutional reforms and have established new participatory rules and institutions. While these hold important emancipatory elements, there are in practice many obstacles to moving towards a more participatory and pluralist democracy (cf. Schilling-Vacaflor, 2011). Indigenous groups, *campesinos*, and local communities negatively affected by mining and oil drilling often find their new presidents unreceptive to their views and demands. President Correa has used particularly intimidating discursive attacks, speaking of ‘ecological infantilism’ and ‘infantile indigenism’ that impede mining. Indeed, as Anthony Bebbington (2009: 19) states, ‘dissent shows no sign of going away’.

Due to the new political and economic circumstances, local protests against mineral extraction have become more isolated nationally. With their new social programmes funded by higher mineral income, the leftist governments have more legitimacy than their neoliberal predecessors. Furthermore, like Chávez, Morales, and Correa have sought and found ways to control (co-opt) or weaken organized civil society. Local organizations thus find that national

social movements are less supportive than in the past to their demands and their critical attitude toward the government. This new national context is particularly intimidating to small and marginalized (indigenous) groups living in isolated areas, whether in the Amazon (where most oil drilling takes place) or in the Andes (with its numerous metal mines).

Conclusions

The above analysis of the politics and political economy of mineral extraction in South America indicates constant interaction between actors and developments at local, national, and international levels. Quite simply, the pattern of mineral governance in South America fluctuates constantly. Recent national policy reforms arose from civic discontent and various local resistance efforts to the previous national mineral policies and relative power of transnational companies, which were heavily influenced (and sometimes dictated) by international institutions. While there was some international political pressure against the recent reforms, there were also enabling international economic trends, especially the global commodity boom. At the regional level, the reforms of some countries inspired others, and regional cooperation and integration have at least become more politically important. Simultaneously, expanding extractive activities paves the way toward new local claims and conflicts, including greater tensions between national and subnational state institutions.

The re-politicization of minerals in South America is one of the most important contemporary developments. What the leftist regimes have achieved in only a few years is impressive: tighter state control (*vis-à-vis* MNCs) and state sovereignty (*vis-à-vis* IFIs and other foreign interference), higher public revenues, more social spending, and less poverty and inequality. Small steps have been taken towards turning mineral wealth into a basis for additional investments and development. Yet as the new mineral policies, helped by the global commodity boom, yield major social and economic benefits, the new regimes also prefer to keep this a highly centralized field of governance and to set strict limits on local demands from civil society. In the new conflicts over mining and oil drilling, local communities once again face exclusion and intimidations, as well as repression. Considering the massive expansion of extractive industries throughout the region and the general unwillingness to consider demands for environmental justice, minerals are likely to be increasingly politicized in the years to come.

Notes

1. This text presents results from my research projects on the politics of extractivism in Latin America, on Latin American relations with China, and on the governance of natural resources in the region and therefore builds on some previous publications: *Latin America Facing China* (with Alex E. Fernández Jilberto, Berghahn Books, 2010), an article in the *Journal of Developing Societies* (Vol. 28, No.2, 2012), and a chapter in *Civil Society and the State in Left-Led Latin America* (edited by Barry Cannon and Peadar Kirby, Zed Books, 2012). Financial support from the European Union for the project on Environmental Governance in Latin America and the Caribbean (ENGOV, FP7-SSH-2010-3) is gratefully acknowledged.
2. UNCTAD's *World Investment Report 2007* (UNCTAD, 2007: 84) defines minerals as 'energy minerals (oil, gas, coal and uranium), metallic minerals, and non-metallic minerals (industrial and construction minerals and precious stones)' - of which oil, gas, and metals are the most important for our analysis - and extractive industries as 'primary activities involved in the extraction on non-renewable resources'.
3. The election of Dilma Rousseff in Brazil (2010) and Ollanta Humala in Peru (2011) indicate that the political dominance of the left in Latin America may continue in the current decade.
4. The emerging role of Chinese banks as important creditors to Latin America has been documented by Kevin P. Gallagher, Amos Irwin, and Katherine Koleski (2012).
5. Several organization gather and present information on conflicts around extractive activities in the region, such as OCMAL, the Observatorio de Conflictos Mineros de América Latina (www.olca.cl/ocmal/). The ENGOV website features an Inventory of Databases on Socio-Environmental Conflicts in Latin America (www.engov.eu).
6. The leftist regimes in Bolivia and Ecuador quickly started constitutional reforms by constitutional assemblies and their democratic approval via a referendum. The extent to which extent local communities and indigenous peoples are gaining a say and influence in mining and oil projects, however, has yet to become clear. With the increased central state control over these strategic sectors, local demands for information, consultation, influence, or protection have in some instances led to harsh confrontations.
7. National systems for the government's collection of its share of mining income differ greatly. They include a hybrid taxation system for private companies, and in several countries some large state-owned companies as well. In Chile, for example, the state company Codelco generates 43 percent of the government's revenue from copper, while the rest comes from taxing the country's private mining sector, consisting of ten large (transnational) companies (cf. Campodónico, 2008; UNCTAD, 2005: 117-27).
8. Interestingly, in the case of Chile and Mexico, profound neoliberal restructuring coincided with a policy against privatizing Chile's state-owned copper company Codelco and Mexico's state-owned oil company Pemex, which remain a primary source of the national budget.
9. From a developmental point of view, mineral sector policies went far beyond securing public sector revenues. Developing countries need an overall development strategy to use non-renewable mineral wealth to improve their present situation and ensure sustainable development through building 'a diversified economy through investment in human capital, infrastructure and productive capital' (UNCTAD, 2007: 93).

10. In this distribution model about half the mineral revenues go to local prefectures, municipalities, and universities. This decentralized distribution does not correspond with the number of inhabitants, let alone with that of poor inhabitants, and heavily favours some of the wealthier departments with a small population, such as Tarija and Pando, at the expense of departments with many poor inhabitants, such as La Paz, and mining departments with a large population, such as Potosí and Oruro. In 2007, for example, per capita hydrocarbon revenues were \$491 in the gas-producing province Tarija and \$751 in the non gas-producing province of Pando, while those in La Paz with its large and poor population equalled \$27 (Weisbrot & Sandoval, 2008b).
11. In 2005, for example, Ecuador's then Minister of Economy (currently President) Rafael Correa was replaced after pressure and threats from the IFIs, which opposed his plans for greater public spending on social causes through ceilings on foreign debt payments and higher taxes on oil drilling.

References

- Acosta, A. (2011) 'Ecuador: Unas reformas petroleras con muy poca reforma', *Ecuador Debate* 82, Abril: 45-60.
- Assies, W. (2004) 'Bolivia: A Gasified Democracy', *European Review of Latin American and Caribbean Studies* 76, April: 25-43.
- Bebbington, A. (ed.) (2007) *Minería, Movimientos Sociales y Respuestas: una ecología política de transformaciones territoriales*. Lima: IEP Instituto de Estudios Peruanos.
- Bebbington, A. (2009) 'The New Extraction: Rewriting the Political Ecology of the Andes?' *NACLA Report on the America* September/October: 12-20.
- Campodónico, H. (2008) *Renta petrolera y minera en países seleccionados de América Latina*. Santiago: CEPAL.
- CEPAL (2008a) *Balance Preliminar de las Economías de América Latina y el Caribe*. Santiago: CEPAL.
- (2008b) *Las Relaciones Económicas y Comerciales entre América Latina y Asia-Pacífico. El vínculo con China*. Santiago: CEPAL.
- (2010) *Panorama de la inserción internacional de América Latina y el Caribe 2009-2010: Crisis originada en el Centro y recuperación impulsada por las economías emergentes*. Santiago: CEPAL.
- (2012a) *ECLAC Notes* 72, June.
- (2012b) 'Presentación de la Secretaría Ejecutiva de la CEPAL, Alicia Bárcena, en el seminario Gobernanza de los recursos naturales en América Latina y el Caribe', Santiago, 24 de abril de 2012: http://www.cepal.org/noticias/paginas/8/33638/240424_PresentacionSE_Slides23abril-HAconABI.pdf
- Conaghan, C. M. (2008) 'Ecuador: Correa's Plebiscitary Presidency', *Journal of Democracy* 19 (2): 46-60.
- Downs, E. S. (2011) *Inside China, Inc: China Developments Bank's Cross-Border Energy Deals*. Washington, DC: The Brookings Institution.
- Ellner, S. (2010) 'Venezuela: The Challenge to a "Model Democracy''. In J. Knippers Black (ed.) *Latin America: Its Problems and Its Promise: A*

- Multidisciplinary Approach* (Edition 5). Boulder, CO: Westview Press: 399-412.
- Fernández Jilberto, A. E. and Hogenboom, B. (2008a) 'The new expansion of conglomerates and economic groups: an introduction to global neoliberalisation and local power shifts. In A. E. Fernández Jilberto and B. Hogenboom (eds) *Big Business and Economic Development: Conglomerates and Economic Groups in Developing Countries and Transition Economies under Globalisation*. London and New York: Routledge: 1-28.
- (2008b) 'Latin American conglomerates in the neoliberal era: the politics of economic concentration in Chile and Mexico'. In A. E. Fernández Jilberto and B. Hogenboom (eds) *Big Business and Economic Development: Conglomerates and Economic Groups in Developing Countries and Transition Economies under Globalisation*. London and New York: Routledge: 135-166.
- Fernández Jilberto, A. E. and Hogenboom, B. (eds) (2010) *Latin America Facing China: South-South Relations beyond the Washington Consensus*. New York and Oxford: Berghahn Books.
- Gallagher, K.P., Irwin, A., and Koleski, K. (2012) 'The New Banks in Town: Chinese Finance in Latin America' (report available at www.ase.tufts.edu/jgdae/).
- Harris, R. L. (2003) 'Popular resistance to globalization and neoliberalism in Latin America', *Journal of Developing Societies* 19(2-3): 365-426.
- Hinojosa, L. (2009) 'Riqueza mineral y pobreza en los Andes', paper prepared for LASA 2009.
- Jenkins, R. (2011) 'El "efecto China" en los precios de los productores básicos y en el valor de las exportaciones de América Latina', *Revista CEPAL* 103, Abril: 77-93.
- Kuyek, J. (2006) 'Legitimizing plunder: Canadian mining companies and corporate social responsibility'. In L. North, T. D. Clark and V. Patroni (eds) *Community Rights and Corporate Responsibility: Canadian Mining and Oil Companies in Latin America*. Toronto: Between the Lines: 203-221.
- North, L., Clark, T. D. and Patroni, V. (eds) (2006) *Community Rights and Corporate Responsibility: Canadian Mining and Oil Companies in Latin America*. Toronto: Between the Lines.
- Ocampo, J. A. (2005) 'Beyond the Washington consensus: what do we mean?' *Journal of Post Keynesian Economics* 27(2): 293-314.
- Poveda, P. (2010) 'Bolivia and China: Indirect Relations in a Global Market'. In A. E. Fernández Jilberto and B. Hogenboom (eds) *Latin America Facing China: South-South Relations beyond the Washington Consensus*. New York and Oxford: Berghahn Books: 153-165.
- Rodríguez-Garavito, C., Barrett, P. and Chavez, D. (2008) 'Utopia reborn? Introduction to the study of the new Latin American left'. In C. Rodríguez-Garavito, P. Barrett and D. Chavez (eds) *The New Latin American Left. Utopia Reborn*. London: Pluto Press: 1-41.
- Rosales, O. and Mikio K. (2012) *China and Latin America and the Caribbean. Building a strategic economic and trade relationship*. Santiago: ECLAC.
- Santiago, M. I. (2006) *The ecology of oil: environment, labor, and the Mexican Revolution, 1900-1938*. Cambridge: Cambridge University Press.

- Schilling-Vacaflor, A. (2011) 'Bolivia's New Constitution: Towards Participatory Democracy and Political Pluralism?' *European Review of Latin American and Caribbean Studies* 90: 3-22.
- Yashar, D. J. (2005) *Contesting Citizenship in Latin America. The Rise of Indigenous Movements and the Postliberal Challenge*. Cambridge: Cambridge University Press.
- UNCTAD (2005) *Trade and Development Report 2005. New Features of Global Interdependence*. New York and Geneva: United Nations.
- (2007) *World Investment Report 2007 – Transnational Corporations, Extractive Industries and Development*. New York and Geneva: United Nations.
- Weisbrot, M. (2007) 'Changes in Latin America: Consequences for Human Development', *International Journal of Health Services* 37(3): 477-500.
- Weisbrot, M. and Sandoval, L. (2008a) *Update: The Venezuelan Economy in the Chávez Years*. Washington, D.C: Center for Economic and Policy Research (at www.cepr.net).
- (2008b) 'The distribution of Bolivia's most important natural resources and the autonomy conflicts' (Issue Brief, July). Washington, D.C: Center for Economic and Policy Research (at www.cepr.net).

LINKING NATURAL-RESOURCE EXPLOITATION WITH WORLD MARKETS:

ROAD INFRASTRUCTURE AND ITS IMPACT ON LAND-USE CONVERSION IN AMAZONIA

PITOU VAN DIJCK

This chapter focuses on the interaction between natural-resource exploitation and infrastructure development in Amazonia and the resulting anthropogenic pressure on environmental systems. The study shows that rapid expansion of natural-resource exploitation, reviewed in Chapter 1 of this volume, has contributed to developing a network of official and unofficial roads to facilitate transportation of people and goods and to connect the region with world markets. Construction of this road network has heavily impacted land use in Amazonia and induced widespread and significant economic, social, and environmental change. This holds true particularly for areas experiencing relative few effects from economic development thus far. To date, about 80 per cent of deforestation in Amazonia is within 30 kilometres of an official road. In view of the recent plans for cross-continental infrastructure development, as well as the plans of national and state governments and municipalities, infrastructure networks in South America in general and in Amazonia in particular will expand in the years to come. The official road network is complemented by many thousands of kilometres of unofficial and illegal roads constructed by private firms involved in exploitation of natural resources. Illegal roads are even constructed in officially protected areas and reserves. As a consequence of these completed and planned construction projects, the overall map of land use in the area is changing rapidly. Large forested areas are transformed by econom-

ic activity; roads and economic development lead to fragmentation of the forests; and improved accessibility poses a still greater threat to the environment and the livelihood of indigenous peoples.

In this context of rapid integration of Amazonia on world markets as a production platform of natural resources, the second part of this chapter focuses specifically on the potential contributions of so-called strategic environmental assessments (SEA) of road impacts and on the related plans of action. SEAs essentially aim at assessing potential economic, social, and environmental impacts of economic programmes and plans including infrastructure. More specifically, SEAs aim ultimately at controlling and mitigating potential negative impacts and at boosting potential positive impacts of such infrastructure programmes and plans. SEAs are a relatively new mechanism with high potential, but so far their contribution to conserving the natural environment and enhancing the wellbeing of indigenous peoples in South America has been rather limited. In order to contribute more effectively and efficiently to their stated objectives, SEAs require improvements as shown in the final part of this chapter.

Following this introduction, the second section of this chapter is a stylized review of the current boom in natural-resource exploitation in South America and presents the spatial distribution of these activities in a series of maps. The third section focuses on the direct and indirect impacts of natural-resource exploitation. The fourth section places the development of road infrastructure in the broader context of socio-economic and biophysical drivers of impacts, as reflected by land-use conversion in Amazonia. The fifth section charts the new agenda for road infrastructure development in South America and devotes special attention to major programmes such as the continental IIRSA-COSIPLAN and the PAC in Brazil. Next, the sixth section investigates the potential and probable impacts of roads on the area traversed and opened. The seventh section studies the potential roles of SEAs in controlling and managing direct and indirect impacts of induced anthropogenic pressure in territories opened and transformed. The eighth section presents a brief outline of a comprehensive and innovative type of SEA that addresses some of the shortcomings in many traditional SEAs. The final section sums up the main conclusions from this study and presents some reflections on the potential of comprehensive and participatory SEAs to enhance the welfare of those living in the potential impact area of such infrastructure programmes and plans.

Natural-resource exploitation in Amazonia

The dynamics of natural-resource exploitation

Natural-resource exploitation and processing has been important in the economic structure of most countries in South America since the late 19th century. Agriculture, cattle ranching, and mining shaped the economies in the region, attracted (foreign) investment, financed the government sector, and dominated exports. The strong dependence of national economies on international commodities markets has resulted in boom-bust cycles and major fluctuations in overall annual economic growth rates and a large number of related socio-economic and monetary variables.

Endowment with natural resources does not necessarily entail high rates of overall economic growth and development. On the contrary, long-term comparisons of overall growth rates in regions throughout the world indicate that areas well-endowed with natural resources such as South America, the Middle East, and Africa are not among the economically most dynamic and successful areas. Over the longer term, commodity markets tend to be characterized by a highly volatile prices and major fluctuations in traded volumes. Strong dependence on a few commodities therefore tends to make a country more vulnerable to external shocks. Boom-bust cycles are characteristic, involving periods of rising prices and revenues for investors and employees, governments, and traders, followed by declining prices and a downturn in revenues. In economies highly dominated by production and income based on natural-resource exploitation, rising international commodity prices and foreign-exchange revenues may result in a rising exchange rate, i.e. a relative value of the domestic currency, which may cause so-called Dutch Disease effects. By implication, the other sectors of tradeables, including potential export sectors as well as import-substitution sectors, may be affected negatively by the relative rise in the value of the domestic currency, resulting in still stronger dependence of the economy on a limited number of commodity exports and on the sectors of non-tradeables. Effective macro-economic management in these conditions requires very strong economic and political capacities at the national level.

In recent years international markets for natural resources have grown rapidly, increasing overall economic growth in commodity-exporting countries in South America, as well as in other regions. Growth rates are greatly boosted by real growth in intermediate demand for natural resources to be processed in the manufacturing industry, increasingly so in newly industrializing countries, particularly in Asia. Moreover, the rise in per capita income in a large group of developing countries including the BRICs promotes demand for natural resources for producing food or food products.

Agricultural crops satisfy demand for food products, either directly or indirectly as inputs for cattle. Growth patterns of food products do not simply reflect a general pattern across markets but may vary considerably depending on the commodities and time period. The category of food products, even staples of food products, involves a wide variety of product categories, ranging from basic goods, such as rice, wheat, and sugar, to luxuries and non-essentials, such as chocolate, coffee, tea, fruits, and nuts. Direct demand for food crops, particularly staples, may decline as a share of overall spending or per capita consumption at rising levels of income per capita, but demand including intermediate use may be significantly higher, due to strong preferences for meat and meat products with high intermediate food input levels. Also, a wide variety of manufactured goods requires soy as an intermediate input. Demand for energy moreover generates demand for agro-based products such as biofuels, including sugar cane.

High international demand for mining products as intermediate inputs for manufactured products and for energy, both non-renewable and renewable, are another source of natural resource-related, export-oriented growth in South America. Chapter 1 of this volume presents basic data to illustrate the development of the sector in South America. Mining is generally a capital-intensive and energy-intensive sector, requiring substantial inputs of energy and infrastructure per product unit. Specialization patterns may shift due to fluctuations in demand, technological progress, substitution processes, and worldwide shifts in available stocks at different costs levels. Decline in proven reserves as a share of actual levels of annual worldwide demand tends to drive international prices upwards and trigger initiatives to develop new input-saving techniques or substitutes. Hence, the contribution of different types of natural resources to economic dynamics may shift substantially over the medium term. Finally, markets reflect not only scarcities and market power but uncertainties as well. Speculative demand for resources is a factor impacting prices and may contribute to price fluctuations, impacting real demand, production, and trade in commodities in the process.

Mapping natural-resource exploitation in Amazonia

The role of Amazonia as a supplier of a wide range of natural resources has increased greatly since the 1960s, when domestic colonization of the area began. For a general overview of this process in Brazil, see the World Resources Institute 2006 and the Instituto Socioambiental (ISA) 2009. Maps 2.1-2.5 present a stylized depiction of the actual concentration of major types of natural-resource exploitation in Brazilian Amazonia: agriculture and cattle ranching; timber logging; mining, prospecting, and oil, and gas exploration.

Cattle ranching, large and small scale agriculture, timber harvesting, and gold mining are among the more traditional types of natural-resource exploitation in South America in general and in Amazonia in particular, having widespread impacts on large territories.

Mineral mining, development of gas and oilfields, and hydro-energy generation, have become more prominent in recent years, although the direct spatial impacts of these new types of extractions, so far at least, are still rather limited as compared to agriculture, cattle ranching, and timber logging. The main exception in this regard is small-scale gold mining, which has spread rapidly in recent years and impacts large areas throughout Amazonia. In view of the large number of plans for hydro-energy production and the construction of storage lakes, as well as the location of exploitable reserves and the spread of areas designated for mineral prospecting, the (direct) spatial impacts of the exploitation of these resources are expected to increase markedly.

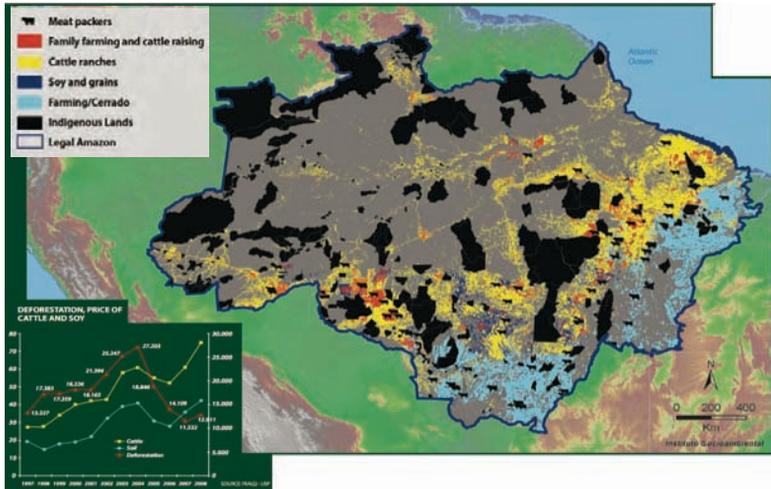
As a point of reference, maps show the location of protected areas for *indigenas*. For more specific information on these protected areas, see the contribution by Fábio De Castro in Chapter 3 of this volume. Protected areas significantly curtail land-use conversion and deforestation, as shown by model studies (see Wood and Porro 2002 and Van Dijck 2013). At the same time, however, even the protected areas are threatened by illegal forms of natural-resource exploitation like timber logging, hunting, prospecting, as well as illegal construction of unpaved roads, as shown by Carneiro and Braga de Souza 2009 and by IMAZON and ISA 2011.

Though highly aggregated, the maps indicate that the traditional types of economic exploitation – small-scale and large-scale agriculture and cattle ranching – are strongly concentrated in the eastern, south-eastern, and southern belts of Amazonia. This area is often referred to as the Arch of Deforestation. Road construction during the military era in the 1960s and 70s to support colonization of Amazonia has strongly contributed to spatial shaping of these economic developments. Moreover, the traditional location of economic activities in Amazonia has been determined by the location of traditional means of transportation in the region, the river system: some of these activities have been developed along the River Amazon, Negro, and Madeira.

Timber exploitation is concentrated in the southern belt, in the Northeast (Pará), and along the highways mentioned above. Construction of the BR 364 instigated deforestation at an unprecedented scale in Rondonia. In the meantime, the Arch of Deforestation has expanded and broadened significantly.

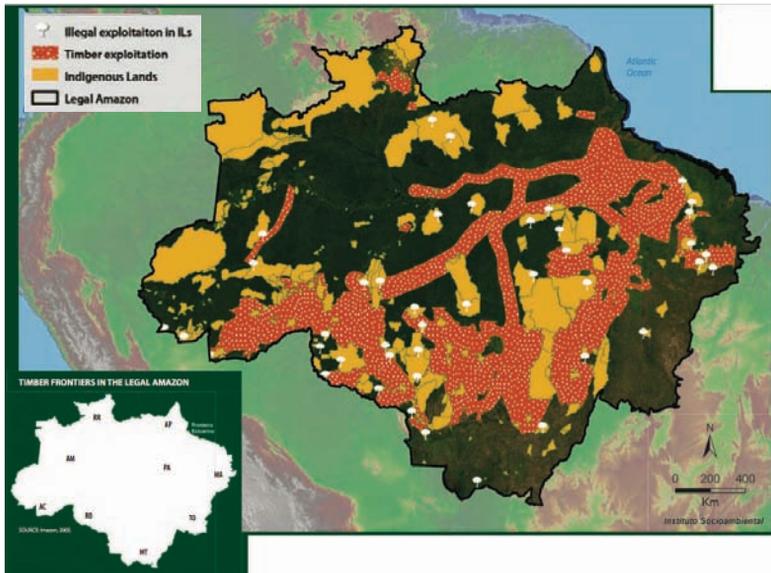
Prospecting (*garimpo*) may be considered a rudimentary type of mining and has been practised as a small-scale, often unofficial or

Map 2.1 Spatial distribution of agriculture and cattle raising in Amazonia



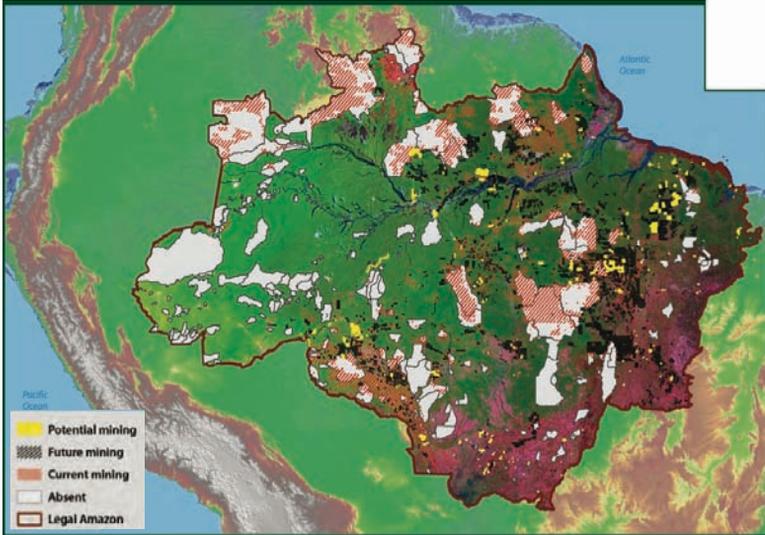
Source: F. Arnaldo Carneiro and O. Braga de Souza, November 2009. *Atlas of Pressures and Threats to Indigenous Lands in the Brazilian Amazon*. Sao Paulo: The Socio-environmental Institute (ISA), p. 31.

Map 2.2 Spatial distribution of logging in Amazonia



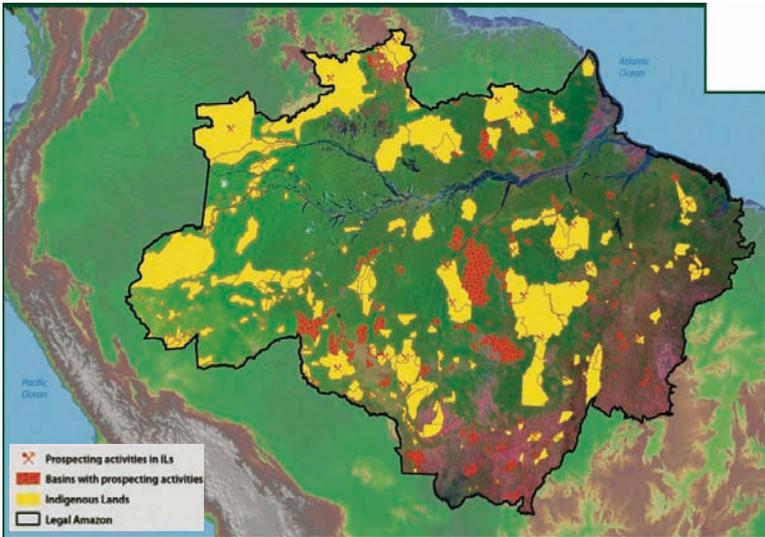
Source: F. Arnaldo Carneiro and O. Braga de Souza, *ibidem*, p. 43.

Map 2.3 Spatial distribution of mining in Amazonia



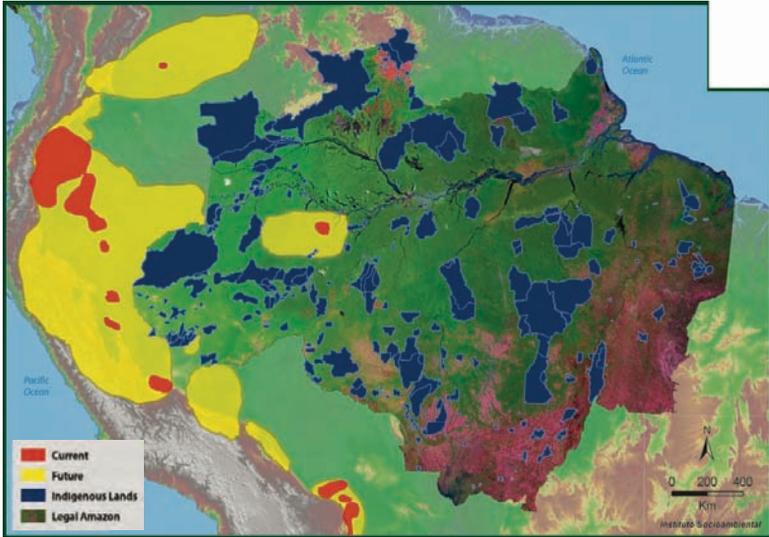
Source: F. Arnaldo Carneiro and O. Braga de Souza, *ibidem*, p. 35.

Map 2.4 Spatial distribution of prospecting in Amazonia



Source: F. Arnaldo Carneiro and O. Braga de Souza, *ibidem*, p. 39.

Map 2.5 Spatial distribution of oil and gas in Amazonia (current exploitation zones and declared interests)



Source: F. Arnaldo Carneiro and O. Braga de Souza, *ibidem*, p. 41.

illegal type of activity throughout Amazonia, including protected areas and reserves. Most prospecting activities concern gold, but some involve diamond and hyaline quartz exploration sites. Since the new gold boom with rising gold prices started in the 1990s, the activity has increased strongly throughout many basins, rivers, and river beds. This holds true not only for Brazilian Amazonia but for other countries in the area as well.

Mining – particularly bauxite, cassiterite, and copper – is widespread throughout Amazonia. As may be seen from the location of current, future, and potential mining areas, this type of natural-reserve exploitation is expected to develop rapidly in the future in view of high international demand and prices and ample financial resources to finance investment.

Oil and natural-gas explorations have thus far been concentrated in the western sections of Amazonia but are expected to be developed in areas located in the centre of Amazonia. To support these activities a network of legal and illegal unpaved roads has been constructed since the early 1960s as discussed in the third section of this chapter and shown in Maps 2.6-2.9.

Direct and indirect impacts of natural-resource extraction

To fully appreciate the impacts of natural-resource exploitation on society or the economy at large, the scope of analysis needs to be

broadened beyond the intrinsic exploitation process. Barbara Hogenboom indicates at the beginning of Chapter 1 that minerals are highly political materials. Their exploitation is not only subject to political decision making but may also impact the decision-making process, particularly in cases where the socio-economic consequences of exploitation are regionally or nationally significant. The point made in this section is that the socio-economic, environmental, and political impact of natural-resource exploitation is much more significant when the activities directly and indirectly linked with the actual resource exploitation are included in the analysis. Apart from the direct spatial and environmental impacts of natural-resource exploitation that may be large and spatially widespread, as indicated in the previous section and illustrated in the maps, exploitation of natural resources generates indirect impacts by backward and forward-linked economic sectors. Backward linkages include economic activities encouraged to supply the inputs required to exploit the natural resources. In addition, forward-linked sectors that use the output may be distinguished from the sectors extracting natural resources. Including backward-linked and forward-linked sectors in the analysis of the impact of natural-resource exploitation yields a much broader picture showing the full economic, social, environmental, and political weight of the sector.

In that context physical infrastructure, including roads, ports, harbours, airports, and energy-supply systems, has a major role in facilitating transportation of primary and intermediate inputs, as well as transportation of outputs to the industrial sectors using them and the end consumers of the products, domestically and abroad. Put differently, development of transport facilities is conducive to economic activities and, alternatively, may be promoted by investors in natural-resource exploitation.

Based on the above, ranking sectors according to the weight of their respective impacts on society or on the economy at large may differ substantially between assessments that exclude or include these linked effects. Different types of natural-resource exploitation may be distinguished according to the different combinations of primary inputs per unit of value added and the different types of intermediate supplies of products and services. Hence, all sectors differ in their overall – primary plus intermediate – input requirements and their environmental impacts, measured in terms of natural-resource use and output of waste and pollution. Applying traditional input-output analysis as described briefly below enables in-depth and detailed study of input requirements and their environmental impacts. Input-output analysis is a traditional and general economic type of analysis that has yet to be applied in the specific context of assessing impacts of sectoral developments in environmentally sensitive regions (see also Van Dijk, 2013, pp. 88-90).

An input-output table essentially depicts the interrelations between production sectors and direct and indirect use of inputs to generate a unit of product in all the sectors listed. Hence, the table enables assessment of required inputs of labour, capital, land, energy, transportation, and all sorts of intermediate industrial, agricultural, and service inputs per production unit of specified types of natural resources. These tables thus facilitate understanding the linkage between direct and indirect impacts of natural-resource exploitation. Unintended production outputs like polluted air, land, and water are not ordinarily included as outputs, but tables may be adjusted to show environmental implications of production processes. To serve specific analytical requirements regarding the assessment of potential environmental or spatial impacts of production, the analysis may be adjusted by including different types of land (forests), water, and air as production inputs and by including different types of pollution as production outputs.

For every natural-resource producing sector (j) we write that the value of production or output equals the value added (wages, profits, and taxes) generated by the factors of production, in addition to the value of intermediate inputs or deliveries (ij). Write:

$$\text{PRODUCTION } j = f[\text{PRIMARY INPUTS: CAPITAL, LABOUR, LAND}]_{ij} + [\text{INTERMEDIATE INPUTS: ENERGY, TRANSPORTATION, PROCESSING, SERVICES}]_{ij}, \text{ for } i, j = 1, 2, \dots, n.$$

To express impacts on the environment more explicitly, we add to Production j Pollution of water, air and soil as outputs related to production of j . In addition, intermediate use of natural resources in the production of natural resources may be made more explicit by distinguishing inputs of water and other natural resource-rich intermediate inputs, except for energy and land, which have been specified previously (for a more detailed illustration of the method, see Van Dijck 2013, Chapter 5).

Distinguishing between small-scale and large-scale sub-sectors of production of mining and other forms of natural-resource exploitation is useful in this context, as these subsectors operate at different production functions, require different combinations of intermediate inputs, and have different types of environmental and spatial impacts: these subsectors differ in their generation of unintended by-products such as pollution. This distinction corresponds with the typology applied by Geist and Lambin (2001), which identifies poverty-driven and capital-driven patterns of land-use conversion and deforestation. The first type is associated with small farmers, cattle ranchers, and prospectors driven by lack of income opportunities to start operating in the forest. In most cases these producers lack capital, specific skills, and land titles.

Small-scale production does not automatically limit impact in terms of land-use conversion. Small farmers without land titles do not qualify for bank loans and consequently may have difficulty financing pesticides, fertilizers, and equipment, as a result of which they can hardly improve the low and (declining) productivity of the land. This situation prevents them from escaping from poverty and forces them to move towards new plots of land within the same region after approximately five to eight years. Hence, this type of production involves frequent intra-regional shifts of production sites.

Capital-driven land-use conversion is associated with commercial farming, cattle ranching, and timber logging. These types of activities essentially require roads or proximity to waterways to service markets. This type of frontier development is strongly encouraged by policies aimed at colonization and deforestation by means of credits, subsidies, and development projects (Ozório de Almeida and Campari 1995).

Related economic activities: Infrastructure

Expanding commodities production areas is conducive to arranging supportive transport and energy facilities such as roads, railways and waterways, and ports and airports, and for generation and transportation systems for different types of energy, including dams and high-voltage transmission systems. Roads play a key role in opening territories and facilitating natural-resource exploitation in remote areas. Expressed in terms of production function, roads facilitate actual construction of the production site, in-migration and transportation of labour, capital goods, and supporting services, delivery of intermediate inputs and outputs, and construction of energy production sites and energy transportation systems (high voltage lines) and connect production sites with distribution and service centres.

After several decades of relative neglect of the stock of physical infrastructure as reflected by fairly low investment in construction, renovation, maintenance, and repair, developing transport infrastructure and energy-related infrastructure figures high on the agenda of national governments in all South American countries. Infrastructure has become crucial in improving positions of countries and enterprises in global markets and their competitive strength. The more economies are opened and connected with world markets, the more domestic, regional, and local growth in production and demand depends on world markets, and the more infrastructure linkages between domestic economies and international markets are required to support investment, production, trade, and ultimately income and general wellbeing. In globalizing economies infrastructure has a key role.

Infrastructure linkages not only promote development of natural resource-based production platforms but also generate their own

dynamics and impacts in the areas along the trajectory of transport corridors. Increased connectivity offers new options for competition, market development, and production opportunities, both within the opened area and in the outside world.

In combination, these interrelated economic activities and types of infrastructure may transform large territories over the long term. Impact areas of transport infrastructure, specifically road infrastructure, may involve environmental, economic, and social transformation of broad corridors along these roads, thus increasing anthropogenic pressure and significantly changing the environment and how the inhabitants of the impact area earn their livelihood. In the long run, international corridors may even bring about new economic development poles and centres of gravity.

Impacts on land use

Changes in land use and deforestation in Amazonia and the Guyanas have been concentrated particularly in corridors along paved and unpaved roads. These roads have traditionally been built to encourage colonization of the area for economic, social, political, or military-strategic reasons or have been constructed by governments, private firms, or by means of public-private partnerships to support specific investment projects related to exploitation of natural resources. Current road projects such as IIRSA and PAC present roads as so-called development hubs, i.e.: mechanisms for developing vast territories by facilitating economic activities and consequently land-use conversion.

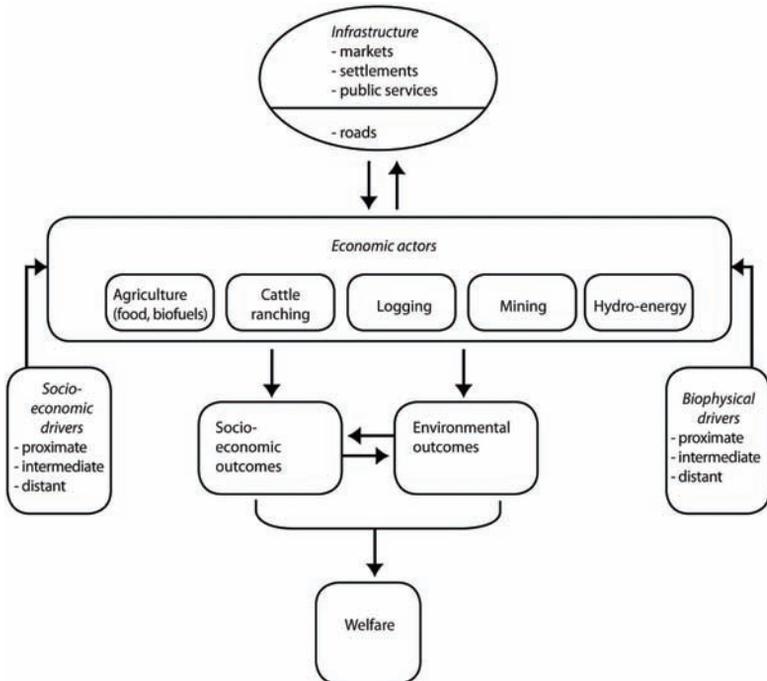
Transformation of land use – involving changes in land ownership and accessibility of natural resources critical to the livelihood of local communities such as fertile soils, water, non-timber forest products – may have significant impacts on the wellbeing, income, and livelihood of those living off the land in the potential impact area. Although investments in resource exploitation and road infrastructure may offer new opportunities for both local inhabitants and migrants into the area, they entail risks as well. These risks, or the perception of probable risks, may create uncertainty, unrest, and resistance, conflict, and opposition to investment plans.

Before focusing specifically on new approaches to the *ex-ante* assessment of potential socio-economic and environmental impacts of roads and of related policies to manage such impacts in the sixth section (Roads and their impacts: Assessments), the next section reviews the broad range of socio-economic and biophysical factors determining the potential impacts of economic interventions in Amazonia. The broader approach facilitates a comprehensive assessment of the interrelated changes that may take place as a consequence of such economic interventions in environmentally sensitive surroundings.

Land-use conversion drivers: Socio-economic and biophysical dimensions

The scheme developed by Wood (2002), which is summarized in Figure 2.1, is a useful starting point for an analysis of the impacts of economic activities, specifically natural-resource exploitation and construction of infrastructure, on land use and concurrently on environmental systems and landscapes and the organization of rural life, including the livelihood strategies of local populations. The scheme identifies two clusters of variables that drive change in land use: socio-economic factors and environmental factors. Following Wood, these variables function differently at distant, intermediate, and proximate levels and scales. Some observations are in place concerning the potential significance of these types of variables in the context of our analysis. Clearly, neither the variables nor the specified levels and scales are fully independent but, on the contrary, interact strongly, as clarified below.

Figure 2.1 Drivers of land-use change: schematic approach



Source: P. van Dijck, *The Impact of IIRSA Road Infrastructure on Amazonia*, Figure 5.1, p. , London: Routledge, 2013. Based on C.H. Wood, 'Introduction: Land Use and Deforestation in the Amazon'. Figure 2, p. 9. In *Deforestation and Land Use in the Amazon*, eds C.H. Wood and R. Porro, Gainesville: University Press of Florida, 2002.

Socio-economic drivers: Access to markets

In the area of socio-economic drivers, markets, policies, regulatory systems, and infrastructure are distinguished at four declining levels of administrative status: international, regional, national, and local. The more economies are liberalized, and the more production is globalized, the more international markets dominate global and local allocation of production factors, location of production units, and consumption patterns. Moreover, the more production is oriented towards global markets, the greater the significance of transport infrastructure in facilitating international transactions and in making operations cost-competitive.

Trade liberalization has reduced barriers to enter national markets in South America significantly since the early 1980s. Nominal and effective most-favoured nation (MFN) tariff protection rates have dropped sharply, thereby reducing *de facto* the significance of national or regional clusters of preferential markets as a meaningful layer for analyzing the behaviour of individual investors and producers. Regarding investment, liberalization of capital markets, privatization, and the increase in bilateral and group investment treaties have all contributed to the role of foreign investment in the exploitation of natural resources and – in very limited measure – in the construction of road infrastructure.

The second layer of markets is at the regional level. Countries cooperate in many different ways to varying degrees in trade-policy arrangements, investment treaties, and many other types of group arrangements that change production conditions or terms for users. Preferential trade agreements, ranging from free-trade areas to economic unions, tend to favour producers within a region over outsiders by providing more favourable regional market access. However, multilateral liberalization, as reflected by lower MFN tariff rates, in effect reduces the net preferential margin and consequently the significance of these preferential trade agreements.

The third layer consists of national markets, and, under specific conditions, there is also a fourth layer of local markets. National markets, like regional markets, may favour home market producers through protectionist or discriminatory economic instruments and measures. Local conditions may vary because of differences in transaction costs including transportation costs. Clearly, as markets are liberalized, and infrastructure furthers integration of national markets and accessibility of local markets, less differentiation of local markets is required. Local and often illegal road networks, however, are significant in facilitating exploitation of natural resources, especially timber logging, cattle ranching, and gold digging, as shown above.

Socio-economic drivers: Government interventions on domestic markets

In addition to government interventions regulating access to international, regional, and domestic markets, other types of government and non-government interventions on domestic markets impact the location and volume of production, including domestic taxation and subsidization, a wide variety of production regulations, as well as more specific rules and regulations controlling land use, investment in supporting infrastructure, and initiatives and legislation to protect eco-systems and selected territories as habitats for *indigenas* and endangered species.

Here, too, measures may be designed and applied multilaterally, regionally, nationally, and locally by governments but also by non-governmental stakeholders, such as private firms and NGOs. Specialized multilateral agencies have elaborated a wide range of rules and regulations restricting the discretion of national governments to determine arbitrarily domestic matters that affect land use directly and indirectly. Production and environmental standards and regulations are cases in point.

Governments have applied a wide range of instruments directly supporting integration of Amazonia in the national economy and colonization of the area with the objective of raising overall production and more specifically creating new opportunities for the poor and landless. Construction of infrastructure, supply of services in colonization centres, availability of subsidized credit schemes, and tax holidays are among the instruments frequently used to support exploitation and development of Amazonia (Ozório de Almeida and Campari 1995).

Decisions concerning the actual exploitation of natural resources and consequently land use are generally taken by private international or domestic firms, but other stakeholders largely determine their context. Many countries consider subterranean natural resources to be the property of the people but subject to government control as far as their use is concerned. Land may be owned privately in most countries on the continent, but ownership by foreign investors is often restricted. The role of state-run or state-controlled companies may be significant in several countries, particularly in sectors deemed of strategic importance. Privatization measures since the 1980s, however, have reduced the role of the state and have provided opportunities for domestic and international investors in these areas. Moreover, in view of the significant contribution of natural-resource exploitation to government revenues and foreign-exchange revenues, control over resource exploitation is rigid and comprehensive in most countries.

Transportation and energy-related infrastructure is key to economic growth and development. Institutions at all levels are involved

in construction, design, and regulation of infrastructure. Infrastructure may in many respects be considered a public commodity, and its provision has traditionally figured among the core responsibilities of national governments. Most infrastructure is in fact the work of national governments in South America, as well as in most other countries in the world. Analyses of the role and impact of infrastructure in the context of natural resource-based developments in South America should take into account that the design, construction, and maintenance of infrastructure, particularly road infrastructure, is not the exclusive domain of national governments, and that national governments are not necessarily the most efficient suppliers of infrastructure. Local governments and municipalities have constructed local unpaved roads to benefit local development. Private companies in the mining, timber exploitation, agriculture, and cattle ranching sectors have constructed unpaved roads to connect sourcing areas with transfer locations, distribution centres, and markets. Some public-private partnerships in road construction have been initiated recently as well. One case in point is the State Programme for the Recuperation of Roads – Programa Estradeiro – of the State of Mato Grosso, which was initiated by Governor Blairo Maggi in 2003. For an analysis of the programme, see Van Dijck and Den Haak (2006). Internationally, countries in South America have started to cooperate to develop corridors in the context of IIRSA and COSIPLAN, although national governments remain in charge of the ultimate decision-making (Van Dijck 2013).

In addition to measures to support exploitation of natural resources and conversion of land use, governments may control or restrict land-use conversion or deforestation. Protection of territories may serve different purposes and take various forms. Areas may be designated to protect and support groups of *indigenas*, or for environmental reasons to support endangered species or environmental hotspots. See Chapter 3 of this volume for a more in-depth analysis of this specific policy instrument. As statistical studies show, designating protected areas is one of the most effective ways of curtailing land-use conversion and deforestation. The negative impact of such areas on land-use conversion and deforestation might be mitigated through improved surveillance mechanisms, such as satellites and drones, and timely interventions. The reservations established along the southern section of the BR 164 in Brazil, linking Cuiaba with Santarem, are often mentioned as a successful example of such a strategy. At the same time, however, illegal mining, timber logging, and road construction take place inside such protected areas. Closer proximity to roads (less than 25 kilometres) significantly increases the probability of fires and deforestation in protected areas (WRI 2006 p.60). Finally, while protection may be considered primarily the task of national governments, non-governmental organizations

(NGOs) may be active in supporting and protecting groups of *indigenas* and natural parks by means of co-financing protective measures.

Biophysical variables

Land-use conversion is affected not only by socio-economic variables but also by several categories of so-called biophysical variables. These variables influence physical production conditions at distant, intermediate, and proximate levels, ranging from global climate conditions to more localized or regionalized factors, such as precipitation, water levels, topography, weather, suitability of the soil for production of marketable commodities, presence of pests and diseases impacting agricultural production and cattle ranching (as is the case with foot and mouth disease); and the availability of efficient infrastructure to link potential production areas with manufacturing production platforms to process and market commodities. Land quality and related variables in particular are a major factor determining the size of the impact area along newly built or newly paved roads (Van Dijck 2013, pp 90-101).

These biophysical variables tend to be less volatile than most of the socio-economic variables presented above. Particularly in the current era, however, some biophysical variables have become less stable and predictable as a result of interventions in the local or regional environment or because of climate change. Put differently, several biophysical variables are affected by socio-economic factors and are subject to the functioning of markets, government policies, and regulations. First, locally, overexploitation of the soil may reduce its fertility and productive potential and promote intra-regional migration and shifts in production location. Consequently, the area of land-use conversion expands, when little is invested in supporting soil fertility, and depletion of nutrients is high. Second, road construction accompanied by wider deforested corridors may contribute to reduced precipitation, an increase in fire hazards, and the probability of large-scale destruction of areas. Third, climate change may affect precipitation in large parts of Amazonia and beyond in several different ways, resulting in both increasing and decreasing levels of precipitation, affecting growth potentials and fertility, and consequently the productive values of the soils. Beyond a so-called tipping point, patterns of change may even result in unstoppable and irreversible processes that may permanently affect the functioning of existing eco-systems and land use.

The socio-economic and biophysical variables reviewed above help explain types and degrees of land-use conversion, ranging from marginal transformations to complete clearing and redevelopment of land and forests. Ultimately, the combined effect of these variables on potential revenues from different types of land use, including

those from existing land use (the forest or savannah), determines the outcome of the extent and location of land-use conversion.

Quality and suitability of the soil and other production conditions, technology, and (international) prices determine outcomes in terms of land use. As all these variables tend to change over time, in combination with a host of other variables referred to in Figure 2.1, land-use conversion is not simply a one-off type of change in a specific area but should be seen as continuously dynamic, implying that the same area of land may be used in several different ways in subsequent periods, after being deforested (see Andersen et al. 2002, p. 68, Table 4.2).

Over the history of land-use conversion in Amazonia, cattle ranching has been the main source of deforestation in Amazonia, followed by logging and agriculture. So far, mining has directly impacted only a small share of Amazonia's territory, although including the indirect impacts of roads and hydro-energy systems may expand the area impacted by mining considerably. Rising demand for mining products may increase the impact of this type of natural-resource exploitation significantly in the future. Price fluctuations of input factors and outputs, as well as technological change, may affect the production process and consequently direct and indirect impacts on land use in the course of time. Most land-use conversion models arising from road construction are static, however, and, moreover, do not directly include price effects as explanatory variables in most relevant equations.

The study of land-use conversion arising from road construction will be continued in the section on roads and their impacts, after a brief presentation of the development of road construction in Amazonia in the next section.

Infrastructure development in Amazonia

Overall, the density of the infrastructure system and specifically of the road system has increased strongly since road construction began in Amazonia in the 1960s, as shown on Maps 2.6 - 2.9. During the 1960s and 70s, the military constructed several large, unpaved highways, such as the Transamazon Highway (BR 230), the BR 163 (Cuiabá-Santarém), the BR 319 (Manaus-Porto Velho), and the BR 364 (Mato Grosso- Acre). These projects aimed to support development and integration of Amazonia – ‘to bring people without land to land without people’, as formulated during that era of internal colonization.

Globalization and regional economic integration among countries in South America have helped establishing a supportive infrastructure become a priority. Reducing intra-regional policy-driven barriers

to trade (e.g. import tariffs and quotas) and complicating trade regulations, as implemented during the 1980s and 90s, clearly have the potential to promote trade between the countries in the region, but realizing this potential depends on a host of trade-impeding factors, including infrastructure. Developments in MERCOSUR are a case in point. Substantial liberalization of trade between Argentina, Brazil, Uruguay, and Paraguay in the early 1990s, followed by the establishment of free-trade areas between MERCOSUR countries with Chile and Bolivia and the expansion of MERCOSUR to include Venezuela as a new member country have significantly increased trade among most of these countries and may continue to do so in the years to come. Similar developments have been taking place among member countries of the Andean regional trade bloc. This development has been supported by massive investment in infrastructure, such as the Brazilian programme *Avança Brasil* and the *Programa de Aceleração do Crescimento (PAC)*. Both PAC and IIRSA operate according to the key concept of ‘national axes of integration and development’ as a principle for organizing infrastructure and related development. In such an approach regional development and private investments are generated and concentrated in relation to government-financed infrastructure.

The IIRSA (Initiative for the Integration of Regional Infrastructure in South America), was launched in September 2000 as a broad infrastructure programme for all countries in South America. The IDB and Brazil were driving forces behind the programme. IIRSA has operated based on a Consensus Agenda among all governments of South America and financial institutions. The programme identifies nine development hubs and 31 key programmes for the 2000-2010 period. Financial inputs are generated by national governments, IDB, CAF, and FONPLATA with cooperation from Brazil’s national development bank BNDES.

IIRSA is a rather special initiative, having a regional perspective – with all countries in the region involved – on infrastructure, operating without bureaucracy and with a decision-making structure involving government representatives, technical experts, and financial institutions. The involvement of NGOs and the private sector at that level of operation, however, is minimal. Other regional infrastructure programmes organized along more or less similar lines are Plan Puebla Panamá in Central America, and TEN-T of the European Union.

By 2010, the IIRSA programme was integrated in COSIPLAN and became the infrastructure component of UNASUR, a multidimensional integration system for the entire region comprising economic, political, and military components. IIRSA and COSIPLAN do indeed integrate (national) infrastructure and by doing so potentially generate high added value from limited investment. National and regional

infrastructure programmes clearly interact and are mutually supportive, as are PAC and IIRSA. Remarkably, IIRSA-related investment in maritime and river transport, which is the predominant mode of (bulk) transport in Amazonia, has been minimal.

Both official and unofficial (privately constructed) and illegal roads have helped open up Amazonia and have promoted its exploitation. The maps show different types of infrastructure and road infrastructure in (Brazilian) Amazonia. Roads are concentrated in the eastern, south-eastern, and southern parts of Amazonia, as most traditional economic activities were concentrated there. Apart from roads, a limited number of railways has been constructed, essentially for transportation of mining products. Moreover, as Map 2.6 shows, pipelines and transmission lines create connections and, as their construction requires building roads, lead to improved accessibility of the region. The PAC and IIRSA-COSIPLAN initiatives involve building new corridors or improving existing road connections and waterways. PAC initiatives are strongly focused on improving the investment climate and facilitating (export-oriented) natural-resource exploitation. Together, the PAC and IIRSA plans deeply impact Amazonia, including northern Amazonia and the Guyanas, which so far are the least environmentally affected parts of Amazonia. The IIRSA Guianese Shield hub, shown in Map 2.9 and 2.10, helps realize the ambition of the Brazilian Arco Norte plan: of linking the metropolis of Manaus at the heart of Brazil's Amazonia to its northern neighbours in the Guyanas (Guyana, Suriname, and French Guyana). These transport corridors link agriculture and mining production platforms in northern Brazil to Caribbean seaports that provide access to markets in Europe, the United States, and East Asia. Brazil has set up these corridors to reduce transport distances and costs as compared to transport via the harbours on the Brazilian east coast. In addition, Suriname hopes to construct a direct link between the harbour of Paramaribo and Manaus to serve a similar transit function.

North-south linkages across the central part of Amazonia are envisaged, are being planned, or are currently under construction. One such pathway is the planned reconstruction of the BR 319 between Manaus and Porto Velho, although these plans have been postponed time and again. In combination with the ongoing and planned improvements of the Amazon waterway, the proposals to enhance the transport capability of the Rio Napo, and the roads envisaged to the north and south, these investments will eventually turn Manaus into an economic centre with a large-scale anthropogenic and economic impact on northern Amazonia.

Moreover, the combination of the roads referred to above would create a truly long-range link across the heart of South America, ultimately connecting La Paz, Bolivia, situated in the Andes south of Bolivian Amazonia, with Paramaribo and Caracas at the northern

extreme of the Guyanas at the edge of the Caribbean (for a more comprehensive study of Manaus as an infrastructure hub of the future, see Van Dijck 2013).

In addition, the BR 163 linking Cuiabá and Santarém is being renovated and paved to reduce costs of transporting soya and to increase reliability and timely delivery at the ports. More recently, plans have been drafted to build a second north-south soya corridor, situated more to the east, between the state of Mato Grosso and the port of Belém in the state of Pará.

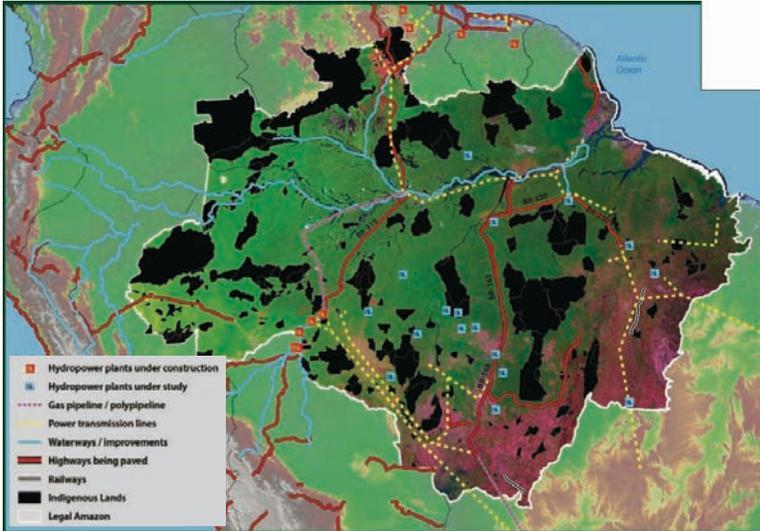
New PAC investment projects also aim to improve and expand the railway system in Brazil, including north-south connections. Railways may be an economically efficient substitute for roads, particularly for bulk cargo and may be environmentally attractive, as railways tend to mean more limited opening of areas for migrants and prospectors.

Realizing these plans will significantly improve long-range connectivity of Amazonia, as well as prospects for developing economic hubs in Amazonia. Improved accessibility of the region would facilitate penetration in many directions and will make possible widely dispersed exploitation of natural resources and related land-use conversion.

Roads and their impacts: Assessments

Roads – regardless of the purpose behind their construction - contribute in several ways to land-use conversion in the territory they open. In analyzing impacts of roads, different types of roads should be distinguished, as well as the types of territories they cross. Regarding types of roads, the distinction between paved and unpaved roads may be pivotal. In recent decades unpaved roads, some of which were subsequently paved, usually opened territories. Most local roads constructed by municipalities and by firms involved in mining, timber logging, cattle ranching, and agriculture production are unpaved. The new plans to build corridors that link new mining locations, hydro-energy complexes, and other sites used to exploit natural resources, however, involve constructing paved roads (often labelled ‘highways’) that are not necessarily restructured versions of existing unpaved roads. Essentially, these roads increase access to potentially productive land or, to put it differently, enlarge the stock of accessible productive land and consequently reduce the market price of land. The combination of reduced transport costs and reduced land prices promotes land-use conversion and deforestation, particularly in combination with high prices for timber, cattle, and agricultural produce.

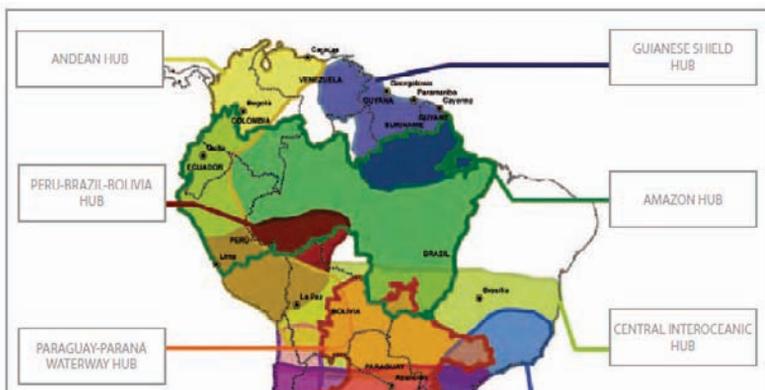
Map 2.6 Spatial distribution of planned and ongoing infrastructure projects in Amazonia



Source: Arnaldo Carneiro, F. and O. Braga de Souza. November 2009, p. 17.

Paving these roads at a later stage may increase the price of land adjacent to the road, as paving cuts transportation time, increases the feasibility of ensuring year-round access to markets in all weather conditions, and reduces the maintenance and depreciation costs of equipment and loss of value of the cargo. For these reasons roads and highways that link production sites with international harbours or airports should ideally be paved to make the related production sites more internationally competitive.

Map 2.7 IIRSA hubs and projects in Amazonia



Source: www.iirsa.org

A road has characteristics of a public commodity, as do large tracts of land and forests adjacent to the road. Land access is difficult to control, and territories are penetrated to engage in small-scale farming and cattle ranching, timber harvesting, and prospecting, to mention the most common types of small-scale unofficial activities in the region. As a consequence, a system of unpaved side roads tends to develop in what is often referred to as a herringbone pattern. Such a widely dispersed system of side roads should receive consideration in assessments of the potential impact areas of a road.

Construction of roads, paved and unpaved, increases the anthropogenic pressure in the areas adjacent to the roads, not only because of the new economic activities directly promoted by improved accessibility of the land but also because of economic activities supporting land-use conversion and natural-resource exploitation. Service centres develop in newly opened territories, featuring *inter alia* healthcare services, repair and maintenance facilities, transport facilities, and leisure centres. Hence, the developing hub and spoke system links semi-urbanized service centres with centres of natural-resource exploitation.

To explain road-related land-use conversion or deforestation, models select a number of the variables identified in the second section (Natural-resource exploitation in Amazonia):

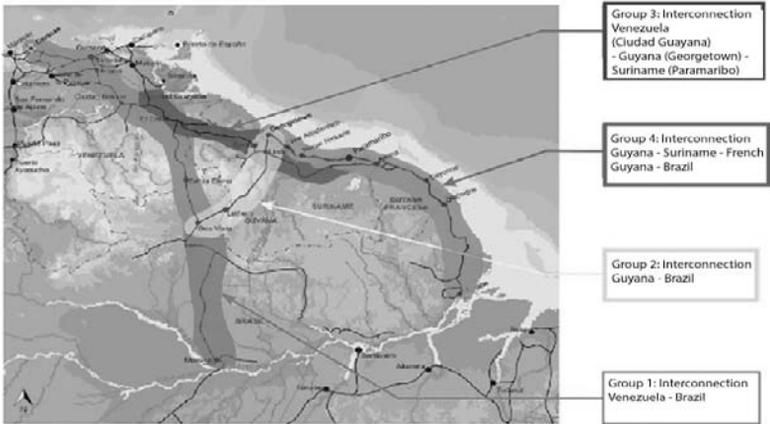
$$\text{LAND-USE CONVERSION/ DEFORESTATION } j = f [\text{SOCIO-ECONOMIC FACTORS}] + [\text{BIO-PHYSICAL FACTORS}] \text{ } i \text{ for area } j = 1, 2, \dots, n \text{ and proxies for drivers } i, i = 1, 2, \dots, n.$$

Road-related studies assess the probability of deforestation along a specific road or test the significance of selected variables – the drivers of deforestation – to explain land-use conversion.

In most studies variables related to so-called proximate and intermediate drivers – or local or national/regional conditions – prevail: soil quality, level of precipitation, distance to markets and distance to roads or railways, proximity to already deforested areas, degree of protection, location in a colonization area, or location in a forest concession. These models may help explain the size and shape of the deforested area adjacent to the road: deforestation is more probable in areas with soils and levels of precipitation suitable for agricultural production or cattle ranching, located closer to markets, roads, and railways, in proximity of already deforested sections, in forest concession areas, and at a distance from protected areas.

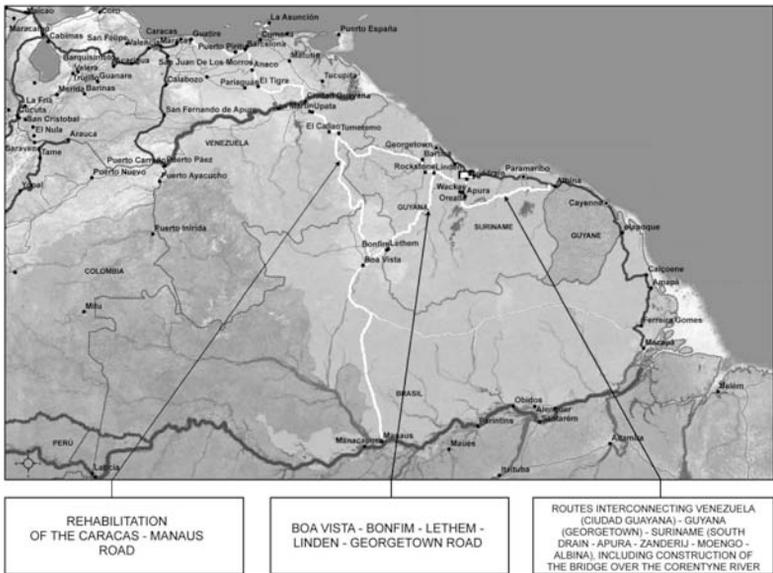
Few studies are based on relative prices for timber, agricultural products, and cattle or meat to explain land-use conversion. Other sources of income generated by a forest, such as non-timber forest products, are not mentioned to explain lack of conversion. Payments for eco-services such as carbon sequestration could potentially play a role (in models of the future) but are rarely included in models.

Map 2.8 IIRSA Guianese Shield hub



Source: www.iirsa.org

Map 2.9 UNASUR, COSIPLAN, Integration Priority Project Agenda for the Guianese Shield



Source: UNASUR, COSIPLAN, Integration Priority Project Agenda, November 2011, Map 5, p. 43.

In addition to road-focused models, more general regional models improve our understanding of the role of road infrastructure in deforestation. These models analyse more broadly the impact of anthropogenic pressure on a forested region and focus on population size and overall income of population centres that function as a hierarchy of hubs in the forest. Such models present the forest as a type

of urbanized area. Population centres may be seen as service centres capable of serving the sub-region and generating flows of goods, services, migrants, traffic, and transport, and in the process, exerting anthropogenic pressure on territories surrounding these locations.

Regional models that use scenarios to assess future deforestation are based on adjustments in packages of policy-related variables: governments may decide to encourage economic development in growth poles or service centres by applying a range of instruments or may select instruments to protect the forest by applying an effective regime for protected areas and by abandoning the use of instruments in support of deforestation, including road construction. This process may depict the contribution of the selected policy alternatives to deforestation (see Soares-Filho et al. 2006; and Garcia et al. 2007).

Assessing and managing local and regional impacts: SEAs as a tool

National and local perspectives

In view of the growth of investment in natural-resource exploitation and in related infrastructure and plans to expand these activities in the future, *ex-ante* assessment of potential effects and development of methods to manage negative and positive impacts of such investments must receive high priority to avoid social and environmental costs and to enhance welfare effects in the future.

In that context strategic environmental assessments (SEA) have a specific role. First, an SEA generates knowledge of and insight into the potential impact area. Second, clarifying preferences among local inhabitants, their representatives, and related organizations in the impact area concerning infrastructure and its potential future impacts as perceived by them prior to actual construction provides useful information. Third, an SEA facilitates formulating policies to manage impacts and reduce negative effects on local populations and the environment. Protection of the areas reserved for indigenous peoples from penetration and conservation of environmental hot spots, endangered species, and an endangered eco-system with high potential values may be among the significant objectives of the strategic action plans resulting from an SEA.

SEAs are a relatively new instrument, and experience with SEAs in South America is rather limited. Consequently, the level of specific expertise and the degree of legal and institutional support may be insufficient, which reduces the likelihood that SEAs will be useful. In several countries in South America (e.g. Brazil) an SEA is required by law. Moreover, financial institutions, such as the IDB, CAF, FON-PLATA, and BNDES, require SEAs as a precondition for co-financing infrastructure. The IDB requires participative SEAs, although the concept of 'participative' has yet to be clearly specified. Moreover, the

World Bank requires free, prior, and informed consent in the case of infrastructure projects that penetrate territories of indigenous peoples.

There is no fixed or uniform concept of an SEA, and SEAs as developed during the past two decades or so differ widely in structure, content, and their roles in infrastructure development and related policies. The ultimate objective of SEAs is to enhance the overall benefits of these investments in infrastructure and to reduce negative effects. The potential of such assessment studies and related plans of action may be substantial, but their effectiveness in realizing the stated objectives depends on many factors, ranging from the quality of the study, timing, integration in overall local, regional, and national policies, as well as on institutional capabilities to execute the action plan over several years.

In general terms SEAs involve (1) a baseline study with a description of economic, social, and environmental conditions in the so-called impact area of the investment project (road); (2) an assessment of potential positive and negative impacts; (3) consultation of local populations or their representatives; (4) scenarios for alternatives; and (5) a strategic action plan with proposals for encouraging positive impacts and reducing negative impacts of the proposed road.

In view of the diversity in types of issues to be addressed, particularly in Amazonia, SEAs are prepared by multidisciplinary teams, with backgrounds in agronomy, forestry, engineering, anthropology, language studies, environmental studies, fishery, and economics.

Notwithstanding vast differences in SEAs and the sheer impossibility of generalizing about the impact of SEAs on planning, design, and actual implementation of the plan to construct a road, SEAs at least provide additional insight into potential impacts or perceptions thereof and offer the opportunity to identify potential problems and opportunities created by the road and visualize challenges to policy makers. Nevertheless, actual use value of SEAs is frequently limited by several factors reviewed below.

Potentials and shortcomings of SEAs

One possible shortcoming is that the impact area may be defined rather arbitrarily in SEAs. In some cases the borders of the proclaimed impact area are determined by mountain chains or wide rivers, which are expected to mitigate the impact of a road on land-use conversion and economic activity. Other SEAs use municipal boundaries and national borders to determine potential impact areas, which may be unrelated to the spread of the economic effects of infrastructure in a region.

Moreover, in many cases investment in the knowledge base of the studies is rather limited: (1) SEAs are based on available documents and information; (2) only representatives of the population are con-

sulted, mainly those active at the level of municipalities and government agencies; (3) environmental assessments do not include valuation of environmental services; and (4) alternative trajectories or transport modes do not receive consideration.

A participatory approach is applied in very limited measure in most SEAs. Information in support of the baseline study and the strategic action plan is therefore lost, as a result of neglecting information available from the locals. The timelines for SEAs proposed by CAF and recently by the IDB will seriously hamper optimal involvement of the local population.

Finally, and most seriously, time rather than spatial factors complicates SEAs and threatens its relevance: roads take a long time to build, and impacts – due to encouragement of private investment – are similarly slow to materialize. Put differently, the impact-generating process greatly exceeds the time horizon of policy makers. The danger is therefore that SEAs may function primarily as elements in the decision-making process conducive to approval and funding of road construction, not necessarily as ways of maximizing the potential benefits of the road.

As stated above, the ultimate objective of an SEA is to formulate a series of initiatives and interventions combined in a plan of action, in order to maximize the beneficial effects of infrastructure investments for social wellbeing. Some critical factors limit the potential contribution of the plan of action. The first is the obvious risk that the plan is merely a list of the wishes of several groups in the impact area, rather than a cohesive investment, regulation, and intervention plan. Second, financial resources may be lacking to introduce the required or requested measures and initiatives. The third complicating factor is the extended period of implementation, as it requires longer-term management by institutions and planning procedures. Finally, It is hard to see how the strategic action plan can serve as an instrument for implementing required measures, if implementation is not a condition for external financing of the overall infrastructure project.

The potential of SEAs to help manage impacts and enhance general wellbeing is related to the following crucial aspects: size of the potential impact area; dependence of the populations living in the potential impact area on the environment for their livelihood; the potential value of the eco-systems and the services they provide at local, regional, and even global levels; the type of actions proposed to achieve outcomes different from those achieved without corrective policy interventions; and the extent to which an SEA and the related plan of action are integrated in overall policy and decision-making. These points will be elaborated briefly below.

The (potential) impact areas of IIRSA roads may cover a substantial share of the national territory of countries. In many cases environmental and socio-economic aspects of the impact area receive

only limited consideration. Particularly in Amazonia, assessments in the context of an SEA are complicated by the sheer size of the potential impact area, limited opportunities to visit and study potential impact areas and limited availability of information necessary for appropriate and fairly comprehensive assessments. In many cases financial limitations and time constraints reduce options for substantial assessment studies. More fundamentally, the lack of markets for many environmental services, i.e. indirect use values, impede valuation of the environment to compare the net welfare impact of alternative uses of the environment. Lack of insight into future market patterns for direct use values (including demand for natural resources, timber, and food) similarly complicate optimizing decisions concerning use of the environment in the (potential) impact area.

Reviews of SEAs in South America and other continents suggest that the effectiveness of SEAs can be enhanced in several ways. The decision-making process will benefit from timely generation and disclosure of SEA-related information, preferably prior to final decision-making on routing, selection of the transport mode, and related issues. Real world experience shows that most SEAs are started once such decisions have already been taken, which reduces their potential significance in this regard. Baseline studies and surveys that are inherent components of SEAs could play a key role in planning and preparing optimal routing of a corridor, if planned adequately. Taking into account the objectives and priorities of different interest groups enables routings more optimal than those based on priorities of a selected number of stakeholders, involving only the national government and its most significant partners in the process. Comprehensive and timely involvement of stakeholders may consequently yield greater satisfaction with the road project and cooperation from stakeholders in the impact area. Such a process may take into account economic, social, commercial, technical, transport-related, and environmental dimensions.

Moreover, rather than focusing mainly on mitigating negative impacts, an SEA should aim to generate information proactively based on preferences and objections among different groups of stakeholders concerning routing. Suitability maps based on spatial multi-criteria analysis are a useful tool in this process, allowing for lowest-cost or least-resistance paths to be devised. The priorities and concerns of local inhabitants and of *indigenas* merit consideration in the process. Special regulations and principles need to be observed, such as free, prior, and informed consent from *indigenas*, to be obtained by the authorities prior to penetrating their territory with a road or other major investment projects.

Towards a comprehensive and innovative type of SEA

By way of experiment, a comprehensive, participatory SEA has been designed and undertaken by Van Dijck (2011 and 2013). The aim of this SEA is to assess impacts of a planned road designed to connect Paramaribo, Suriname, with the south of Suriname and ultimately with Manaus, Brazil, i.e. to connect the capital city with a population concentration living in the forest along the Suriname river; to construct a direct link between Suriname and northern Brazil and ultimately Manaus; and to facilitate hydro-energy works in the south of the country, involving roads, dams, a canal, and power stations. The SEA was carried out as a joint project with IVM-VU, EDUGIS, and Object Vision, all associated with the VU University Amsterdam. Partnership with these institutions has facilitated devising GIS maps and economic-spatial modelling of the spatial impacts of roads. Moreover, a substantial survey was conducted among the inhabitants in the potential impact area with Stichting Equalance in Paramaribo (for a detailed presentation of this experimental SEA, see Van Dijck 2013 pp. 164-180 and 232-238).

The ultimate objective of the experiment was to show that (1) significant improvement in participatory level can be realized effectively and efficiently, (2) GIS maps and specifically modelling exercises can contribute significantly to the understanding of potential impacts, and (3) mapping and modelling may encourage participation by local inhabitants. The experimental SEA was inspired by the Corredor Norte SEA in Bolivia and was performed by DHV South America (DHV 2006).

The experimental SEA has shown that a substantial population survey based on a significant and representative population sample can be processed fairly rapidly and cost-effectively. Also, visual aids such as GIS maps, results of modelling exercises in Powerpoint presentations or short motion pictures, and a video may raise awareness among the local population. These visual mechanisms are useful in view of the low literacy rates in the interior. Widespread internet facilities make GIS-based information mechanisms like EDUGIS accessible to local populations, allowing locals to examine maps that show government plans for infrastructure development and concession venues for timber and natural-resource exploitation. Moreover, a brief and easily accessible visual summary of the main results of the SEA type of project, featured together in a short video, enhances more general understanding of potential impacts and perceptions among inhabitants of the potential impact area.

Mapping the possible locations of the future road corridor – or for that matter of hydro-energy works, mining sites, and the like – and identifying overlaps between locations of municipalities and areas of significance for livelihood strategies of local inhabitants may raise

awareness concerning the implications of proposals and plans among the local population in the potential impact area as well as among policy makers. For such ends, GIS maps have been produced depicting areas with logging and mining concessions, locations of planned roads, biodiversity values, locations with presumed gold reserves, and population centres. These maps are free and available to the public. See the EDUGIS website (www.edigus.nl), where maps have been uploaded that relate to the proposed road between Paramaribo and Manaus.

The modelling exercise with the ClueScanner model enables simulation of spatial development in the impact area over the long term. Rather than simply assuming a specific impact area – surrounded by rivers, mountain ranges, national borders, or municipal boundaries, as is the case in most SEAs and alternative assessment studies – the model generates the shape and size of the impact area based on a range of variables that reflect the functioning of selected physical and socio-economic drivers as identified in this chapter's section on drivers of land-use conversion.

Conclusions and final observations

As a consequence of infrastructure development – particularly road construction and hydro-energy generation – commercialization and internationalization of Amazonia has been accelerated, resulting in new forms of land-use conversion and increased anthropogenic pressure. More roads, railways, harbours, and storage lakes are being constructed or planned to support natural-resource exploitation, i.e. mining and other types of economic activities.

While in the past cattle ranching and timber logging were the main drivers of deforestation, mining, production of hydro-energy, and construction of road corridors nowadays compound the process of land-use conversion. Comparing the outcomes of spatial models showing potential impact areas of these economic activities with the location of major centres of natural-resource exploitation in previous decades indicates that areas relatively unaffected and with low rates of deforestation thus far are expected to experience increasing anthropogenic pressure, resulting in deforestation, fragmentation, pollution of rivers, increasing fire hazards, and loss of species and ecosystems. This holds true for the central, western, and northern parts of Amazonia and the Guyanas. Expansion of protected areas and higher effective protection, as studied in Chapter 3 of this volume, may counter these developments for the benefit of indigenous peoples and environmental systems. However, protected areas are also impacted by illegal mining, timber cutting, and road construction.

In that context, SEAs may be a useful tool to mitigate negative impacts of economic activity and enhance positive impacts. However, SEAs tend to be rather limited in scope, and their policy relevance is frequently compromised further by suboptimal timing. SEAs might be made more instrumental by timing them judiciously and by broadening and deepening the impact analysis, by enhancing participatory aspects of the investigation and the design of the action plan, by using modelling techniques, and by integrating the action plan better in local and regional planning.

Although road-related studies like SEAs may cover vast stretches of national territory, impacts may extend well beyond the stated impact area of an SEA. The potential overall economic, social, and environmental impacts of integrated road programmes currently implemented in Amazonia and the Guyanas, such as the IIRSA and PAC, probably far exceed the aggregate impacts of individual roads constructed in these regions, with respect to regional spread and profoundness alike. Combinations of roads and interregional connections may trigger or speed up a region's integration in international markets and enhance its appeal to investors and suitability as a production platform. They may be conducive to forming new hubs and centres of economic gravity and accelerate anthropogenic pressure at these locations and along the roads that connect them with production and distribution centres or markets. At the same time, networks of roads lead to greater isolation and fragmentation of flora and fauna, eco-systems, and areas crucial for the livelihood of local inhabitants. These effects may be overlooked in assessment studies that address impacts of individual roads only, as SEAs do. A case in point is the impact of deforestation induced by road construction on precipitation and the corresponding increase in fire hazard. Such impacts may even lead to the introduction of so-called tipping points in Amazonia. Analysis of such impacts requires environmental models covering the entire Amazonia and accommodating the highlights of these road programmes. Even a state-of-the-art SEA underestimates such impacts.

References

- Ahmed, K., J.R. Mercier and R. Verheem (2005) *Strategic Environmental Assessment: Concept and Practice*. World Bank Environment Strategy Notes, Volume 14. Washington, D.C.: The World Bank.
- Andersen, L.E., C. Granger, E. Reis, D. Weinhold, and S. Wunder (2002) *The Dynamics of Deforestation and Economic Growth in the Brazilian Amazon*. Cambridge: Cambridge University Press.
- Arnaldo Carneiro, F. and O. Braga de Souza (2009) *Atlas of Pressures and Threats to Indigenous Lands in the Brazilian Amazon*. São Paulo: The Socioenvironmental Institute (ISA).

- CAF (2008) *Las Evaluaciones Ambientales y Sociales con Enfoque Estratégico como Instrumentos de Planificación para IIRSA: Metodología, Componentes y Fases*. CAF.
- DHV (2006) *Evaluación Ambiental Estratégica del Corredor Norte – La Paz, Guayaramerín, Cobija*. La Paz.
- Geist, H. and E.F. Lambin (2001) *What Drives tropical Deforestation? A Meta-Analysis of Proximate and Underlying Causes of Deforestation Based on Subnational Case Study Evidence*. LUCR Report Series Number 4, CIACO, Louvain-la-Neuve.
- IAIA (2002) *Strategic Environmental Assessment Performance Criteria: Special Publications Series No. 1*. International Association for Impact Assessment.
- IIRSA (2009) *Indicative Territorial Planning, Project Portfolio IIRSA*. Washington D.C.: IIRSA.
- Kis Madrid, C., G. Hickney and M. Bouchard (2011) ‘Strategic Environmental Assessment Effectiveness and the Initiative for the Integration of Regional Infrastructure in South America (IIRSA): A Multiple Case Review’, *Journal of Environmental Assessment Policy and Management*. 13(4): 515-540.
- Netherlands Commission for Environmental Assessment (2006) *Strategic Environmental Assessment, Views and Experiences (1)* OECD-DAC inclusive.
- Dijck, P. van, and S. den Haak (2006) *Troublesome Construction, IIRSA and Public-Private Partnerships in Road Infrastructure*. Cuaderno del CEDLA, Number 20, Amsterdam.
- Dijck, P. van (2010) ‘IIRSA and the Integration of Latin America in the World Economy’. Laval University, Quebec.
- (2010a) ‘Ten Years of IIRSA: Assessing the Potential Socio-Economic and Environmental Impacts of the IIRSA Road Infrastructure Programme for South America’. LASA, Toronto.
- (2011) ‘Suriname Economic Variables in the Context of Strategic Culture’. Suriname Seminar Florida International University (FIU), Miami.
- (2011a) ‘Op Weg naar het Eind van de Kaart. De Gevolgen van Asfalt door de Jungle’. *OSO, Tijdschrift voor Surinamistiek en het Caraïbisch Gebied*. 2: 267-282.
- (2012) ‘Strategic Environmental Assessments (SEAs) as an Instrument for Participation and Knowledge Building in Environmental Management’, LASA, San Francisco.
- (ed.) (2013) *The Impact of IIRSA Road Infrastructure on Amazonia*. London and New York: Routledge.
- Garcia, R, B. Soares-Filho and D. Oya Sawyer (2007) ‘Socioeconomic Dimensions, Migration, and Deforestation: An Integrated Model of Territorial Organization for the Brazilian Amazon’, *Ecological Indicators* 7: 719-730.
- Instituto Socioambiental (ISA) (2004) *Biodiversity in the Brazilian Amazon*. São Paulo: ISA.
- Ozório de Almeida, A.L., and J. Campari (1995) *Sustainable Settlement in the Brazilian Amazon*. Oxford: Oxford University Press.
- Soares-Filho, B.S., D. Nepstad, L. Curran, G. Cerqueiral, R. Garcia, C. Ramos, E. Voll, A. McDonald, P. Lefebvre and P. Schlesinger (2006) ‘Modeling Conservation in the Amazon Basin’, *Nature* 440:520-523.

- Wood, C. H. and R. Porro (2002) *Deforestation and Land Use in the Amazon*. Gainesville: University Press of Florida,
- World Resources Institute (2006) *Human Pressure on the Brazilian Amazon Forests*. Belém.
- IMAZON, ISA. (2011) *Protected Areas in the Brazilian Amazon: Challenges and Opportunities*. Belém.

ETHNIC TERRITORIES IN BRAZIL: SOCIAL INCLUSION OR POLITICAL TRAP?

FÁBIO DE CASTRO¹

In recent decades natural resource governance has been heavily transformed in many developing countries. Centralized, top-down, blueprint models have served as a foundation for designing and implementing a wide range of collaborative initiatives, including state and non-state actors (Borrini-Fewerabend et al. 2007; Lemos and Agrawal 2006). This shift in theory and practice of natural resource management has resulted from changes in the perspective of socio-environmental research, policy-making, and advocacy work.

In the late 1980s, the *commons* research emerged as a multidisciplinary academic perspective to investigate the relationship between local users and natural resources. Numerous case studies disclosed alternative models of sustainable production and livelihood crafted by marginalized rural populations (Ostrom 1990). In addition to research, both state and non-state actors underwent major transformations that directly influenced policy-making and advocacy campaigns addressing socio-environmental challenges. Several developing countries have embarked on a political democratization process, in which revitalization of social movements and civic participation in decision-making were pivotal (Ribot 2004). New constitutions, political decentralization, and socially inclusive policies are examples of institutional innovations that have deepened environmental citizenship (Latta and Hannah 2010). At the same time, *glocal* alliances between local and international organizations strengthened the political and economic power of local actors creating new paths for advocacy strategies (Keck and Sikkink 1998). As a result, local management systems have gradually evolved from being virtually invisible in

conservation policies and regarded as ‘primitive’, pre-capitalist practices into a key component in the strategy to combine conservation and social justice goals. As part of this new perspective, state and non-state actors have been brought together to design innovative strategies in which sustainable territories and co-management systems represent an arena for state agencies and local users to build knowledge and share responsibility (Armitage et al. 2008).

In South America, coupling nature conservation with social justice has been central in the new environmental governance (Baud et al. 2011). Obsolete preservationist, asocial models of protected area have gradually been replaced by a large range of sustainable territories. According to these new territorial models, ethnic communities (e.g. indigenous lands, extractive reserves, maroons, riverine and coastal communities) have special rights to land and resources and supposedly participate actively in designing, implementing, and monitoring co-management systems. Despite domestic and regional differences, a growing number of protected areas in both terrestrial and marine ecosystems have emerged all over South America (see Map 3.1). Over the past two decades the share of protected areas has doubled, from 10.5 per cent of the region in 1990 to 20.8 per cent in 2009 (Elbers 2011). The role of protected areas in the conservation agenda has unquestionably grown in the region, and ethnic territories in particular have become a key strategy for combining conservation and social justice goals.

This dramatic increase in protected areas in South America has coincided with expansion of agricultural land and extractive industries (Zimmerer 2011). National governments often present these figures as evidence of compatibility between conservation and development policies. The national discourse emphasizing a win-win situation, however, is at odds with data from activists and researchers regarding socio-environmental impacts from large-scale activities, and the polarization between production and conservation territories has been a source of conflicts (Carneiro-Filho and Braga Souza 2009, Zhouri and Laschefski 2010, Castro 2012a). Moreover, major gaps between design and implementation of participative initiatives often arise from institutional limitations, such as invited participatory spaces to certain actors (Cornwall 2004) and technocratic language and procedures (Taddei 2011).

Brazil is a case in point. Here, the boom in both ethnic communities and farming/extractive areas has given rise to mixed outcomes. As one of the world’s top greenhouse gas emitters, nearly 80 per cent is generated from deforestation in mega-biodiversity biomes in this country (Fearnside 2008). International demands for conservation, as well as local demands for social justice, contrast with Brazil’s national economic development project in recent decades. National devel-

Map 3.1 Spatial distribution of protected areas in Latin America

Source: IUCN 2011, www.protectedplanet.net

opment plans such as *Avança Brasil* (1995-2001) and *Programa de Aceleração do Crescimento* – PAC I and II (2001-present) have been heavily focused on expansion of commodity production (e.g. agriculture and minerals), energy production, and infrastructure building (Dijck this volume). As in other countries in South America, the national government has increased the number of protected areas to balance the impact of this development model (Zimmerer 2011). Implementation of ethnic communities entails not only conflicts with development projects but also differences in motivations, perceptions, and principles guiding conservation practices between local users and state agencies (Castro 2012b). In other words, national policies to expand sustainable protected areas may generate major

threats to ethnic communities, unless local obstacles to implementation are properly addressed.

In this chapter, I provide a scaled and integrated analysis of expansion of protected areas in the context of agrarian transformation in the country. By linking national policies and local daily practices and bridging two territorial policies – expansion of protected areas through ethnic territories and expansion of productive area through agribusiness territories - I aim to reveal the political dynamics among different rural actors in shaping the new territorial configuration in the country and to shed light on the resulting implications for the rural population and natural resource sustainability in Brazil.

The analysis is based on primary and secondary data collected at local and national levels. National analysis of the distribution and expansion of different territorial models in Brazil is based on secondary data available online at sites of governmental agencies and addresses the balance between the expansion of the progressive ethnic territorial model targeting ‘traditional populations’ for conservation purposes and the classic agricultural territorial model targeting ‘modern agriculture’ for production purposes. The local perspective of social interactions between state and non-state actors in implementing an ethnic territory is informed by ethnographic data obtained over two decades of longitudinal research in the Lower Amazon floodplain. The focus is the extended build-up of political visibility for the legal recognition of local management systems in the region, which came into being in 2006 with the establishment and implementation of an ethnic territorial model in the area. The Agro-Extractive Settlement Projects (PAE) is a settlement category conceived by the Brazilian Institute for Agrarian Reform (INCRA) for ethnic communities to satisfy their demand for exclusive collective use and management rights.

The benefit of a scaled analytical strategy is twofold. First, it helps contextualize the design and implementation of a specific ethnic territory (local perspective) within a broader political and economic agenda of integrated environmental-territorial policy strategy (national perspective). Second, it offers a medium for reconciling daily practice during the implementation phase with official policies in reconfiguring of the rural territory. The remainder of this chapter is divided into five sections. After a brief introduction on recent institutional changes in territorial-environmental governance in rural areas, I continue with an analysis of the current spatial configuration of production and conservation territories. The section on the reconfiguration of territories addresses the local perspective by focusing on daily practices in the establishment and implementation of an ethnic territory in the Amazonian floodplain, followed by an overview of the challenges arising from the dramatic increase in protected areas with limited participation from and accountability of local users. The last

two sections provide some reflections and discussion and, finally, the general conclusions.

Territorial-environmental governance in Brazil

Protected areas have long been a key component in conservation policies in Brazil (Paz et al. 2006). Until recently, however, they comprised mainly no-take protected areas² as biodiversity hot-spots and flagship species received the most consideration, with little regard for social issues among marginalized rural groups. As a result, ethnic communities were denied formal access to their territory and natural resources (Diegues 1994), while rural development policies promoted expansion of agribusiness, infrastructure, and large-scale extractive activities. These incompatible policies have been the driving forces behind environmental degradation, deepening inequalities, and socio-environmental conflicts (Carneiro-Filho and Souza 2009; Zhouri and Laschefski 2010).

Only in the 1990s did this picture start to change. Manifestations of environmental citizenship among rural communities supported by IENGOs became widespread (Hochstetler and Keck 2007). The greened discourse of social movements coupled ecological with cultural diversity, environmental protection with local livelihood, and ‘traditional’ identity with rights to nature (Acselrad 2008). At the same time, the international community has pressured the government to tackle the rapid land cover change in the tropical forest. The confluence of the socio-environmental movements with demands for national carbon mitigation policies has opened political channels to much of the rural population, whose rights to land and nature have gradually become formalized.

The development of ethnic territories in Brazil has been marked by two institutional milestones. First, the Constitution of 1988 formally recognized the territorial rights of Indigenous and *quilombolas* (Afro-Brazilian rural communities). Second, the National System of Conservation Units (SNUC) implemented by the Ministry of Environment in 2001 officially recognized ‘traditional populations’ as groups eligible for special rights to live in protected areas and to use and manage their natural resources. Together with the Constitution of 1988, the SNUC provided the national state with the institutional tool needed to meet local demands for granting rights to land and nature to ethnic communities. More recently, the agrarian reform agency has restored an agrarian settlement model initially established for upland rubber tappers in the late 1980s to grant special territorial rights to floodplain communities in the Amazon.

‘Traditional populations’ are legally defined as ‘groups who recognize themselves as culturally distinctive and hold their own social

organization, territorial and natural resource use as a way to reproduce their cultural, social, religious, ancestral, and economic conditions, using knowledge, innovation, and practices generated and transmitted through traditional means' (Decree 6,040, 2007). Such a broad definition has paved the way for a wide range of categories of rural communities to claim their 'traditional' identity.

Ethnic territory claims resounded on the left-leaning national government agenda as a way of combining social justice, conservation, and poverty alleviation through inclusion of local populations in the decision-making process. As a result, different categories of ethnic territories have thrived in rural areas, such as Indigenous lands (Lisansky 2005), extractive reserves (Rosendo 2007), *quilombo* settlements (French 2009), and floodplain and coastal communities (McGrath et al. 2008; Diegues 2004). The institutional framework for this new configuration of conservation territories is multifaceted, with five national agencies playing a central role: the National Foundation for Indigenous Populations (FUNAI), the Palmares Cultural Foundation (FCP), the National Agency for Agrarian Reform (INCRA), the Chico Mendes Institute of Conservation and Biodiversity (ICMBio) and the Institute of Environment and Renewable Natural Resources (IBAMA). Each agency is located in a different Ministry, and they differ in their historical backgrounds, political motivations, and objectives.

FUNAI, which was established under the military government in 1967, is part of the Ministry of Justice (MJ) and is responsible for identifying, regulating, and protecting indigenous land. While previously structured as a tutelage agency for the indigenous populations, concrete steps toward autonomy and land rights to indigenous territories were undertaken only after the Constitution of 1988 (Lisansky 2005). The FCP, founded in 1988 as part of a new constitutionally mandated social inclusion program for Afro-Brazilian society, is located at the Ministry of Culture (MEC) and runs programs and projects aimed at promoting inclusion of Afro-Brazilians in national society. Only after 2000, however, did the designating and implementing *quilombolas* territories truly get under way, as part of a broader agenda of socially inclusive policies for African-Brazilians.

INCRA, formed in 1970, is currently part of the Ministry of the Agrarian Development (MDA) and manages agrarian settlements and public lands. INCRA's approach to development is based on three pillars – provision of individual land titles, infrastructure development, and credit lines – often overlooked in environmental and cultural contexts. Only recently has INCRA engaged in initiatives addressing alternative land tenure systems (e.g. collectives), production systems (e.g. agroforestry), and cultural background (e.g. traditional populations).

Finally, ICMBio and IBAMA are part of the Ministry of Environment (MMA) with conservation policy responsibilities. ICMBio,

formed in 2007, supervises establishment and governance of national conservation units. Originally focused on the preservationist model of full protection areas, this agency has recently adapted its strategy to meet the growing demand for sustainable protection areas (Rylands and Brandon 2005). IBAMA is in charge of evaluating, approving and monitoring management plans for protected areas and compliance with forest legislation. Management plans in ethnic territories are supposed to be formulated together with local communities, i.e. local knowledge and community-based systems of governance are to be incorporated in the document. Agribusiness territories promoted by the Ministry of Agriculture and Food Supply (MAPA) complement this complex territorial-environmental governance in rural Brazil.

Ethnic territories grant local residents special collective rights to land and resources. However, they are supervised by different government agencies that differ with respect to their institutional background, mission, and political visibility (Table 3.1). As a result, although they all aim to combine goals of conservation, social inclusion, and poverty alleviation, they differ in their main focus and strategies. As a result, the extent of autonomy, rights, and institutional support depends on the ethnic-territorial model. The range of options combined with the complex history of cultural continuity in the country has led to a forum-shopping by some communities able to choose between different territorial categories to suit their political motives (see e.g. French 2009). The following section addresses the recent configuration of ethnic territories in the context of a broader territorial transformation observed.

Table 3.1 Agencies and Ethnic communities in Brazil

Ministry	Agency	Main Mission	Settlement Category
MJ	FUNAI	Human Rights	Indigenous Territory
MEC	FCP	Cultural Diversity	<i>Quilombola</i> Territory
MMA	ICMBio	Environmental Conservation	Extractive Reserve and Sustainable Development Reserves
MDA	INCRA	Rural Development	Agro-Extractive Settlement Project

Reconfiguration of conservation and production territories in rural Brazil

Since the 1990s, the configuration of protected areas in Brazil has been transformed into a mosaic covering approximately one quarter of the national territory distributed among over 2,000 ethnic territories, including indigenous and non-indigenous traditional communities. Approximately one fifth of the 1.1 million km² of conservation

units consists of ethnic territories – extractive reserves and sustainable development reserves – distributed in 93 units (CNUC/MMA 2011). Another 1.1 million km² has been allocated to indigenous territories (Carneiro-Filho and Braga de Souza 2009). In addition, over a thousand *quilombola* territories are at different stages of development (INCRA/DFQ 2011), while INCRA initiated a programme in 2006 to expand agro-extractive settlements on the Amazonian floodplain covering more than 20,000 km² divided into 240 units.

The spatial distribution of ethnic territories includes a visible preponderance of the Amazonian biome, where nearly half of the total area is included in protected areas (Rolla and Ricardo 2009). In addition to the strong demand for conservation policies, this region houses a large proportion of the traditional populations in the country. Legal recognition of ethnic communities therefore represents a major advance in environmental governance in Brazil. The official figures reveal an important achievement resulting from efforts to combine conservation policies with social justice and poverty alleviation objectives in mega-biodiversity areas. This conservation model also accommodates policy proposals deriving from the commons theory, which emphasizes recognition of collective rights to land and establishment of co-management systems as key elements for sustainable and equitable use of natural resources. Careful examination of the pattern of expansion in production territories and the political process of mediating the implementation of ethnic communities reveals a more complex picture.

Agrarian reform settlements involving small farming territories have more than quadrupled since 1995 from 19 million ha to 84 million ha in 2010, encompassing 25 per cent of the farmland nationwide. Despite the increase in land titling, private rural properties have dropped from nearly half of the national territory in the 1980s to 37 per cent in 2000.³ In addition, land concentration has remained unchanged since 1985. Of the current 330 million ha of farmland, only 2.7 per cent is occupied by landholdings smaller than 10 ha, while 43 per cent is occupied by landholdings larger than 1,000 ha (Table 3.2). Finally, farmlands remain the main area of deforestation due to violation of forest legislation. Although environmentalists argue that forming ethnic communities is not an inappropriate strategy to foster conservation (Olmos et al. 2001), empirical evidence shows that these cultural territories have been quite effective in halting deforestation (Nepstad et al. 2006; Sparovek et al. 2010).

Despite poor conservation performance on private land, efforts to relax forest regulations in farmlands have received political support in the recent amendment process of the Forest Act. If approved, the new Forest Act, combined with increasingly restrictive regulation of land use in ethnic communities, will confirm the political inequality

Table 3.2 Total area of farming land and the most relevant protected areas involving traditional populations in Brazil (updated to 2011)

	Category	#	Area (ha)
Rural Properties ¹			
	< 10 ha		7,798,607
	10-100 ha		62,893,091
	100-1000 ha		112,696,478
	> 1000 ha		146,553,218
	Total	5,200,000	329,941,393
Conservation Units ²			
	RESEX	66	13,247,824
	RDS	26	10,983,481
	Total	73	24,231,395
Indigenous Territory ³		543	111,812,433
Maroon Territory ⁴		255	11,798,671
PAE ⁴		157	329,029

Key: 1 = IBGE; 2 = MMA; 3 = ISA; 4 = INCRA

between private and collective rural landholders: responsibility for conservation will be assigned entirely to ethnic communities, while higher-impact land use activities by landholders will be legitimized.

In other words, a territorial polarization has emerged in Brazil. On the one hand, conservation territories have been established in mega-biodiversity biomes, where collective-oriented, low impacting, nature-friendly groups are located. On the other hand, productive territories have expanded in the frontier, where private-oriented, high-impacting activities are endorsed by the state. Full allocation of conservation responsibility to ethnic communities not only increases the burden of these populations in protecting local (natural resources) and global (environmental services) commons but also condemns them to a subsistence-based orientation, as culturally static populations are expected to perform their activities in harmony with nature (Castro et al. 2006). At the same time, local communities must confront trans-boundary impacts caused by the expansion of production territories (e.g. mining, UHE, soybean) in their surroundings, while they are blamed from violating severe restrictions on resource use in their own territories (Castro 2012a). In other words, rights to land and resources have come with increased responsibility for conservation, rigid land use regulations, and impact from trans-boundary activities. Under these circumstances, the expected multi-

ple goals of social justice, environmental conservation, and economic development in ethnic communities is difficult to envision.

The tension between multiple goals is particularly evident in the agrarian reform settlement for ethnic groups, in which farming activities are pivotal in the land use plan. INCRA has a long history of territorial governance based on private land rights for landless peasants. Rigid, top-down, technocratic procedures are not compatible with the demand for institutional flexibility necessary to deal with cultural and environmental diversity in ethnic territories. In the next section, I offer an analysis of the implementation of the agro-extractive settlements on the Amazonian floodplain to explore the challenges in the implementation of such an innovative territorial model carried out by a state agency grounded in old institutional framework and facing internal and external conflicts.

Implementation gap: Formalizing informal practices in the Lower Amazon

As discussed earlier, territorial governance in rural Brazil encompasses three main dimensions: conservation, social justice, and rural development. However, balance and degree of overlap between multiple objectives vary across different territorial models. The Agro-extractive settlement project (PAE) is particularly relevant in this discussion, because the three dimensions are clearly included in the definition of this territorial model. The PAE was launched in 1989 by INCRA to address demands from rubber tappers living in the upland forest and was revised in 1996 to emphasize the importance of agricultural activities among these ethnic communities, based on four pillars:

1. *Social justice*: inclusion of the traditional population in territorial governance and elaboration of the management plan
2. *Land tenure*: collective land use rights for local residents through temporary, renewable concessions between the local association and the state agency
3. *Natural resource management*: participatory process for elaboration of a Management Plan to be approved by the state environmental agency and
4. *Agro-extractive development*: provision of infrastructure, small financial grants, credit lines, and technical assistance for PAE residents.

The search for a suitable territorial model for the Amazonian floodplain dates back to early 1980s, when a structured lake management system based on local governance emerged in the region (McGrath et al. 1993). The ‘fishing accord,’ as it was locally known, emerged as a response to intensified fishing in the region and provided for lake

zoning comprising full protection, managed access, and open access, as well as a set of rules to regulate use and monitoring of the lake system (Castro 1999). Until recently, the fishing accords were fragmented and primarily addressed fishing resources (Castro and McGrath 2003). Over the past two decades, however, a series of initiatives from state agencies and NGOs, combined with recent economic changes in the country, led sweeping transformations in the political and socioeconomic position of local residents. First, local communities became more politically organized with strong alliances with international organizations for sustainable production (McGrath et al 2008). At the same time, local residents gradually became more involved in cattle ranching (Merry et al. 2004), while commercial fishing increased among both community residents and urban fishers. Finally, cash flow into the community has increased remarkably thanks to government social benefits, such as pensions, unemployment benefits, and the conditional cash transfer programme *Bolsa Família*.

These transformations aligned the agenda for local mobilization with the national agenda to promote ethnic communities and participatory procedures. As a result, the 'fishing accords' were officially recognized in 2001 through a Normative Instruction regulating a fishing co-management system. Despite this institutional advance, limited economic opportunities, lack of exclusive property rights to floodplain, and organizational capacity continued to impede the sustainability of the co-management system (McGrath et al 2008). The emphasis of the fishing accords on conservation goals was limited to addressing economic demands concerning the subsistence of locals. Furthermore, state ownership of floodplains has prevented local residents from imposing sanctions on those violating regulations (Benatti 2005). In addition, the absence of formal land rights has deprived local residents of access to rural credit lines. Local users, government agencies, and NGOs quickly realized the limitations of the fishing accords and the need for a territorial model that combined conservation with land security and rural development to ensure sustainability of natural resources and local livelihoods in the floodplain.

After extensive deliberation, the Agro-extractive settlement project (PAE) was selected as the most suitable territorial model for the floodplain. The PAE is a unique experience in the floodplain and represents the outcome of gradual inclusion of local practices in an integrated territorial framework, i.e. the community-based, fishing-oriented management systems emerging in the 1980s have been incorporated in a regional, landscape-oriented conservation and development plan. Community residents become partners in the Management Plan, which gathers local knowledge, governance systems, and social practices. In sum, this territorial model represents not

only an integrated system for addressing multiple demands for the floodplain communities and ecosystems but is also the outcome of a long-term bottom-up process of negotiating reclamation of the commons by local residents in many different parts of the Amazonian floodplain (Castro and McGrath 2011).

Notwithstanding the innovative character of this territorial model, the guiding principles and institutional apparatus of INCRA emphasize private, upland-based, colonist settlement models. This approach is at odds with the floodplain context, where land tenure is fluid and property limits may vary over space and time (Castro 1999), and long-term social relations mediate resource use decisions (Castro 2012b). Rather than being the culmination of a long struggle, the implementation of PAEs in the Lower Amazon was therefore the beginning of new challenges marked by tension between cooperation and conflicts among four main stakeholders – local residents, grassroots organizations, a local NGO, and INCRA (Castro 2012b). INCRA, designated as the agency in charge of the creation and implementation of the PAEs, embraced this territorial model as an opportunity to increase new settlements in the region. Facing political pressure to solve land conflicts and raise the political profile of the national government for re-election, INCRA targeted established riverine communities to boost figures for settlements and beneficiaries quickly, with minimal efforts and scarce financial means. Despite the promising prospects of a participatory, bottom-up process, forming PAEs in the region thus became a classic top-down, blueprint, technocratic experience.

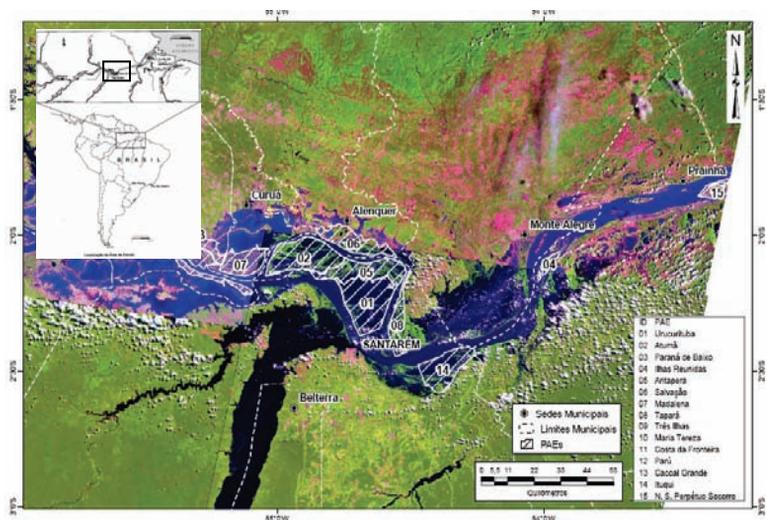
Following conventional procedures, dozens of units were demarcated in a few months with little accountability or information to local residents. The Fishers' Union played a key facilitating role. According to the participatory procedures, formal requests from local residents are necessary to initiate PAEs. To accelerate the process, INCRA proposed an alternative procedure and requested that the formal requests for PAEs come from the regional Fishers' Unions on behalf of all communities in the region. As the organization that officially represents the floodplain residents, the Fishers' Union seized the opportunity to raise its political visibility among its constituency by assisting INCRA. However, the absence of prior consultation, ambiguous information, lack of transparency, and mistrust of government agencies instigated confusion and fear among local residents. Instead of the dissemination of information, knowledge building, and joint deliberation envisaged in the participatory design, INCRA resorted to clientelist persuasion methods to gain local support. Promises of economic benefits from infrastructure, material, and credit lines, as well as legal assistance in driving large farmers out of the settlement, encouraged community residents to support the implementation of PAEs. Interestingly, well-organized communities

were more resistant, due to their organizational capacity to request procedural transparency.

In 2006, accusations of corruption in upland settlement projects in the region forced INCRA to discontinue all activities, including the formation of floodplain PAEs. In 2008, when the activities resumed, two major institutional changes had taken place. First, INCRA hired 200 new employers as part of a national selection system. The new staff was deeply concerned about social issues and receptive to adjusting institutional procedures to take into account environmental and cultural diversity. Second, INCRA welcomed new partnerships and sought support from a local NGO, which was commissioned to elaborate the participatory management plan in 15 PAEs (Map 3.2).

In addition to the extended experience with floodplain community work, the local NGO was closely involved in advocacy work that resulted in official recognition of the fishing accords and selection of PAEs as the territorial model for floodplain communities. Their involvement in implementing the PAEs therefore greatly strengthened the participatory component in elaborating the Management Plan. Nevertheless, the terms of partnership between INCRA and the NGO were based on overly ambitious goals, an understaffed team, a tight schedule, and inflexible procedures. Despite the unfavourable conditions, the local NGO saw its leadership role in this activity as a unique opportunity to enhance its influence in the long-awaited solution to land insecurity among floodplain residents. By working closely with community residents, the NGO sought recognition of its

Map 3.2 Spatial distribution of the agro-extractive settlements (PAEs) in the Lower Amazonian floodplain



Source: IPAM – Santarém

Table 3.3 Role and motivations of the four main actors implementing the PAE in the Lower Amazon

	Level	Role	Motivation
INCRA	National	Legal framework; Economic support; Infrastructure; Technical assistance	Political pressure; National target; Institutional innovation
Local NGO	Regional	Participatory Management Plan; Legal assistance	Financial input; Local commitment; Political influence; Professional recognition
Fishers' Union	Municipal	Formal request to create PAE Unemployment salary	Political prestige; Increased representativeness
Communities	Local	Knowledge input Management activities (Council)	Exclusive use rights; Financial input; Empowerment; Sustainable production

efforts to formalize the local management system. On the other hand, the contract with INCRA provided much-needed financial security for the organization to avert phasing out a major funding agency. With no prospects for alternative funding, they became financially dependent on INCRA, which limited their autonomy and bargaining power to negotiate more suitable conditions to carry out effective participatory procedures. Shifting from an independent organization funded by international agencies to the rigid, bureaucratic institutional framework of INCRA presented major challenges to flexible scheduling and the financial administration necessary for an effective participatory process.

As a result, the Management Plans were drafted under time pressure, with contrived participation that was often limited in its representative quality. When questioned about the effectiveness of this strategy and their rationale for partial participation, the NGO staff explained that 'they did their best under the limited time, funding and staff constraints', and 'they did it that way, rather than leaving it to other organizations less committed to the community causes.' Remarkably, the outcome varied across communities. Mobilization and participation were more effective in Santarem, where the NGO had a long-term presence, in contrast to other municipalities, where limited local organizational capacity impeded effective participation at such short notice.

In sum, despite the long bottom-up process that led to an innovative territorial design for the floodplain, planning and implementation took place in a complex social context, in which conflicting goals,

perceptions, and motivations among collaborating actors resulted in unexpected outcomes (Table 3.3). The implementation gap described above reveals missed opportunities at two points, where effective participation failed. First, while setting up the PAEs, hasty, technocratic procedures overlooked local realities, instigating confusion, distrust, and conflicts. Second, during the elaboration of the Management Plan, constraints relating to time, financial, and staff limited effective participation of local residents, despite the long experience and political commitment of the local NGO in implementing the PAEs. Overall, this case reveals that even with supposedly suitable territorial models and formal procedures for participation, informal decisions guided by different perceptions may jeopardize accomplishment of socially inclusive policies, as in the case of ethnic communities and co-management systems.

Discussion

The dramatic increase in ethnic territories in South America in general and in Brazil in particular contrasts with the rising socio-environmental conflicts between local populations and large-scale impacting activities promoted by national governments (see e.g. Caruthers 2008; Carneiro-Filho et al. 2009; Zhouri and Laschefski 2010; Latta and Witmann 2012). Such a dilemma reveals two related processes in the reconfiguration of rural territories in the region: 1) the polarization between conservation and production territories at the national level; and 2) the gap between formal rights granted to local populations and informalities arising during implementation at the local level.

A scaled perspective on the increase of protected areas in Brazil reveals how progress in returning territorial rights to marginalized rural groups may yield unexpected outcomes. Ethnic territories are undoubtedly a major advance in the struggle to eliminate inequalities in access to land and natural resources. Forming ethnic communities amid the expansion of highly impacting land-use territories may, however, lead to new inequalities in distribution of 'production' land and conservation responsibilities among different rural groups. On the one hand, ethnic communities have a central role in national conservation policies, in which several territorial models envisage local populations as active players in the design, implementation, and monitoring process. Their exclusive rights to land and nature, are therefore closely associated with their legal responsibility for securing their territories against both internal and external pressures. However, ethnic communities are granted the undesirable role of guardians of the global commons, while impacts from large-scale

activities within and around their territories have recently escalated (Carneiro-Filho and Souza 2009).

In other words, the establishment of ethnic territories represents the end of a struggle for legal recognition of the territorial rights of marginalized groups. Their implementation, however, marks the start of new struggles to ensure participatory processes and avert new inequalities. Careful examination of the establishment and implementation of PAEs in the Amazonian floodplain has shed light on the obstacles to effective participation. Despite the bottom-up design process and favourable institutional arrangement, daily practices among different actors involved in the process have culminated in outcomes that deviate from expectations. While the local populations have obtained some degree of land security, they face restricted participation, severely curtailed land use, and scarce technical and financial support for developing sustainable economic activities. This dilemma raises questions about how cooperative and conflictive processes interact in designing and implementing protected areas and co-management.

Collective action research examines drivers of collaboration among local users and ways of incorporating informal rules into broader policy frameworks (Jentoft et al 1998; Jentoft 2005; Ostrom 1990; Berkes and Folke 2000). Environmental justice research, on the other hand, addresses drivers of inequalities and contestations (Caruthers 2008; Martinez-Alier). In Brazil, where conflictive relations between communities and the state (e.g., top-down policies, marginalization in policy-making, and lack of institutional support for local practices) have recently been replaced by collaborative relations founded on social inclusion and participatory procedures, an integrated analytical perspective reconciling cooperation and conflict is needed. As ethnic communities have been successfully included in the territorial governance and granted a broad range of territorial categories, present conflict-based analysis does not explain advances in rights to nature and land granted to marginalized groups. By the same token, as ethnic communities are confronted with limited participation, rising impacts and implementation gaps, cooperation-based analysis is similarly insufficient for addressing asymmetric relations among stakeholders. This tension between cooperative and conflictive interactions currently fuels the politics between communities and the state in the reconfiguration of rural territories. Conflictive and cooperative processes are two sides of the same coin, and placing the interplay between these two processes as the analytical core may improve understanding of the conditions in which ethnic territories and co-management systems are established and implemented and help assess the implications of these territorial models to achieve multiple goals.

This chapter demonstrates how such analytical perspectives promote understanding the role of ethnic communities in the governance of rural territories in Brazil. Only by combining scaled (local and national) and multi-process (interplay between cooperative and conflictive interactions) analyses will a complex process of re-scaling rights and duties among rural actors be disclosed. Land rights granted to ethnic communities entail global responsibilities for conservation. Moreover, relying on their traditional identity to raise funding, recruit political support, or develop economic opportunities has implications not only for their livelihood strategies but also for legitimization of impacting land use activities by other rural actors and exclusion of non-traditional marginalized peasants from national channels (Castro et al. 2006; Penna-Firme and Brondizio 2007).

In other words, the environmental citizenship that emerged from *glocal* connections in the 1990s has shifted to the recentralization of conservation policies in the hands of the national government. This 'state capture' is characterized by promotion of ethnic communities as a political tool to showcase a progressive conservation policy strategy that combines sociocultural elements and compensates for the expansion of high-impacting land-use activities elsewhere. However, the official figures supporting the 'green state' image contrasts with the increasing challenges related to implementation gaps, violations of the constitution and human rights in infrastructure projects and agribusiness (see Zhouri and Laschefski 2010). Socio-environmental conflicts over hydroelectric power plant construction are a case in point. Since the 70s, when the Belo Monte UHE complex in the Xingu river was first planned, social movements have confronted military, neo-liberal and post-neoliberal governments, and successfully stopped the process to avoid major social and ecological impacts in the region (Fearnside 2006). However, the national government overruled formal procedures foreseen by national (national constitution and Public Attorney) and international (Convention 169) institutions (Hall and Brandford 2012) and authorized its construction in 2011. In the following year, the national government announced another UHE complex in the Tapajos River, which entails cancelling ca. 75 thousand hectares of protected areas. In reaction to this measure, officials from the Ministry of Environment publicly denounced the lack of transparency and inappropriate procedure through a signed open letter, but to no avail.

In sum, the national project of polarization between conservation and production territories, combined with the daily practices of local interactions, has given rise to new inequalities among rural populations. Polarized territorial policies at the national level designate ethnic communities as guardians of global commons with limited consideration for their land-use aspirations. Moreover, expansion of protected areas legitimizes advances in large-scale activities that have

directly and indirectly impacted ethnic communities. Finally, ethnic communities have excluded non-traditional peasants from the core of the territorial governance agenda by prioritizing certain cultural identities. Differences between goals and perceptions among organizations interacting in the implementation of ethnic communities may lead to limited participatory procedures at local levels. The extent to which ethnic territories and co-management systems help reduce inequality will depend not only on implementation policies in those territories but also on the broad political agenda of the state for addressing polarization between conservation and production territories.

Conclusions

Ethnic communities and co-management systems are major accomplishments arising from environmental citizenship worldwide. By building political networks with external actors, ethnic communities have become key partners in pursuing the multiple goals of conservation, social justice, and poverty alleviation. In this regard, these territories have major potential for strengthening environmental governance. If improperly delivered, however, ethnic territories may lead to adverse outcomes. In this article, I have described three challenges faced by communities in Brazil. First, improper implementation processes may cause a sort of 'blueprint' participation, in which local actors are induced to join through imposed standard procedures and unsuitable arenas for deliberation, negotiation, and diversification of management strategies. Second, improper governance in private territories may deepen inequalities by assigning conservation responsibilities to ethnic groups, while high impact land use activities are legitimized by private actors. Third, overemphasizing identity for territorial rights may lead to exclusion of non-traditional peasants in territorial governance. All in all, in this scaled context the ethnic territorial surge drives depoliticization of ethnic social movements, as the territorial rights granted to a large area neutralize their claims. At the same time, demands for production territories from large-scale private actors regarded as development propellers are met.

In sum, even though ethnic territories have helped address land and resource inequalities among marginalized ethnic groups, their delivery has coincided with at least three new struggles: 1) the struggle to reclaim their autonomy to determine their own livelihood strategies; 2) the struggle to reclaim joint responsibility for conservation with other rural actors; and 3) the struggle to become active partners in the implementation of their own territories. The successful outcome of these struggles will depend on the ability of the ethnic communities to devise new strategies to regain political space in the

current scaled socio-environmental configuration characterized by complex networks of state and non-state actors.

Notes

1. Financial support from the European Union for the project on Environmental Governance in Latin America and the Caribbean (ENGOV, FP7-SSH-2010-3) is gratefully acknowledged.
2. Category of protected area in which human activities are highly restricted.
3. <http://www.ibge.gov.br/home/estatistica/economia/agropecuaria/censoagro/2006/default.shtm>

References

- Acsehrad, H. (2008) 'Grassroots Reframing of Environmental Struggles in Brazil'. In D.V. Carruthers (ed.) *Environmental Justice in Latin America: Problems, Promises, and Practice*, Cambridge, MA: MIT Press, 75-97.
- Armitage, D., F. Berkes and N. Doubleday (eds) (2008) *Adaptive Co-Management: Collaboration, Learning, and Multi-Level Governance* (Sustainability and the Environment), Vancouver: UBC Press.
- Baud, M., F. Castro and B. Hogenboom (2011) 'Environmental governance in Latin America: Towards an integrative research agenda', *ERLACS* 90:79-88.
- Benatti, J. H. (ed.) (2005) *A Questão Fundiária e o Manejo dos Recursos Naturais da Várzea: Análise para Elaboração de Novos Modelos Jurídicos*. Manaus: Provárzea-Ibama.
- Berkes, F. and C. Folke (eds) (1998) *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*. Cambridge: Cambridge University Press.
- Borrini-Feyerabend, G., M. Pimbert, M.T. Farvar, A. Kothari and Y. Renard (2007) *Sharing Power: A Global Guide to Collaborative Management of Natural Resources*. London: Earthscan Publications.
- Carneiro-Filho, A. and O. Braga de Souza (2009) *Atlas of Pressures and Threats to Indigenous Lands in the Brazilian Amazon*, São Paulo, Brazil: Instituto Socioambiental.
- Carruthers, D. V. (ed) (2008) *Environmental Justice in Latin America: Problems, Promises, and Practice*. Cambridge: MIT Press.
- Castro, F. (1999) 'Fishing Accords: The Political Ecology of Fishing Intensification in the Amazon', *CIPEC Dissertation Series*, No 4. Bloomington: Indiana University.
- (2012a) 'Multi-scale environmental citizenship: Traditional populations and protected areas in Brazil', In A. Latta and H. Wittman, (eds.) *Environmental and Citizenship in Latin America: Natures, Subjects, and Struggles*, CEDLA Latin America Studies 101. New York: Berghahn Books, 39-58.

- (2012b) 'Between Cooperation and Conflict: The Implementation of Agro-Extractive Settlements in the Lower Amazon Floodplain'. In E. Brondizio and E. Moran (eds.) *Human-Environment Interactions: Current and Future Directions*,. Dordrecht: Springer, 213-234
- Castro, F., and D. McGrath (2003) 'Community-Based Management of Lakes and Sustainability of Floodplain Resources in the Lower Amazon', *Human Organization* 62(2): 123-133.
- (2011) 'Reintroducing the Commons: Implementation of Agro-extractive Settlements in the Lower Amazon Floodplain' *Library of Best Practices Promoting Policies of Social Inclusion*.
- Castro, F., A. Siqueira, E. Brondizio and L. Ferreira (2006) 'Use and Misuse of the Concepts of Tradition and Property Rights in the Conservation of Natural Resources in the Atlantic Forest (Brazil)', *Ambiente e Sociedade* 9 (1): 23-39.
- Cornwall, A. (2004) 'Spaces for Transformation? Reflections on Issues of Power and Difference in Participation in Development, In S. Hickey and G. Mohan (eds.) *Participation from Tyranny to Transformation?*, London and New York: Zed Books
- Diegues, A. C. S. (1994) *O Mito da Natureza Intocada*. São Paulo, Brazil: NUPAUB/USP.
- (2004) *A Pesca Construindo Sociedades*. São Paulo, Brazil: NUPAUB/USP.
- Elbers, J. (ed) (2011) *Las Áreas Protegidas de América Latina: Solución Actual y Perspectivas para el Futuro*, IUCN and Ministerio de Medio Ambiente y Medio Rural y Mariño de España.
- Fearnside, P.M. (2006) 'Dams in the Amazon: Belo Monte and Brazil's Hydroelectric Development of the Xingu River Basin', *Environmental Management* 38(1):16-27.
- (2008) 'Deforestation in Brazilian Amazonia and Global Warming', *Annals of Arid Zone* 47(3-4):1-20.
- French, J. H. (2009) *Legalizing Identities: Becoming Black or Indian in Brazil's Northeast*. Chapel Hill: University of North Carolina Press.
- Hall, A. and S. Branford (2012) 'Development, Dams and Dilma: The Saga of Belo Monte', *Critical Sociology*, 38(6): 851-862.
- Hochstetler, K. and M.E. Keck (2007) *Greening Brazil: Environmental Activism in State and Society*. Durham: Duke University Press.
- Jentoft, S. (2005) 'Fisheries Co-management as Empowerment' *Marine Policy* 29 (1):1-7.
- Jentoft, S., B.J. McCay and D.C. Wilson (1998) 'Social Theory and Fisheries Co-management', *Marine Policy* 22(4-5):425-436.
- Keck, M.E. and K. Sikkink (1998) *Activists Beyond Borders: Advocacy Networks in International Politics*. New York: Cornell University Press.
- Latta, A. and H. Wittman (2010) 'Environmental Citizenship in Latin America: A New Paradigm for Theory and Practice', *ERLACS* 89:107-116.
- (eds) (2012) *Environmental and Citizenship in Latin America: Natures, Subjects, and Struggles*. CEDLA Latin America Studies 101. New York: Berghahn Books.
- Lemos, M.C. and A. Agrawal (2006) 'Environmental Governance', *Annual Review of Environment and Resources* 31:297-325.

- Lisansky, J. (2005) 'Fostering Change for Brazil's Indigenous People: The Role of the Pilot Programme'. In A. Hall (ed.) *Global Impact, Local Action: New Environmental Policy in Latin America*. London: Brookings Institution Press, 170-186.
- McGrath, D., F. Castro, C. Fudemma, B.D. Amaral and J. Calabria (1993) 'Fisheries and the Evolution of Resource Management on the Lower Amazon Basin', *Human Ecology* 21(2):167-195.
- McGrath, D., A. Cardoso, O. Almeida and J. Pezzuti (2008) 'Constructing a Policy and Institutional Framework for an Ecosystem-based Approach to Managing the Lower Amazon Floodplain', *Environment, Development and Sustainability* 10(5):677-695.
- Merry, F. D., P.A. Sheikh, and D. McGrath (2004) 'The Role of Informal Contracts in the Growth of Small Cattle Herds on the Floodplain of the Lower Amazon', *Agriculture and Human Values* 21:377-386.
- Nepstad, D., B.S. Soares-Filho, F. Merry, A. Lima, P. Moutinho, J. Carter, M. Bowman, A. Cattaneo, H. Rodrigues, S. Schwartzman, D. McGrath, C.M. Stickler, R. Lubowski, P. Piris-Cabezas, S. Rivero, A. Alencar, O. Almenidar, and O. Stella (2009) 'The End of Deforestation in the Brazilian Amazon', *Science* 326(5958):1350-1351.
- Olmos, F., J. Albuquerque, M. Galetti, M. Milano, I. Camara, A. Coimbra-Filho, J. Pacheco, C. Bauer, C. Pena, T. Freitas, M. Pizo and A. Aleixo (2001) 'Correção Política e Biodiversidade: A Crescente Ameaça das "Populações Tradicionais" à Mata Atlântica'. In J.L. Albuquerque (org.) *Ornitologia e conservação: das ciências às estratégias.*, Tubarão: Editora Unisul.
- Ostrom, E. (1990) *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.
- Paz, R. J., G. L. Freitas and E. A. Souza. (2006) *Unidades de Conservação no Brasil: História e Legislação*. João Pessoa, Brasil: Ed. Universitária UFPB.
- Penna-Firme, R., and E. Brondizio. (2007) 'The Risks of Commodifying Poverty: Rural Communities, Quilombola Identity, and Nature Conservation in Brazil', *Habitus* 5(2):355-373.
- Ribot, J.C. (2004) *Waiting for Democracy: The Politics of Choice in Natural Resource Decentralization*. Washington, DC: World Resource Institute.
- Rosendo, S. (2007) 'Partnerships across Scales: Lessons from Extractive Reserves in Brazilian Amazonia'. In M. A. F. Ros-Tonen (ed.) *Partnerships in Sustainable Forest Resource Management: Learning from Latin America*, Latin America Studies 94, CEDLA. Leiden, The Netherlands: Brill, 229-254.
- Rylands, A. B., and K. Brandon (2005) 'Brazilian Protected Areas', *Conservation Biology* 19(3): 612-618.
- Sparovek, G., G. Berndes, I.S.F. Klug and A.G.O. Barretto (2010) 'Brazilian Agriculture and Environmental Legislation: Status and Future Challenges', *Environmental Science and Technology* 44(16): 6046-6053.
- Taddei, R. (2011) 'Watered-down Democratization: Modernization versus Social Participation in Water Management in Northeast Brazil', *Agriculture and Human Values* 28(1):109-121.
- Zhour, A. and K. Laschewski (eds.) (2010) *Desenvolvimento e Conflitos Ambientais*. Belo Horizonte: Editora da UFMG.

Zimmerer, K.S. (2011) 'Conservation Boom with Agricultural Growth? Sustainability and Shifting Environmental Governance in Latin America, 1985-2008 (Mexico, Costa Rica, Brazil, Peru, Bolivia)', *Latin American Research Review* 46:82-114.

CONCLUSIONS AND FINAL REFLECTIONS

PITOU VAN DIJCK, FÁBIO DE CASTRO AND BARBARA HOGENBOOM

For centuries, natural resource exploitation has dominated the overall growth and development process in nearly all South American countries. It has shaped their economic structure, the political agenda, and socio-cultural life. This natural-resource based development pattern has impacted the region's accession to world markets for goods and services and has generated flows of foreign direct investment to the continent. At the same time, the relative abundance of natural resources and the potential to generate income from their exploitation has shaped domestic economic and social relations at macro and local levels, affecting the livelihoods of large segments of the population.

Governance of their abundant natural resources has proven extremely challenging to South American societies. Strong dependence on volatile international commodity markets tends to generate boom-bust cycles in national economies. This is particularly the case in small countries that rely heavily on producing and exporting one or just a few natural resources, as is typically the case in a number of countries in South and Central America and the Caribbean. External shocks impact the domestic economy by causing volatile foreign-exchange revenues and exchange rates, government revenues, direct and indirect employment, income, and ultimately overall wellbeing. As economic literature shows, such circumstances complicate socio-economic management and require economic and political capacities that frequently exceed the scope of policymakers. A stabilization fund may be highly instrumental in reducing volatility induced by external shocks, but few countries have introduced such a fund and have been able to manage it effectively and efficiently. Brazil's rather recent initiatives in this regard are an interesting case in point. As a conse-

quence, volatility may come at a high economic, social, and political cost (Collier and Gunning 1999). Moreover, large foreign investors, governments of resource-seeking nations, as well as international organizations, have also conditioned and shaped the policies and practices of natural resource use. This even holds true for the Amazon in Brazil, which is the region's largest country (Bunker 1985). This influence of international markets and powerful foreign actors on national development interacts with the outcomes of conflicts between different social groups within countries. Such conflicts sometimes result in changing policies on natural-resource exploitation, its socio-economic and legal context, and the division of the various costs and benefits of this exploitation.

In recent history, the political and economic context of resource exploitation and of macro-economic management in general changed rather drastically with the introduction of the neoliberal agenda in the 1980s and 90s. The policy shift resulted in reduced government control over markets and greater influence of domestic and foreign investors (Stallings and Peres 2000; Edwards 2010). These policies were supported by governments in the home countries of foreign firms and by international organizations, such as the International Monetary Fund (IMF), the World Bank, and the Inter-American Development Bank (IDB). This major change in economic policy had social and environmental impacts throughout the region (Liverman and Vilas 2006). Since the late 1990s, however, social movements have increasingly challenged these neoliberal policies for being socially unfair. Local resistance and national protests against liberalization of the economy and growing support for leftist political parties culminated in electoral victories of left-wing presidential candidates in most countries in the region during the 2000s. This new political setting paved the way for reforms of national institutions and regulations concerning exploitation of natural resources like oil, gas, and minerals, coinciding with new domestic and international priorities regarding environmental degradation resulting from resource exploitation and their direct and indirect impact on local communities and indigenous groups. Realizing non-destructive, socially acceptable, effective, and efficient frameworks for sustainable and equitable development in South America remains highly challenging (Baud, Castro and Hogenboom 2011). While some governments have adopted a neo-developmental agenda to reconcile economic with social objectives, indigenous cosmologies view severing human-nature linkages as a major threat to sustainability. Numerous local conflicts on access to resources and land, protection of livelihoods, and environmental justice throughout South America express the increasing contestation of the dominant development models (Carruthers 2008) and the need to rethink environmental citizenship (Latta and Witt-

man 2012) and relations between humans and nature (Gudynas 2009).

In this new context, South America has emerged as a region where natural resources figure prominently in political, economic, and social processes. The previous articles highlight three cross-scale aspects of the nature-society nexus in this region: 1) recentralization of extractive sectors, 2) the global connections of the Amazonian commodities, and 3) the role of the national state in local and global conservation policies.

Re-politicization and recentralization of extractive sectors

Strong growth in global demand for food products, energy, and minerals since the early 2000s has resulted in rising prices, stimulating natural resource extraction throughout the region, including in Amazonia. As shown in Chapter 1, however, mineral production (mining and oil and gas exploitation) is especially politicized. The introduction of the neoliberal agenda in the 1980s and 90s led the government control over extractive sectors as implemented during previous decades to be dismantled. While deregulation and liberalization of these sectors initially instigated only mild discontent within civil society, the privatization policies became increasingly contentious. Furthermore, governance of mineral extraction also became re-politicized, as a result of increasing local mobilizations against the disruptive social and environmental implications of large mining and oil projects. This re-politicization deepened as local contestations became part of broader anti-neoliberal movements, in which indigenous groups and environmental organizations figured prominently.

When the South American left made its surprising political comeback throughout the region, mineral resources were once again labelled as strategic. The state has taken a more centre-stage position in their governance and has reregulated and partly restricted the role of (foreign) private companies. Thanks in part to relatively high prices, a larger share of the revenues is used by the public sector to fund national social programmes and repay national debt. Despite the criticism of foreign actors on the expanded role of the state in extractive activities, many South American countries have reformed their policies. Nationally and locally, however, criticism and conflicts are ongoing. While these policy shifts are often supported by the electorate and urban social movements, expansion of extractivism means that more local communities are affected. Political trivialization and even criminalization of recent protests indicates, *inter alia*, that mineral extraction is crucial for the current political regimes. Apart from conflicts, new partnerships are taking shape. The Chinese government and state-controlled banks have provided loans to Brazil, Vene-

zuela, and Ecuador that are linked to long-term oil supply contracts with Chinese firms. Moreover, booming markets and the economic crisis in the USA and EU have helped some South American mineral companies internationalize their activities regionally and globally, as has been the case with the Brazilian companies Vale and Petrobras: Vale is the world's second-largest mining company, and Petrobras is the largest oil company of the region. Yet again, these recent trends are challenged by groups that fear new foreign control and socio-environmental destruction .

Linking Amazonia with world commodity markets

In support of the process of globalization and integration in world markets and, more specifically, the exploitation of natural resources in South America, governments in South America have invested in major infrastructure programmes, including IIRSA and PAC. By 2010, the IIRSA programme was re-embedded in COSIPLAN, the infrastructure component of UNASUR, which is the regional integration system. Only a limited share of IIRSA road investment, however, truly supports regional integration, and most of it serves to strengthen national links with international markets. Moreover, IIRSA functions as a platform of national governments and financial institutions, and NGOs and the private sector do not participate directly in discussions between the countries involved in the development of 'regional' hubs. As explained in Chapter 2, comprehensive assessments of potential impacts are urgently needed prior to the decision to construct road corridors. While strategic environmental assessments (SEAs) have a potentially crucial role in this regard, experience with SEAs in South America, and particularly Amazonia, remains rather limited thus far. SEAs have been significant only as instruments to support environmental management and sustainable development of local communities.

Infrastructure and related economic activities generate large-scale land-use conversion and deforestation in Amazonia. Impact areas along mega roads may be very substantial indeed. Many corridors span over 1,000 kilometres, and impacts can extend up to 50 kilometres at each side of the road. Impact intensity tends to be greater in closer proximity to the road. Areas with intensive impacts (high percentage of land-use conversion per square kilometre) are concentrated near villages, cities, previously deforested areas, in territories with matching land suitability, and in territories adjacent to other transport or energy infrastructure or rivers. Impacts are strongly linked to a fishbone pattern of unpaved roads generated by the construction of the main road. Deforestation and land-use change to accommodate cattle ranching, agriculture, storage lakes, forestry, and

mining in Amazonia and the Guyanas are strongly concentrated along road corridors. The impact area of the 1,300 kilometre-long Corredor Norte in Bolivia, among the major case studies in the research project, is assumed to be 234,000 square kilometres, i.e. 22 per cent of the surface area of Bolivia. Impact areas of interregional roads cover a substantial share of national territory. Indeed, the new investment boom in natural resources, the new interest in Asian markets, and the new infrastructure programmes may lead to new centres of gravity in Amazonia, a new type of land use, and a new spatial development pattern. Apart from the traditional concentration of economic activities, road infrastructure, and deforestation along the so-called Arch of Deforestation in the east, southeast, and south of Amazonia, new corridors are being built that penetrate the heart of Amazonia.

Natural-resource management and conservationist policies

In recent years natural resource management and conservationist policies have shifted from the traditional centralized top-down approach in favour of a wide range of collaborative initiatives. Many countries in the region have initiated a democratization process that has enabled revitalization of social movements and active civic participation in decision-making through decentralization measures. Moreover, alliances between local and international organizations have strengthened the political and economic power of local actors and created new channels for advocacy work. From being virtually invisible in conservation policies, local management practices have gradually become a political tool for combining conservation and social inclusion objectives. Together with state agencies, NGOs have advanced a socio-environmental agenda highlighting co-management systems.

These social and political changes have led actors with different interests, perceptions, and strategies to interact more closely in formal and informal decision-making arenas, as demonstrated in Chapter 3. Political decentralization has redefined procedures, responsibilities, and eligibility criteria according to social and cultural features of local users, while climate governance has directed recentralization of targets and decision-making to the national state. As a result, tension between collaborative and conflictive relations among actors within and across scales has characterized this process revolving around power relations. Only by coupling conflict and partnership analysis can the social dynamics between actors in shaping management systems thus be made clear and the implications of potential and shortcomings of sustainable use of natural resource be evaluated.

Legal recognition of ethnic communities has been a major advance in the environmental governance in Brazil. Several territorial categories have been devised as part of long-lasting social mobilization supported by the Catholic Church and NGOs and, more recently, endorsed by the state. As a result, over 2,000 ethnic territories have been established or claimed and are currently in different stages of implementation. These territories covering more than 150 million ha (approximately one fifth of the national territory) are shaped as corridors and mosaics in different parts of the country but are mainly concentrated in the Amazon. However, formalization of informal tenure and management systems has raised a few problems in many local communities. First, the common struggle of marginalized rural populations to increase their access to land and resources has materialized in two different claims: social justice among peasants and environmental justice among 'traditional' groups. Decoupling environmental (conservation) and social (agrarian) dimensions of land and resources has led to polarization between traditional and non-traditional groups, as well as between social and environmental NGOs. Second, the cost of conservation has been transferred mainly to ethnic populations. Minimizing the monitoring role of the state transfers huge responsibilities to local residents for safeguarding their territories. Third, the increasing number of ethnic territories has legitimized the expansion of agribusiness as a counterpart policy to support economic growth. In this regard, two polarized territories have been consolidated: 'conservation' territories in state land under the aegis of ethnic groups virtually limited to subsistence activities and 'production' territories on private land primarily controlled by agribusiness and state land controlled by extractive companies.

Final reflections

The findings as presented in the previous chapters indicate at new partnerships, policies, and opportunities, as well as new challenges and risks, particularly for local communities and the environment. The analysis of the expansion of extractive activities, infrastructure projects, and conservation territories reveals rising tensions between conflicting local, national, and international interests and actors regarding use and preservation of natural resources. With high commodity prices and more infrastructure, remote areas are becoming accessible to new actors. In effect, the struggle for territory and natural resources is increasing as well.

Three challenges emerge from the analysis of the above processes. First, the widespread preference among the population of several South American countries for using revenues from resource exploitation for general social development rather than allocating them only

to a minority figures high on the new political agenda. The political agenda has been reoriented in favour of poverty alleviation and the reduction of income, inequalities, and exclusion. In view of the composition of societies and especially the concentration of population and poverty in urban areas and the advantages of the urban population in terms of political organization and influence over those living in rural areas, however, this new focus may result in a strong and widely shared preference for maximizing income and particularly tax revenues and less support for environmental risk reduction and sustainable development. Second, the high priority for investment in road infrastructure to facilitate production for world commodity markets enhances the opportunity to exploit natural resources in mega-biodiversity biomes such as Amazonia. The required strategic environmental assessments have the potential to contribute to the positive impact on quality of life of such investments and limit environmental and social disruptions, although these potentials have been realised only in limited measure. The developments thus far do not show an inherent rationale for a more comprehensive approach to these assessments reflecting more thorough consideration for quality of life implications for local communities and environmental impacts. Third, the drive towards exploitation of natural resources, supported by relatively high prices and new scarcities, also impacts the protected areas in Amazonia. While responsibility for conservation is concentrated in the hands of ethnic communities, protected areas are increasingly penetrated by illegal roads and affected by illegal logging, gold digging, hunting, and agribusiness expansion. In combination with inadequate regulations and weak law enforcement, these developments will result in rapid and widespread deterioration of ecosystems in Amazonia.

In sum, the scaled perspective focusing on the tension between collaboration and conflicts in natural resource use and protection reveals political reconfiguration of state and non-state actors regarding access to and control over natural resources and a shift in responsibilities for production and conservation initiatives. New scaling patterns have emerged in the region over the past decade, such as re-centralization of national government in expanding protected areas, regionalizing infrastructure development, and deepening transnationalization in the expansion of minerals. How these re-scaling strategies influence the *glocal* connections consolidated by the socio-environmental movements in the 1990s will depend on the new strategies deployed by civil society organizations to regain political space in negotiations about nature, social justice, and alternative development models.

References

- Baud, M.; Castro, F. and Hogenboom, B. (2011) 'Environmental governance in Latin America: Towards an integrative research agenda', *ERLACS* 90:79-88.
- Bunker, S. (1985) *Underdeveloping the Amazon: Extraction, Unequal Exchange, and the Failure of the Modern State*. Chicago and London: The University of Chicago Press.
- Carruthers, D. V. (ed.) (2008) *Environmental Justice in Latin America: Problems, Promise, and Practice*. Cambridge: MIT Press.
- Collier, P. and Gunning, J. W. and associates (1999) *Trade Shocks in Developing Countries*, Volumes 1 and 2. New York: Oxford University Press.
- Edwards, S. (2010) *Left Behind. Latin America and the False Promise of Populism*. Chicago and London: The University of Chicago Press.
- Gudynas, E. (2009) 'Ciudadanía ambiental y meta-ciudadánías ecológicas: Revisión y alternativas en América Latina', *Desenvolvimento e Meio Ambiente* 19: 53-72.
- Latta, A. and Wittman, H., (eds) (2012) *Environmental and Citizenship in Latin America: Natures, Subjects, and Struggles*. CEDLA Latin America Studies 101. New York and Oxford: Berghahn Books.
- Liverman, D. M. and Vilas, S. (2006) 'Neoliberalism and the Environment in Latin America', *Annual Review of Environment and Resources* 31: 327-363.
- Stallings, B. and Peres, W. (2000) *Growth, Employment and Equity, The Impact of the Economic Reforms in Latin America and the Caribbean*. Washington D.C.: ECLAC and Brookings Institution Press.

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Barbara Hogenboom, Pitou van Dijck, and Fábio de Castro have combined their diverse disciplinary approaches in this study to emphasize the economic, social, environmental and political challenges facing the region. Their chapters include outcomes of their own recent research that are in part related to ENGOV, an EU-sponsored project focusing on environmental governance in Latin America and the Caribbean, and to a WWF-sponsored research project.

Fábio de Castro is Assistant Professor of Brazilian Studies, Pitou van Dijck is Associate Professor of Economics, and Barbara Hogenboom is Associate Professor of Political Science, all at CEDLA, Amsterdam.



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