

forest, all the while maintaining the objective and investigative spirit of true journalism. The result is a useful synthesis of the best available statistics and scientific studies to support the efforts of those who – within governments or in civil society – are trying to conserve the forest.

With its detailed graphics and documentary style, this book reveals how pervasive fraud has traditionally controlled timber production, transport and trade. We also demonstrate the ingenious ways in which good practices are spreading and building a new economic model that reconciles development and conservation.



Illegal logging in the Amazon has long attracted the attention of environmentalists in Brazil and abroad, but the issue is becoming increasingly urgent. Climate change and other challenges faced by the planet in the 21st century mobilize businesses and require a new approach by the government to fight predatory uses of the forest. Fraud takes many forms, from the initial timber harvest to its final use in furniture and construction, which complicates efforts to stem and control illegal trade. This challenge requires a broad effort to ensure the conservation of natural resources for future generations.

Wood - From the forest to the consumer



From the forest to the consumer

How to address the swirl of interests, emotions and actions surrounding the most important tropical forest in the world? The Amazon Forest reveals innumerable dilemmas that our interconnected planet faces today. One of the most pressing matters is associated to wood and its economic applications – an issue that encapsulates the challenge of conserving natural resources for future generations.

Addressing these issues is the mission of the Friends of the Amazon Network, an initiative by the Center for Sustainability Studies and the Center for Public Management and Government Studies at the Getulio Vargas Foundation. The network uses information as a strategic tool to mobilize governments, businesses and society as a whole towards changing attitudes.

We went deep into the Amazon in search of the stories behind the figures that describe the

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WOOD

From the forest to the consumer

First Edition

São Paulo
FGV RAE
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Preface

Illegal logging causes a number of environmental and social damages in countries where wood is sourced from native forests. Logging in protected areas is an act of irresponsibility that exacerbates the loss of biodiversity. In addition, uncontrolled deforestation and bushfires may aggravate climate change, not to mention the negative effects they impose on local populations, such as the impoverishment of rural communities whose livelihoods depend on forest products.

Several studies show that Brazil ranks high in terms of irresponsible use of natural resources, including native wood from the Amazon.

Even more worrisome is the fact that the state, despite being responsible for regulating logging activities, is one of the largest consumers of native wood, which subverts the goals of any government committed to sustainable environmental management.

By monitoring the development and impacts of illegal timber production and consumption around the world, the Friends of the Amazon Network – an initiative by the Getulio Vargas Foundation with support from the British Government and the European Commission – identified a need to describe and evaluate, in a brief and instructive manner, the different mechanisms the state has available to reverse this predatory practice. One of the aspects discussed in this book is the role of civil servants in major efforts aimed at repressing illegal logging and timber production, as well as identifying products derived from these activities in order to prevent their consumption.

This is the purpose of this publication, which uses detailed infographics and a journalistic approach, including interviews and true stories, to outline the complexity of Amazon timber's chain of custody – from logging, processing and transportation to commercialization in the Brazilian market.

In its four chapters, this book offers an overview of the forests and their ecosystem services worldwide, as well as an evaluation of challenges and obstacles inherent to responsible timber production and consumption. It discusses efforts to use technological resources in order to enhance the government's action and to minimize conflicts in the forest, reduce greenhouse gas emissions and reverse the enormous tax evasion resulting from illegal logging.

This challenge is further compounded by the fact that the government is indeed a major consumer of timber. Economic tools have been developed and are available to the government to encourage the responsible purchase of products and services – especially timber – in what is now being called “sustainable procurement”.

In addition to the barriers and challenges posed by illegal logging, we hope that readers will also be able to identify the possible solutions to this problem. There are opportunities for building a responsible business that benefits the forest and the communities that inhabit it, encouraging everyone to participate in the conservation and best use of the environment around us.

Enjoy your reading!

São Paulo, March 4th 2011.

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WOOD

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1 Forests under the spotlight



The world turns its attention to the sustainable economic use of this natural treasure as a guarantor of biodiversity, water, climate, income, and industrial raw materials

Even from afar, a visitor to the Royal Botanic Garden is able to see a large iron structure covered in fogged glass nestled among the extensive lawns, and rose and tulip gardens. The building may resemble a small crystal palace, but it is actually the oldest greenhouse for tropical species built in temperate countries such as the United Kingdom. These are the Kew Gardens, one of the world's most traditional botanical centers, situated on the banks of the River Thames, just a few kilometers from London's pulsating center. Sir Ghilleen Prance, who directed the Botanic Gardens from 1988 to 1999, guides us towards the imposing greenhouse. He explains that the building was finished in 1848, when the British Empire was at its peak. It was during Queen Victoria's reign and researchers at Her Majesty's service in Southeast Asia, South America and Central Africa were sending back species from tropical forests in the farthest corners of the world.

The collection illustrates the importance of forests to the world. From the Amazon, species known for their economic value were taken to the Kew Gardens, such as the mahogany – *Swietenia Macrophylla* – whose wood was the most prized of South America's tropical forests. The Amazon Forest holds hundreds of renowned tree species and most of them are commercially valuable. The fact that these species are so abundantly represented in botanical

collections abroad reflects something else other than past efforts to conserve the global genetic heritage. These collections reflect the strategic importance of studying and conserving these species, not only for their economic and social value, but for their importance to the planet's climate.

Inside the greenhouse, the chill from London's evening is immediately replaced by humid and warm air. "The temperature is kept at 24 degrees," says Prance. Underneath a mane of white hair, lurks the keen research mind of one of the most renowned botanists specialized in species of the Amazon. In 1964,

Forests are essential to the well-being and sustainability of the planet. However, every year their area shrinks by an average of 13 million hectares

after taking part in an expedition to the forests of Suriname, he arrived in Brazil to start research in partnership with the National Institute of Amazon Research (INPA in the Portuguese acronym), founded a decade before in Manaus.

"I got to Brazil just as the cycle of large scale deforestation was beginning, advanced mainly by government projects

such the Trans-Amazonian highway," he says. Prance witnessed the onset of an accelerating process of destruction that today, many decades later, has already destroyed 17% of the original forest – an area equivalent to three times the state of São Paulo.

Making sure that species from the Amazon are protected in botanical gardens allows future generations to get to know them, but it does not mean that today the impacts of deforestation on ecosystems are smaller than before. On the contrary, forests are constantly threatened by fragmentation, deforestation, fire, climate change and loss of biological diversity.

Despite the slower pace of deforestation seen in the last decade, absolute numbers are still high. The latest report from the United Nations Food and Agriculture Organization (FAO) published in 2010, shows that the average forest area cleared annually has fallen from 16 million hectares in the 1990s to 13

million hectares over the last 10 years. In sum, every year an area equivalent to one and a half times that of Portugal is lost. South America and Africa are the leaders and account for more than half of global deforestation.

This situation is worrisome because those regions contain the largest areas of native old forest for future logging. This natural preserve is under continuous pressure. In parts of the world that have a longer history of using forest resources, such as Europe and Asia, current efforts focus on reforestation and recovery. On these continents, in spite of some gains in forested area, there are still high rates of deforestation in order to meet world demand for energy, wood and other forest products.

Nature's cornucopia

Forests are terrestrial ecosystems essential for the survival of thousands of living creatures. Native or planted forests cover one third of the Earth's surface and their distribution is concentrated in five countries: Russia, China, Brazil, Canada and the United States. These refuges with diversified landscape and climate support the reproduction of life and hold more than half of all animal and plant species in the planet.

When we think about this expanse of green it is natural to immediately connect it to the necessity of protecting biodiversity. However, the benefits of conserving forests are much larger than simply saving species. Forests perform ecological functions essential for the planet's well-being – services ranging from the supply of clean water to cities to the production of timber for building houses and furniture, as well as the manufacture of cosmetics and a wealth of other common products that depend on the health of ecosystems. These services contribute to the climate's stability and are essential factors to food production such as rain patterns, soil stability, nutrient accumulation, pollination and pest control.

Natural abundance is on display everywhere in the Brazilian Amazon, mirroring the diversity of the landscape. The forests are dense and open, part

of a mosaic of ecosystems: floodplains, freshwater swamp forests, wetlands, Cerrado and mountainous refuges. The forest is an enormous repository for commercially valuable wood, as well as other forms of carbon, a strategic “commodity” in the fight against climate change. The region is irrigated by the world’s largest river network, which contains 15% of the planet’s potable water – a resource that is becoming scarce due to pollution, population increase and economic growth in emerging countries. The Amazon also holds significant potential to use water to generate energy. The region’s capacity is estimated at 105,500 MW – a third of the current installed capacity for hydroelectric production in Brazil according to the National Agency for Electric Energy (Aneel).

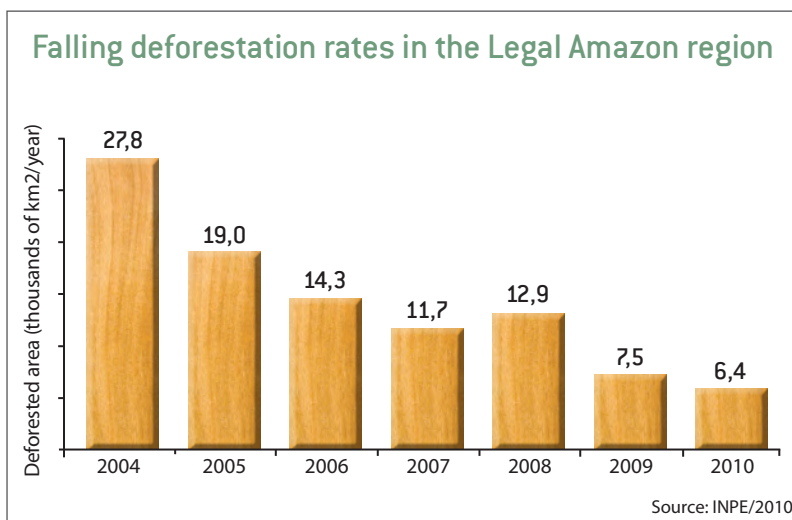
Despite its important role for the stability of global environment, the Amazon, like other tropical rainforests, is targeted for destruction. Approximately 40% of global forests were cleared in the last century. According to UN researchers, the pace of extinction may have negative effects on the economy and on the stocks of food and water crucial to the growing human population, which is estimated to reach 9 billion by 2050. The effects of rainforest destruction are global and not limited to some far-off future. Scientific studies carried out by researchers at the University of São Paulo indicate that changes in forest cover in the Amazon have effects on the rain patterns elsewhere in Brazil, such as parts of the Midwest, the Southeast and the South. These regions support most of the agriculture production and the population vulnerable to disasters like floods and mudslides.

Although the use of tree plantations to supply timber for industrial uses is increasing, the world largely consumes timber from native forests. It makes sense then to ensure that its extraction is done sustainably. The world has lost a third of the genetic resources used for agriculture and food production in the last century. The UN’s Millennium Ecosystem Assessment, compiled by researchers from several countries, shows that of the 24 ecosystem services crucial to human survival 60% are in a state of advanced degradation. The human population consumes 25% more resources on average than what the planet

can naturally replace, causing negative effects for the quality of life and the supply of raw materials to industry.

The magnitude of these threats has moved the issue beyond the narrow confines of environmentalists' circles and into the realm of strategic planning by governments and the business agenda for companies. Because consumption is one of the causes of biodiversity loss, conservation efforts must involve economic activities and society as a whole. "Demand creates supply," says the coordinator of the Center for Sustainability Studies at Fundação Getulio Vargas (FGV), Mario Monzoni. That is also true for environmental issues such as the harvesting of native trees. "The impact of consumption is still marginal, but increasing," adds Monzoni.

The responsible production and consumption of timber are directly related to the challenge of conservation and, at the same time, of ensuring humanity's well-being. It is indispensable to advance on that front if we are to meet the Millennium Goals by 2015, as set by the UN. We will need to double the efforts, according to Bill Jackson, deputy director general of the International Union for Conservation of Nature (IUCN), the oldest and largest



environmental organization in the world. He agrees that some advances were made by 2010, deemed the International Year of Biodiversity. "There certainly are a number of innovative policies for the management of forest resources arising in different countries," he says. On the other hand, Jackson points out, "it seems that governments haven't yet understood that containing deforestation and its impacts on biodiversity is a condition to reduce poverty and misery".

The destruction of natural ecosystems causes losses of 4.5 trillion dollars every year, and has impacts on forest production and the income of the poor

Ecosystem services supplied by forests, despite being crucial for human survival, are largely ignored and have no assigned economic value. An initiative by the United Nations Environment Programme (UNEP) attempted to change this state of affairs in 2009 and 2010 by answering the question, "How much is biodiversity

worth?" A group of experts from all over the world, led by Pavan Sukdev, chief-economist for investment funds at Deutsche Bank, produced a series of reports entitled "The Economics of Ecosystems and Biodiversity" (TEEB). More than once during his lectures, Sukdev, a British citizen of Pakistani origin, explained that the study does not necessarily seek to establish a price for forests, but rather to ensure that society acknowledges its value. "If the goal was only to give forests a price, we would have an immediate response: the price is infinite, inestimable," he usually says.

However, the study came up with a value, based on economic activities related to the forest, to show the costs of deforestation. The conclusion is shocking: the destruction of vital ecosystems costs between 2.5 and 4.5 trillion dollars every year.

Nevertheless, there is reason for hope. On the positive side, the study found that there is increasing use of payments for ecosystem services as a

tool for conservation, mainly in areas under intense deforestation pressure. It is clear that these pristine areas are important for the livelihood of rural communities, especially in developing countries. According to the TEEB study, ecosystem services account for 47% to 89% of income of the poorest people, a segment of the population that occupies the frontline in the supply of forest products, including wood.

The numbers are alarming. Nonetheless, they could have a different scale if policies and tools for sustainable production and consumption of forest products were put in place. Studies demonstrate that forests are the origin of approximately 5 thousand commercial products. The forestry sector alone accounts for 2% of the global economy according to the Millennium Ecosystem Assessment published in 2005.

The economy of the forest

Timber products account for most of the income generated from forests. FAO's data indicates that between 2003 and 2007, the forestry sector's revenues exceeded 100 billion dollars annually. Since 1961 global exports have increased 25 fold. The value of non-timber forest products, especially food, was estimated to be 18.5 billion dollars in 2005.

In Brazil, the forest economy involves substantial numbers and affects the social and economic conditions in the Amazon, home to 21 million people. Timber logs are an important resource and account for almost half (47%) of revenues from the use of native forests in Brazil as a whole. In the Amazon, that proportion reaches two thirds of revenues. These numbers were extracted from research done at the Federal University in São Carlos and at the School of Agriculture Luiz de Queiroz at the University of São Paulo. Aiming to build a social matrix for the Legal Amazon (a socio-geographic division that covers the entire Amazon Basin), the study shows the importance of forestry to social development in the Amazon, a region that covers 59% of the country's territory but accounts for only 14% of its Gross Domestic Product (GDP).

The production of timber from native trees is a significant source of jobs and income in the forest, as well as throughout the supply chain until the product reaches the consumer as furniture, new houses or buildings. However, Amazon production has been declining in recent years according to the Forest Facts 2010 report by the Institute for Men and the Environment – Imazon (see chapter 2). Several factors explain this decline, among them the strengthening of the Brazilian real against the American dollar and increasing efforts by the government to stop illegal logging.

Production numbers for the whole of Brazil reveal the enormous size of illegal activities within the logging industry, past and present (see chapter 3), as well as the significant potential for sustainable management. The latter is a viable and legal way to supply industries with forest raw materials and reclaim the space previously taken by illegal activities.

Protection strategies

Natural stocks are immense. The Amazon holds more than 356 million hectares of natural forest and 84.7% of the native wood available in all of Brazil's biomes according to the Brazilian Forest Services (SFB). Most of these resources might be used sustainably, given that the government finds solutions to landholding issues and other problems that limit progress in the region. If the forest is managed for low impact – and that tool is used as a mechanism to increase the value and conservation of natural resources –, there are billions of dollars to be made.

Many countries protect their forests to secure fresh water sources and to reduce the spread of degradation, which affects one fourth of the planet's soils. Conservation reduces erosion of riverbanks and slopes, and regulates the infiltration during groundwater recharge, says the Convention on Biological Diversity (CBD). The water supply of 35 of the world's largest 105 cities comes from forested watersheds.

Deforestation could dry up the natural springs that feed rivers, cause

the silting of rivers, seriously damaging fresh water supplies. Forest conservation measures are important because three quarters of the world's accessible fresh water come from forested watersheds. However, only 8% of these areas are located inside parks and reserves where soils and water are protected. Most of these protected areas are in Asia – mainly in China –, a continent that strives to supply water to ever increasing industries and populations. In Africa, ecosystem protection is also aimed at reducing the process of environmental degradation that leads to water deficits.

In addition to protecting water sources, forest conservation efforts also focus on biodiversity. Today there are 463 million hectares under protection due to biodiversity concerns, 20% more than a decade ago. Success in maintaining fauna and flora species relies on the existence of primary forests,

A WARNING AGAINST POVERTY

The majority of municipalities that produce timber in the Amazon live below the poverty line, despite the richness and economic potential of their forests. The more illegal and predatory activities present in any given municipality, the lower its Human Development Index (HDI), shows research done by the Institute for Men and the Environment (Imazon). "The State of the Amazon" study, published recently by Imazon, evaluates the region according to efforts aimed at reaching the Millennium Development Goals – targets related to inequality, health, education and infant and childbirth mortality set by the UN in 2005. A

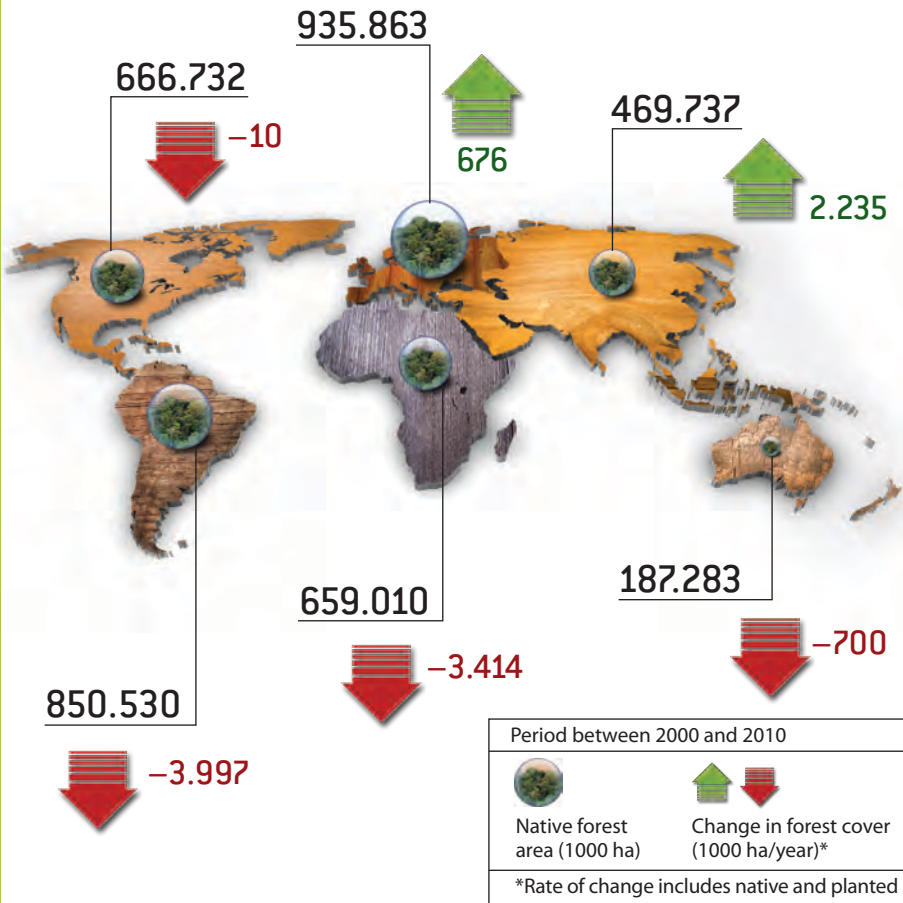
total of 25 indicators were considered in the assessments of forest municipalities in the period from 1990 to 2009. Overall, these municipalities revealed poor scores, well below the national average, including the lack of basic sanitation, high rates of malaria and AIDS, and a disadvantaged status of women with respect to work benefits and participation in politics. There was some progress in reducing rates of deforestation and creating new protected areas. However, social inequality is still significant: the richest 1% of the population received 10.7% of the total income in the Amazon in 2009, while the poorest 50% received 15.1%.

those that have not yet been exploited and still keep their original characteristics. More than one third of forests on the planet are primary forests, according to a FAO report that does not include forests in the Congo, Cameroon, and Venezuela. Regionally, South America has the largest concentration of primary forests, followed by Central America, North America and Europe. The world has a reasonable amount of forestland and a portion of this total is suitable for economic use. What is worrisome, however, is the fact that in one decade the planet lost 40 million hectares of forest – with most of the effects concentrated in tropical countries with high rates of biodiversity.

The largest net loss of forests in the 1990s occurred in Brazil and Indonesia, but both countries have since reduced the pace of deforestation. In 2009, forest areas cleared in the Amazon were 42% smaller than in the previous year, calculates the National Institute for Space Research (INPE). In 2010, the rate of deforestation fell to the lowest level in 20 years and the total area cleared that year was 13.6% smaller than in 2009. Still, a total of 6.4 thousand square kilometers, an area equivalent to 80% of the metropolitan region of São Paulo, was deforested. Despite the descending curve in the last couple of years, satellite images show that deforestation almost quadrupled in the second half of 2010 compared to the same period from the previous year.

Is the downward trend turning around? Whatever the answer, the numbers demonstrate that there is much to be done. Deforestation is usually preceded by fire or predatory logging and the Amazon forest is always under pressure. It is a never-ending story with a complex plot that began in the 1970s and 1980s with developmental drive of the military government, which built roads and encouraged mass migration by promising settlers Eldorado. The environment had to be conquered at any cost. Trees were felled to give way to the new era and logging financed the establishment of pastures and later, farmland. Public land grabbing, squatting and thuggery were the norm and turned the forest into a no man's land. This lawlessness is Brazil's

The world's native forest



Source:AO/2010

2.5 to 4.5 trillion U.S. dollars

per year are lost with the destruction of vital ecosystems (source: TEEB, 2010b)

US\$ 100 billion

is the total revenue per year of timber industry worldwide (source: FAO, 2010)

US\$ 2.5 billion

was the gross revenue of the logging industry in the Amazon in 2009 (source: Imazon, 2010)

main environmental problem and must be defeated before any real progress against deforestation can be made.

The perverse cycle of destruction lasted for decades, mired in chaotic land arrangements, until the world turned its attention to the Amazon and asked how a forest so essential to the planet could be destroyed in such a wanton fashion. One indicator of this abuse is in the production of timber, mostly of illegal origin and without any environmental regulation. The situation is serious but not irreversible. In face of the environmental dilemmas of the 21st century, scientists and public administrators are presenting solutions to change the region's fate. More restrictive legislation created new control mechanisms to limit destructive practices. Different sectors of civil society formed alliances such as the "Zero Deforestation" movement, launched by seven organizations in 2007 with the aim of stopping deforestation by 2015.

Forest management is one of the most widely used tools to reverse the economic drivers behind deforestation of tropical forests in Brazil and other countries. Forest management establishes rules and methods for the low impact production of timber and non-timber products. Followed correctly, these rules and methods help to maintain the ecological conditions necessary for the supply of ecosystem services and the future economic use of the forest (see chapter 2).

Besides contributing to the sustainable use of forest resources, forest management aims to reduce the pressures from illicit incursions into indigenous territories, national parks, ecological reserves and other conservation areas. In this way, forest management also contributes to biodiversity protection.

There is a large global effort to increase forest cover within protected areas, which have doubled in size in the last 20 years, according to FAO. However, predatory use of forest resources is still the norm, the result of economic and cultural circumstances as well as chronic problems such as lack of skilled labor, governance and political will. In order for these problems to

be overcome, a behavior change is necessary by all parties involved in the forestry chain, from the producer of forest products to the industries, including environmental agencies' inspectors, civil servants who buy wood for public works, and consumers at the end of the line.

In addition to protected areas, payment for environmental services that replace predatory activities and forest management aimed at reducing the impacts of commercial exploitation, conservation strategies are also part of the frontline of public policies – be it for better enforcement and governance, or as a driver of economic, social and environmental change. At the core of this process, there are market and governance instruments that encourage the sustainable use of the forest. This is the case of responsible public procurement and socio-environmental certification – a seal that distinguishes forest products whose manufacturing takes people and the environment into

| Vegetation cover in the Legal Amazon region in 2009 | | | | |
|---|--|----------------------|---------------------------------|---------------------|
| State | Area (thousands of km ²) | Vegetation cover (%) | | |
| | | Forests | Non-forest native vegetation | Deforested areas |
| Acre | 152,6 | 87,0 | — | 13,0 |
| Amapá | 142,8 | 78,3 | 20,3 | 1,4 |
| Amazonas | 1.570,7 | 87,0 | 10,6 | 2,4 |
| Maranhão | 249,6 | 15,6 | 42,3 | 42,1 |
| Mato Grosso | 903,4 | 33,9 | 43,5 | 22,6 |
| Pará | 1.247,7 | 72,0 | 7,8 | 20,2 |
| Rondônia | 237,6 | 54,1 | 11,8 | 34,0 |
| Roraima | 224,3 | 61,7 | 34,7 | 3,6 |
| Tocantins | 277,6 | 6,2 | 83,6 | 10,3 |
| Legal Amazon | 5.006,3 | 62,7 | 22,5 | 14,8 |

Source: Forest Facts 2010/Imazon

consideration (see chapter 4).

In the wake of climate change

With climate change on the agenda, forests became central due to their relation to the carbon cycle. Deforestation and forest degradation are responsible for large emissions of greenhouse gases. Thus, maintaining the integrity of forest ecosystems is vital to mitigation and adaptation to already occurring climate changes. The UN Framework Convention on Climate Change (UNFCCC) estimates that the planet's forests store 628 Gt of carbon, or twice as much as emissions cut by Europe from 1990 to 2008.

Trees capture carbon from the atmosphere during photosynthesis, but fire and deforestation release that carbon back into the environment. In the 1990s, total emissions due to deforestation were substantial: 5.8 Gt yearly, the equivalent to almost 10% of all carbon stored in forests around the world. Because this number went up, more recently it has been agreed that avoiding forest destruction might be the most efficient alternative to reducing emissions in the short term.

Brazil holds 20% of the carbon stored in biomass, which is the mass of all living organisms on Earth. Ever since discussions first started around a global agreement to cut greenhouse gases emissions, these numbers attract attention to the Amazon, where emissions due to land use changes include not only the clearcutting of forests but also forest fires. In 1997 when the Kyoto Protocol was signed, however, member countries to the UNFCCC decided to exclude the issue from the list of measures designated to mitigate emissions, pointing to the difficulty in efficiently monitoring large scale emission cuts. It took eight years before a coalition of tropical countries, led by Costa Rica and Papua New Guinea, was able to get a proposal to cut emissions due to deforestation back on the agenda. That was 2005 in the UNFCCC meeting in Montreal.

The proposal has received official support from several countries over

the last five years and it is now known as REDD – Reducing Emissions from Deforestation and Forest Degradation. This scheme involves financial compensation through projects supported by international partnerships aimed at cutting greenhouse gas emissions by stopping deforestation, conserving natural forests and reforesting of degraded areas. An advanced program known as REDD+ provides compensation for the sustainable use of forests and opens a range of opportunities to expand the use of forest management as an emission cutting tool.

The ultimate goal of these mechanisms is to establish an environment in which the difference between felling and planting, or regeneration of forests is zero. There is potential for 27 billion dollars in annual investments in schemes to cut emissions from deforestation by 2020, according to a 2008 study commissioned by the British government from a team led by businessman Johan Eliasch. A third of this amount could be raised in the carbon market and could be used to encourage farmers, settlers with the land reform program, and traditional communities to preserve, with potential to cut global deforestation of tropical forests in half.

There is still a long way to go. For the REDD mechanisms to generate benefits, it is necessary to strengthen governance and enforcement to end illegal activities. However, there are some positive indicators. In 2008 the Brazilian government created the Amazon Fund to collect donations to prevent and fight deforestation. During the 15th meeting of the parties to the UNFCCC in Copenhagen the following year, Brazil announced that it will cut deforestation in the Amazon by 80% from 2005 levels by 2020. The commitment is associated with voluntary targets to reduce greenhouse gas emissions and should have effects on logging activities. There is expectation

As part of the efforts to curb global warming, forest management may offer economic benefits in the carbon market

of new rules, control methods, incentives and national and international market requirements, which will reflect on the practices employed throughout the supply chain up to the consumer.

This is the onset of a new era for the logging industry. The UN declared 2011 the International Year of Forests, which should expand efforts to increase forest conservation and in turn, their benefits to human beings. "Biodiversity conservation requires not only the engagement of the government, but of all segments of society," says WWF Brazil's Conservation Director Claudio Maretti. "It is necessary to create protected areas with restricted use

Brazil's commitment to cut carbon emissions from deforestation will promote best practices for timber production

and we have made some progress on that front, but this is not the only piece in the game," he adds, emphasizing the importance of using economic policies to change production and consumption patterns. He also points to the challenge of increasing the economic value of forests and their products so they can be used

without damaging the environment. The challenge is to increase the scale and change the state of affairs, in which less than 1% of the value of industrial products originating from biodiversity remains in the forest. "Without sustainable use, we will burn our most valuable asset".

SUMMARY

■ THE IMPORTANCE OF FORESTS

Native forests are essential to the water supply, to the supply of raw materials to industries and to the keep the balance of the climate. Despite that, 40% of forests have been destroyed over the last century.

■ IS DEFORESTATION DIMINISHING?

Law enforcement and the appreciation of the Brazilian currency largely explain the halving of deforestation in the Amazon between 2008 and 2010. However, satellite images show that destruction has been gaining pace since the beginning of 2011.

■ DESTRUCTION BEGETS POVERTY

The world loses 4.5 trillion dollars a year due to damage to natural assets. Deprived of income alternatives, local communities practice economic activities that damage the forest.

■ LOSS OF BIODIVERSITY

Most of the destruction occurs in tropical forests that are rich in biodiversity and important economic resources such as timber.

■ STRATEGIES FOR CONSERVATION

Forest conservation strategies include the establishment of protected areas, the use of sustainable forest management practices and the payment for ecosystem services supplied by forests.

■ CLIMATE CHANGE

Brazilian forests hold 20% of all carbon on the planet. The country has the opportunity to become a leader in forest management and benefit from projects that reward conservation..







Opportunities, obstacles and power of new attitude towards legal timber, from logging to consumption

A

Adelaide Fátima, owner of the Canaã timber company in Rio Branco – capital of the state of Acre, in the Amazon region – caused a stir when over a decade ago she decided to no longer use the products of illegal deforestation in her business. Fátima received economic incentives from the state's government and opted instead for wood harvested according to sustainable forest management techniques, which lower the impact of logging on ecosystems and allow trees to regrow for future use. She faced relentless reaction. "I was even expelled from the loggers' union," says Fátima. Nowadays she is the president of the state's association of industries that use timber from forest management (Asimmanejo). The entity was founded by a small but ambitious group of entrepreneurs who envisioned a new era for the logging business. "Aware of the commercial success of competitors who chose timber from forest management and facing market requirements, skeptical entrepreneurs joined soon after," she says.

The sustainable use of native forests has been a recurring issue in Acre's history since the assassination of community leader Chico Mendes in the town of Xapuri in 1988. His death exhibited to the world the struggle of Amazon's rubber tappers against powerful lobbies that backed the forest's destruction. More than two decades on, the state of Acre adopted the forest's economy as

its cultural identity and as a driver for development. Today 95% of timber is obtained through methods that do not destroy the forest. The remaining 5% still originates from deforestation and it primarily comes from small-scale properties, according to official data.

Timber companies made this scenario possible by establishing a pact to stop predatory deforestation. With money from the Pilot Program to Conserve the Brazilian Rainforest (PPG7) – an initiative funded by rich countries –, for two years they invested in training people, upgrading their businesses and disseminating forest management practices. “There was no turning back, we either made our businesses legal or we would have to shut down,” says Fátima. She has been investing further. In general, timber companies in the region buy

Timber companies received financial support from the government and NGOs to make a pact to stop deforestation and shift to sustainable wood production

timber from landowners who had a harvesting plan approved by the state environmental agency. “Now, instead of buying from them, we will apply to have 2.7 thousand hectares in the municipality of Sena Madureira licensed,” she says.

She will pay 1.7 million reais in rent to the landowner to produce 45

thousand cubic meters of timber logs for two years, generating an estimated net profit of 1.4 million reais. “We will start other projects in our own areas, acquired in remote hard to reach areas, as soon as the state improves the roads,” says Fátima. Her ambition is to supply timber for the housing projects included in the federal government’s Growth Acceleration Program (PAC).

The association headed by Fátima focuses on improving techniques, raising support, searching for incentives and exchanging experiences based on the best practices as ways to turn the supply chain of sustainable wood into a viable business. “If in the past there were 50 timber companies that harvested only cedar, mahogany and Brazilian cherry, today the 23 companies in the state that apply

forest management techniques use more than 20 species, relieving the pressure on overused stocks," explains Fátima. She points out that the Amazon is not an uninhabited green expanse and as a significant income source for the local communities, timber production should be encouraged. However, the reputation of the timber industry, despite the use of conservation techniques, is still linked to the destruction of the forest.

Before migrating to Acre in the late 1980s, Fátima and her family illegally harvested wood in the state of Rondônia. They had come from the state of Paraná, in southern Brazil, to work using the wood left behind by ranchers establishing their pastures. "We even went into Paraguay looking for peroba wood," she admits, looking proud for having changed her ways. Time has gone by, but there is still a lack of information and prejudice. "My daughter has chosen to major in Forest Engineering in college to be able to keep the family's business in the future, but she is sharply criticized in school for coming from a logging family".

Problems such as the prejudice against Fátima's daughter will soon end if the timber industry keeps operating legally. Just a couple of years ago, images of forest fires in the Amazon, as well as trees being felled by tractors equipped with chains were common fare on television. It will take some time to reverse this perception as society fully comprehends the benefits of sustainable timber production. Meanwhile, governments, businesses and NGOs support the path to a new industry with policies and concerted action. As an example Fátima points to the recent ecological-economic zoning conducted in Acre with an eye to regulate land use and encourage the establishment of legal forest reserves, especially along highways, as a way to contain deforestation. "Once land tenure is sorted out, land owners are able to overcome obstacles that prevented them from adopting forest management, and that increases the number of areas available," she explains.

As a result of the move by timber companies towards forest management, as well as the increased demand for sustainable timber, production in the state of Acre doubled from 170 thousand cubic meters in 2008 to 350 thousand cubic

meters of logs in 2010. The area licensed for logging increased by a factor of ten over a decade and there is need for new investment. "There is no lack of forest to explore, as long as you keep in mind a diversified use of natural resources and social inclusion," says Acre's Environment Secretary Sérgio Resende. Acre has a big advantage in this, as forests cover 90% of the state's area and half of them were declared protected areas. Private properties hold 1.8 million hectares of forests, an area equivalent to 15 times the size of the city of Rio de Janeiro. Half of those private forests have received licenses for sustainable use.

The state of Acre offers forests and incentives for legal logging

The rest of Acre's vast territory is composed of public and community areas. This includes the strategic Antimary State Forest was the first to receive certification from the Forest Stewardship Council (FSC) that attests to its products' sustainable origin. Timber companies and indigenous communities that obtained harvesting rights through public concession have been using Antimary State Forest's area of 76.8 thousand hectares since 2004.

In contrast with the federal management of forests, Acre's model is based on exploration by third parties, while the state is responsible for auctioning the timber off to sawmills and industry for processing. Families that live in the forest receive part of the auctions' revenue and are allowed to sell the logs they are able to harvest in their parcels, as well as receiving training in forest management. Harvesting is only allowed during dry months and generates between six and eight thousand reais for these families. "Local communities feel the real pocketbook effects [of this system and] choose to preserve the forest," says Secretary Sérgio Resende.

The first Brazilian forest reserve was created in the areas surrounding the Antimary River in 1911 and it has been important ever since. Declared a state forest in 1997, the Antimary Forest yields 22 thousand cubic meters of timber logs annually – more than half that volume is exported. The potential yield is

much larger however, with the current licensing permitting the production of 700 thousand cubic meters a year. "Large production in public forests is strategic to controlling lumber stocks and prices," explains Resende. Acre's model is also safer from the standpoint of land tenure, a chronic problem that slows the progress of legalized and low impact logging in the Amazon.

With an eye to long-term development, three other state forests are being prepared to go through the public concession process in 2011. They are located in the so-called Gregório River Complex, in the westernmost region of the state and encompass 480 thousand hectares of public land, as well as 150 thousand hectares of private land. The whole complex may receive investment of up to 52 million dollars. The state government tries to attract foreign investors by pointing out advantages beyond abundance of the forest itself: plentiful energy from the hydroelectric complex being built on the Madeira River, as well as the possibility of getting production to port in the Pacific thanks to a new highway connecting Acre to the Peruvian coast.

Potential investors may be lured by land availability, tax incentives and the newly built infrastructure, as well as by the new opportunities created by changes in legislation. Some investors

may migrate from other parts of the Amazon in search of opportunities to operate within the law. Recent examples of the changes to legislation include payments for ecosystem services – payment to land owners and communities for their efforts to conserve nature and thus, water supply, climate balance and biodiversity. By tapping the forest instead of destroying it, there is also the prospect of raising revenue through carbon markets, especially through the REDD+ (Reducing Emissions from Deforestation and Forest Degradation) mechanism (see chapter 1).

**Forest management,
the prospect of gains in
the carbon markets and
payments for ecosystem
services increase land
value**

Land value is the best gauge of the success of forest development. An unused hectare of forest within a radius of 100 km of Acre's capital was worth 70 reais ten years ago. Today, an area of the same size licensed for forest management is worth 500 reais. "Forest production can take us to an enviable level of wealth in just 20 years," predicts Resende.

The value of timber production – which today amounts to double that of livestock and 16% of gross state product – is expected to increase as new

If the challenge of expanding processing capabilities and capacity is met, business revenues and workers income will improve

areas are open to exploration and public works are forced to employ locally produced timber. "Despite the availability of so much forest for legal logging, builders often buy cheaper timber of unknown origin, from other regions," admits Resende.

The overall scenario is positive in spite of obstacles such as the red

tape involved in licensing forest production and the need for public subsidies. Pressure and support from environmental NGOs in favor of sustainable practices have been crucial for the timber industry. "We financed training and the first initiatives in forest management within local communities and even exchanged experiences internationally," says WWF Brazil's coordinator for the Rio Branco office, Alberto Tavares, nicknamed Dande.

A cooperative was created as a result of NGO involvement and today it has a seat at the State Forest Council, which allows its members to influence local policymaking on forest issues. The cooperative also helped businesses to mobilize, organize and go through pilot projects, contributing to make certification a reality for Acre's timber industry. "Right now our role is to link those two sides of the chain – communities and businesses – in favor of collective development," says Dande.

Almost half of the state of Acre – an area of 6 million hectares – could be used for sustainable timber log production, with estimated revenues of 1.8 billion reais annually. Contrary to what such large numbers may suggest, there is no need to irrationally exploit the area and if the state government's plans are an indication, the only way to use this green expanse is to harvest wood using low impact techniques. Each hectare of tropical forest in that area contains on average 200 mature trees and a thousand young trees. From the mature stock, four to six trees per hectare can be removed every 30 years, leaving enough time for the area to naturally regenerate.

From logging to processing of raw materials in sawmills, woodwork shops, plywood and fiberboard factories, the industry numbers 400 businesses in the state and employs 2.5 thousand workers. A state-built factory that produces wooden flooring and decks is now privately operated and adds scale to production in the Industrial Hub of Xapuri. Situated alongside a plant that uses the natural latex produced by rubber tappers to manufacture condoms, the factory produces one container a day of timber products for export and uses 40 thousand cubic meters of logs annually.

Exports doubled from 2003 to 2009, according to government data. The cluster of furniture makers in Rio Branco – Acre's capital – is nationally recognized for taking native forest products to the main domestic consumer markets. A bit farther away, the industrial complex planned for the Juruá River area wants to raise 54 million reais in new business investment.

Extractive communities join the industrial production

The commodity chain for timber includes public nurseries able to produce 4 million seeds annually. Forest production is also supported by services and machinery such as tractors worth 2 million reais bought to mechanize production by indigenous communities.

"In exchange for help to legally produce timber, we are committed to not burning the forest to establish pasture and crops," says Evandro Araújo de Aquino, who supervises Cooperfloresta, a cooperative of 511 families that live off extractive industries. Each family gets 500 reais per year if they join the state's program designed to give forest assets a value. In another initiative, the state pays the cost (6 thousand reais per family), does the planning and gathers documents for the communities to apply for an environmental license to produce timber.

"Once a community area receives a license and is able to practice forest management, [the land] is worth ten times more," says Aquino. Twenty per cent of families already have an FSC diploma that attests to the good management of their land. "We look for partnerships with buyers and international organizations to increase the value for our differentiated product," he adds.

There are some supply problems, such as intermittent production due to extended wet seasons that prevent logging, such as in 2010. Usually communities work for six months during the dry season. Another bottleneck is the lack of infrastructure. "We need at least 150 km of new roads to be able to access the forest, not to mention another 450 km that need upgrading," Aquino complains.

One obstacle is the ambiguous nature of land holdings. As a result of the ineffectiveness of the federal government in solving the problem, extractive settlements are unable to obtain land title and therefore, the license to produce timber. Added to these problems is the lack of organization and administration, the result being that Acre's extractive communities are unable to increase the

scale of their production despite covering a larger area (2.7 million hectares) than public and private owners. Environmental agencies have approved the harvesting of 10 thousand cubic meters of logs per year in community areas, but currently there are only 6 thousand cubic meters being produced. “The situation used to be worse, we used to harvest only a third of that volume before 2009,” Aquino says.

To increase their revenues, communities are going back to an activity they

CHICO MENDES’ HERITAGE

We drove 189 km from Acre’s capital, Rio Branco, to the municipality of Xapuri to investigate what has changed in the forest where Chico Mendes used to live. From the road we saw extensive pastures dotted with solitary Brazil nut trees, showing the power of the cattle ranching business and its advance on parts of the tropical rainforest. In the distance, fragments of preserved forest were still visible.

From Xapuri, it takes another 25 km on dirt and winding roads to get to the Seringal Cachoeira, a rubber plantation that preserves the heritage of Chico Mendes, the rubber tapper leader assassinated in 1988. In the 1980s, the area witnessed clashes between rubber tappers and landowners who wanted to occupy and clear the forest. Today the rubber plantation is a benchmark for forest management and part of the Chico Mendes Agricultural and Extractive Project. There we meet Antônio Teixeira Mendes, nicknamed

Duda, a cousin of Mendes. “I was born in the forest but really got to know it ten years ago, when I started to use forest management,” he says.

The Porto Dias Rubber Association was the first community area to adopt, in 1996, forest management techniques. The Seringal Cachoeira followed two years later and in 2002 was the first to receive a social and environmental label for its timber. With the certification, wood became as important a product for the community as Brazil nuts and rubber. The timber logs are sold for five times more than before receiving the label and today represents the community’s largest income source. “We get everything we need from the forest without destroying it,” says Sebastião Teixeira Mendes. He worked as a rubber tapper for 45 years and now specializes in explaining how forest management works to visitors from all parts of Brazil and the world

The native wood supply chain

Forest

The Forest Law allows deforestation within limits and establishes a Legal Reserve and areas of permanent forest preservation. Timber can also be harvested by selectively cutting trees based on a previously authorized management plan.

Correct harvest

The use of management plans decreases the impacts on forests, helps to maintain genetic stock and allows for future harvest. Regulated by law and directives, forest management plans may be submitted and carried out by the landowner, a timber company or a third party.



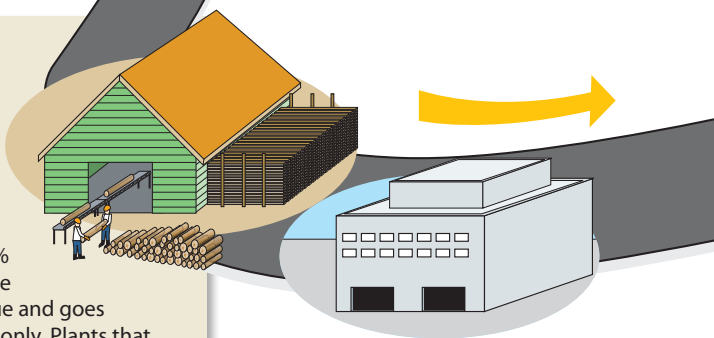
Transportation

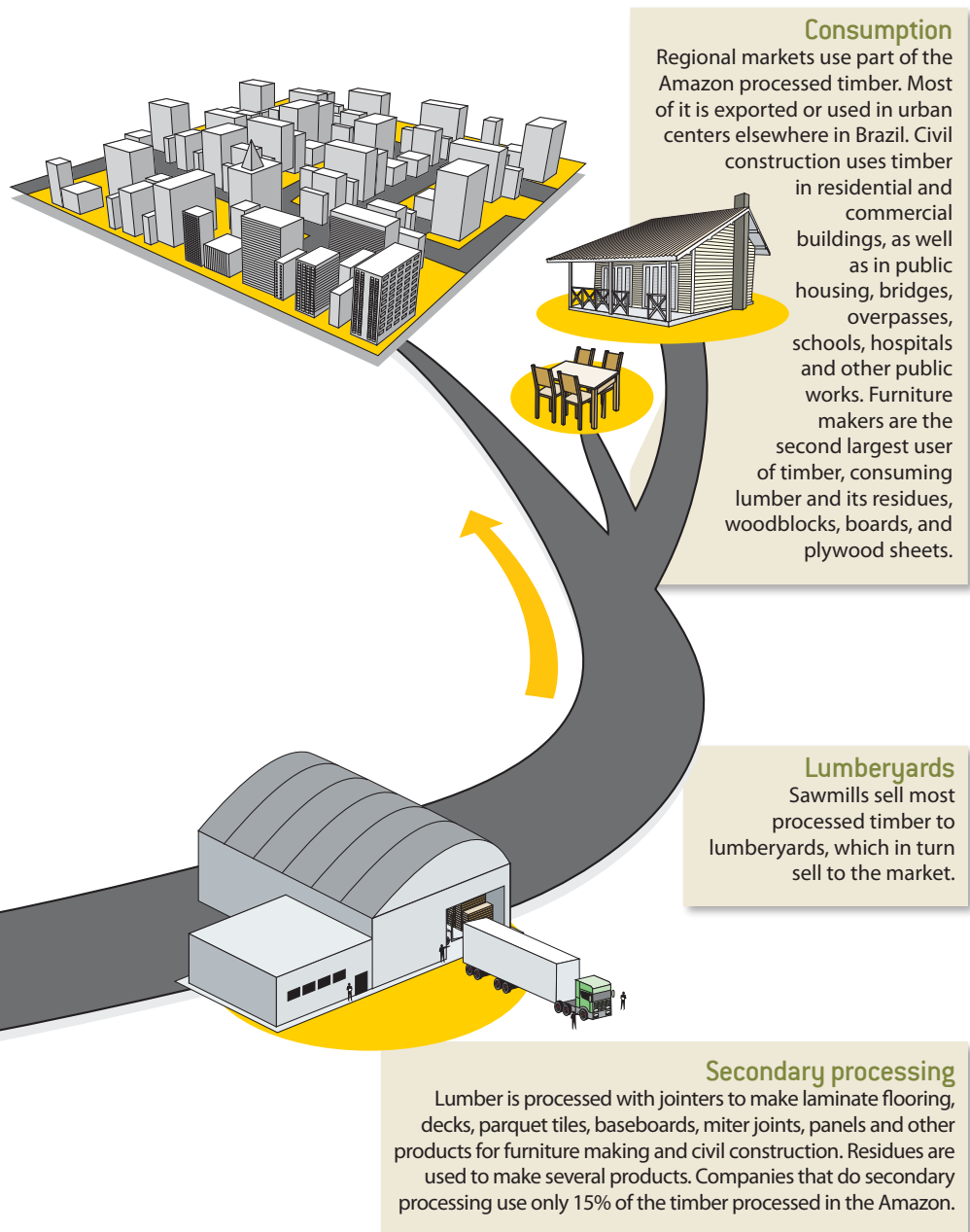
Timber logs are transported on rivers or roads and must carry a forest document that attests to its origin and informs its destination. From the forest to the plants that perform the initial processing stage, timber travels 117 km on average.



Primary processing

Sawmills transform logs into boards. Half of the wood is lost in the process and the residue is used to make charcoal or employed in brickyards. Smaller and less equipped sawmills produce more residue. More than 70% of the timber produced in the Amazon is of low added value and goes through primary processing only. Plants that make laminated timber and plywood use logs and produce 13% of Amazon timber products.





Source: Imazon

abandoned years ago due to administration problems: processing. They plan to start in 2011 with 25% of the timber usually outsourced to sawmills. "We have buyers for all our community production, especially in the United Kingdom," Aquino says. The communities want to receive certification by the FSC as well as a Fair Trade label, which attests to the product's origin and ensures the producers get paid 10% more than their conventional competitors. "We prefer to depend on the market rather than on government welfare as is the case with the community use of public forests," says Aquino, adding that things have improved since Chico Mendes' time.

A new vision for the logging business in the Amazon

The model developed by Acre, despite the challenges it still has to face, is seen as a benchmark for Amazon's native wood. The latest data suggest that operating within the law and according to sustainable practices can generate long lasting commercial gains as well as development with social benefits and no environmental damage. In fact, Acre was the only state in the Legal Amazon region to increase logging activities in 2009. In the Amazon Forest as a whole, the consumption of timber logs was almost halved between 2004 and 2009, as indicated by a study from Imazon. The number of jobs in the industry fell from 344 thousand to 203 thousand.

"Production is likely to keep falling in the short term until it reaches a sustainable level at which it is possible to reconcile profits with low environmental impact in order not to exhaust natural stocks," says Daniel Santos, a coordinator of the study "Amazon Forest Facts 2010". The survival of the industry, after all, depends on finding that equilibrium.

There are pressures from different sources. "The appreciation of the Brazilian currency against the American dollar, its effects on exports, the international crisis that started in 2008, variations in prices for commodities such as soybeans, as well as better enforcement against illegal activities all explain

the lower production,” says Santos.

Of the 2.2 thousand timber companies that operate in the Amazon today, slightly more than half are sawmills. Four years ago their numbers were a third higher, according to Imazon, which has been doing the counting every five years since 1998. “We survey all the sawmills in operation, spend an entire year moving around in the forest to interview a representative number of companies,” explains Santos.

The researchers venture to isolated places – small and rudimentary sawmills usually operate in estuaries accessible only by boat, with the timber shipped by ferry. Many woodcutters do not like to give information away, especially in areas where production has collapsed. “Most end up talking though,” says Santos, adding that the survey allows for a better understanding of local cultural, economic and social realities. “It is not rare that loggers chose to operate illegally due to costs, bureaucracy, the lack of orientation from environmental agencies and ignorance about low impact techniques”.

The challenge of going beyond the sawmills

Besides measuring the decline in production, the researchers also studied the harvesting and initial processing of timber. They found that sawmills buy most of their timber (61%) from third parties instead of logging it themselves. Sawmills are the starting point of a chain that transforms wood into the products as we know them – furniture, doors, windows, etc.

The processing of wood involves many phases. The so-called “primary processing” uses tools such as circular saws to transform logs into clapboards, planks, beams and rafters. In this initial phase, vises are used to process hardwood into sheets to make plywood.

The “secondary processing” transforms lumber (sawn wood) into refined and value-added products such as flooring, decks, parquets, baseboards, ceilings and furniture. Most of the timber companies in the Amazon produce

lumber (sawn wood). Companies that make finished products absorb only 15% of processed wood; 13% is turned into plywood and fiberboard. There is need for investment in technology, training and industrial infrastructure to allow the region to be able to process timber into finished products instead of only supplying raw materials and importing the products back.

Logging methods also need attention: tractors dragging chains and knocking down anything in their way are still used to harvest 18% of the logs. There is also high wastage of natural resources, especially in the small sawmills and poor transportation infrastructure. According to Imazon, one third of timber produced is transported on unsealed and almost impassable roads.

Despite difficulties, Brazil is well positioned in international markets. It is the largest supplier of tropical lumber, with 35% of global production. Despite

Sawmills process most of the timber into primary products. The Amazon needs infrastructure to manufacture prime products

stable rates of consumption in recent years, Brazil has large potential for growth by identifying new opportunities and increasing its market share.

The reason is simple: the country has the largest area of tropical forest on the planet. The conditions are in place to significantly increase legal production of timber, reduce defo-

restation and generate income for local communities as well as regional and national markets. At the heart of the transformation that can occur in the Amazon is an activity that drives the rational use of natural resources: sustainable forest management.

What is forest management all about?

The Cauaxi farm is situated in the municipality of Paragominas, in the eastern region of the state of Pará – one of the most devastated areas of the Amazon. This is where a chainsaw operator, 33-year-old Arivaldo de Souza, starts

another working day in the forest. Searching for the first tree to fell, he finds a 20-meter muiracatiara (*Astronium lecontei*), whose wood is used for furniture, marked with the number 271. A giant tarantula spider on its trunk fails to stop Arivaldo. He knocks at the trunk with a machete and reckons it is hollow – that means it is not suitable and Arivaldo spares the tree. A bit further there is another candidate, an exuberant maparajuba (*Manikara paraensis*), identified by the number 196 and highly sought by civil construction companies.

The “slaughter” will take place. Arivaldo calculates the best direction to have the trunk fall in order to avoid damage to adjacent trees, and plans an escape route. He then incises the base of the trunk at specific points so as to direct the fall. When the giant maparajuba finally receives the “mercy cut,” it tumbles from above. The rumble echoes in the forest against the respectful, slightly perplexed, silence of the witnesses.

The whole operation takes only four minutes. It would be a shocking scene if it were not for an important detail: the cut is completely legal, authorized by the environmental authority, planned and done with safety and minimum damage to the forest. The cutting method is one of many activities involved in sustainable forest management – the practice of harvesting timber according to a plan and rules for identification and selection of species, as well as techniques for cutting and dragging the logs to trucks, and monitoring of the forest throughout the process. Sustainable forest management allows for the economic use of the forest with the lowest impact possible, enabling it to regenerate itself before it is used again.

In the past, Arivaldo worked as a mechanic at a chainsaw dealer and as an illegal logger, but he is skillful when it comes to sustainable forest management. “We used to cut randomly and would be paid for trunks felled,” he says. In the past, he would cut more than 50 trees in an exhausting workday. “Nowadays, by following the rules not to destroy, I make the same amount and do less work,” he adds.

At Arivaldo's side is 27 year-old Zenilton Amaral, whose specialty is to produce species inventories, which means searching the forest to find trees with commercial value and numbering them. He received training to become a taxonomist, in local lingo, a 'mateiro' – a worker known for his extensive knowledge of forest species and secrets. Zenilton points to an enormous tree, 85-centimeters in diameter, and asserts: "it's a tauari [Courtari tauari], whose wood is excellent to make mitre for use in buildings".

The next step after Zenilton has measured the trunks and numbered the trees for future harvests is to draw maps showing the location of each of these trees. Such data are crucial to determine the routes that tractors will follow to get to the fallen trunks and using steel cables, drag them to storage courtyards by the road. From there trucks will carry the logs to sawmills. "Besides reducing the impact, these procedures increase machinery productivity and cut costs," says André Miranda, nicknamed Dodô, a technical expert with the Tropical Forest Institute (IFT), an NGO that promotes training and research on forest management.

"Planning is the key to avoid destroying the forest," adds Dodô. The work is done judiciously; "Before sending them to the sawmills, we visit the trees in the field up to six times throughout the management processes". With the forest inventory at hand, technicians decide which trees are to be felled and which will remain standing in order to maintain the forest healthy and ensure its future use. Non-timber species, the vegetation on riverbanks and mandatory conservation areas are kept intact, as well as the so-called "matrix trees," which are preserved as a source of seeds for future growth. Species that have fewer than three specimens in an area of 100 hectares cannot be felled. Of those whose trunk's diameter is big enough to be harvested, 10% must be conserved.

Usually a management area is divided in parcels for annual exploration. While only one parcel is explored in one given year, the others – which had trees harvested in previous years – are allowed to regenerate until the next "harvest cycle" in 25 or 30 years. The length of the cycle depends on how intense the initial logging per hectare was. Specialists assure that if these patterns are followed,

forests can regenerate and maintain healthy ecosystems, with positive effects for biodiversity, water supply and other services crucial to human life and the planet.

Native trees and the various levels of logging

Besides sustainable forest management, there are many practices used to harvest wood from native trees. The predominant practice and one of the most destructive, is the so-called “conventional” harvesting: the selective cut of one or more commercial species without any effort to restrict damage to the forest. Settlers and land grabbers spread the practice throughout the Amazon, cutting forest to prove that the land was occupied and to clear land for planting and pasture. In areas where conventional harvesting is used, loggers build roads without planning, fail to follow rules for a rational and safe harvest and pay workers for the number of logs they cut. Species are not inventoried and biodiversity is dealt with carelessly. To sum up, the lack of control during

Timber frontiers in the Legal Amazon Region

| Timber frontier | Frontiers' age (years) | Forest type | Municipalities |
|-----------------------|------------------------|--|--|
| Old | > 30 | Open, transition (South) and dense (North) | Sinop and Feliz Natal (Mato Grosso), Paragominas and Tailândia (Pará) |
| Intermediate | 10 —30 | Open (South) and dense (North) | Cláudia and Marcelândia (Mato Grosso), Cujubim and Machadinho do Oeste (Rondônia), Rio Branco (Acre) |
| New | < 10 | Dense | Castelo de Sonho (Pará), Aripuanã and Colniza (Mato Grosso) |
| Estuarine enviroments | > 300 | Freshwater swamp forest | Belém, Breves and Pontel (Pará) |

Source: Forest Facts 2010/Imazon

harvest spreads waste and destruction throughout the forest and depletes its productive potential.

Another practice, the so-called “authorized deforestation,” involves clear-cutting the forest to use the land for agriculture or pasture, but within legal limits: according to the Brazilian Forest Law (Código Florestal Brasileiro), landowners in the Amazon may cut up to 20% of native forest to establish economic activities. To control its impacts, the clearing should be done in accordance to the area's ecologic-economic zoning, but that rarely happens. Despite being authorized by the environmental authorities, this practice is harmful to biodiversity. The latest data available, for 2004, show that “authorized deforestation” accounts for 20% of timber produced in the Amazon.

Yet another practice is the “certified forest management,” which strictly follows the law, employs low impact techniques and adopts social and environmental criteria to conserve water, minimize waste and ensure good working, health and safety conditions. These procedures are audited and the product may receive a label to attest to the market its sustainable and socially fair origin. According to the IFT, only 4% of the timber produced in the Amazon is certified.

It took thirty years for Brazilian lawmakers to legislate on the particulars of forest management, which has been part of the Forest Law since 1965. It was only in 2006 that the National Council for the Environment (Conama) set national rules for the management of native species. Previously, logging plans were made privately with no regard for field measurements and basic requirements such as the forest inventory to identify and quantify species to be harvested.

Despite rules in place since 2006, problems persist. “We could avoid lots of damage if the rules were not just pieces of paper,” says IFT's director Marco Lentini. He adds: “Some management plans are officially approved, but not implemented, or they are implemented with serious flaws, which ends up providing legal cover for predatory practices”. This approach not only causes environmental

damage, but is also linked to schemes to decoy timber harvested in areas not open to logging (see chapter 3). “In the states of Pará and Mato Grosso, third parties lease 500 to 800 hectares parcels for easy profits, ignoring the need for forest regeneration and long term production,” points out Lentini.

In the municipality of Paragominas, in the northeast portion of the state of Pará, the IFT compares areas that employ conventional logging techniques to other of similar size that use forest management. At the former the damage is exposed: access roads erode the soil and damage the vegetation along the streams and on 40 degrees or larger slopes, areas where conservation is mandatory. Logging opens clearings that increase the exposure of the forest to sunlight, which drives off the fauna and prevents shadow-dependent plant species from growing. Such indiscriminate logging also increases wood waste. The forest is biologically impoverished and commercially devalued.

**In most of the area
logged in the Amazon,
production involves
no efforts to minimize
adverse effects**

“While careless logging destroyed 10% of the conventional management pilot area, in the forest management area the collective impacts of clearing by tractors, roads and other activities was halved,” says IFT member Marley Nogueira. He is proud to demonstrate how the “intelligent” method to cut trees diminishes the environmental damage and increases logging productivity. “We harvest 20% fewer trees but have an overall yield that is comparable to the areas of predatory management,” he says. He assures that forest management optimizes forest production. “With conventional management, half of the trees that should have been left for future logging were already felled, making it impossible to reuse the area”.

The destructive logic that turns the Amazon forest into pasture involves a series of steps. The first one is to harvest the best species, such as ipê (mostly

CHANGING COURSE

His business card does not bear his name, only a company address, telephone number and email, the FSC tree logo in the corner. The focus of attention is a sentence in Portuguese and English: "Respect for nature is our raw material." Jandir Santim, the owner of Laminados Triunfo, a plywood manufacturer in Acre, has placed all of his bets on the potential of the logging industry for change. Today he is one of the leaders in legal and sustainable timber production in the Amazon.

Santim owns São Jorge I Farm, in the municipality of Sena Madureira. Through certified forest management, he harvests timber from his land for processing at the Industrial Complex in Rio Branco. He was awarded public concession of the Antimary State Forest and operating rights, in association with other businesses, of a state-built flooring manufacturer in Xapuri. His business' consumption of timber increased from 50 thousand to 130 thousand from 2009 to 2010 and approximately 80% of production is exported, and now the waste from his factories is converted into biomass fuel for electricity generation.

Working within the law has made Santim proud of being a logger. He admits he made mistakes in the past – his family, with a long logging history, used to cut araucarias (*Araucaria angustifolia*) in the Southern region of Brazil. Once those araucaria stocks were exhausted, he moved to Campo Grande, in the state of Mato Grosso, to open a plywood manufacturer that used timber of uncontrolled origin. "I tried to have a sustainable management plan at that time, but in face of the obstacles imposed by the environmental authorities I gave up".

The solution he found was to migrate to the state of Acre where the state government offers incentives to those who adopt sustainable production methods. After receiving social and environmental certification, Santim was able to win new foreign contracts, forge new partnerships and accumulate working capital to increase log stocks. "It is a cultural change to start harvesting from the forest without endangering the future," he points out. Now he is preparing his son Jandir Júnior to take over a business that draws benefits from a standing forest.

from the genus *Tabebuia*) and *jacarandá* (from the genus *Jacaranda*), felling even young specimens. The second step involves mercilessly clotheslining the remaining trees with tractors. Finally, the undergrowth is removed by burning and gives way to pasture. "The illegal logger clears everything because he does not know what is in the forest," says Marley. "Forest management can reverse the destructive cycle and contribute to the region's economy".

The younger generation looks for opportunities. "The world is watching us because of global warming," says 18 year-old Rodrigo Marinho, a student at the Technical School in Manaus who attended a forest management course offered by the IFT at Cauaxi Farm. He and his friends, 22 year old Williams Costa and 18 year-old Anderson Barbosa peruse a map of the trees to be harvested. After two weeks of on-site activities, the students learned how to identify tree species and also how to legally fell them. "We get a chill when we hear the buzz of the chainsaw, but we know there is a sustainable way to use that chainsaw," says Rodrigo, hoping it will be easy to get a job in forest management.

Sustainable logging creates opportunities

Economic activities that support a healthy forest, such as legal logging, are socially and environmentally important for the Amazon. The latest data from Imazon show that the logging industry was responsible for 204 thousand jobs in 2009. Each of those jobs creates other two indirect ones, with positive effects for quality of life, income and thus, the economy as a whole.

Legal logging allows for improvement in public services such as public safety, sanitation, health care and education. It also promotes social inclusion. The stream of income generated by legal activities encourages people to keep living in the forest instead of migrating to the fringes of capital cities in the Amazon. Finally, it helps to change the perception that trees are valuable only when cut with broadax and firebrand. In fact, they yield more and for longer when some are spared and others are judiciously selected for harvest.

Opportunities abound in the carbon markets as well. According to research published by Imazon, forest management cuts greenhouse gas emissions by 36%. This means that, by choosing to use wood from native trees and legal operations, the civil construction industry may contribute to mitigate climate change. Buildings, popular housing, overpasses and tunnels in the urban centers, as in a domino effect, are connected to the forest. Those who choose to use legal timber receive, in the form of reduced environmental impact on the planet as a whole, the benefits of sustainably using natural resources.

There is a simple scientific explanation for that. The harvest of timber from mature forests through forest management opens up space for younger trees to develop. To grow, they absorb carbon and release oxygen. Research done in France and published by the National Forum on Forest Activities indicates that one ton of wood contains 1.4 tons of CO₂. Down the supply chain, carbon remains locked into the products made with wood from adult trees – if these products are

employed in the construction of durable buildings, the efficiency of carbon capture is doubled.

Besides being a renewable resource, wood also contributes to thermal conditions in buildings that are conducive to saving energy. Taking these characteristics into account, European countries with international

targets to cut carbon emissions have set associated targets to increase the use of wood in civil construction. By giving priority to wooden products with a sustainable origin – instead of substituting wood for alternative materials such as plastic or steel –, consumers help to create economic conditions to suppress predatory activities and encourage legal logging in the forest.

Forest management helps the forest to retain carbon and thus creates opportunities in the fight against climate change

The power of markets against negative impacts in the Amazon

Purchase decisions in large consumer markets are intimately connected to what happens in the forest. It seems logical: if there is supply of illicit wood it is probably because there is someone willing to buy it. Inversely, the increase in the number of consumers looking for legal and sustainable timber products has a positive effect on slowing down deforestation, minimizing the loss of biodiversity and the threat of climate change.

There is strong global pressure to change the economic conditions in tropical timber-producing areas by appreciating the value of the forest and making sure its stocks are preserved for future generations. At the heart of these concerns, there is significant potential for Brazil to expand its presence in international markets, where global demand for timber currently outstrips supply due to the exhaustion of tropical forests in Malaysia and Indonesia and to political instability in other producer countries. Because of limited supply, prices have gone up in recent years. Paradoxically, in 2009, only 21% of the native wood processed in the Amazon was exported, a percentage lower than five years before, according to Imazon.

To fulfill its potential and supply the international markets using forest management, Brazil needs to overcome challenges such as lack of communication along the supply chain, low return from sustainable logging and low productivity at the sawmills. However, a recent study commissioned by an international organization brought light to the exciting potential for Amazon wood. The worst scenario for 2020 assumes that Brazil's share of global exports are kept at the current level and that enforcement reduces illegal logging participation in total production to 20% – resulting in an increase from 1 billion reais to 1.6 billion reais in the annual income generated by logging. The best scenario assumes doubling of exports and an end to illicit logging, which would more than double income and have positive effects for employment.

Combating illicit production is a precondition for increasing Brazilian exports to markets such as the United States and Europe, which apply commercial instruments to control the origin of the product.

The Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan was adopted in 2003 by the European Commission as an instrument to deal with the global problem of illegal logging and trade in its products.

The FLEGT Action Plan was a response to the high volumes of illegal timber entering the European market, which previously had no oversight mechanism to monitor imports. Within the scope of this new initiative, the European Commission funds the Friends of the Amazon Network which in turn, supports public policy towards sustainable logging.

The initiative's main goal is to establish voluntary bilateral or regional partnerships with producing countries in order to prevent illegal timber from entering the European market, as well as to encourage improvements in governance and productive capacity in exporting countries. It also aims to reduce consumption of illegal timber and discourage investments by European institutions that may inadvertently encourage illicit activities.

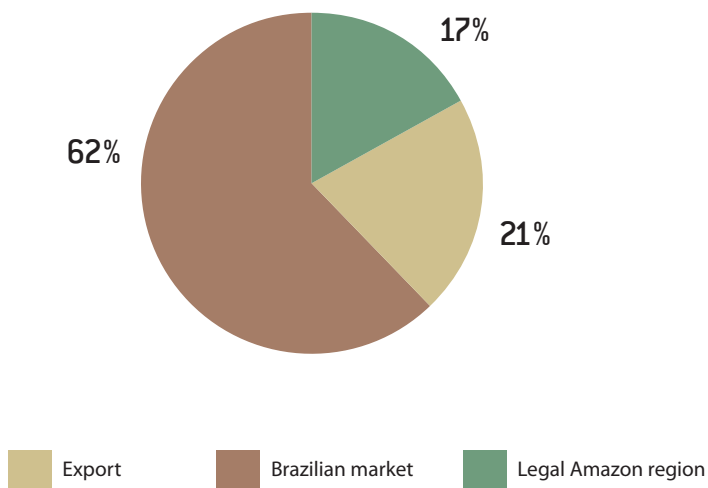
The Lacey Act was passed in May 1900 as the first federal law about conservation issues in the United States. It has been amended but it still represents the foundation for conservation legislation in the US. It established civil and criminal sanctions against a series of offenses, focusing mainly on banning trade in fish, wild animals and plants collected, transported or sold illegally. It was last amended by the Food and Energy Act of 2008 (Farm Bill 2008), which establishes mechanisms to combat illegal logging and increases the number of protected animals and plants. It has extended protection to products and by-products of plants illegally obtained in their country of origin and transported to the US, either as raw material or manufactured products, including those manufactured in third countries.

Logging in the Legal Amazon Region

| State | Number of timber producing municipalities | Number of companies | Current annual consumption of logs (thousands m³) | Gross income (US\$ millions) | Direct and indirect jobs |
|---------------------|---|---------------------|---|------------------------------|--------------------------|
| Acre | 1 | 24 | 422 | 181,96 | 4.641 |
| Amapá | 1 | 48 | 94 | 32,10 | 1.516 |
| Amazonas | 3 | 58 | 367 | 115,19 | 6.525 |
| Maranhão | 1 | 54 | 254 | 59,00 | 3.975 |
| MatoGrosso | 20 | 592 | 4.004 | 1.598,36 | 56.932 |
| Pará | 31 | 1.067 | 6.599 | 2.177,61 | 92.423 |
| Rondônia | 14 | 346 | 2.220 | 713,49 | 34.825 |
| Roraima | 1 | 37 | 188 | 62,66 | 2.865 |
| Legal Amazon | 72 | 2.226 | 14.148 | 4.940,39 | 203.702 |

Source: SFB, Imazon/2010

Markets for lumber



Source: SFB, Imazon/2010

Main international timber trade control mechanisms

| FLEGT | Lacey Act |
|--|--|
| Origin: European Community | Origin: United States |
| Coverage: Native and exotic wood, including timber used to make paper and cellulose | Coverage: Wildlife species (fauna and flora), and native wood. |
| Valid: since March 2013 | Valid: last amended in 2008 |
| Operational model: Voluntary bilateral agreement. Countries reject it based on national sovereignty arguments. It may act as a trade barrier. | Operational model: Non-binding partnerships with exporting countries to check if they comply with American standards |
| Advantages: Countries that certify their product may increase their share in the European market. It may increase forest governance in producing countries. | Advantages: Unified monitoring and access to the entire American market, the world's largest for floorings and decks. |

Under the eye of environmental and social certification

Environmental and social certification differentiates the products whose extraction or manufacture respects the forest and people who live and work in it, and it is a powerful voluntary market-based tool that is increasingly required by importers. By applying strict social and environmental rules that are audited on site by independent and internationally renowned third parties, the label certifies the origin of the product and the best practices used in producing it. It guarantees to the consumer the origin of the natural resources used to make the product, and simultaneously rewards the producers with premiums and market access. "The certification of forest management in the Amazon has made little progress in recent years due to illegal land tenure," says Maria Tereza Rodrigues, executive secretary of the Brazilian Program for Forest Certification (Cerflor), an official certification system implemented by the federal government. Cerflor is approved by the Programme for the Endorsement of

Forest Certification (PEFC), an international NGO dedicated to promoting sustainable forest management that endorses 32 national certifications systems.

The Forest Stewardship Council (FSC) is an independent association of groups and NGOs associated with forestry that provides social and environmental certification. It follows less strict rules than Cerflor but it has developed a strong reputation internationally. "Demand for the FSC label will increase as we see progress in the concession of public forests to private companies," says Leonardo Sobral, an engineer with the Institute for Forest and Agricultural Management and Certification (Imaflora), an FSC accredited certification body (see chapter 4). The public concession of forests ensures land tenure, long-term production and thus, contributes to combat predatory activities. Certified lumber from sustainable management may substitute lumber from illegal wood in national and international markets. By getting certified, producers commit to improvements that may lead to reduced costs and increased productivity, thus enhancing the economic viability of forest management.

In 1997, Amazonas-based Madeireira Mil was the first sawmill to get FSC certification for low impact timber production in the Amazon. Nowadays there are 1.2 million hectares in the region producing timber from native trees with an FSC label, but the potential for certification is still large. In many cases the certification goes beyond the forest and ensures social and environmental attributes throughout the supply chain until the product reaches the consumer. There is increasing interest in certification by manufacturers and retailers – lacking an increase in the certification of native forests, there will be a shortage of products to supply them.

"Economic growth, Brazil's growing exposure to international markets and the prospect of large public works for the Olympic Games and the World Cup are bringing certified lumber products to the attention of civil construction," says Sobral. In anticipating changes, the FSC has recently resumed its campaign in Brazil. "The appreciation of the Brazilian real against the dollar affects the export business and opens up opportunities in the domestic market, which is a

promising driver to expand the use of best production practices”.

Governments, environmental organizations and corporations have encouraged alliances between the biggest consumers of wood. A landmark of such movement was the Legal Timber program, a cooperation agreement established in 2009 between the State of São Paulo, the city of São Paulo, the environmental NGO WWF-Brazil, the Center for Sustainability Studies at Getulio Vargas Foundation, and businesses that voluntarily agree to use legal timber. The goal is to transform the civil construction industry and its supply chain into important drivers for forest conservation.

Membership in the program is growing as environmental awareness expands, as the market begins to demand certification and as new rules for responsible procurement of timber in public works come into effect (see chapter 4). To achieve its goals, the program develops mechanisms for control, such as requirement for documentation attesting legal origin and incentives to choose certified products. Such instruments help procurement departments at state-owned and private enterprises to identify and monitor the timber they buy. The program offers technical training to procurement officers and does research to diversify the number of timber products available to the civil construction sector.

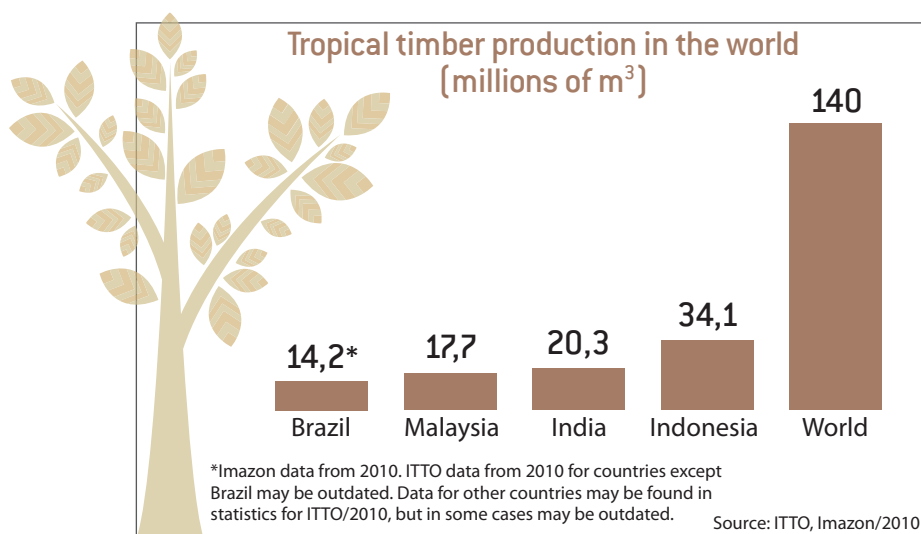
Today, professional forest management accounts for a very small proportion of the area used for timber in the Amazon – less than 1.5 million hectares. “To have an idea of how small that area is, if the current total timber production were sustainably harvested, the Amazon would need to shrink to 35 or 40 million hectares,” says IFT’s Marco Lentini.

To move to the next level, it is necessary to overcome certain obstacles. One of the main problems is the cost of operating lawfully and competition with illegal products. “Illegal loggers do not do damage control and do not pay taxes, and their laborers work in virtual slavery and in many cases, the area used is not bought or leased but grabbed illegally, as is the case in public properties or conservation areas,” explains Lentini. Despite that, as he points

out, experiments carried out since the 1990s indicate that forest management is economically superior. Costs are 12% lower than conventional logging, there are savings due to the rational use of machinery and a two-thirds reduction in waste with a better use of wood. Meanwhile, having more control over production reduces the losses with fires and halves the impacts on the forest soil and on the trees left to the second harvest cycle in 30 years.

There remains the question of why, even with these benefits, legal logging is still lagging. The answer is that its economic feasibility requires a solid foundation, with public policies, built infrastructure in the forest, land title legalization, incentives to promote forest management and at the end of the chain, responsible consumption of wood, be it by the state or the general public. "Since documents attesting to the origin of the wood could be falsified or contain errors, reliability lies with social and environmental certification," says Lentini.

Reducing the threats to legal logging requires more than better law enforcement and control of origin – it also means breaking cultural barriers such as the continuation of predatory practices that perpetuate deforestation and its negative effects over many generations. There is resistance to change due to lack of



information and technical training. If Brazil intends to meet the target of having 13 million hectares under forest management by 2016, it would have to train 8 thousand workers for an array of jobs associated with low impact logging. Today, according to Lentini, there are fewer than 4 thousand such professionals.

The knowledge and technology challenge

Economic, cultural, technological and bureaucratic threats jeopardize legal and sustainable management in the Amazon

Obstacles to sustainable logging include the limits of scientific knowledge and of technology, which are being gradually overcome. Methods to increase safety and efficiency of forest production, such as the GPS (Global Position System), begin to be used alongside machetes and chainsaws. The GPS makes it possible to locate trees by satellite and to precisely map the specimens marked for harvesting in each cycle. Developed by the Brazilian Agriculture Research Corporation (Embrapa), the technique lowers the cost of forest management as it streamlines the use of tractors and halves the number of work hours needed for incursions in the forest, explains engineer André Gomes, from the Technology Foundation of the State of Acre (Funtac).

More investment in research is required to better understand what goes on in the forest during different harvest cycles, the degree to which species logged regenerate and what the impacts on fauna are. What is the balance between large-scale commercial logging and a healthy and productive forest? The first conclusive data about these issues were published in 2010, when the first 30-year cycle at the Tapajós National Forest, a pioneer in forest management in the state of Pará, was completed. "Seventy five percent of the biomass volume of trees larger than 45 centimeters in diameter recovered," says the director of the Brazilian Forest Service (SFB), José Natalino Silva.

However, tree species that were heavily logged and grew slowly did not reach enough volume to be harvested again in the region. "Despite having been intensely logged, the area can still be used without problems for another 200 years," says Natalino. He points out that the experience with the Tapajós National Forest indicates that special care is needed, such as interventions to improve natural regeneration, thus, increasing the economic feasibility of the following harvest cycle.

Research also indicates options to avoid the overuse of species that are becoming rare. After mahogany – whose logging is now restricted due to international regulation –, the most threatened species is ipê. At the SFB laboratories in Brasília, scientists bury wood samples from different species to evaluate, after many years, its rate of decay, its durability and potential for alternative use in the civil construction industry. There are more than a thousand tree species in the Amazon, but only 60 to 80 are suitable for commercial use. Forty of these are considered technically and economically viable, but their occurrence in different areas of the forest varies.

Studies indicate that forest management areas could increase their revenues by 40-50% by expanding the number of species under use for timber. There are more than 100 species suitable for commercial logging within legal specifications and these species can yield between 700 and 1.4 thousand dollars per hectare in the Amazon. In comparison, highly sought timber such as *maçanduba* (from the genus *Manilkara*) and *cumarú* (*Dipteryx odorata*) can reach 1.2 to 3.6 thousand dollars per hectare.

The National Service for Industrial Training (Senai) works with loggers associations in the far corners of the Amazon to teach workers to reduce waste in the sawmills, which would lead to less logging in the forest. In the hundreds of small Amazon sawmills with little capital or technology, half of the raw materials end up being thrown away due to inadequate machinery, lack of maintenance or ignorance about techniques to transform round logs into squared planks, a

process in which a lot of material is lost. As a result, waste is accumulated and ends up largely being burned and producing pollution. In other cases waste is turned into charcoal and used to produce energy or wood byproducts. The excess waste generated at sawmills commonly presents opportunities to cover up illegal activities (see chapter 3).

The shortcomings of land title legalization

The Legal Amazon region has a historical problem resulting from the squatting of vacant public lands with no title or a legal mandate for use. Lack of control over the land encourages impunity and turns the forest into a no man's land with no legal owners to be deemed responsible or punished. According to Imazon, an area of 2.6 million square kilometers, or 53% of the Brazilian Amazon, is under such conditions.

By using less noble tree species, it is possible to alleviate the threat of extinction on highly sought Amazon species such as mahogany and ipê

Land with no title is always in dispute. The absence of land titles makes it impossible for environmental authorities to license these areas for forest management and other important activities that would contribute to social development and the sustainable use of the forest. The land issue also undermines the public concession of na-

tional forests, the extension of which would be amplified if areas currently with no owner could be declared federal land. "It is impracticable to give out concessions for the use of these areas before we are clear about which areas are federal property," says Imazon's researcher Brenda Brito.

To reduce the uncertainties and legalize occupation of the land, Brazil has been changing its legislation. One such change concerns the dimensions of public areas that can be transferred or donated by the federal government

– the current limit is 1.5 thousand hectares. The federal government issued a Medida Provisória (Provisional Measure) (number 458/2009) to simplify the procedures for obtaining land title – the objective is to legalize legitimate occupation of land, especially by small farmers and local communities. “There is a commitment to the land’s social and environmental function, which can be demarcated using satellite imagery,” explains the coordinator of the Legal Land program at the Ministry for Agrarian Development, Carlos Mário Guedes de Guedes. The program aims to legalize land covering 67.4 million hectares in the Legal Amazon region, affecting 296.8 thousand holdings in almost 500 municipalities. However, only 1.1% of the 2010 target was met.

The Legal Land program determines that federal land in the Amazon with no assigned use can be transferred to squatters that occupied those areas by December 2004. For areas of up to 100 hectares, land title is issued for free. For larger areas, the federal government offers financing depending on the size of the property. However, the initiative is controversial among environmentalists. They think that, by offering land titles for free, the government’s incentive goes to squatters who clear the forest in new areas instead of those who increase productivity in larger areas already cleared.

In order to avoid further problems, the legislation contains provisions to avoid legalization of grabbed lands, i.e., lands that were occupied and cleared with the sole purpose of ensuring land tenure legalization. In an effort to increase transparency, the government publishes the new land titles on the Internet. “The idea is to fight both deforestation and illegal occupation of federal land in the Amazon at the same time,” says Guedes.

Nevertheless, environmentalists warn that instead of solving the issue this approach could worsen the situation, adding that the law should make landholders responsible for environmental damages before their land title is issued. They also point out that the Provisional Measure fails to designate the competent entities to deal with environmental issues, leaving omissions and contradictions to be corrected according to the current environmental

legislation. Estimates indicate that there are 10 million hectares within conservation areas that are under dispute, including some with squatters and private properties that should be expropriated.

SUMMARY

■ OPPORTUNITIES

Forest management increases the value of land and offers the perspective of gains in the carbon markets and with payments for ecosystem services.

■ TIMBER PRODUCTION

Timber production in the Amazon fell by half from 2004 to 2009 as a result of increased control and the international financial crisis.

■ TYPES OF USE

Wood from native trees can be obtained through forest management, authorized deforestation to establish pasture and crop land, or from conventional deforestation that follows no rules and causes damage to the forest.

■ BENEFITS OF FOREST MANAGEMENT

Sustainable forest management applies techniques to minimize waste that also reduce cost of production and damage to the forest.

■ CERTIFICATION

Certified management guarantees that timber was legally harvested according to social and environmental standards that may affect the entire supply chain up to the consumer. Certification also has market benefits.

■ OBSTACLES FOR THE SUSTAINABLE USE OF FORESTS

There are cultural, economic, and technological barriers for the legal use of the forest, as well as state's bureaucracy and weak governance.





3 In pursuit of legal production



Better public management, control and technology allows the timber industry to achieve higher standards, reducing conflict in the forest, tax evasion and carbon emissions

The mood was tense at Sister Dorothy's Settlement in the municipality of Rádom do Pará, state of Pará. Small-scale loggers had accepted a proposal from an "agent" to submit a community forest management plan to the environmental agency in order to profit from logging. Everything seemed to be legal and environmentally sustainable. The license was issued, but not one single log was transported out of the region – they were actually coming from far away areas not open to logging. Suspicion that there was something wrong arose when the electronic controlling system detected a large logging authorization for the area and enforcement agents decided to check on site.

They found more than 150 thousand cubic meters of illegally cut timber. The holder of the harvesting license had received a code to access the electronic controlling system and proceeded to issue documents that theoretically proved the legal origin of the timber. He then sold the documents to clandestine loggers. With the "papers" in hand, they fool enforcement agents while transporting logs harvested using methods that destroy the forest. With origins of the illegal timber disguised, it ends up in sawmills and in the rest of the processing chain. The leader of the gang and eight companies that bought the timber were accused of environmental crimes and of deceiving the settlers. The Federal

Prosecutor's Office is asking for 9.8 million dollars in reparation as well as the reforestation of 264 hectares.

The settlement is named after the American nun murdered in 2005 for defending forest communities against illegal loggers. Its problems are common elsewhere in the state of Pará. Anapu, the municipality where Sister Dorothy Stang lived, was on the brink of violent conflict in 2010 when residents from the Esperança Settlement attacked invaders who were cutting the forest. A couple of months earlier, protesters set timber trucks on fire. The public authorities have

More than one third of logging activities in the Amazon is illegal, and in most authorized areas logging still causes damage to the forest

always been neglectful in the region, where the law of the jungle literally reigns. The mood was assuaged with the construction of surveillance cabins at the settlement's entrance, but the greed for timber is still present.

Logging output and its social and economic importance are significant in the Amazon, so are the pro-

blems caused by it. Imazon's report Forest Facts 2010 estimates that in the previous year 33% of the 14.1 million cubic meters of timber logs produced in the Amazon lacked authorization from environmental authorities. The previous estimate from 2005 showed that unauthorized logging was prevalent. Current numbers have come down but are still troublesome, especially because it is known that most of the authorized timber production, despite being legal, is of low quality, poorly inspected and employs methods that damage the forest.

However, the problem is global. Data gathered by WWF show that more than half the timber produced in Southeast Asia, Central Africa, South America and Russia is of illegal origin – however, it supplies 15% of the global market. The Royal Institute of International Affairs, based in London, defends a “zero tolerance” approach towards illegal production, which adds up to 100 million cubic meters a year. If these logs were laid down from end to end, they would

encircle the planet ten times.

Causes and consequences of frauds

The roots of illegal logging are deeply entangled – unraveling them is difficult but not impossible. Illegal logging is directly linked to government corruption and thrives with the lack of technical qualification and enforcement framework; impunity; state governance issues; low investment; human errors and weaknesses of the controlling system. Adherence to the letter of the law is absent in areas where land arrangements are chaotic and conflict is rife. There are also the long distances, characteristic of the Amazon, hard to reach remote areas, poor infrastructure, and low quality of life in the forest where the state is almost entirely absent.

There is a lively debate about the size of the illegal economy that damages the Amazon and the possibility of replacing it with sustainable practices. The urgency of the problem is underlined by the size of the region, which covers almost half of a country of continental dimensions. “We are always trying to point out those who benefit from destruction and to blame the consumer who is far away from the forest, but we forget the main driver for fraud: public land grabbing,” says activist with the NGO Conservation International, Valmir Ortega. By illegally occupying vacant areas that are not being used by the state, land grabbers aim at later legalizing their land tenure with the relevant authorities. Ortega says that such activity forms the first, low-cost link in an economic chain of operations. After enticing indigenous communities or forming partnerships with local leaders, the “entrepreneur” pays henchmen to “clear” the area and looks for illegal companies interested in buying the logs to make boards or charcoal. There is also the option of simply burning the area without using the resources in order to establish pasture. For a 10 thousand hectare area, the cost to convert the forest is of approximately 1 million reais, a sum that may be paid for with profits from timber. In a matter of a few years the land grabber may be able to sell the area for 20 million reais, or 20 fold the initial investment. “It is a highly

profitable business," says Ortega. As a former Environment Secretary with the State of Pará, he knows the details of that market. "What is more troublesome is the fact that fraud is seen in the region as normal and routine and thus, it is legitimized by habit and by the courts," he warns, adding that the Amazon lacks a control mechanism against land grabbing. "The environmental authorities' capabilities to prevent these activities are pitiful".

Negative effects range from carbon emissions to tax evasion

One of the dominant factors behind fraud is bureaucracy. "They try to beat us by tiring us out,," vents a civil servant that works for the town of Acrelândia (in the state of Acre). Waiting to be served at the Environment Institute of Acre (IMAC), he recounted that it had been 40 days since the town received the environmental license to cut down two Brazil nut trees situated in an urban area and whose nuts were a hazard to passers-by. "Now it's another uphill battle to get authorization to transport the logs that are lying on the street". He planned to use the wood to improve bridges in Acrelândia's rural areas, reducing transportation risks in the region.

If it takes so long to solve such a simple problem, what can be expected from the intricate licensing process for forest management? "The law determines that we should analyze documents and issue authorization within four months, however, lack of land title usually slows down the process, which can take two years or more," says IMAC president Cleísa Cartaxo.

The consequences of this agonizing process go beyond damages to biodiversity and the vital services it provides to human beings and to the planet such as water sources, food and industrial raw materials. Intimately connected to climate change, deforestation is at the center of the global agenda. According to experts, carbon emissions from illegal logging in Brazil added to 55.8 million tons in 2009 – the amount is equivalent to 10% of Brazil's target for emission cuts by 2020. The calculation assumes that the entire area illegally

logged could be converted to pasture.

The effects go beyond environmental issues. Illegal clearing of the forest poses a barrier to respectable enterprises that aim to minimize negative effects on the vegetation. Furthermore, it jeopardizes jobs and fair work relations. The profits obtained from illegal logging fund more deforestation, feeding the cycle of destruction. In a lawless land, distant from law enforcement and judicial authorities, banditry, violence, conflict and intrusion proliferate. In addition to negative social effects, there are large economic losses. Globally, the losses with illegal lumbering add to 15 billion dollars – one third of that represents evasion of taxes and royalties, according to 2007 data published by the Organization for Economic Cooperation and Development (OECD).

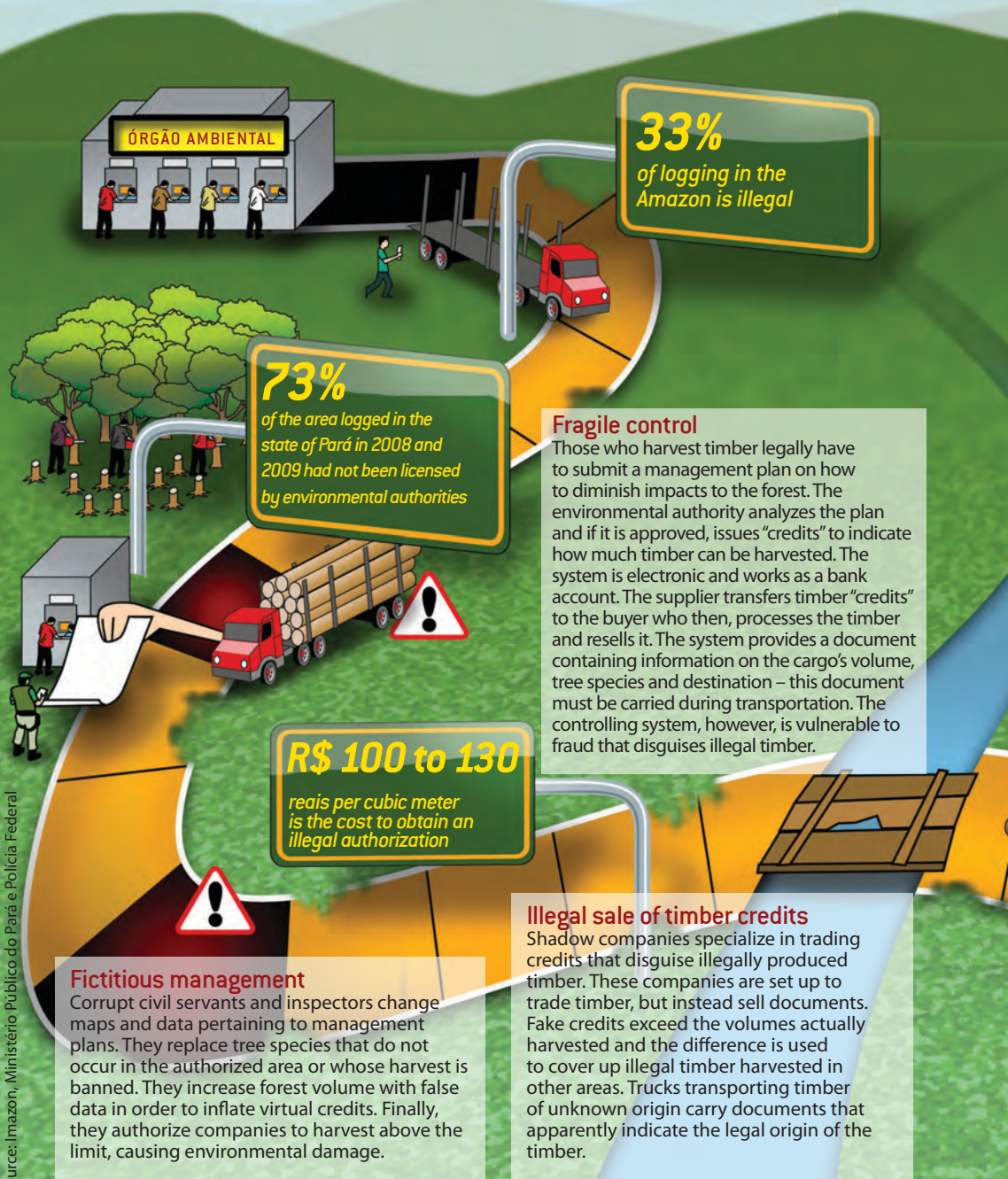
With no control over illegal logging, the federal and state governments failed to collect 477 million reais owed in tax in 2009

Tax evasion takes a toll on public accounts. State and federal governments have failed to collect up to 477 million reais in taxes due to illegal logging in the Brazilian Amazon, according to estimates based on information supplied by businesses and an evaluation of total logging production by Imazon. The forfeited revenue exceeds the annual budget for maintenance of national parks and other conservation areas in Brazil, allocated annually to the Chico Mendes Institute for Conservation and Biodiversity (ICMBio), an entity associated with the Ministry of the Environment. Other unofficial figures show even higher tax evasion –and emphasize the need for an exact measurement of the costs to public coffers as a way to support the strategic mobilization of state governments towards policies and actions to combat fraud.

The neglect of a public property that can yield economic benefits, i. e., the forest, is an invitation to fraud. By opening access and roads to the forest, illegal logging lays the groundwork for deforestation in a process that can end in total conversion to pasture.

The route of illegal timber

How illegally and predatorily produced timber deceives controlling mechanisms and gets to be used in homes in Brazil and around the world

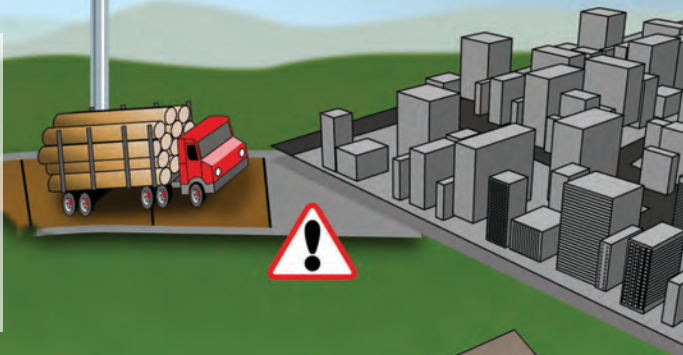


17%

of Amazon timber is consumed in the state of São Paulo

From the forest to store windows

When it is transported to the cities, timber is subject to inspection. The cargo must match the information contained in the transport permit. When there are frauds, the volume and species of timber stocked by retailers and builders do not match their balance in the electronic system. Poor enforcement allows for illegal timber to be used by consumers.



Problems in sawmills and factories

The government's controlling system assumes that half of the logs are turned into lumber. The rest is classified as residue. In fact, sawmills are able to use less than the amount predicted by the system. The difference between the estimated and the real timber usage ends up covering up the harvest of timber from batches of illegal or unknown origin.

20%

of logging authorizations issued by the state of Pará in 2008 and 2009 were fraudulent



Predatory felling

When there is fraud, credits issued to an authorized management plan are used instead to "legalize" wood harvested in areas closed to exploration. In many cases, the harvest takes place in areas where conservation is mandatory, such as riverbanks, or in public lands and ecological reserves.

Lack of technical skills and structure

The controlling system is hindered by technical weaknesses and poor enforcement: different management plans for the same area overlap and areas already deforested get logging licenses. It is difficult to prove ownership of land, and conservation areas and indigenous land end up licensed for harvesting.

Illegal logging leaves governments and companies – suppliers and consumers of wood products – vulnerable to commercial and environmental pressures, including the risk of seeing its main raw material source exhausted. Possible solutions are complex and require careful, efficient and time-demanding management. To get to know the social and environmental connections between themselves and the wood they deal with, it is important that the business community, construction firms and civil servants responsible for procurement understand the Amazon reality and the routes of fraud.

Unveiling the controlling system for timber

Establishing control over the flow of Amazon native wood from the forest to the consumer starts with the harvesting license. According to Brazilian law, timber can be harvested through forest management or through deforestation to clear areas for crops, cattle and other economic activities. The latter must be authorized by the state environmental agency or the Brazilian Institute for the Environment and Natural Resources (Ibama) and the landowner must observe the limits of the Legal Reserve. Currently, the law determines that in the Amazon, 80% of vegetation in the property area must be conserved. However, even within these limits, “authorized deforestation” is not sustainable. Despite being legal, this kind of logging does not contribute to conservation efforts and its product is predatory. On the other hand, if approved by the environmental authorities and conducted responsibly, forest management minimizes damage to the forest and ensures its conservation.

To obtain a harvesting license, the interested party must present documentation about the property and the workers responsible for the harvest, as well as maps and a forest inventory containing volume estimates and the name of the species to be harvested. This procedure is the same for authorized deforestation or forest management, but the latter also involves the submission of a harvest plan to comply with legal, technical and operational requirements.

Technical and legal experts analyze the documents, check if the property title is legitimate and if it is located within conservation or indigenous areas.

Sustainable forest management divides the area to be harvested into parcels – each one is harvested for twelve months while the others are left to regenerate. Before the logger is able to harvest wood in these areas, he needs to submit an Annual Operational Plan (POA). If it is approved, the Logging Authorization (Autex), a document required for timber production and storage, is issued. The timber produced under this system must carry identification plates so that it is traceable from forest to industry.

The Autex is issued for the person who submitted the management plan. In the next step, the environmental authority inputs a certain amount of credits – equivalent to the timber volume authorized for harvest – into the electronic controlling system. The system is available on the Internet, but

to be able to access it both the timber supplier and the consumer must register with the Federal Technical Registry, which is managed by Ibama. As with a bank account, the user receives a code to be able to conduct transactions with the timber credits. For instance, a supplier that has sold logs, boards and other timber byproducts, transfers credits from his account to the buyer's.

The buyer then needs to register his acceptance of the offer and finally the system issues an online document that certifies the legal origin of the timber. The document must be carried during transportation and match the amount, timber species and destination of the product being transported. There are currently two types of documents used for that kind of control. The Forest Origin Document (DOF) is issued nationally by Ibama and used in most states. It was hastily put together in 2006 when deforestation rates in the Amazon were climbing and there was international pressure to solve the problem. Previously, control was done

A logging license requires a series of documents, satellite based maps to confirm the boundaries of the area to be harvested

manually and involved a great amount of bureaucracy, paper and stamps. The old Forest Products Transport Authorization (ATPF) had loopholes that allowed for frauds such as obvious falsification of data. A survey by Ibama proved that 54% of ATPFs issued were fraudulent.

Federal law allows the states to adopt their own models and the states of Mato Grosso, Pará and Rondônia chose to use a different platform until February 2011: the Forest Products Transport and Trading System (Sisflora) developed by Tecnomapas, a business in Mato Grosso. Recently the state of Rondônia announced that it intends to start using the DOF. The state of Minas Gerais uses the Electronic Environmental Control Document (GCA-Eletrônica). Both these systems issue transport documents and must be interconnected with Ibama's database. In order to efficiently control the movement of timber between states that use different control systems, it is necessary for all of them to be integrated. The same goes for the final stage of consumption. The state of São Paulo, the largest consumer of Amazon wood, uses the DOF to monitor the product's transportation on its roads, as well as storage by retailers and construction companies (see chapter 4). Both DOF and Sisflora were designed for quick and efficient monitoring of legal timber throughout the supply chain. They represent an important evolution, but opportunities for cheating and for destructive practices evolve simultaneously.

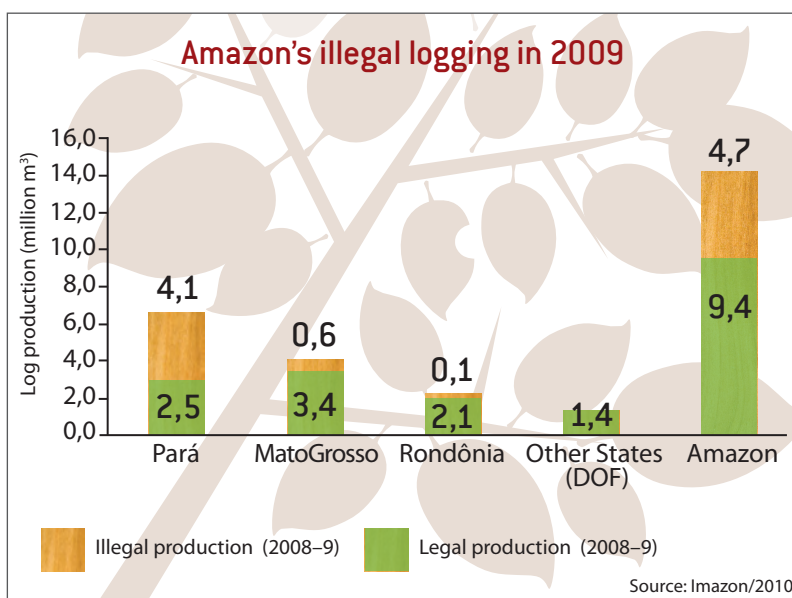
How and where fraud occurs

Even before a single tree is cut down, there is fraudulent licensing of both forest management and authorized deforestation, and fraud also permeates the entire supply chain from the forest to the consumer. The problem is not only errors and deficiencies of the system. Corruption is behind the issue of licenses allowing harvest in places not open to logging, even in areas where there is no forest. The fraudster overestimates volumes and supplies wrong information about species to boost his credits in the system. Fictitious management plans are approved, as in the case of the Fábrica Farm in the municipality

of Acará, in the state of Pará.

The system showed that the electronic timber credits for the Fábrica Farm management plan had been used up, but the on-site inspectors verified that the forest had not been touched and not a single tree had been cut. A license had been issued for 43 thousand cubic meters of logs and 64 thousand cubic meters of residues for charcoal. Said volumes of material had been produced in fact, but in a far away region that was not open for timber exploration. The timber was “legalized” with the credits from Fábrica Farm. Third parties bought the credits from Fábrica’s management plan holder – the person who submitted the plan to environmental authorities.

The woman who received the fraudulent license and 32 companies that bought timber credits from her ended up in court and may be forced to pay 100 million reais in reparation and to reforest an area of 2.6 thousand hectares. The case, along with dozens other suits, is piled up on the desk of federal prosecutor Bruno Valente. “The most common fraud no longer involves loads of timber,



but documents that confer a legal status to a product that in fact is fraudulent and predatory," says Valente, who works for the Federal Prosecution Service in Belém, the capital of Pará.

"In other cases, licenses are issued for fraudulent management plans in conservation, indigenous or even already deforested areas," he says. Such rogue licenses give rise to dummy companies that trade the false timber credits. Valente emphasizes that there is no accounting or fiscal logic to these practices. He asks: "How can a trading business claim that it sells logs if the product, instead of being sold in shops or lumber yards, is shipped directly from the producer

Fictitious management plans generate timber credits that disguise illegal timber harvested in protected areas and areas where logging is not allowed

to sawmills and industries that transform it into byproducts?" The problem is exacerbated because "It is cheaper to buy pirate documents to disguise illegal timber than to invest in sustainable logging as determined by law," Valente says.

In addition to fictitious management plans, falsified documents, harvesting without a license and the illegal sale of authorizations, there are plenty

of opportunities for fraud throughout the processing chain. One of the problems lies in the use of wood residues from sawmills. Following Ibama's standard, the electronic controlling system assumes that for every 100 cubic meters of logs, 50 are turned into lumber. That means that half of the volume of logs processed in sawmills is classified as residue and can be sold to make charcoal or for other purposes. When it calculates the timber credits of sawmills, the system automatically includes that volume as waste. However, with the precarious technology available in the far corners of the Amazon, the amount of wood turned into lumber is smaller than the volume predicted by the system. Furthermore, as there is no on-site inspection to determine the precise volume, the excessive timber credits generated by the system end up decoying timber of unknown origin.

"The right thing to do would be to develop a mechanism to return the remaining credits," says Valente. In some cases, the problem is the opposite: sawmills use more of the logs and generate less waste. However, the system does not consider the higher volume of timber processed and the company ends up receiving fewer credits for its lumber and byproducts. If the sawmill does not report its usage rate to the environmental authorities, part of its production will automatically be considered illegal. "These are complex issues that need to be continuously improved," says Valente.

The sins of the Deus é Grande Farm

Corrupt officials even input fictitious timber credits to the controlling system to cover up the illegal harvest in areas where logging is not allowed. This kind of fraud is easily carried out during "adjustment operations," which balance out the difference between data reported by the supplier and the buyer. The law allows for correcting both DOF and Sisflora's Forest Document after the timber reaches its final destination. However, this possibility makes inspection harder during transportation and is an invitation to fraud. Some civil servants have the code to perform adjustments in the system, but by inputting more timber credits than appropriate, they end up authorizing a larger harvest. "When the fraud is detected, the responsible party can argue that their code was stolen," says Valente.

Its name notwithstanding, the Deus é Grande Farm in the municipality of Pacajá (Pará), staged fraudulent operations in 2009. In a matter of seconds, credits for 55.6 thousand cubic meters of timber were mysteriously inserted in the system, almost 5 times the volume stated in the farm's management plan, approved a year earlier. More than 50 wood species were illegally altered in the system. "It all happened at the environmental agency's headquarters, furtively, after hours," says Valente, who is going to court to seek 40 million reais in reparation.

A recent report by the Federal Prosecution Service listed the most com-

mon fraud operations and recommended that Pará's Environment Secretariat (SEMA) improve 43 aspects of the controlling system. "The one year period to achieve solutions is already over," says Valente, adding that he intends to go to court to force the issue. If errors and deficiencies are not addressed, the electronic system developed to be a solution against fraud might end up facilitating it. Evidence of fraud could be easily detected, but for several reasons, chiefly among them the state's lack of structure, there is no effective control. Sometimes, it is just a matter of minutes between the time someone inputs credits for the supplier and the buyer reports receiving the cargo. "The speed indicates that no timber was transported from the authorized areas," explains Valente, reinforcing that the sole interest is for the fraudulent document papers, which are available immediately on the Internet. It appears that there is no limit to fraud: in one case, a cargo of many logs was "transported" by a vehicle whose plates, according to the controlling system, belonged to a motorcycle.

According to news that circulated in 2008, timber companies paid hackers to attack the controlling system and forge online credits, raising the authorized volume of timber to 1.7 million of cubic meters, the equivalent to 680 Olympic-sized swimming pools.

Today, fraudsters specialize in making timber credits disappear quickly between suppliers and sawmills, which makes monitoring more difficult. "The electronic controlling system needs filters and technical improvements to avoid this kind of problem, but that in turn depends on political will," says Valente. "It is very hard to prove that there is criminal activity among high ranking government officials, but there is at least omission and neglect".

Bribes galore disrupt lawful operations

We visited the Federal Police headquarters in Belém one week after eight SEMA officials were arrested for issuing fraudulent licenses to timber companies. "The inspectors received 5-15 thousand reais to license shadow companies," says

police officer Fernando Berbert, head of the Environmental Crime Repression Program. "In their testimony, the lumbermen said that the license for a management plan is not issued without a bribe," he says. "We tapped phone conversations in which an inspector says she has asked for 450 thousand reais to approve a management plan". Berbert says that such arrests are just the tip of the iceberg. One of the arrested officers earns a gross monthly salary of 2.3 thousand reais

MARCELÂNDIA, DEFORESTATION VILLAIN

Charcoal furnaces by the roadside suggest the fate of so many trees – to be turned into ash. The furnaces burn fallen trunks and branches and all the scrap left over after the sawmills transform logs into boards. The dense smoke gives the scene a desolate air, especially when we realize that its origin lies in the predatory use of the forest. The site is Marcelândia, a municipality in the state of Mato Grosso that tops illegal logging. An area larger than six thousand soccer fields was cleared without authorization between July 2008 and July 2009, according to a recent study by Imazon based on satellite imagery.

Ibama's inspectors, police officers and bailiffs are not welcome and the region is presently being forced to search for economic alternatives to timber logs. Law enforcement was intensified in the past two years, causing the number of sawmills in

the region to fall by half. There is a line of unemployed people in front of the town hall waiting to receive food staples. Former loggers burn trees to open space for pasture and cattle. Bushfires spread and to control them the town depends on water trucks which are ironically paid for by sawmills.

Because it faces so many risks due to forest destruction, Marcelândia is also the stage for projects that seek to preserve important water sources that feed the Xingu River. "We are rebuilding what we helped to destroy," says Adão Rodrigues Leal, who used to work as lumberman sawing the timber of 20 trees a day. Today he works at the public nursery planting seedlings that will reforest the town, as part of the Y Ikaty Xingu campaign, led by the Social and Environmental Institute (ISA).

and had just purchased a 130 thousand reais vehicle a couple of months before.

According to Berbert, corruption accounts for 5 to 10% of management plans' costs. "These schemes economically undermine anyone who wants to work within the law," he says. However, controlling it has proved difficult. The Federal Police has only three agents to investigate environmental crimes in all of Brazil, whereas the drug trafficking team is much larger. "Meanwhile the enquiries peter out and the crimes go unpunished," says Berbert, working in isolation in a small room at the end of a corridor on the second floor of police headquarters.

He admits that the agents have only rudimentary skills to identify tree species. Despite such deficiencies, they have been taking part in large-scale federal operations along with Ibama and military personnel to combat clandestine logging. In 2008, the Ring of Fire Operation discovered management plans approved for areas that had long been pasture, among other frauds. The most productive areas in the state of Pará usually produce 20 cubic meters of timber, according to Berbert. "It is strange if management plans allow for the maximum harvest permitted – 29 cubic meters –, as it is as if there were only dense forests to be harvested".

There are strong indications that these exaggerated volumes are used to disguise timber harvested in areas where logging is not allowed. After the Ring of Fire Operation, the Federal Police examined the maps for all management plans approved by SEMA during 2008. There were frauds in a hundred of the four hundred plans, including licensing of conservation areas such as national parks. Aware of the problems, Ibama blocked any activity by the rogue properties in the Federal Technical Registry, which should prevent the issue of permits for the transportation of timber. However, the state environmental authority acted to benefit the loggers by uncoupling its controlling system (Sisflora) from the federal system (DOF), making control difficult.

Fraud is not carried out exclusively by landowners who want to clear their land of trees. Much of the subterfuge is carried out by middlemen who negotiate timber prices with the landowner and receives from him the legal right to apply

for licenses and submit management and cutting plans for approval. This middleman is known as the management plan holder and as such, submits documents to the environment authorities. He is then given permission to legally harvest timber, even though he will not extract one single trunk from the authorized area. With the authorization in hands, the middleman sells the timber credits he was assigned for the approved management plan. The credits are then electronically transferred to timber companies, generating the permit for transportation.

The cost of timber credits varies from 100 to 130 reais per cubic meters, says Berbert, and after being processed, the “disguised” timber goes to the market. “Often the landowner only gets to know about the scheme when the system, due to inconsistencies, blocks his property at the state registry”.

From the Federal Police, we moved to SEMA's headquarters, where we met acting secretary Edvaldo Pereira. He has more than 30 years of experience in forestry and agreed to talk “only about legal issues, not illegal ones”. With three officials by his side, he blamed system errors, “The controlling system is good, but it needs continuous improvement to ensure timber monitoring.” He complained that his office is understaffed: “50 staff members to analyze management plans are not enough”. Nevertheless, he says, “in 2010 we were able to authorize almost 8.4 million cubic meters of timber logs, a volume almost double than the previous year”. He argues that a larger amount of legal timber to supply industries puts a check on clandestine activities. The state government plans to start accepting bids to build a system to monitor timber trucks by satellite on their way to the consumer markets and then do the journey in reverse to check where the timber came from. “The next step will be to have a chip installed on the logs to find out if they had documents forged”.

Corruption accounts for 5-10% of the management plan's costs to logging activities, according to the Federal Police

Aside from these plans, a lot is yet to be done to counter frauds. Pará is the largest producer in Brazil and the only state in the Amazon region where the volume of illegal timber exceeds the authorized harvest. But even when logging is allowed, there is no guarantee that predatory techniques are not involved. "Illegal timber is cheaper and less bureaucratic," says Luis Alberto Pereira, president of the Amazon Forestry Supply Chain Association (Unifloresta), a business association that provides legal assistance to timber companies.

CRIMINAL SCHEMES SPREAD FEAR

The following conversation with a journalist from Pará illustrates the underworld of illegal timber in the Amazon.

- Do you know any illegal timber schemes there?

- Yes, many of them.

- I need to suss out these stories.

- But that is very risky.

- Why risky?

- It's a network of high ranking people I prefer not to know much. In fact, when people tell me, I try to change the subject. There are people with a lot to lose and, in order not to lose they are ready to do anything. Have you watched Elite Squad 2, the movie?

- No, but I can imagine what you mean.

- It's the same thing, federal police officers fight among themselves to decide who will escort the timber. A corporal does not antagonize an

official.

- What do you mean?

- There are bribes I got to know the whole scheme by getting close to a woman who deals drugs.

- A woman?

- Yes. This world is incredibly dirty. My life has been crazy because I became her confidant, her friend. She started to open up and now she does not talk about anything else.

- What is the risk?

- Sometimes it's better not to know anything. High ranking officials at Ibama have lost their jobs. The whole thing has to do with the Indians, they are the biggest suppliers of timber. The chief drives an F 1000 but it could have been a Hilux. The other day the loggers invaded their land to steal timber when they were away for the Indian Games. It was a big mess.

The legal harvest of some species, such as *maçaranduba*, may cost twice as much as doing it illegally, which compensates for the bribes – they can get to 1.7 thousand reais per inspected truck. The transportation permit is valid for 10 days and the trucks reuse it in many journeys. And there is the problem of river transportation: “until recently half of the cargo shipped from ports did not carry a Forest Document,” says Pereira.

“The inspectors profit from lack of information in the forest,” he says. His association advises companies to act legally – to help them with reforestation native areas, it has developed software that analyzes data on location, timber prices, species and its uses. “Reforestation is profitable, but there is little information [on the best way] to do it,” says Pereira. He was born in Rio de Janeiro and moved to Pará to work in sawmills with his father – today he owns a timber processing plant and part of its production is exported. In general, timber companies argue they slip into fraud because there are too many onerous restrictions. On the other hand, control must be rigorous exactly because these frauds abound. In this vicious cycle, the biggest loser is the state of Pará – despite its large potential to benefit from timber, the state has a poor reputation nationally and internationally due to frauds.

Inspection stations on the roads to the larger consumer markets should catch illegal cargo of timber. Even when it reaches its final destination and before it is transformed into furniture or used in buildings, there is still opportunity for control. Construction companies, building material deposits and even joineries can access the system and issue documents proving the products’ legal origin. Between production in the forest and consumption of timber in large Brazilian cities, however, there are technical and governance barriers – the main one is the lack of integration between the most important control platforms, the DOF and Sisflora.

The licensing process step by step

Forest management plans face a long and winding road within environmental

1

Data submission

The first step in the licensing process is to obtain the Authorization Prior to the Technical Analysis (APAT) by submitting data to identify the producer of timber, as well as the property owner. The submission must also include information on areas set aside to comply with the Legal Reserve and permanent forest preservation requirements, as well as already deforested areas.

It is also necessary to prove ownership of the land by registering with the Rural Property Registry (CCIR).

The applicant needs to attach a Technical Responsibility Note (ART), issued by the Regional Engineering and Architecture Council (CREA), and signed by a forest engineer.

The documents are verified and validated by different sectors of the environmental agency.

2

A plan to tap the forest

After receiving the APAT, the producer must submit a Sustainable Forest Management Plan (PMFS).

One single document covers the entire 30-year management cycle. The document specifies the timeframe for production and divides the property in parcels for annual exploration, known as Annual Production Units (UPAs).

The plan must cover the infrastructure necessary for production and contains a forest inventory calculating volumes to be harvested by species. It is mandatory to attach satellite images of the property and documents proving compliance with the Legal Reserve.

Environmental agents verify inconsistencies, such as overlapping of areas with different ownership. They also check the forest inventory data and volume estimates.

The producer commits not to abandon the area during the management cycle by signing a Management Forest Maintenance Document.

At this stage, it is necessary to again submit a document identifying the engineer responsible for the management plan.

3

Registering with the controlling system

To have the management plan approved, it is indispensable to have it registered at the Federal Technical Registry (CTF). The state of Pará also requires that the plan be registered at the Forest Products Register (CEPROF). Loggers, sawmills, processing plants, transportation agents and retailers must register in order to start operating.

4

Annual approval

Every year, an Annual Operation Plan (POA) for each Annual Production Unit needs to be approved. In order to obtain approval, documents concerning annual operations need to be submitted – forest inventory, maps, residue use plans. Producers also need to submit trade agreements to sell timber to industry and declare volumes and destinations.

5

Finally, the license to operate

Legal and technical experts of the environmental agency analyse the documents. They verify inconsistencies, such as the overlapping of areas with different ownership titles or areas where there is no forest to be explored. Data related to the inventory and volume of wood to be harvested is checked. Used in some states, SIMLAN is the system that comprehends all levels of the process.

Once the management plan and the POA are approved, the agency issues the Operation License (LO) and the Forest Exploration Authorization (Autex) – which have different names depending on the state.

The authorization is entered into the official electronic system that controls forest products (Sisflora and DOF), generating timber credits according to the origin, destination, species and volumes approved. The producer receives a code to be able to issue the Forest Document (DOF), which must be carried during transportation to processing plants and then to the consumer.

Source: Marcus Biazatti/IDESAM

Solutions that lead to legal timber

Approved in 2006, the Public Forest Management Law transferred the responsibilities for licensing and control from the federal government to the local government of Brazil's nine Amazon states. Previously, it had been Ibama's responsibility to authorize management plans and control the flow of timber and wood byproducts out of the forest. "Decentralization was a last minute decision, there was no debate about its impacts and the minimum capabilities needed by the states to take on the new responsibility," said Greenpeace Amazônia research coordinator, Marcelo Marquesini, in 2010. The law established a new authorization system and defined actions to transfer capabilities from federal to state entities. "Forest protection, however, is not usually a high priority for local governments as they are historically tied to the political elite that profit from the logging industry," he said.

Brazil's Amazon states were assigned key responsibilities for the region's future without having the resources and structure to effectively control logging activities. When that happened, Brazil had not yet achieved an efficient and safe system to control the low impact harvest of trees, inspect transport and storage of timber, and combat illegal logging. With the transfer of responsibilities to the states, the Ministry of the Environment established a working group to implement the Forest Origin Document (DOF) – the system was built hastily due to the transition process and the need to standardize procedures among the states, and training had yet to be offered.

The state of Mato Grosso – which at that time reported the highest rate of deforestation among Amazon states – pioneered the decentralization process by adopting its own electronic system to control timber flows from the forest to processing sites. The system represented an important improvement and was in use also in the states of Rondônia and Pará by February 2011. However, the system did not completely prevent fraud and soon a key question was raised: how would states that chose the other controlling system recognize and control documents issued by Mato Grosso's system?

The different electronic systems should be integrated. Despite some progress in that direction, the two systems still do not completely “speak” the same language. There are loopholes that allow for illegal activities during several stages of the timber journey, including the consumption end. By registering with the DOF, retailer companies in the consumer markets are able to verify online the validity of transportation permits, as well as the description of species and volumes contained in the cargoes. Because the systems are not fully integrated, retailers that receive timber from states that use the other system, Sisflora, have difficulties monitoring shipments.

In addition to inspection at the consumer end, one of the weakest points of the system lies in the transfer of timber credits between states that use different electronic platforms. There was clear evidence of the size of the

problem in 2008 when the state of Pará approved very few management plans. In order to be able to keep production up, sawmills bought illegal timber with licenses from other states, such as Maranhão, which uses the DOF. Since Pará uses Sisflora, timber credits are manually input into the system once the producing state’s environmental authority mails the authorization document.

Because long distance transportation in the Amazon is economically infeasible, there is widespread suspicion that not a single log was shipped from other states – instead all the timber was probably removed illegally from forests in Pará. The document was used to decoy the true source of the timber. If the environment official made a mistake or received a bribe, it is also possible that he may have overstated the number of credits in the system, allowing for more timber to be harvested than the authorized volume.

The search for legal timber production requires better governance to avoid the overlapping of federal and state jurisdictions. Furthermore, it requi-

When delegating forest management to the individual states, the federal government should provide training and better surveillance capabilities

res, as established by law, a participatory and transparent controlling system that is impervious to the political interference such as that seen in recent elections in Pará.

The problems with decentralization

"The timber licensing and controlling systems have not kept up with the pace of recent progress in environmental regulation and management legislation which in turn, can be difficult to interpret," says Marcus Biazatti, a re-

Lack of integration between different electronic controlling systems used by the states creates loopholes for illegal and predatory action in the Amazon Forest

searcher with the Amazon Conservation and Sustainable Development Institute. He surveyed legislation from different Amazon states and identified various shortcomings, as well as possible solutions for improving forest management. The Global Green Growth Institute, an international organization that develops low carbon projects in Brazil, supported

the study. "It's almost as though legislation in different states use different languages," says Biazatti. "There are loopholes that may result in operations that feed illegal schemes". Good management plans are left in the same queue as bad and illegal ones, and all of them are prisoner to the same sluggish pace of administrative processes. "There is a lack of standards so the analysis often depends on the common sense and goodwill of the official doing it," says Biazatti.

Observers associated with NGOs say that better auditing mechanisms, frequent on-site inspections and standardized data are needed to effectively monitor timber flows. One problem is that different regions use different names for the same tree species. However, the most acute problem is the failure by DOF to update reports on the commercialization of timber produced in different states. Because they do not have access to data pertaining to their region, inspectors are unable to statistically monitor production and are forced to visit

the sites to check how many trees were left standing and to renew sawmills annual licenses. If licenses are not renewed in time, the system automatically blocks the company's account, preventing it from selling any timber. To solve this type of problem, the state of Acre plans to invest 100 thousand reais to develop its own modular licensing system.

"We were not prepared for the boom in forest management," says Mara Rúbia Said, a forest licensing manager at the Environmental Protection Institute of the state of Amazonas (IPAAM). She recalls the chaos of having only four engineers to perform the tasks previously carried out by Ibama officials. Today there are 16 engineers, "but we need at least double that," she says. Even worse, as the licensing process is not computerized, folders pile on desks and on the floor. Since 2006, 1.5 thousand management plans have been submitted. To avoid even more red tape in obtaining a license for different plots each year, timber companies end up deviating from the management plan and harvesting all their area at once in the first year.

With the decentralization process, Ibama is now responsible only for authorizing clearing in large-scale plots – 2 thousand hectares or more – in the Amazon, as well as management plans for plots larger than 50 thousand hectares. It also control the timber flow nationally and the movement of forest products in and out of the country.

State governments are responsible for everything else regarding environmental management. The Ministry of the Environment signed cooperation agreements to help the states build capacity and train personnel, and the United Nations Environment Program (UNEP) invested 3.8 million reais in that process in 2008 and 2009. "In 2011 we need to review the agreements with the states, since many have become obsolete in face of changes in forest management since the system was decentralized," says Ibama's general coordinator for forest use authorization, Carlos Fabiano Cardoso.

"There has to be total integration between the DOF and Sisflora, and not only partial integration as it happens today," says Cardoso, explaining that the-

Routes of DOF

See how the timber control system works

Up to 2006, authorities used the Forest Products Transport Authorization (ATPF) to monitor the flow of timber between the forest and the consumer. Lacking in efficiency and transparency, the process was all done on paper, with stamps and labels, leaving a lot of room for fraud.

The Forest Origin Document (DOF) substituted the ATPF. Previously, control was done with the use of paper and focused on the transportation. The DOF is an electronic document based on information, which is generated through a computerized system based on a centralized database.

The system is operated by Ibama and used to control timber flows in the states of Acre, Amazonas, Maranhão and Amapá. The states of Mato Grosso, Pará and Rondônia used, until February 2011, an independent electronic model, the Sisflora, which should be integrated to the national controlling system, the DOF.

Objectives

- transparency and agility
- guarantee legal origin of raw materials
- control timber flows from the forest to the consumer
- reduce human error
- increase control safety

Challenges

- standardize information on transportation permits
- improve DOF and Sisflora's integration
- increase the realibility of enforcement in states
- link forest to fiscal control
- create an integrated consumers registry
- adapt the system to regional characteristics

The system can be accessed online at www.ibama.gov.br

Oferecer

Orgão: **ATUF 2004.5.2001.2000**

Ato de Processo: **1230.ATUF/2007-01** Data de Registro: **07/02/2008**

Nome completo: _____

Data de Emissão: **01/01/2008** Data de Validade do Documento: **01/01/2007**

Matrícula: **000011111-000**

Endereço do Consumidor: **CARLOS A. DE OLIVEIRA/0001-00** Raza: **Indígena** Nacionalidade: **CTB**

Nome do Produto: _____

| Item | Descrição | Quantidade | Valor | Valor Total |
|------|-------------------|------------|--------|-------------|
| 1 | Tronco de madeira | 100,000 | 10,000 | 1,000,000 |
| 2 | Tronco de madeira | 100,000 | 10,000 | 1,000,000 |
| 3 | Tronco de madeira | 100,000 | 10,000 | 1,000,000 |
| 4 | Tronco de madeira | 100,000 | 10,000 | 1,000,000 |
| 5 | Tronco de madeira | 100,000 | 10,000 | 1,000,000 |
| 6 | Tronco de madeira | 100,000 | 10,000 | 1,000,000 |
| 7 | Tronco de madeira | 100,000 | 10,000 | 1,000,000 |
| 8 | Tronco de madeira | 100,000 | 10,000 | 1,000,000 |

DOF emitido com sucesso!
IMPRESSÃO DO DOF

Ministério do Meio Ambiente
Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis
DOCUMENTO DE ORIGEM FLORESTAL - DOF

1- Processo: **MINISTÉRIO AMBIENTE DO PARÁ SA 1000** 2- Sistema: **DOF**

3- Sistema: **SECTOR INDUSTRIAL, DO PARÁ SA 1000** 4- Sistema: **SECTOR INDUSTRIAL**

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29- Sistema: **SECTOR INDUSTRIAL** 30- Sistema: **SECTOR INDUSTRIAL**



- After having the management plan approved and the harvesting license issued, the producer is able to offer logs or lumber to the market within authorized limits.



- Both the producer and the buyer – a sawmill or a processing plant – must be registered to receive an access code to the system and be able to make transactions with timber credits. They inform how much wood will be transformed into products and how much residue will be left. They also inform the cargo's destination.

- When the buyer accepts the producer's offer, he/she receives timber credits and the system issues the permit for transportation to the final destination – plants, lumberyards, civil construction projects or ports. The document contains data about the timber's origin, volume, species and destination and must be carried at all times until it reaches the destination.



- The DOF system is fed with information from SISPROV, a database that includes data from field inspections and satellite images, so that timber credits transactions are checked against availability in the forest and approved management plans.



- Once the timber reaches its destination, the buyer is able to enter the information into the system. The system automatically checks the date, adjusts the producer's and buyer's balances accordingly, and issues a certificate of compliance. The system can be accessed online, via printed reports or with a free phone call.

re has been little progress in integrating the systems due to technical obstacles and state environment agencies internal problems. "In the states that do not use the federal system, our hands are tied and we are unable to perform cross-checks in order to enforce the law," he says. Positive action in Minas Gerais shows how big the problem is for the rest of the country; "By developing an efficient system to compare information without the need to carry out on-site checks, the state discovered that 30% of the timber consumed there was of

unknown origin, and was able to issue 580 million reais in fines."

The electronic controlling system is just a tool and needs to be supplemented with on site inspections

A big challenge is traceability, or monitoring the process from the point of harvest up to consumption. Again, the systems are inconsistent. Sisflora monitors virtually the entire supply chain, from raw logs to finished products, with the exception of

retail sales. However, the DOF does not monitor plywood and processed timber. It follows the process up until timber is turned into lumber, which is the first processing step. "It is technically very difficult to monitor finished products throughout the chain; millions of conversion factors would be necessary," argues Fabiano, adding that the priority should be to prove the timber's origin. "The electronic system is only a tool; without a simultaneous effort of large-scale enforcement operations, it provides no guarantee that logging is being done legally".

In 2010 there were 138 operations to combat illegal logging in the Amazon – some of them involved the Federal Police and the Army. The operations apprehended approximately 120 thousand cubic meters of timber logs and lumber, enough to fill 6 thousand trucks – the volume, however, was one third smaller than in the previous year. "The strategy is to deprive those responsible for environmental crimes of capital," says Ibama's enforcement coordinator,

Bruno Barbosa. To solve the problem of data inconsistency, he thinks that all states should migrate to the DOF, a system that monitors forest products worth between 16 and 18 billion reais annually.

Technology at the service of legal logging

Satellite imagery, a powerful weapon in the fight against deforestation, is known for keeping loggers, farmers and ranchers awake. The National Space Research Institute (INPE) operates the two official satellite monitoring systems: the Prodes, which annually analyzes the destruction of the Amazon, and the Deter, which provides monthly data to support enforcement on the ground. Imazon launched in 2006 an alternative and independent system to increase data transparency and help calibrate official indices. The Deforestation Warning System (SAD) uses NASA images to detect both clearcutting, where the forest is totally suppressed and the soil exposed, and degraded areas where trees are still standing but there has been fire or other impacts. The official analysis done by INPE does not differentiate deforestation from degradation and classes all impacts as deforestation. "We do have agreements with the Federal Prosecution Service and municipalities to provide bulletins to support monitoring," says SAD's coordinator Sanae Hayashi. Significant improvements are planned in partnership with Google to develop a multisensor warning system for the daily scan over the Amazon. The new system should be accessible by anyone on the Internet.

Improvements in satellite imagery allow for ever more precise and varied maps, and contribute to combating fraud and increasing the quality of forest management. The licensing process currently requires detailed maps, not just geographic coordinates as in the past. Once the management plan has been approved and is being monitored, the same concept applies, at larger scales and using better analysis.

By overlapping satellite images, Imazon's researchers verified that 73%

of the total area logged in 2008 and 2009 had not been authorized – in other words, logging was illegal. In the previous study, for 2007 and 2008, illegal logging was even larger (89% of the area). In recent years the rate has slowed, but it is still high. “Since there hasn’t been an increase in authorized areas, we could infer that there was no migration to sustainable logging, but loggers simply left the market,” says the coordinator of Amazon’s Logging Monitoring System (SIMEX), André Monteiro.

The images caught pasture interspersed with areas licensed for timber management. “This suggests that the timber logs covered by those licenses was harvested from some area where logging is not allowed,” explains Monteiro. He says that the environmental authority has also licensed properties that had already been harvested. Finally, the maps revealed logging beyond the limits of licensed areas. There are also forests that remain intact one year after being licensed for harvest – that means the management plan was submitted only to enable the sale of timber credits to cover up illegal logging somewhere else.

Logging is carried out carelessly. The different shades of green on satellite imagery taken of the state of Pará in 2009 indicate that most management plans were of indifferent quality. The number of high quality management plans diminished by one third, which demonstrates the lack of investment and criteria to minimize environmental damage due to logging.

Satellite images highlight the municipalities with high illegal logging rates. In the most recent study conducted by Amazon in Pará, Paragominas showed the worst performance. The municipality was placed in the Ministry of the Environment’s Black List, at risk of losing federal money transfers, but made a comeback (box on page xx). “Initially the mayor argued that the town was being looted by intruders from other regions, but we were able to prove that the problems were happening inside private properties and not in public areas,” says Monteiro. Today, in order to register with the Rural Environmental Registry and obtain licenses, most farms in the region have satellite image maps done.

There is illegal logging within conservation areas such as national parks and biological reserves, as well as around land reform settlements. Illegal logging is most acute in the Freedom Sustainable Development Project, a settlement in the municipality of Portel (Pará). Founded after the murder of Sister Dorothy, the settlement ended up as a stronghold for illegal loggers. More enforcement in private properties means that illegal logging moves to indigenous areas, where the environmental authorities have no jurisdiction and the only authority is the National Indian Foundation. In many cases, the Indian villages are accomplice to illegal logging. Imazon finished a study of satellite images of Mato Grosso in December 2010 that revealed a critical situation.

THE PARAGOMINAS EXAMPLE

The first municipality in the Amazon to have its name taken off the Deforestation List of the Ministry of the Environment, Paragominas is a showcase for the best practices in combating the chainsaws that deforested half of its territory. In only two years, the rate of deforestation slowed by more than 90% and the municipality's reforested area is the largest certified forest area in the Amazon.

The Green County Project, developed in cooperation between the town hall, businesses and NGOs, is an example to be followed. In a pioneer initiative to combat the shadow economy, 92% of private properties achieved compliance with requirements of the Rural

Environment Registry (CAR).

The municipality endorsed the Zero Deforestation Pact and the Sustainable and Legal Production Pact, which promote sustainability standards for agriculture and cattle ranching, and it plans to develop a guarantee of origin label for local products.

"The initiative has been successful because it mixes politics, education and popular participation in a development model based on a sustainable relationship between men and nature," says coordinator of the Friends of the Amazon Network, Malu Villela

While illegal deforestation as a whole fell 57% from August 2008 to July 2009, when compared to the same period of the previous year, it increased four-fold within indigenous areas. It increased 1.301% within the area of the Aripuaña indigenous people.

The dusty landscape around highway BR-163 – which links Cuiabá, the capital of Mato Grosso, to Santarém, the second most important city in Pará – brings the American Far West to mind. In Cachoeira da Serra, in Mato Gros-

Satellite images elicit management approved plans within national parks, indigenous reserves and even in areas with no forest left

so, the silent streets make it feel like a ghost town. Most of the population used to work as loggers or in sawmills, but they left in search of jobs. "Trade is down 80%," says 50-year-old Silvio de Oliveira Bittencourt, a bar owner in the local bus station. His main business now is selling bus tickets to workers leaving for other parts of Brazil.

From there we travel to Serra do Cachimbo in Pará, a region where very few people have land title and therefore, care for the forest. There is conflict everywhere. Approximately 150 landholders risk being expelled after the federal government established a biological reserve in the region, which forbids any type of economic activity. They and their families came from other parts of the country, occupied public land, established pastures, helped to build roads, bridges and towns. They acted according to the land use policies of the past and now have to look for alternatives. These landholders believe that productive areas that are already occupied should be excluded from the reserve. The remaining area with standing virgin forest could be declared a national park, they suggest. The Brazilian Senate is currently considering a project to change the reserve's limits.

"It is necessary to follow a different logic from now on," says Gustavo Irgang, a consultant that advises landholders. "Those who start working legally

and follow the environmental requirements will survive,” he says, adding that the Amazon today “sees the end of a cycle”.

The power of alliances against destruction

The satellite images are clear and expose how urgent it is to change production patterns – this context has inspired action by different sectors, including logging, in search of solutions. The Zero Deforestation Pact, for example, was signed in 2007 by a dozen large environmental NGOs with the aim of ending deforestation by 2015. The target is to invest 1 billion reais per year to improve governance and promote financial compensation for those who conserve the Amazon. The Pact has national and international funding.

In 2008 timber companies joined the efforts to ban predatory logging and signed the Sustainable and Legal Logging Pact, which also involves NGOs, the state government of Pará and the Ministry of the Environment. The initiative was inspired by the Soy Moratorium, which established voluntary targets to reduce impacts from agriculture and criteria to boycott businesses that practice deforestation. At the end of 2010 the Prosecution Service in Pará announced another strategic project, the Legal Meat program. Cattle ranchers that join the program commit to apply for environmental licenses to be able to sell animals to abattoirs. It is one more step in the siege against illegal logging – it targets the unauthorized establishment of pasture –, and it has already led to a decrease in deforestation in Pará.

States, municipalities, NGOs and large buyers of timber form alliances to stop forest destruction (see chapter 4). “We believe nothing can be achieved in the Amazon without multi-sector action,” says Social and Environmental Institute’s Sérgio Mauro Santos Silva. “There is no more room for competing interests from environmental NGOs and businesses, which were used to fighting each other”.

SUMMARY

■ PREDATORY TIMBER

More than one third of the timber produced in the Amazon is of clandestine origin. In the state of Pará, illegal timber accounts for 60%.

■ MULTIPLE CAUSES

The roots of fraud are corruption, lack of enforcement structure, human errors, weaknesses of the electronic controlling system, as well as poor public governance and land grabbing.

■ DISASTROUS CONSEQUENCES

In 2009, illegal logging represented tax evasion to the tune of 477 million reais and caused greenhouse gas emissions equivalent to 55.8 million tons of carbon.

■ CONTROLLING SYSTEM

The system that electronically controls timber origin and flow has flaws and is vulnerable to fraud.

■ ISSUES WITH DECENTRALIZATION

Federal legislation (number 11.284/2006) transferred forest management to the states, but to this day states are unprepared to take on the new role. The federal system (DOF) is not fully integrated with the state systems.

■ TECHNOLOGY AGAINST FRAUD

Satellite images show that management plans have been approved for logging inside conservation areas, indigenous lands and areas that have already been cleared.





4 The power of public authorities



The role played by the government in the enforcement, market mobilization and capacity building for the responsible procurement of timber

Police officers simultaneously inspect roads and lumberyards throughout the state of São Paulo. A truck with plates from Rondônia is stopped by a police roadblock on the outskirts of the municipality of Colômbia, 600 km from the state's capital. The cargo has raised suspicions because its volume is higher than the one stated on the Forest Origin Document (DOF), which works as the timber's birth certificate so consumers have guarantee of its legal origin. The species stated on the document is also different from the ones being transported. It was 2 pm on a Friday and time was short. Three hours later a team of inspectors arrived at the lumberyard slated to receive the cargo in Diadema, in the metropolitan region of São Paulo. They found many frauds there, including a cargo of Brazil nut trees – an endangered species prohibited by law from harvest and trade. The inspectors seized the contraband, issued fines to both the transportation company and the retailer, and arrested the truck driver.

The operation took place in mid-2010 under the name Operation Canopy and issued 2.3 million reais in fines and seized 1 thousand tons of timber. It is just one example of the state exercising its responsibility in controlling the flow of forest products within regions where they are sold and consumed. "We have little say on the production of timber in the Amazon, so there is very little we

can do within the borders of our state if the documents were forged closer to the origin," says São Paulo's Environmental Police chief, Milton Nomura. "It's the same as with drug trafficking: from a criminal standpoint, the problem is not so much with the user, but with who produces and sells the product".

Captain Marcos Diniz, who coordinates police surveillance of timber operations explains, "If we can close off one of the endpoints, chances are things will change in the source regions." It is like a domino effect; "To avoid inspection problems at the final destination, retailers prefer to buy timber from regions in the Amazon with a clean environmental image, such as Acre". At the Environmental Police Headquarters in the Vila Mariana district in São Paulo, the entrance is adorned by an image of Saint Francis and his insepa-

Under increasing police surveillance, buyers from São Paulo choose timber that comes from locations in the Amazon where lawful logging is more guaranteed

able dog. The building, painted green, matches the officers' mission, as stated on a plaque at the reception desk: "to protect the environment by preventing and fighting environmental crimes".

The environmental police routine has two basic aspects. One involves intelligence work to compare on-

line data from the DOF to the stocks declared by retailers and timber users. If frauds are found, the agents issue fines and adjust the timber balance owed to the company in question. The second aspect is preventive and involves periodically carrying out checkpoints in strategic places on the roads that link the Amazon and São Paulo. As a result of those operations, 8 tons of seized timber awaits court orders as to whether the material is to be auctioned off or donated to public works.

The amount of timber seized is still small, since fraudsters have learned how to forge licenses and avoid transportation inspections. The controlling system has evolved significantly in recent years compared to the old paper

forest forms that used to be hastily filled in by truck drivers when stopped for inspection. However, there are bottlenecks that need to be resolved at the timber's origin. São Paulo's environmental police force is one third of the entire Brazilian force – of 6 thousand officers –, and it does not grow at the same pace as the crimes they are combating. "We do have a method for control, but we lack in capacity to implement it," says Diniz.

There is increasing commitment from those who buy timber at the end of the chain in São Paulo. "With increased control, there are fewer penalties issued, which shows that the market adapts to the rules and changes its behavior," says Diniz. When the environmental police started working four years ago, "people did not know the law and regulations, let alone how to put them into practice".

The number of registered lumberyards in São Paulo – currently there are around 6 thousand of them – illustrates the increased commitment. In 2007, they were only half of that number and most operated illegally. "By competing for market share, they changed their practices and started looking for legal suppliers. The market adjusts itself naturally".

The state of São Paulo's Native Wood Retailers Registry (Cadmadeira) was established by decree in 2008 and became a decisive step in changing the state of affairs. Registration is voluntary except for those who sell timber to the state and some municipalities for civil construction. Retailers must comply with four preconditions to have their registry approved: demonstrate a clean slate in terms of fines related to timber; register with the Federal Technical Registry run by Ibama; register with the São Paulo Commercial Committee; and to regularly operate the DOF.

To stand out in the market, however, a retailer may apply for a best-practice label. The State's Environment Secretary issues the label – valid for a year – after evaluating the company's operations. Inspectors check if it has the licenses to operate, if the timber is organized by type and species in its

patios, and if its stocks match the balance in the electronic registry. At the moment, 35 companies – half of the applicants – have received the label.

Monitoring of the market by the government

Out of approximately 2 thousand businesses that deal with timber in the state of São Paulo, 230 are registered with the Cadmadeira – from lumberyards to retailers and sawmills. There are also charcoal makers and building companies that stock forest products and byproducts – these cannot register with Cadmadeira, but as other businesses they are monitored by the DOF.

“At first timber companies resisted regulation,” says environmental engineer Carlos Eduardo Beduschi, coordinator of the Sustainable Use Program at São Paulo State’s Environment Secretariat. At that time, there was little knowledge and guidance about the legislation, not to mention a lack of organization and obstacles when dealing with government. Slowly, things started to change. A milestone in this process was the launch of the state program Green-Blue Municipality, through which municipalities that commit to good practices are the first to receive money transfers from the state government. Legislation made registry with Cadmadeira mandatory for companies that want to supply timber to public works. Today, more than 300 of the 645 municipalities in the state of São Paulo have their own rules for the use of legal timber. “Demand has been growing,” says Beduschi, adding that the challenge now is to make sure local regulations are worth more than the paper they are printed on.

The trigger to this process was the decision by the state government in 2006 to sign the protocol São Paulo Friend of the Amazon, which aims to monitor native timber used within the state’s territory and later was turned into a strategic environmental program. The state’s capital had signed the protocol the previous year and pressure was mounting for the state to control the use of products that contribute to deforestation. At that time, the environmental organization Greenpeace bought illegal timber in the Amazon and transported

it throughout the country to get to São Paulo, demonstrating the inefficacy of the controlling system. In 2000, a group of NGOs had published the report "Hitting the Target," showing for the first time the destination of the Amazon native timber: São Paulo. Today, the state consumes 17% of Amazon production, most of it for civil construction applications.

Enforcement against illegal logging is now reaching the consumer end of the supply chain. In April 2007, the state government started managing the federal electronic controlling system in São Paulo, but flaws soon became apparent. "It was hard to obtain guidance from Ibama about the system," says Beduschi, who also acts as a state manager of the DOF. However, progress with Cadmadeira got the state government interested in monitoring. At the other end, despite the enduring lack of information and disputing interpretation of regulations, businesses started to comply.

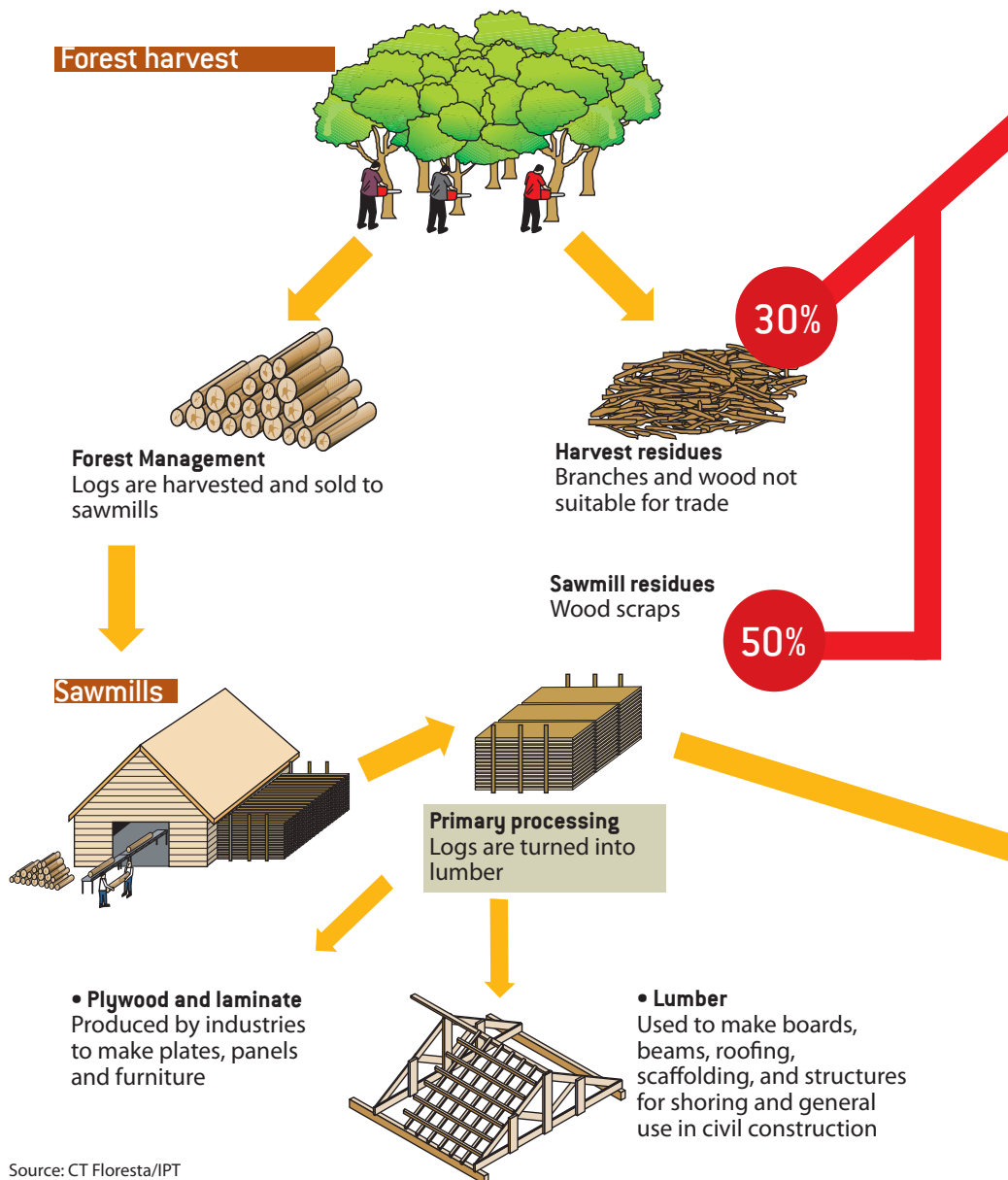
"We are working on a guide for retailers," says the manager. Few of them are aware, for instance, that any volume of timber is subject to monitoring. "Any amount of timber sold, even less than 2 cubic meters, needs to be in the DOF," says Beduschi. According to a National Environment Council standard, timber products sold must be classified by type – beams, boards, rafters, joists, etc.

There are different problems. "In some cases, without an environmental license, trading companies will cut the timber again in order to make byproducts," he says. As a result, there is a difference between the electronic system balance and the actual stock, which can cause fines to be issued if there is an inspection. "The challenge now is to convince retailers to sell only to building companies registered with the DOF," says Beduschi. "To fight illegal timber throughout the production process, it is crucial to work across the entire chain".

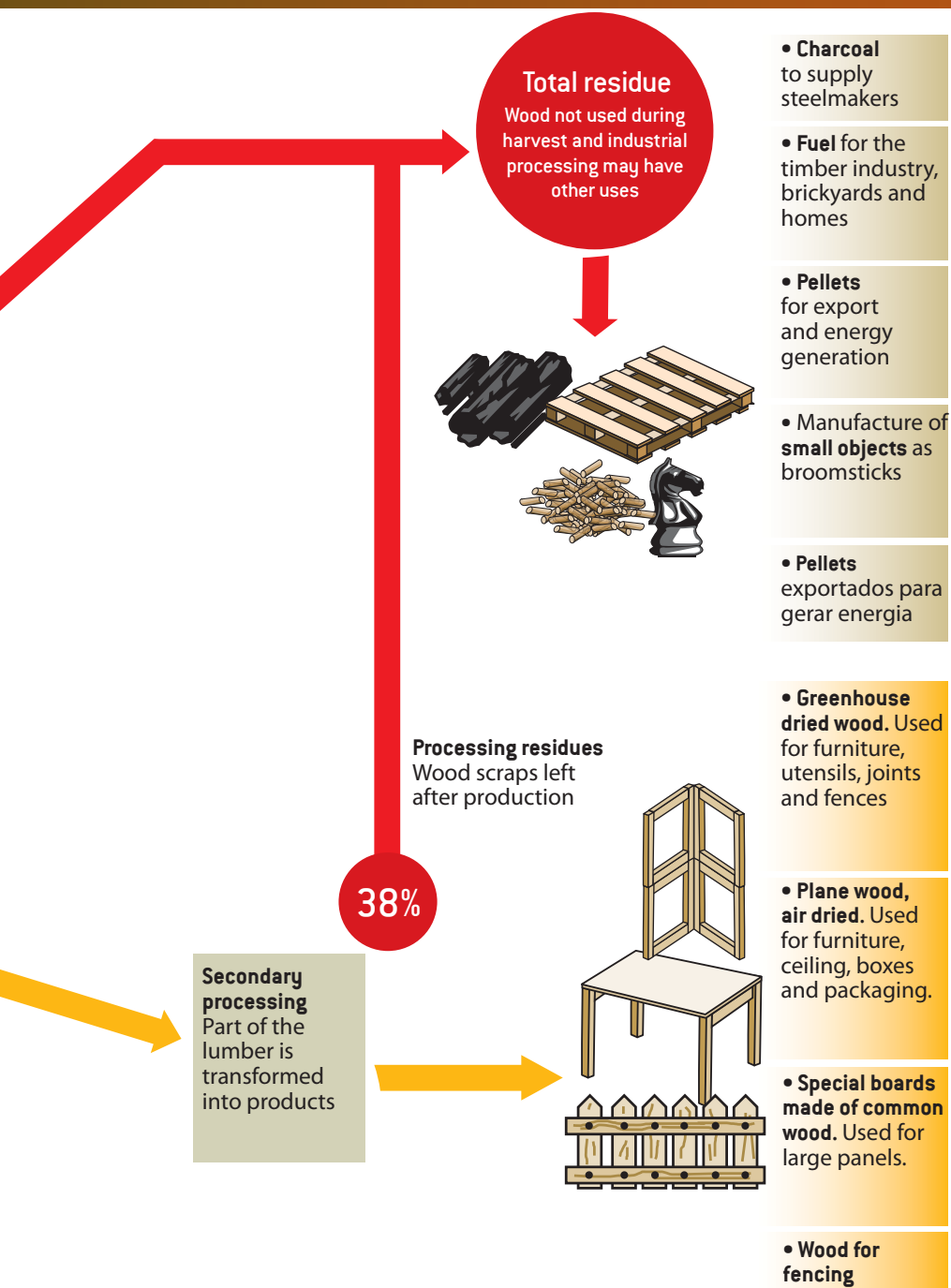
One out of five trees harvested in the Amazon is used in São Paulo. Its strong purchasing power can help in the fight against deforestation

A thousand ways to use timber

See how timber processing phases work, its residues and the destination of its products



Source: CT Floresta/IPT



He points out that even the individual consumer who buys timber to make a bed frame or to use in a house addition should leave the retail store with a tax receipt and the Forest Origin Document. “Despite the problems, the market has been slowly adjusting and advancing,” he says.

A protocol that engages retailers and building companies

Signed in March 2009 by 23 organizations – companies, NGOs, government agencies and research centers –, the Legal Timber (Madeira é Legal) protocol has been a driving force behind the movement aimed at fighting deforestation. Focusing on the consumer market in São Paulo and incorporating the Cadmadeira and the DOF, it developed initiatives to promote sustainable practices and support conservation and economic development in the Amazon. At the center of its efforts is the civil construction sector, the largest consumer of native tropical wood, used to make roof structure, concrete molds, scaffolding, beams to shore slabs, as well as windows, doors, floorings and baseboards.

“There was strong demand from the state for a collective effort,” says Lilian Sarrouf, technical coordinator of the Environment Committee at the Civil Construction of Large Structures Industry Association (SindusCon-SP). SindusCon takes part in the Legal Timber program along with the association of Amazon Certified Forest Producers (PFCA), WWF Brazil and the Friends of the Amazon Network at Fundação Getúlio Vargas’ Center for Sustainability Studies.

“When we talk about sustainability, it is important to remember that civil construction companies cannot operate alone,” says Lilian. “We need to involve the final user”. She says that the voluntary protocol was a result of the involvement of producers and consumers. “We are in a learning phase, when we start operating in full swing we can think about making the protocol mandatory”.

Meanwhile, one of the main tasks is to guide the market towards a new consumption pattern and train professionals for responsible procurement. In addition to encouraging producers to get social and environmental cer-

tification, the Legal Timber program offers training to small businesses such as timber retailers and architecture firms. “These are two important links in the chain, since most of the civil construction jobs are carried out by private and small companies,” says Lilian. The strategy to fight fraud is not, she emphasizes, to substitute native wood for alternative materials such as plastic or metal. On the contrary, the effort is to encourage the use of Amazon products that carry guarantees of origin and of sustainable production. This is how it is possible to keep jobs and income in the forest, as well as encourage good practices and minimize the risk of predatory activities.

According to Lilian, the program that started in São Paulo tends to be exported to other states through the actions of subscribing companies. Some of them also take part

in the Global Forest & Trade Network (GFTN), an alliance of international organizations led by WWF and dedicated to promoting sustainable practices, enhancing enforcement and acting as an interface between producers and buyers of responsible forest products.

“We are considering a new system to monitor lumber trucks by satellite,” says WWF forest engineer Estevão Braga, who manages the GFTN in Brazil. That system would map the transportation network to confirm that the origin of the timber being transported matches the one stated on its documentation. “Companies interested in eliminating the competition from illegal products are voluntarily developing a pilot project,” says Braga. “Once the system is ready, the government will make it mandatory for trucks to carry the equipment”.

Globally, the GFTN includes almost 400 companies – both producers

**The “Legal Timber”
program promotes
professional training and
responsible consumption
for a number of sectors
in urban areas, keeping
income and jobs in the
forest area**

and users of timber – present in 40 countries. They trade a total of 45 billion dollars in forest products, or 195 million cubic meters of timber. In producing countries, the GFTN works to improve forest management and encourages certification by the FSC. In importing countries, the network helps to establish policies to avoid the purchase of illegal timber and gradually move towards certified wood.

Obstacles to be overcome in Brazil include the need to get building companies to register with Ibama's Federal Technical Registry so that they can access the DOF and have a guarantee of origin for the timber they buy. To accomplish that, companies that get funding from the Federal Savings Bank – a government-owned financial institution – are required to show the Forest Origin Document for the timber used in federal housing project such as "My House My Life".

On the other hand, companies complain about the bureaucracy and lingering problems in the federal controlling system. "There are weaknesses and a lack of security," says Braga. "The system focuses on the timber's origin, but there are bottlenecks both in the production and trading of timber," says Rafik Hussein Filho, a lawyer with the São Paulo's state Timber Wholesale Trade Association (Sindimasp). "It is very difficult to check the legal origin of what we buy due to the lack of integration of each state's database into one larger system". According to him, it is necessary to adapt the electronic control of timber flows to the retail dynamic, which is different from the producers' logic and deals with the finished product. In addition to that, says Hussein, frequent system outages adversely affect retailers, since they are not allowed to sell timber without the origin document.

Hussein believes that it is not enough to step up surveillance efforts and there should be incentives to change behavior, such as less taxation on timber that carries a forest origin document. Most Brazilian states tax timber at 12%, but São Paulo taxes it at 18%. "As a result, many companies prefer alternative materials that are less environmentally friendly than tim-

ber,” says Hussein. “Tax benefits could make São Paulo operate completely within the law in ten years”.

Blocking illegal timber with technology

In addition to detecting licensing issues and improving forest management (as discussed in chapter 3), technology can be used to control the other end of the supply chain and contribute to responsible timber consumption. There are two fronts in which the Legal Timber protocol has been advancing. On the one hand, it prevents illegal timber getting to the market and on the other hand, it gives guidance to builders about the rational use of timber to avoid waste.

USING PURCHASING POWER

It is crucial to have the participation of civil construction companies in the effort to stop the use of illegal timber. One of those companies, Tecnisa, committed in 2011 to use only FSC certified timber in its buildings, with audits by WWF to trace the product throughout the supply chain. Tecnisa adapted its procurement policies and its suppliers were given one year to comply to the new rules. Being one of the ten largest construction companies in Brazil, Tecnisa's purchasing power made a difference. “We guarantee purchase

without scaring our partners,” says supplies coordinator Jonas Gomes. “It has been a slow effort that has proven successful”. Tecnisa developed manuals and awareness programs, and carried out visits to industrial plants. By being loyal to its suppliers and guaranteeing purchases in advance, it is able to buy certified timber for the same price as other building companies that do not have the same commitment.

First, the challenge is to monitor roads and the timber transported to São Paulo. With tightened control, a crucial problem arose. "Environmental police agents could control the cargo's volume, but were unable to identify the wood species and check if their harvest was allowed," says researcher at the Forestry Institute, Sandra Florsheim. This brought a new digital technology to road enforcement operations: a portable system that connects a notebook to a microscope that captures the wood characteristics and generates images from different angles. The images are sent online to the Institute's labs and in a matter of minutes, the agents on the road have technical reports in their hands.

When the agents first used the equipment – nicknamed "dino-lite" –, they issued more than 782 thousand reais in fines and apprehended 1.1 thousand cubic meters in timber products. These positive results meant that more agents are being trained to use the system and today there are 10 portable microscopes in use on the roads. Sandra says the number is not enough, but the system has drawn the attention of other states: "Pará, Mato Grosso and Acre have asked to have their agents trained".

Sensible use by the civil construction sector

When the southern forests of Brazil were exhausted in the 1960s, construction companies were forced to find alternatives to peroba-rosa (*Aspidosperma polyneuron*) and Parana-pine (*Araucaria angustifolia*), the only timber species known and used at the time. The beginning of a new settlement cycle in the Amazon brought to light an enormous number of species, all of them tempting but unknown to the markets. Users adapted to the new species, but for three decades they were not catalogued until environmental issues took hold of the supply chain. Only then did the urgency of recognizing these new species become apparent.

Main tree species used in civil construction



Garapa

Scientific name: *Apuleia leiocarpa*

Characteristics: Color varies from yellowish-beige to nut-brownish-pink. Lustrous and smooth to touch, it has an imperceptible smell.

Main uses: beams, poles, stakes, fence posts. In civil construction it is used as beams, rafters, battens, boards and parquet tiles. It is also used for beer kegs, tool handles and keels for boats.



Itaúba

Scientific name: *Mezilaurus itauba*

Characteristics: Its color is beige against olive brown. It has a smooth texture and a nice smell. Fungi and termite-resistant, it is not easily sawn, but it stands nails and screws, allowing for perfect finishing.

Main uses: it is used in civil construction and for floorings, poles, pillars, beams, parquet tiles, bridge structures, rafters, boards, frames for doors and windows, and woodturning.



Jatobá

Scientific name: *Hymenaea* sp.

Characteristics: It is beige and auburn, with dark stains. It is easily cut but it does not stand nails and screws. Resistant to termites but not to fungi.

Main uses: highly sought for fine furniture making. It is also used for poles, beams, laminates, columns, parquet tiles, as well as wooden objects such as walking sticks, tools, bows for music instruments and pianos.

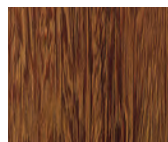


Pau-roxo

Scientific name: *Peltogyne* sp.

Characteristics: It has a purple color that gets darker in contact with air. It has a smooth surface, soft shine and fine texture.

Main uses: Heavy civil construction, high quality furniture, domestic flooring and boat construction. It is also used for decorative plates, tool handles, cutlery, sports equipment, toys and decorative objects.



Sucupira

Scientific name: *Diploptropis purpurea*

Characteristics: It is beige and dark brown, with a rough texture and sweet smell. It is not easily worked, but can be finely finished and is termite-resistant.

Main uses: Civil construction as planks, foundations, rafters, and parquet tiles, as well as woodworking and general carpentry.

Source: IPT

In 2000, the Institute for Technological Research (IPT) in São Paulo launched the book "Timber: Sustainable Use in Construction" to guide architects, engineers and builders. When the book's second edition was published in 2009, the Legal Timber initiative had mobilized the construction sector in search of good practices to fight Amazon's destruction.

The guidebook explores environmental issues, explains the certification process and teaches the reader how to avoid buying timber from species whose harvest is illegal. IPT's biologist Geraldo José Zenid says that it brings general information to construction companies. To address the problems that these companies face, Zenid has included in the book information about 40 of the more than 3 thousand species available in the Amazon Forest. "Despite such amazing diversity, we use only 25 species to make 80% of the products we trade," he says. The book guides the reader through the process of identifying each species and provides information for ideal uses. It also points to alternatives with similar characteristics to traditional species, allowing for diversification and less pressure on those threatened by excessive use.

Want to know how to buy timber for specific needs? Wood for use in humid areas, fungus and insect-resistant, suitable for roofing, beams or concrete molds, as well as how to reuse, or to dispose of wood – the information is in the guidebook. "We technically show how to avoid waste while using wood," says Zenid, adding that it is common practice for builders to order beams longer than needed. Throughout the production process, wood losses amount to 80% – in other words, the volume sold to consumers is equivalent to 20% of the logs harvested. Reducing waste and improving residue use mean that less of the forest is used up.

Timber is not the main material used in the civil construction sector in Brazil or in Latin America as a whole. "This is due to a bias by the engineering and architecture schools, which is being corrected," says Zenid. In colonial times, Portugal and Spain had little timber and used stone – an abundant material – to build. "In Southern Brazil, where settlers came from other parts of

Europe, building with timber is more common”.

Zenid believes that builders should rethink their conservative behavior towards forest products. “Timber is a renewable resource, it has a good weight to strength ratio, and can be used both for light and heavy structures”. It is an easy material to work with that does not require sophisticated equipment; and its transportation and handling is easy. “In addition to that, trees capture CO₂ when they grow, which helps to mitigate the greenhouse effect, he says.

The challenge of responsible government procurement

The role of the government in enforcing legislation to fight illegal logging is indisputable. By using its purchasing power, it can serve as an example of responsible practices. Data compiled by the Center for Sustainability Studies at Fundação Getúlio Vargas (GVces) show that governments around the world spend 8% to 25% of their countries GDPs to buy goods and services. Such proportion is estimated to be 10% in Brazil.

**Wasteless consumption
of reduces unchecked
logging and diminishes
the pressure on
endangered commercial
species**

Globally, the governments’ adoption of responsible procurement became common after the World Summit on Sustainable Development in 2002 in Johannesburg, South Africa – responsibility for the impacts of public procurement was one item on the agenda. The concept of “sustainable procurement” was born at the summit as a solution to incorporate social and environmental standards to public procurement and hiring. “Sustainable procurement promotes changes in consumption by adding an environmental mechanism to the traditional criteria of transparency and best price for good acquisitions,” says GVces’ Sustainable Consumption Program coordinator, Luciana Betiol.

The state government of São Paulo established a working group in 2004 to introduce environmental standards to public procurement. The complex process to identify mechanisms ended four years later with initiation of the Sustainable Public Hiring Program. The idea was to have public procurement managers trained to analyze environmental requirements and to create a sustainable procurement committee inside each state agency, reporting to the Environment Secretariat. "However, we've had great difficulty engaging civil servants, especially in monitoring the complexity of timber flows," says the Secretariat's environmental planning coordinator, Denize Cavalcanti.

"Slowly some agencies are introducing social and environmental requirements to procurement announcements," says Denize. The launch of Cadmadeira has proved to be the most effective action to make that possible for forest products, she adds. To be able to supply state public works with timber, companies must register with Cadmadeira. "There is the possibility of new scenarios, especially because traditionally, reluctant agencies such as the Federal Court of Accounts start to see the environmental issue with new eyes," says Denize. "The risk of buying illegal wood is higher for building companies whose procurement focuses solely on the lowest price".

The state of Minas Gerais introduced sustainable procurement and uses performance evaluation tools developed with support from ICLEI, an international association of local governments present in more than 500 cities around the world. ICLEI and GVCes published in 2008 the "Guidebook for Sustainable Public Procurement," a reference on the issue for use by governments.

There are bottlenecks that still need to be resolved. Federal legislation that regulates public procurement (Law number 8.666/93), states that the lowest price is the defining factor for purchases. In many cases, environmental standards make goods and services more expensive, which clashes with the regulation. The law also determines that all suppliers must be treated equally, which may be difficult to achieve when only a handful of them comply with environmental standards. However, the Brazilian Constitution makes it man-

Resolving the barriers in trade

| Problems | Consequences | Solution |
|--|--|---|
| Purchase of mixed, undifferentiated species. | Lack of control on stock levels and uncertainty over types of wood purchased. The DOF data show discrepancies with the actual cargo, resulting in fines in case of audits. | Require suppliers to sell wood separated by species. |
| Sale of wood to companies improperly registered by the supplier as “final consumers” on the DOF. This is an artifice to be able to trade wood with buyers that are not on the DOF as the law determines. | Buyers and sellers commit an environmental crime by unlawfully performing trade transactions and are not able to prove the legal origin of the timber | Ban the sale of native tree products or byproducts through the issue of a final consumer Forest Origin Document to companies that are not exempt from the Federal Technical Registry. |
| Type of wood (blocks, planks, etc...) entered into DOF does not match cargo received upon purchase. | Supplier's problems are transferred to buyers, who end up selling illicit wood products that are subject to fines. | Cross-check shipments on delivery and refuse to receive lumber from species no listed on DOF forms |
| Unauthorized transformation of one type of lumber into another. (for example, cutting of beams to make rafters) | Discrepancies between the DOF figures and the type of stocked lumber, since residues were not recorded as loss during processing | Ensure that activities are correctly registered with the State Commercial Entity in order to receive environmental licensing for the manufacture of finished products. |
| Invoices and receipts with species and measurements poorly documented. | Discrepancies between the DOF figures and the sales receipt may result in fines. | Detail on the shipping invoice the same figures listed on the DOF: name of the species, volume in cubic meters, type of wood, license plates and routes of shipping vehicle, and the number of the sales receipt. |

datory for the state to consider environmental conservation – based on that, the Congress is examining proposals to insert social and environmental standards into the procurement legislation. Nevertheless, resistance to changing consumption patterns and lack of information undermine public policies for public procurement.

Most of Amazon native wood used in Brazil ends up in public works.

State governments are mobilizing to add social and environmental standards to public procurement, but there are still economic and cultural obstacles to overcome

Buyers of that timber have to adapt to the challenges faced by the planet and local initiatives show that it is possible to change. Americana, a municipality in the state of São Paulo, passed legislation in December 2008 to make it mandatory for technical managers of building projects to commit in writing to using only legal

timber. The town plans to add even more rigorous regulation and requires the forest origin document to be presented in order to issue occupation licenses for new buildings. The process started in 2005 when the town banned the use of illegal timber in public works. It trained civil servants to check if the timber being used was legal. The population actively supported the initiative by reporting lumber of suspect origin.

Fostering forest management to meet an increased demand for timber

Even when civil construction companies use sustainable practices and governments require environmental standards for public procurement, a difficult challenge remains: making sure that all conditions are in place so the forest is able to meet the increased demand for legal timber. This is a two-way street, since it requires the government to promote forest management and make it economically appealing.

"The first thing I've learned is that preserving the Amazon Forest requires that we assign an economic value to it," says businessman Fábio Albuquerque, who directs Ecolog, a company that specializes in producing sustainable, FSC certified timber. "Without incentives it's impossible to change the behavior of someone from Paraná who migrated to the Amazon under the military government with a mandate to clear the forest," he says. "This person needs to have choice, otherwise he will keep selling a tree for 200 reais in order to be able to afford to buy medicine for his children".

But there are many obstacles even for entrepreneurs as Albuquerque. Before his foray into the Amazon, he knew little about forestry. As a civil engineer and businessman, his first forestry experience took place in Itu, a municipality in the state of São Paulo, where he reforested an area he had acquired in order to build a condo. Today the area contains 20 thousand trees in a reserve that is also used for wildlife rehabilitation. The initiative's success made him turn his attention to the Amazon, which he had visited as a child. "Twenty years later, I realized that the Amazon was disappearing faster than the Atlantic Forest had," he says.

He first considered buying an area in order to preserve it in its original state, but a friend convinced him that by using forest management he would provide income for the local community to conserve the environment. To do so, he engaged the help of engineer Tasso Azevedo, one of the founders of the Farm and Forest Management and Certification Institute (Imaflora), an FSC accredited certification body. They looked for an area with no land tenure disputes and settled with a property in Vista Alegre do Abunã, in the state of Rondônia.

Despite receiving social and environmental certification in 2004 that proved the legal origin of his production, Albuquerque had to go to court against Ibama to settle improperly assessed fines. "The inspectors used samples to calculate timber residues without taking into consideration the species of tree, the fact that logs are of irregular shape, or even how much material was in fact used." Albuquerque got tired of fighting with the authorities and ended

Timber connections

How consumption of timber in big cities funds predatory harvest in the forest



Charcoal

It is used as fuel for steelmakers' furnaces to make pig iron, which in turn is used for a variety of products, such as cars and electronic appliances.

1. Wood is illegally harvested from conservation areas and indigenous land
2. Environmental agents acting in association with criminals disguise the timber with forged documents
3. After the most valuable wood is sold to civil construction and furniture makers, the less sought wood ends up in charcoal furnaces, burnt by people working in unfair and degrading conditions

48 trees are used to make **1 ton** of charcoal (source: MMA)

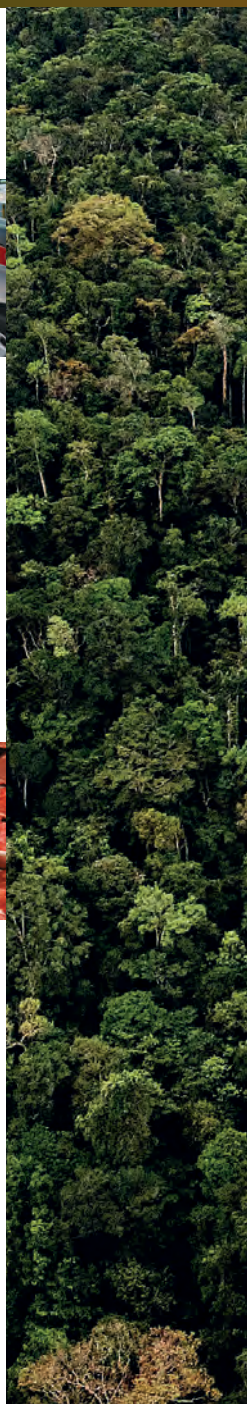


Beef

Approximately 80% of deforested areas in the Amazon are converted into pasture, according to the Interministerial Plan for Prevention and Combat of Deforestation. Land grabbers cheaply acquire land in a scheme that illegally occupies public land.

1. People working in slave-like conditions clear the forest to establish pasture
2. Native wood is felled and used to build cattle pens as well as sold to sawmills
3. Cattle reproduces and is sold to slaughterhouses that supply supermarkets with meat

In the last decade, cattle ranching, fire and land use changes emitted greenhouse effect gases equivalent to **12 billion tons of carbon of carbon dioxide** in the atmosphere (source: Ministry of Science and Technology)





Soybean

The appreciation of soybean in international markets drives the expansion of the crop in the Amazon, increasing deforestation. Clearing the forest changes the climate and reduces precipitation, with adverse effects for biodiversity and traditional agricultural practices

1. Landowners clear the forest, or use land already cleared to establish crops. Cattle ranching and other activities are forced to move and end up destroying new forest areas
2. The opening of roads to transport soybean attracts loggers and promotes destruction. Clearing the forest on riverbanks has negative effects on the water and therefore, on biodiversity and local communities
3. Soybean is largely exported to Europe and the United States, where they are used to produce animal feed and food products sold by supermarkets worldwide.

1.2 million hectares of Amazon forest have already been converted into soybean plantations (source: Greenpeace)



Hidroelectric power generation, mining and roads

The government's strategy to produce enough energy to keep Brazil growing is to build large hydroelectric plants in rivers in the Amazon. Large areas of forest are flooded to build the dams and despite fauna rescue programs, and the previous harvest of wood, there are huge impacts to the environment.

1. Energy waste in big cities is intimately connected to the careless harvest of wood in the Amazon
2. Mining projects and road developments have similar effects. Deforestation and the use of timber harvested during those projects need to be licensed by the environmental agency
3. In urban centers, the consumption of soft drinks in aluminum cans – made of bauxite extracted in the Amazon –, as well as of other daily products, is connected to the forest

The Santo Antônio and Jirau hydroelectric plants on the Madeira River will flood **630 km²** of forests

Source: "Who Benefits from the Destruction of the Amazon 2010" report/ Sustainable Connection Project: São Paulo-Amazonia

up closing his sawmill. Today, he harvests logs and sells to sawmills that supply the companies building the hydroelectric plants of Jirau and Santo Antônio on the Madeira River.

Another businessman, biologist Roberto Waack, did not experience the same problems as Albuquerque because, instead of buying land, he chose to bid for the Jamari National Forest (Rondônia) public concession through Amata, an FSC certified timber company. It was the first federal concession for sustainable use of forests after legislation establishing the public concession model was passed in 2006. Two local companies – Madeflona and Sakura – shared the concession with Amata. Together, they pay 3.8 million reais annually for the right of harvesting trees in the Jamari National Forest for 40 years.

Previously, Waack had been president of Orsa Florestal, a business group that manages 545 thousand hectares in the Jari Valley of Pará. The area is known for the Jari Project, started by American billionaire Daniel Ludwig (1897-1992), who dreamt of turning the forest into a paper empire, but failed in his attempts. Years later, the new owners applied a sustainable production plan and a long term vision for transforming the place. Waack looked for technology in the best universities worldwide and found guidance with the Dutch researcher Johan Zweede, who founded the only school that trains people in forest management in the Amazon, run by the Tropical Forest Institute.

Five years into his Jari experience, Waack started Amata in partnership with businesswoman Ethel Carmona and Dario Guarita Neto, a financier who believed that Amazon's valuable assets were underutilized. The new enterprise was an opportunity for investors to benefit from the forest. Amata was financially supported by the National Development Bank (BNDES) and three investment funds. It took three years to finally win the Jamari concession, but Waack has no complaints. "It is natural since it is a new model," he says, adding that there are already buyers for the newly harvested timber. He plans to use residues as biomass for electricity generation. "It is impossible to change the paradigm overnight," he says.

The federal government still has 10 million hectares in the Amazon to offer in public concessions, with capacity to harvest 21 million cubic meters of timber a year, the equivalent to 20% of the demand for timber. "To reach 40 million hectares and increase supply we need to solve land ownership issues," says Brazilian Forest Service general director, Antonio Carlos Hummel. According to the latest government survey, there are 64 million hectares of public forests not regulated for use in Brazil – the area is almost three times the size of the state of São Paulo and is vulnerable to land grabbers and deforestation. In some of the most affected areas in the Amazon, sustainable production cannot take place for lack of environmental and legal conditions.

"Public forest concession ensures access to titled land and removes the judicial problems that hinder investments in the Amazon," says Hummel. Concession projects are small in

scale if compared to the potential for forest management in the Amazon, but Hummel reckons that the model fosters legal timber production and makes social and environmental certification feasible. By March 2010, there were 1.1 million hectares of federal forests in different phases of concession.

The concession works as an auction where the government estimates production potential by hectare in a given area, and sets a minimum price. The interested parties then present bids for the annual rent. The bid process involves different production allotments and the winner offers not only the best rent but also meets criteria such as investments in community projects. "Return on invested capital varies from 15% to 20%," calculates University of Brasília researcher Álvaro Nogueira de Souza, who analyzes the concessions' economic feasibility for the SFB. The yield kicks in after the fifth year, and the winning bidders are granted 40 year concessions. "The model needs some adjustment in

**Despite red tape
and technological
obsolescence, loggers
invest in forest
management and put
their stakes in a new
era for Amazon timber
production**

the minimum prices," says Souza. "There is no point in investors offering huge premiums but having to file for bankruptcy five years later". That situation does not benefit the government, he points out, because it can force the entrepreneur to turn to illegal practices.

State governments also use public forest concessions to promote legal management. The first state contract will be signed by Pará in 2011 to open

Public forest concessions make it possible to produce timber in the long run and avoid land tenure issues that still hinder many projects

the Mamuru-Arapicú State Forest for harvesting by private companies. With the concession process, the Pará state government began to assess its forests. "Until very recently, the state did not understand the reality of its forests," says the director of Pará's Forest Development Institute, Carlos Augusto Ramos. Slowly, the Forest Grant Annual Plan

assigns use to land that had no owner. Another initiative, known as Harvest Plan, determines credit lines and licensing targets for timber production and job generation. "Previously, financing agents such as the Amazon Bank ignored the harvest prospects," says Ramos, adding that the state must reduce uncertainties about forest production. He points out that the process of land use planning and control must involve community areas since they occupy 60% of the Amazon and their production is important to meet the market's demand.

The state of Amazon chose to follow a similar route. "The focus of our forest policy is small scale sustainable production, under 500 hectares," says the state's Environment Secretariat advisor Philippe Waldhoff. The secretariat set a target for 5 thousand small scale management plans – today it already has 700 plans registered. "The challenge is to change the production pattern of small areas, which usually operate informally and illegally," he says.

"As a precaution, however, we must balance profit from management with costs in terms of biodiversity," says José Maria Cardoso, Conservation

International's vice president. "Management will be just one item within the environmental services industry, which will experience a boom in the next few years and change the value of timber and its importance to society". He expands, "Where are the billions of dollars made from timber? Were they used for conservation or do they benefit only those at the end of the supply chain?"

How consumption in urban areas has effects on the forest

Illegal timber originates in the Amazon and ends up as furniture, objects, houses and apartments, pointing to an intimate link to consumption habits of city dwellers. Often timber is obtained by illegally clearing the forest to establish pasture, plant soybean or to make charcoal for steel production. From cars to meat, from electronics to milk, there is a network of connections between illegal timber and the products we buy without inquiring about their origin.

"It is important to understand these connections so that we can formulate an ethical dilemma and encourage change," says the president of Our São Paulo Movement, Oded Grajew. His organization is part of the "Sustainable Connections: São Paulo-Amazônia" initiative that seeks to mobilize the supply chains of cattle, soybean and timber to preserve the Amazon forest and the people who live in it. The initiative's message is simple: unsustainable logging in the Amazon has effects on both biodiversity and local communities, it increases domestic and foreign companies' profits and feeds conspicuous consumption in Brazilian cities, especially São Paulo. It is impossible to separate forest destruction from consumption in big cities.

The "Who Benefits from Amazon Destruction 2011" report, published by the group, brings details about the connections between consumer products and illegal practices, destruction and work under slave-like conditions (see box on page XX). Dozens of companies signed industrial agreements promoted by the group to fight the consumption of goods with illegal origin.

As for timber, new attitudes are called for in the face of Brazil's economic growth, large infrastructure works and real estate boom. Public coffers will provide 98.5% of the 23 billion reais budgeted to build infrastructure for the 2014 World Cup, according to the Federal Court of Accounts. Such a significant amount proves that the state can use its purchasing power to change procedures and promote sustainability, especially when it comes to timber used in public works.

SUMMARY

■ THE IMPORTANCE OF ENFORCEMENT

The state is responsible for licensing and controlling the flow of timber until it reaches the consumer, as well as inspecting roads and stocks and engaging companies with industrial agreements

■ CIVIL CONSTRUCTION SECTOR CHANGES ITS WAYS

A registry of suppliers and social and environmental certification are voluntary actions that companies use to showcase to consumers the legal origin of their products

■ ECONOMIC INCENTIVES

Tax cuts, responsible public procurement and compensation for those who use the forest non-destructively are tools to support legal logging

■ TECHNOLOGY

The fight against fraud makes use of satellite monitoring and online identification of species during inspections

■ PUBLIC CONCESSIONS

The concession of federal and state forests to private companies promotes forest management and reduces land tenure issues

■ DANGEROUS LIAISONS

The consumption of illegal timber in big cities fuels social injustice and deforestation, both of which are associated with charcoal, meat and soy production. Pitting purchasing power against predatory activities is an urgent priority



Glossary

Biodiversity or biological diversity: This is the variety of ecosystems and the plant and animal species they contain, as well as the diverse ecological functions performed by organisms that inhabit these systems.

Federal Technical Registry (CTF): Established by the National Environment Policy, this instrument regulates polluting activities and the use of natural resources, aiming at controlling the production, transportation and trade of products and byproducts made from Brazilian plants and animals.

Forest certification: This traces timber since its origin and ensures that it is produced using ecologically appropriate, socially fair and economically feasible methods, in compliance with legislation. By differentiating products obtained through good practices and social and environmental standards, value is added to them by way of certification, which increases their access to markets. Buyers that follow responsible procurement policies require certification from their suppliers. There are two certifications systems for timber in Brazil: FSC and Cerflor.

Responsible public procurement: This is a tool used by governments to add social and environmental standards to the call for bids, award of the contract and monitoring of public works. The goal is to avoid that the public procurement of goods and services cause negative impacts to society and the environment.

Forest concession: This is the concession of public land (state or federal forests) for private companies to use the sustainable forest management approach for a limited time. According to Law 11284 of 2006, the government opens the area for bidding and establishes minimum prices – the company with the best offer wins the concession to develop the area for a certain period of time. Companies are also judged by their proposed investments in community projects and timber processing.

Conservation: This means protecting natural resources by using them rationally and ensuring their sustainability and availability for future generations. Forest management is an economic activity focused on conservation. Conservation is different from 'preservation', which means keeping certain areas and resources intact. Preservation is necessary when there is risk of biodiversity loss – a species, an ecosystem or an entire biome.

Ecosystem: This is a system characterized by the interaction of living beings and their physical and chemical environment.

Tax evasion: It is a financial crime where taxes due on commercial transactions fail to be paid, thereby violating the Law on Tax, Economic and Consumption Offenses (Lei dos Crimes contra a Ordem Tributária, Econômica e contra as Relações de Consumo) [Law 8137/90].

Governance: This is a set of processes, habits, policies, laws, regulations and levels

that regulate the management of an institution, be it public, private or organized by civil society.

Forest management: This is a set of techniques used to produce goods (timber, fruit etc.) or services (water, for instance) with minimum impact on the forest, ensuring its long term maintenance and conservation.

Carbon market: This market trades in carbon credits (1 credit equals 1 CO₂ ton) generated by projects that reduce greenhouse gas emissions. The Kyoto Protocol, signed in 1997, established the market where developed countries committed to cut their emissions by 5.2% between 2008 and 2012 according to 1990 levels. Carbon credits act as a currency for these countries to offset their obligations by paying for emission cuts in developing countries. In recent years, a voluntary carbon market unrelated to the official commitments under the Kyoto Protocol has developed. The Reducing Emissions from Deforestation and Forest Degradation (REDD) mechanism financially compensates activities such as forest management that conserve the forest or alleviate its destruction.

Climate change: This is the global change of climate patterns caused by emissions of greenhouse gases to the atmosphere by human activities.

Payment for ecosystem services: This is a mechanism that rewards farmers and extractive communities for the conservation of important natural areas and the mitigation of negative impacts of economic activities.

Legal Reserve: This is a portion of rural properties that, according to the Brazilian Forest Law, needs to be conserved in order to make the use of natural resources sustainable, conserve biodiversity and rehabilitate ecological processes. In the Amazon, it is equivalent to 80% of the property area in regions covered by forest and to 35% in regions covered by Cerrado. In addition to the Legal Reserve, properties must also maintain “permanent preservation areas” on the banks of rivers, on slopes and mountaintops.

Ecosystem services: These are the benefits that natural or cultivated ecosystems provide to the planet, such as water, food, genetic resources, and climate balance.

Sustainability: According to this principle, the current use of natural resources must not compromise the ability of future generations to meet their own needs.

Ecological-Economic Zoning: This is a technical and political tool established under the National Environment Policy that aims to support sustainable development based on the social and environmental conditions and potential of territories.

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