

Green Governance, Green Peace: A Program of International Exchange in Environmental Governance, Community Resource Management, and Conflict Resolution

THE STATE OF FOREST MANAGEMENT RESOURCES IN BRAZIL

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June 2005

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1. Geopolitical and Economic Context

With an area of about 8,500,000 km², Brazil covers almost half of South America. To the North, it borders Venezuela, Guyana, Suriname, French Guyana and Atlantic Ocean. To the South, it borders Uruguay. To the West, it borders Argentina, Paraguay, Bolivia, Peru and Columbia. The Atlantic Ocean bathes its eastern coast. The country borders all nations of South America, with the exception of Chile and Ecuador.



Figure 1 – Geographic Division of Brazil
Source: Almanaque Abril, 1999.

The world sees Brazil as a “traditional” natural resource reserve, of especially tremendous biodiversity with the largest tropical forest on the planet. Historically, economic development in Brazil has been closely related to the exploitation of its natural resources and to territorial expansion. The “frontier” has always provided the resource base necessary for expanding the economy. Frontier expansion has occurred in cycles, at earlier phases a result of export booms and more recently in response to the consolidation of the internal market.

The implementation of various types of export activities at different moments of history explains not only the process of demographic expansion but also the appearance of regional differences. Each export product that led a particular economic boom was associated with a different region of the country: gold in Minas Gerais State, sugar in the Northeast, coffee in the Southeast, rubber

in the Amazon region, etc. The result was that until the 1950s, Brazil was made up of economically dense “islands” isolated from one another and linked directly to the international market. The main activity of the Amazon region was precarious extractivism, mostly of rubber latex. In the *Cerrado* (Savannah) of the central plateau, in the *Caatinga* of the semi-arid northeast and in the subtropical fields in the south, extensive cattle raising was the main rural activity.

The call for national integration was a central focus of Brazil’s developmentalist economic policies. Territorial integration, considered necessary for the growth of the internal market, was made possible by the creation of a network highway and energy infrastructure, beginning in the second half of the 1950s. Territorial integration efforts became more intensive in the 1970s, with the growing use of tax and credit incentives, to spur production outside more developed areas of the country. The construction of Brasilia during this period changed the nation’s political map. It also redesigned the national transportation network, which from then on became increasingly dependent on the growth of the internal market. Brasília was also a stepping stone on the way to the Amazon. The incorporation of remote resource frontiers was, by then, seen to be a geopolitical and security priority. The result had a direct impact on it’s the Amazon’s fragile forest ecosystem.

National integration policies were elaborate and aggressive in the 1970s. The incorporation of natural resources was the primary condition for the growth of the economic frontier in the country after the desired level of industrial and financial concentration was attained in São Paulo. Over time, the frontier expanded to include western Paraná and the central plateau, as well as the Amazon region and the interior of the Northeast. This movement occurred as a consequence of the expansion of modernized agriculture through western Paraná, the central plains and, more recently, into the tablelands of western Bahía and southern Maranhão and Piauí.

The incorporation of new areas into the national economy was also associated with urbanization and industrialization, which involved not only the growth of existing regional and national centers but also large and medium sized cities outside the coastal areas where land occupation historically took place. (IBAMA, 2002). With a 2005 estimate of 183.6 million inhabitants (IBGE), Brazil has 81.2% of its population concentrated in urban areas. There are 13 cities whose population is over 1,000,000 inhabitants. In addition, the country has two megacities, São Paulo and Rio de Janeiro, each with populations over 15 million inhabitants.

The role of the frontier and of access to land distinguishes Brazil from its Latin American neighbors, raising specific agrarian issues. According to BECKER (1993), in Mexico, for example, the shortage of arable lands became a problem early on in the industrialization process. The rigid agrarian structure had to change and state resources had to be mobilized in order to increase the productivity of agricultural projects. Agrarian reform was thus necessary for industrialization. In Brazil, the supply of agricultural products was guaranteed by the incorporation of new lands, without requiring changes in the pre-established land tenure structures.

2. The impact of economic growth on Brazil’s forests

This occupation process has had complex impacts on Brazil’s extraordinary mosaic of ecosystems. This mosaic is produced not only by great climatic diversity but also by Brazil’s topographic diversity. The richness of the Brazilian biodiversity historically led to the belief that the natural resources are inexhaustible, resulting in their predatory and disorderly exploitation from the colonial period on. At some point in time, forest land occupation for timber extraction or food production has played an important role in the process of economic growth in most of areas of the country.

Approximately 550 of Brazil's 850 million hectares are still covered by native forests. Two thirds correspond to the Amazon Forest, and the remainder to the Cerrado, the Caatinga, the Atlantic Forest and associated ecosystems (MMA, 2001).



Figure 2 – Map of main biomes of Brazil

Source: IBGE

In 2000, the United Nations Food and Agricultural Organization's (FAO) decennial survey found that Brazil has 544 million hectares of native forests and 5 million hectares of planted forests which, when combined, cover 64,5 percent of the national territory. The remainder has been converted to other land uses, including agriculture, cattle-ranching, urban areas and infrastructure (IBAMA, 2002).

Brazil's forests correspond to 14,5% of the world's forest cover. While the global average of forest cover per person is 0,6 ha, with great variations according to different countries, the Brazilian average is 3,2 ha of forested land per person. But there is great disparity from region to region. The North Region, presents the highest proportion, with 37,7 ha of forested land per inhabitant. On the other hand, the most densely populated regions have rates that are lower than the global average: 0,35 ha per inhabitant in the South Region, and 0,30 per inhabitant in the Southeast Region. The Northeast Region, is in between with about 1,6 ha of forest per inhabitant. (IBAMA, 2002).

The Atlantic forest, the fifth most threatened biome in the world, originally covered more than one million square kilometers, distributed along the Brazilian coast, with some penetration into the interior. Seventy percent of the Brazilian population lives in the area of this biome, along with the biggest cities and most important industrial regions. Land occupation and use, undertaken in a disorderly manner, resulted in almost complete destruction of the Atlantic forest. Recent data (SOS Atlantic Forest Foundation 1998) estimated that only 8% of the original forest

still exists in isolated spots. In some regions of the Brazilian Northeast, less than 1% of original Atlantic forest cover remains.

The Cerrado, the second largest Brazilian biome (after the Amazon rainforest) occupies around 2 million km², almost 25% of the national territory. It comprises a mosaic of vegetation types, including open formations (called “clean fields”, “dirty fields”, “cerrado fields” and “rockyfields”) and specific types of forests (vereda, riverbank, cerrado and mesophyte forest). The Cerrado is the world’s richest savannah in terms of biodiversity (Conservation International et al., 1999 - apud IBAMA, 2002).

This biome has also been the target of intense, uncontrolled occupation. Considered, for many years, as unimportant from the biological point of view, great extensions of the Cerrado have been destroyed to make way for agriculture, especially of grains for export, with no concern for environmental impacts. Many of these projects were implanted through government incentives seeking to increase grain production for the international market.

“It is estimated that areas with natural vegetation and low human interference represent only 40% of total Cerrado area. That is, 120 million hectares have been already converted. With a demographic density of 22 inhabitants per square kilometer and an agribusiness policy based on the rapid substitution of the natural landscape by large mechanized monocultures, the region is characterized by a highly urbanized population” (UNESCO, 2002).

The Caatinga region comprises an area of approximately 735,000 km², approximately 11% of the national territory, including part of the states of Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia and Minas Gerais. This biome is dominated by only a few types of vegetation which are found only in Brazil. There is no concrete data as to the rate of loss of vegetation cover for the Caatinga. Maps from Radambrasil Project (IBGE, 1993) demonstrate that the area covered by agricultural activities in the biome consisted of 201,786 km², which corresponded to 27,47% of the area. One study that considered the likely impacts of the existing road network estimated an altered area of 131,044 km², in other words 45,32% of the biome. This figure places Caatinga as one of most altered environments in Brazil, surpassed only by the Atlantic Forest and the Cerrado.

Despite being the most well conserved biome in the country in percentage terms, deforestation and burning in the Amazon are among the most important environmental problems in the country. Deforestation is the result of the advance of the agro–pastoral frontier and of timber extraction. During the second half of 20th Century, deforestation was encouraged by the construction of long roads and large public and private colonization projects. During the 1970s and 1980s, tax incentives for agricultural and cattle-ranching activities in the region resulted in extensive deforestation, which continued after incentives ceased. Timber only became the region’s major extraction product after the beginning of the 1970s, with the construction of large roads. Practically 80% of Brazil’s whole-log timber production is extracted from the Amazon region, which corresponds to 40 % of Brazil’s timber exports (MMA, 2000).

In the late 1970s and during the first seven years of the following decade, the gross deforestation rate in Amazon was, on average, over 2 million hectares per year. In the late 1980s the rate declined. In the 1990s, however, it rose again, reaching 2,9 million hectares in 1994/1995. Coincidentally, during this decade, the country enjoyed high rates of investment showing that there is a correlation between deforestation and economic investment.(IBAMA,2002)

The removal of vegetation occurs more intensely in the “Deforestation Belt”, a continuous stretch of land about 3,000 kilometers long and up to 600 kilometers wide, totaling approximately 1,7 million square kilometers (INPE,1998). Between 1978 and 1994, about 75% of deforestation occurred within a distance of 50 kilometers from the region’s paved roads. Between 29% and 58% of the forest within these 100 kilometer wide stretches of land was deforested by 1991 (Alves, 1999; Nepstad et al. 2000; 2001 apud IBAMA, 2002).

3. Forest Resources Management Legal Framework and Policies

Brazilian forest policy has gone through three general periods: a) until the middle of 1960s, when the regulatory framework was organized by the 1934 Forest Code; b) from the second half of the 1960s until 1988, when interventionist state policies predominated, especially involving incentives for reforestation; and c) after 1988, the period marked by democratization and decentralization, by the increased recognition of global ecological crisis and by the rapid dissemination sustainable development notions.

In the first period, the 1930 Revolution and the 1934 Constitution marked the transition of a country dominated by the rural elite, to a Brazil that was beginning to industrialize and urbanize, particularly in the Southeast Region. In this context, and in the context of the *Estado Novo* authoritarian regime, the Forest Code was elaborated and approved in 1934, through the Federal Decree. The Federal Forest Service, the institution responsible for monitoring forest activities, was created in 1925 and took part in discussions around the Code. This document classified forests into different categories and established limitations to the private use depending on the type established. It also regulated the exploitation of public and private forests and created monitoring mechanisms, as well as fines and other punitive procedures.

A system of “forest councils” was formally established at the federal, state and local level, but according SWIOLO (1990), it never became operational due to the inertia and the carelessness of state and local authorities, as well as passive and deliberate resistance.

In the post-war period, the effort to transform the agriculturally based Brazilian economy into an industrial one relied on the regular supply of forest raw materials as a source of energy for both private and public enterprises. Until 1960s, the country’s main source of wood was native forests. By the end of the 1960s, the area of planted forests corresponded to a little over 500.000 hectares. Nevertheless, most of the wood extracted from these forests went to the steel industry and to the railway industry. Except for the South, the country’s forest industrial park was still very moderate.

In 1965, a new Forest Code was enacted, in 1966 tax incentives for deforestation were established and in 1967 the Brazilian Institute for Forestry (IBDF) was created. These three events marked the definition of a new forest policy, which initiated large-scale deforestation. The new Forest Code (Law n.º 4.771, from 1965) was somewhat more interventionist than the previous one. While the previous code provided practically unlimited rights to property owners, the new code subordinated property use to collective interests, increasing the ability of the state to regulate it. The new Code also established two basic lines of policy: forest protection and forest development. With respect to the latter, it defined basic norms for the rational use of natural and planted forests, defined and required forest replacement and established fiscal and financial incentives for maintaining forest coverage. Regarding protection, the Code established a new kind of protection area -- “permanent preservation forests -- established requirements that a percentage of each property be preserved -- known as “legal reserves”-- defined “Areas of Permanent Protection” or APP -- such as bordering water bodies -- disciplined the use of fire and

expanded monitoring mechanisms. It also defined other types of protection areas: National, State and Local Parks; National, State and Local Forests; and Biological Reserves.

The APP and the Legal Reserve would turn out to be particularly important. The APP protects the vegetation around ecologically sensitive lakes and rivers. In addition to preventing erosion and sedimentation of water bodies, the APP provides habitat necessary for the survival of flora and fauna and creates an ecological corridor between protected areas.

During the 70s, another actor began to influence environmental policies: the environmental movement. In the military government responded in 1973 with the creation of the Special Secretariat of the Environment – SEMA, a year after the Stockholm conference. The new agency was responsible for creating the new protected areas.

During the 1970s, the contradictions in federal forest policy became clear. If, on one hand, the government demonstrated concern for the environmental issue on another hand, it promoted the expansion of the agricultural frontier and the occupation of the Amazon at any price.

In the early 1980s, the National Environment Policy (Law nº 6.938, of August, 1981) was enacted. This new policy instituted the National System of Environment – SISNAMA and the National Environment Council – CONAMA. This council has substantial deliberative powers, and includes state and local representatives from the government, private sector, environmental NGOs and workers. Since its creation, CONAMA, together with similar state councils, has become a true fortress in the defense of the environment. It is responsible, among other things, for approving federal norms that fill in the gaps in the legal framework. For example, CONAMA has been active in regulating environmental licensing and environmental impact assessment studies.

In 1988, the new Brazilian Federal Constitution affirmed the relationship between social and economic development and environment quality. In response to constitutional requirements, the “Our Nature Program” was created in 1988. With a clear conservationist vision, this Program emphasized forest protection more than development. In the same year, fiscal incentives to deforestation were eliminated and, in the following year, a new environmental agency, the Brazilian Institute of Environment and Renewable Natural Resources – IBAMA -- was created by joining together the IBDF and two other existing agencies.

By hosting the United Nations Conference on Environment and Development, in 1992 (Rio-92), and by ratifying the signature of the Convention on Biological Diversity, Brazil reaffirmed its constitutional commitment to protecting biodiversity and the nation’s genetic patrimony. These events gave new impetus to environmental protection in the country. Most agree that the UN Conference had tremendous impact on the Brazilian population’s environmental consciousness.

Chapter 11 of the Agenda 21, the document that resulted from Rio-92, was dedicated to forest issues, addressing the multiple roles and functions of all types of forests, forest lands and regions covered by forests. The document made clear that current policies, methods and mechanisms fail to effectively promote the sustainable multiple use of forests– taking into account ecological, economic, social and cultural uses trees, forests and forest areas. The Agenda 21 proposes that to solve these problems, government at the appropriate level should be supported by regional, sub-regional and, when necessary, international organizations in the effort to increase institutional capacity, to promote multiple uses of forests, and to support sustainable development and environmental conservation. This should occur whenever possible through cooperation and coordination. The Brazilian Agenda 21 presents the following strategies for natural resources management: promoting environmental planning for land and mineral resource use; fostering procedures to promote species protection and conservation; developing, proposing and improving scientific knowledge about biodiversity; and establishing environmental quality controls that seek to protect and discipline natural resources use.

In 1998, a much stronger environmental law was enacted at the federal level in Brazil. The Environmental Crimes Law defines penal and administrative sanctions for conduct and activities that damage the environment. This law reaffirmed as crimes most of the activities defined as illegal by the earlier Forest Code, while including a list of other activities that would also be criminalized, and imposing strict penalties. For example, the following activities were made illegal (among others): destroying or damaging forests in permanent preservation areas; cutting trees without official permits; damaging protection areas; causing forest fires; producing, selling, transporting, or releasing gas balloons; extracting minerals in public forests; producing charcoal from hardwood; acquiring wood, firewood or coal without proof that it was produced with a permit; hampering the natural regeneration of forests and the others forms of vegetation; damaging ornamental plants; destroying or damaging the vegetation fixer of dune and protective of mangrove; selling or using unlicensed chainsaws, etc.

In 2000, legislation instituting a national system of protected areas was enacted, establishing criteria and norms for the creation, implantation and management of conservation areas. In the same year, the National Forest Program (PNF) was established and was given high priority by the Federal Government. Its mission is to promote sustainable forestry development, conciliate exploitation with ecosystem protection, as well as to make forestry policy compatible with other public policies. One of the program's objectives is to promote reforestation, recover permanent protection areas, repress illegal deforestation and predatory extraction of forestry resources, and prevent forest fires.

A bill is also currently under discussion in the National Congress that would allow for the regulated private management of public forests. The bill seeks to reverse a common situation in Brazil: the lack of legal regulation and monitoring capacity leads to the effective privatization of public lands as land grabbers find ways to appropriate and occupy land illegally. The bill also seeks to guarantee state sovereignty over these forests: the public forests would remain public, only allowing for concessions to private groups for managed use.

The Brazilian government has implemented other environmental protection programs that include forest management aspects. The Brazilian Biome Conservation and Recuperation Program will promote the implantation of ecological corridors. The Protected Areas Program seeks to create 25 million of hectares of protected areas. The Conservation, Sustainable Use and Recuperation of Biodiversity Program promotes the protection of endangered fauna species. The Climatic Changes and Environment Program includes actions to promote the use of alternative energy sources. The Social and Environmental Development Program (PROAMBIENTE) focuses on family-based agricultural production. Some projects work directly with the Amazon, such as the Amazon Vigilance System– SIVAM, the Land Clearing Detection System– DETER, and the Amazon Protection System– SIPAM.

4. The Amazon Forest: land structure, conflicts and policies

The Amazon forest, the largest and richest tropical forest in the world, includes nine South American countries. Sixty percent of the forest is located in Brazil. Despite its large size, the region has only minor socio-economic importance for the country. The Amazon region accounts for 60% of the Brazilian territory, but it represents less than 5% of the national GDP. The region includes only 10% of Brazil's urban population and about 14% of migrant population, 14% of the nation's roads and 14 % of its cities. The region officially called "Legal Amazonia"¹ is the least populated part of the country, even though it has increased by 13 million people since 1970 (a 172% increase, compared to 82% for the entire country during the same period). Amazonia

¹ The Legal Amazon includes nine Brazilian states : Roraima, Amazonas, Acre, Rondônia, Mato Grosso, Pará, Tocantins, Maranhão and Amapá

continues to represent only 12% of the total population (up from 8% in 1970). Demographic density remains very low: 4.18 inhabitants per square kilometer, compared to 20 inhabitants per km² at the national level. According to Thery (2004), there is only one indicator for which the Amazon's quota is higher than its percentage of territory: the number of land conflict related deaths.

Since the colonial period, the Brazilian Amazon has been the object of systematic extraction of wealth, through different modes of production as well as social and political organization. One consistent trait of the many activities that have prevailed at different moments in the region is that none of these activities actually disappear completely after their period of precedence. For example, the first extractive cycle in the Amazon, known as the “drogas do sertão” (backwoods remedies) period occurred from the early colonial era to the end of the 19th century. The extraction of medicinal products from the region continues, however, to this day. Likewise, the rubber cycle peaked in the early 20th century, but rubber continues to be extracted, although contributing only minimally to the regional economy. Brazil nut extraction, also once important economic activity, continues to ensure the subsistence of the riparian population, along with fishing, hunting, and the collection of fruits for sale on the market.

For centuries, human occupation of the region revolved around rivers, and cities typically appeared at their confluences. In the 1970s, when roads began to be built in the region, this geography changed, with the emergence of settlements along roads and cities at their intersections. The tension between the areas where occupation occurred along rivers and those where expansion along roads took place still plays a role in Amazon social life and politics.

Based on the slogan “integrar para não entregar” (integrate so as to not give away), the military regime in power in the 1970s promoted intense migration to the region through colonization projects. Farmers from throughout Brazil were systematically transferred to that region. Unprepared for life in the forest, the new settlers reproduced and adapted their customary practices. Deforestation in this context was inevitable, since slash and burn agriculture was standard fare for these migrants. At the same time, tax and financial incentives that could not be refused also promoted the expansion of large farms and cattle ranches, with tremendous impact on land tenure patterns. Large properties were handed over to economic groups from the South and Southeast of the country and some of them began to produce for the market.

Ever since the 1970s, the main economic activities of the region include: timber exploitation, agriculture (especially rice, corn and beans), permanent crops (especially cocoa, black pepper and coffee) and cattle ranching. More recently, mechanized grain crops (rice, corn and soybean) have begun to enter the region, starting in the transitional zone between the Amazon ecosystems and the Cerrado, especially alongside of main roads (Belém-Brasília, Cuiabá-Porto Velho and Transamazônica), that have served to supply inputs (fertilizers, pesticides etc.) and that provide access to markets.

During the 1990s, with the exhaustion of the interventionist model of development that began in the Vargas era, a new political situation emerged in the region. The changes began with the creation of the National Council of Rubbertappers. The rubbertapper movement became the symbol of resistance to land expropriation by local populations. Combined with the crisis of the state and international and national environmentalist pressures, this social movement helped promote a new model of development based on sustainability. One result has been the emergence of a multiplicity of local alternative development and conservation projects, with community participation. Such efforts have been supported by transnational networks and other partners, such as nongovernmental organizations, churches, political factions, and the government. Large scale production – so predominant in the 1970s and 1980s, began to share political and economic space with the small scale, family agriculture. This new impulse towards alternative, community-based development means that each local solution is different: projects must be adapted to the local ecosystem, and involve populations with very different ethnic,

territorial, socio-economic and political structures. For the first time, native and traditional local populations begin to play an active role in public policy, as participants in environmental management.

A variety of actors have been involved in promoting such an alternative development project. In addition to the groups mentioned above, the G7, the World Bank, and the Brazilian federal government have also been involved. The first source of large scale initiative in this respect was the Pilot Program to Conserve the Brazilian Rainforest (PPG7), a consortium of over a dozen projects involving several ministries and with multilateral funding, which was initiated in the early 1990s. Around the same time, a special secretariat dedicated to Amazon issues was created in the Ministry of the Environment, the Secretariat of Coordination of Amazon Issues. The work of the Secretariat and the PPG7 have contributed to a dramatic increase in civic and community organizing in the region, as a network of organizations formed to propose and implement alternative projects.

Today, the occupation of the Amazon seems to be entering in a new phase of major changes, involving various interests and conflicts:

- National and international agribusiness has been attracted to the region by the low price of land, the low cost of manual labor, the benefits of large quantities of rain and light; among other advantages. The sectors that have grown most intensely include reforestation and wood products,; grain crops, especially soybeans, and the cattle industry (meat and dairy);
- The struggle of small landless farmers to resist further displacement has been displayed more intensely through invasions of unproductive lands held by large property owners;
- Urgent demands for infra-structure in more populated areas, especially cities, and a generalized moratorium on major infrastructure investments resulting from debt-related fiscal constraint has shifted priorities away from road expansion in the agricultural frontier regions;
- Environmental legislation has become increasingly sophisticated, establishing for example that any major private or public investment must pass through the environmental licensing system.

In sum, we can say that although traditional centralizing and authoritarian practices continue to influence governmental planning, a much larger spectrum of actors now participate in political decision-making.

5. The Cerrado: land structure, conflicts and policies

The Cerrado is known as the last land frontier of the Americas. It has become one of the world's most productive grain producing regions. The region's agricultural boom is based on a development strategy of large-scale mechanized farming. This model has resulted in remarkable growth of the sector, but has also caused intense concentration of wealth and land. Until only a few decades ago, food production in the Cerrado was founded on family labor and the exploitation of more fertile lands for grain production and extensive cattle-ranching. Large cattle ranching and agricultural plantations coexisted with tiny subsistence plots that provided no more than the basic necessities for rural families.

In 1940, the Getúlio Vargas government initiated the first proactive occupation policy in the region, with the creation of agricultural colonies in the states of Goiás and Mato Grosso. Before 1940, the best lands had been destined to the cultivation of rice, beans and corn fields, while the extensive plateaus, characterized by fields and small shrubbery, were destined to cattle-ranching and the extraction of wood, fruits and several species of medicinal plants (THEODORO,

LEONARDOS e DUARTE, 2002). Beginning in the sixties, the Cerrado became a basic food supplier, specializing in rice production. Vast expanses of un-owned land began to be distributed or claimed, especially after the construction of Brasilia increased demand and access to the region.

However, it was only in the 1970s that a new agricultural development policy for the region was initiated in earnest. In 1975 the federal government established POLOCENTRO – the Cerrado Development Program. This program invested major resources in infra-structure (construction of storage facilities, technical assistance, expansion of the transportation system and of the energy network) and other activities (limestone extraction, reforestation). While these official development projects were underway, soybeans began to be cultivated in the region.

In 1980, two other major projects, PADAP – “*Programa de Assentamento Dirigido do Alto Paranaíba*” and PRODECER – of the Japanese-Brazilian Cooperation Program for the Development of the Cerrado were initiated. These programs contributed to the development of an intensive production model in the Cerrado, with the utilization of advanced technologies (intense mechanization, adapted seeds, access to macronutrients). Intensive production expanded when new technologies made soybean production viable in lands with low fertility. This expansion was directly associated with the growing precedence of a land-use model based on large properties. At least 1,200 hectares were considered necessary for soybean production to be economically viable. The low price of land in the region combined with official incentives and the favorable conditions of the market quickly made soybean the most profitable crop in the region. In 1980, the Central West region was responsible for 20% of the national soybean production. In 1990 that percentage was above 40% and in 2003 it reached around 60% (SALOMÃO, 2004).

Soybean cultivation occurs in the Cerrado predominantly on large plantations: 51.3% of farms are larger than 1,000 hectares; the average farm size is 2,114 hectares; 31.3% of farms are between 1,001 and 3,000 hectares in size. About half of the producers own their own farms (WEHMANN & DUARTE, 2002).

Privileging large scale, technologically and energetically intensive and socially exclusionary production has raised new problems. This model neglects environmental consequences. For small producers, that have great difficulty in participating in the increasingly competitive market, the super-exploitation of the natural resources has become the only way to compensate for the technical fragility of the production process (IBAMA, 2002).

From the ecological point of view, irreparable harm can result. The environmental impacts include deforestation, including of riverside vegetation, essential for protection of water resources; indiscriminate exploitation of flora and fauna; abusive use of pesticides and fertilizers in agriculture and of mercury in gold mining, contributing to soil and water contamination; loss of springs and other water sources; and others. The process of soil erosion and the sedimentation of rivers and other water bodies are continuous, reducing water flows and affecting biodiversity. In addition to these problems we have the construction of hydroelectric dams and the expansion of urban areas. Water shortages are also a risk, since the humid Cerrado ecosystems play a particularly important role in the recharging the regional aquifer and in producing the headwaters of several of Brazil’s largest river basins.

Another aspect of transforming land use in the Cerrado region is accelerated urbanization. In only three decades, the urban population of the Center-West Region of Brazil increased by 780%. The process has been disorderly, and has also lead both to environmental degradation and to unequal distribution of the profits and benefits of economic growth. Urbanization results both from the “rural exodus” – migration from the interior that results from land concentration and from the inability of the dynamic agricultural sector to absorb local labor – and from migration from other regions of the country.

The Cerrado is also the birthplace of a utopian urban project – Brasília. Now over four decades old, however, Brasília has reproduced the perversity of the Brazilian model of modernization: the city is characterized by extreme social inequalities, overpopulation, irregular land use, unemployment, violence and social exclusion.

The process of occupation of the Cerrado region can be viewed as a laboratory for analyzing Brazilian problems. Put simply, economic viability has come at the cost of environmental degradation and social injustice. In this sense, fostering “green governance” seems to be a solution to the dilemma of having to choose between economic development, environmental protection and social justice.

6. Conclusion

This paper sought to present a general panorama of forest resource management in Brazil. The economic and social processes underlying the occupation of Brazil’s vast territory have generally resulted in environmental conflicts around forest resources use. We have emphasized these impacts in two Brazilian Biomes, the Amazon and the Cerrado, the two ecosystems most threatened by the current model of economic growth.

Our analysis of state efforts to confront these problems shows that although there have been advances, these have largely been limited to the creation of legal norms and regulations, unaccompanied by effective measures for enforcement. For example, the National Environmental System – SISNAMA – is an extremely coherent legal framework for environmental management. Many of the institutions that operate within the system, however, are fragile and coordination among them is often weak. Problems have been especially intense in relation to implementation on the ground, where popular participation, local autonomy and stakeholder involvement were expected to operate best. Various evaluations since the UN Conference in Rio in 1992 have shown that the main obstacle to disseminating the idea of sustainable development has been the fragility of governance mechanisms.

The Amazon region, historically subjected to predatory occupation, has become the target of conflicting international interests. On the one hand, international NGOs and religious groups guided legitimate environmental consciousness implement many projects in the region; on the other hand, new economic interests have been attracted to the region as biodiversity has gained value as a source of science, technology, money and power. Globalization has created new markets for biotechnology (and for bio-piracy). It has also been the context within which a new paradigm of sustainable development has emerged that gives value to the Amazon for its own sake. International organizations can be found supporting both visions.

With respect to the second largest biome in Brazil, the Cerrado, we have highlighted the unsustainability of land use and agriculture patterns. The Cerrado is not considered national patrimony – a status which the 1988 Federal Constitution gives to the other biomes – and it is widely perceived as having little ecological value. NGOs, political groups, international agencies and government have therefore paid much less attention to the potential for sustainable development and local governance efforts in that biome. Promoting experiments in environmental governance and increasing our knowledge about the Cerrado and ways to face its environmental problems is therefore all the more urgent. Developing a study of “Green Governance” informed by the experiences of other regions and countries can help us confront these environmental, social and economic challenges today.

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