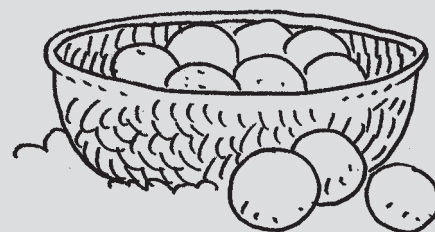


Forests for the people



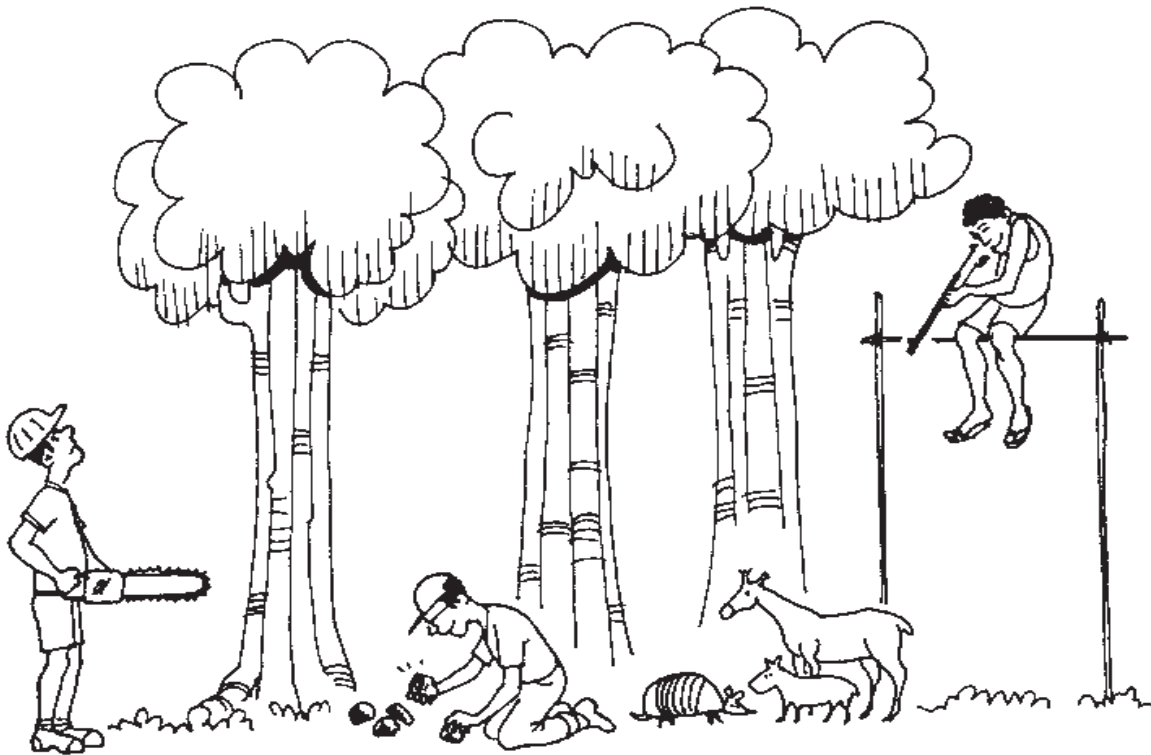




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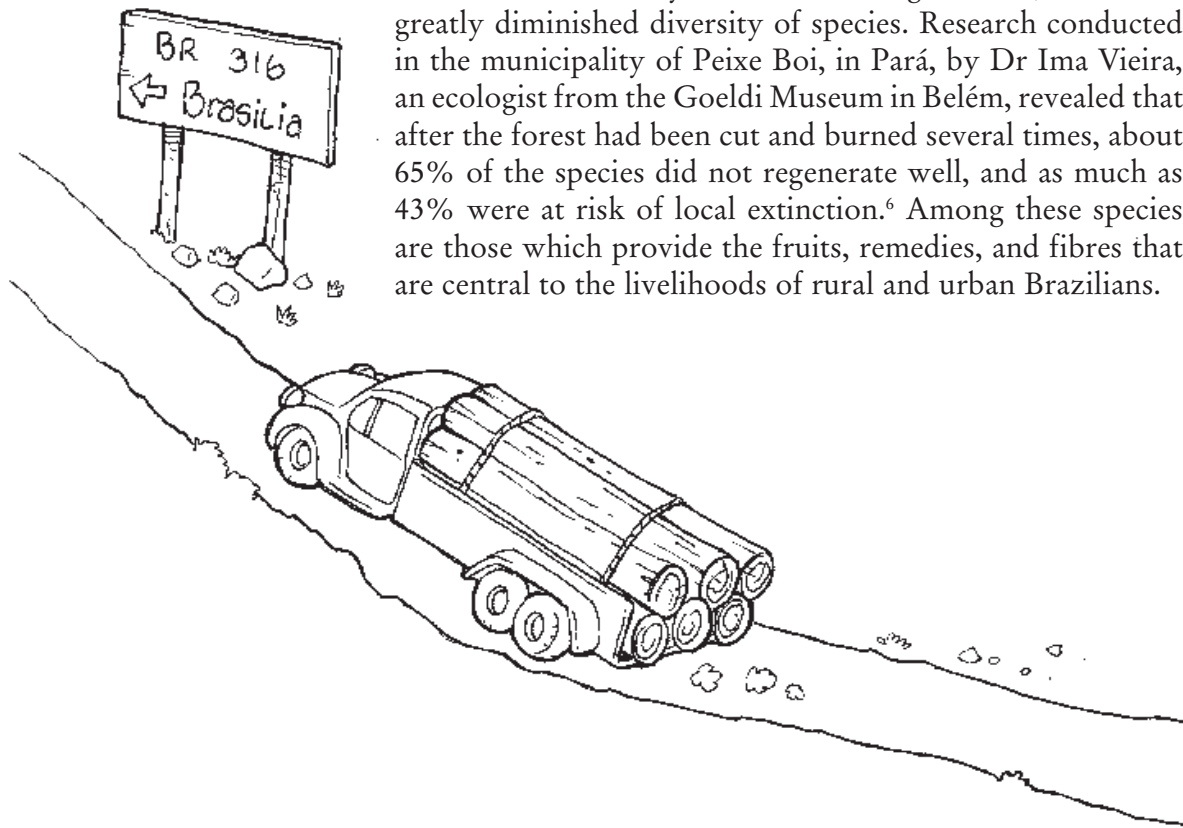
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Conflicting uses: diverse perspectives of forest value



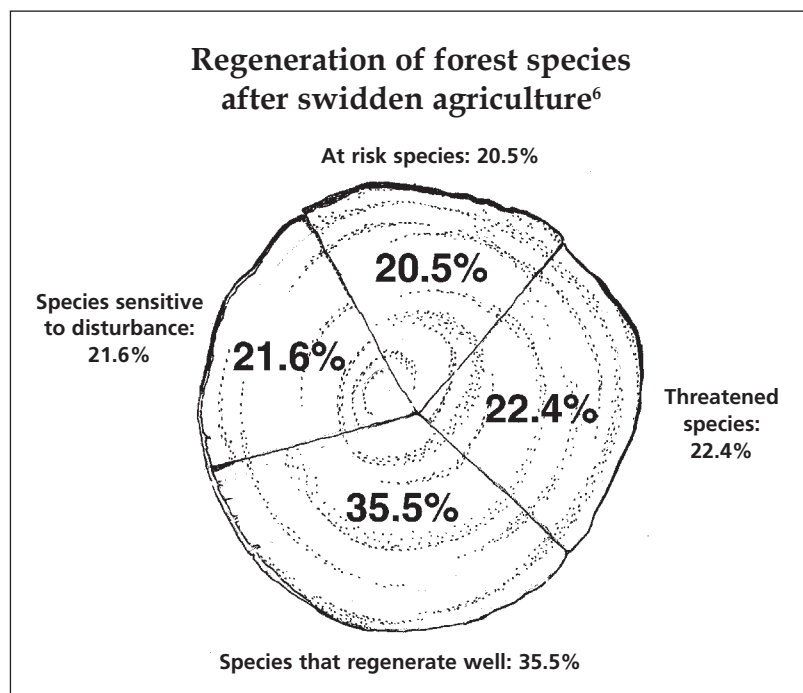
Patricia Shanley
Murilo Serra
Margaret Cymerys
Gabriel Medina
Lêda Luz

The forest offers different goods and values for each person. For instance, a hunter enters the woods and scans the ground for armadillo tracks. A logger eyes the high-quality wood of ipê, a midwife seeks andiroba's oily seeds, while a geologist searches for rocks and minerals. The forest offers something for everyone, but to maintain its abundance over time it must be managed, keeping in mind this great diversity of needs. There are substantial conflicts over forest use in Amazonia today. In the 1960s and 1970s, new roads opened up areas that had previously been accessible only by boat. Ranchers, loggers and landless peasants from throughout Brazil were drawn to the Amazon by government incentives to take advantage of the seemingly limitless land and timber resources.¹ The divergent interests of these various stakeholders have frequently resulted in bloody conflicts that have claimed hundreds of lives over the last three decades.² International consumption of Amazonian beef, grain and ethanol is one of the drivers of these conflicts.³ And while the majority of timber sales are currently domestic, external demand is rising sharply.⁴ Forests in Asia and Africa are swiftly disappearing, with the Amazon potentially poised to become the centre of timber production for the world.



Studies have demonstrated that the blame for the loss of forests in Amazonia cannot be laid at the door of any specific group; rather it is the frequency and intensity of combined activities that make forests vulnerable.⁵ For example, secondary forests return after various cycles of swidden agriculture, but with a greatly diminished diversity of species. Research conducted in the municipality of Peixe Boi, in Pará, by Dr Ima Vieira, an ecologist from the Goeldi Museum in Belém, revealed that after the forest had been cut and burned several times, about 65% of the species did not regenerate well, and as much as 43% were at risk of local extinction.⁶ Among these species are those which provide the fruits, remedies, and fibres that are central to the livelihoods of rural and urban Brazilians.

Changes in land use, such as the introduction of logging, swidden agriculture, intensive hunting and ranching, act as a sieve through which vulnerable plant species may be eliminated. Scientists are only now discovering what forest people have known for some time. As Senhor Marcelo of the village of Ananim said, after various cycles of ranching, logging and fire, "The forest never returns to what it was."

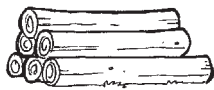


FUTURE OF THE FOREST

Present forest



Changes in land use



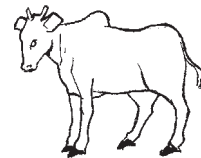
Logging



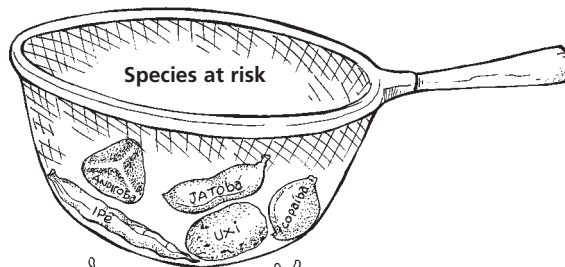
Fire



Farming and ranching



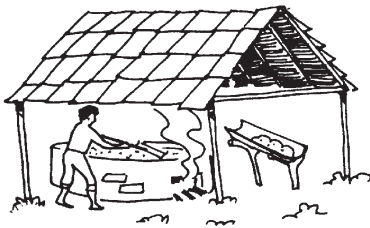
The forest never returns to what it was!



Timber: fair trade

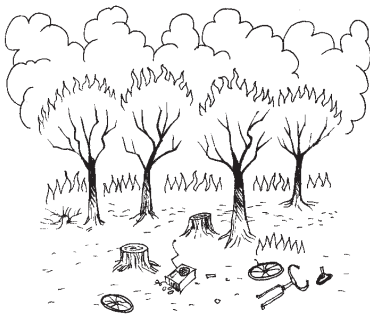
Even when villagers understand the value of forest products for their families' incomes, they often still sell timber for a relatively low price. This scenario happens all over the world. Cash poor families perceive timber as a source of quick cash. But the money generally goes as easily as it comes, leaving families without a free supply of fruit and medicine, and no funds to buy them. Some villagers who have lost their forests, have shared their stories to help others better evaluate the advantages and disadvantages of selling timber. Below are the stories of villagers who sold their forests for cheap, villagers who negotiated for a better price and others who conserved their forests.

Wood for an oven



Senhor Sebastião traded 5 alqueires (24 ha) of pristine forest for an oven that cost US\$146. He quickly regretted it. However, two years later, a new buyer entered and he sold 20 alqueires (96 ha) of virgin forest for US\$156 each, which was about US\$3.12 to US\$4.16 a tree. The logger paid only the first portion of what he owed, left and never returned.

Wood for bicycles



At the end of 1997, a neighbouring community sold 148 alqueires (710 ha) of forest for US\$104 an alqueire. The loggers took everything, including spindly sticks; soon after, fire took the rest. And what happened to the earnings? The remains of broken radios and burnt bicycle parts lie scattered upon the ground.

Wood for medicine



In many cases, parents of sick children sell timber out of desperation. For example, feeling the pain of his sick child, a father in Baixo Tocantins sold five piquiá trees to pay for one injection for his sick son. There was a little money left over to buy a plate of food on the roadside in front of the hospital. If these trees had been sold at the sawmill, they would be worth US\$204. Asked if a logging sale has ever saved the life of a child, community members routinely relate "no".

Watch out for Zé the logger

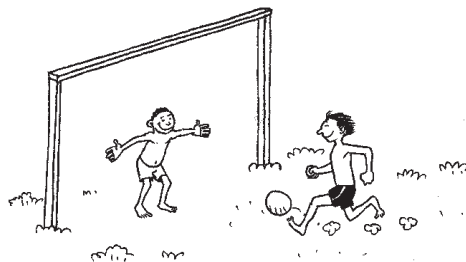
One of the neighbouring villagers, Senhor Zé, preferred to work for cash; he did not like to work in the field, to hunt or to collect forest fruits. A logger arrived and said to him, "If you convince your community to sell their forest, I will pay you well." The logger put US\$176 in his hand and made a payment of US\$1 760 to the community. The community quickly agreed to sell 180 alqueires (864 ha) for US\$10 588 divided into 6 payments. But after the wood was taken out, how many payments do you think they received? Only one, and to get it, the spokesperson for the community had to travel 150 km three different times, leaving his fields for seven days. In the end, each of the 30 families in the community received US\$117. The money quickly disappeared and it became harder and harder to access forest fruits and vines.

Senhor Zé moved to the city, but everything there had to be purchased and was expensive. Out of money, he went back to work with the loggers, convincing other communities to sell their wood. Beware, because a man named Zé could come knocking at your door. If you do plan to do business with loggers, be sure to check out prices first so that you get a fair deal for your wood.



A soccer field – and what else?

In Baixo Tocantins, a few communities negotiated with loggers to receive a better price for their timber and to protect the fruit trees, the medicinal oil trees and other useful species in their forest. Communities can also identify the parts of the forest richest in game and in this way draw the boundaries of a reserve or corridor where no logger can enter. Loggers typically offer to create a soccer field in exchange for timber, which is a welcome sports area for everyone to enjoy. Communities that negotiate well, however, can play soccer without sacrificing the andiroba oil they will need to treat the bumps and bruises they inevitably suffer after the games.



Reserve for the future

The community of Muruteuazinho, on the Guamá River, recognized the huge loss of forest that they suffered from timber sales and shifting cultivation and decided to preserve an area of old growth forest and to plant their swidden fields only in the secondary forest. They increased the productivity of the secondary forest by planting orange and coconut trees and passion fruit. In addition, they mapped the reserve and created a cleared area around the forest to keep fires from entering. To further supplement their income from the land, they began to raise bees for honey.

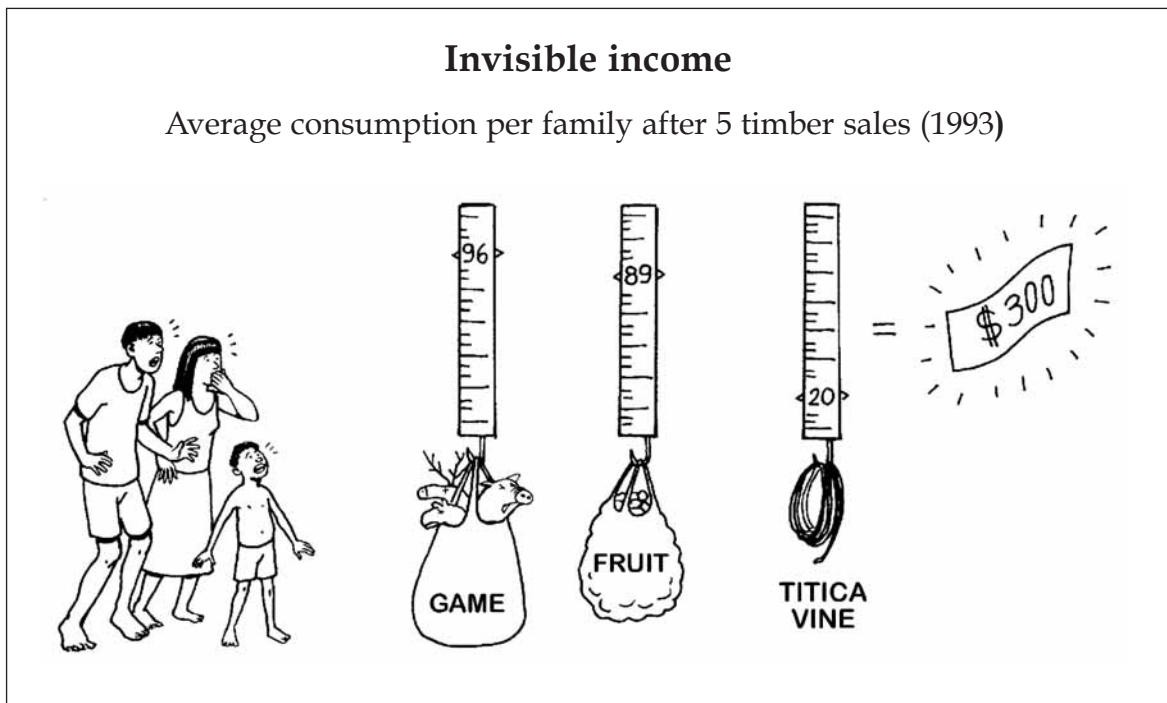


To further supplement their income from the land, they began to raise bees for honey.

Free from the forest

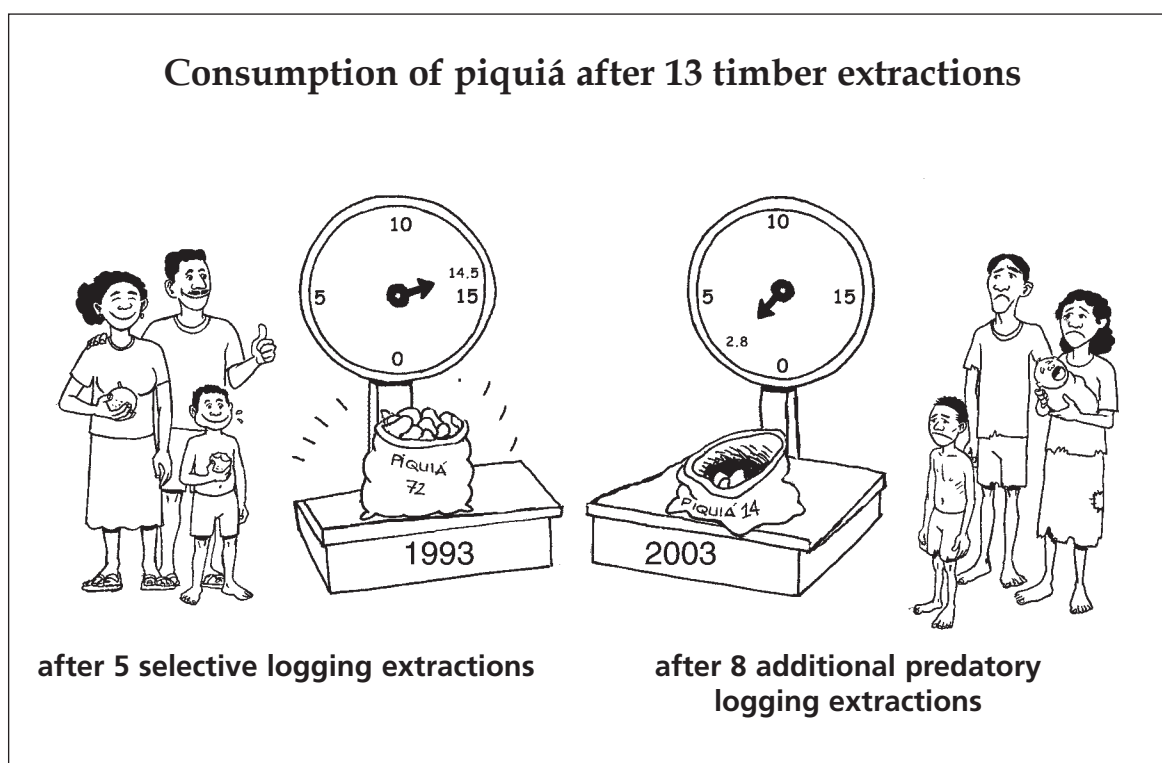
The Farmers Union of Paragominas, in Pará, together with three communities along the Capim River, asked researchers which was more valuable: the money raised by selling wood, or the value of the fruit, game and vines that families consume over the long term. The question seems simple, but the answer depends on a lot of factors, such as the particular species of tree, its abundance in a given area, its production, the distance of the nearest market and its selling price.

The research team studied the forest, the market and local consumption of forest products. Most of the data was gathered by the community, which counted and weighed all of the fruit, fibre and game each family consumed in 1993. When the research began, wood from 3 000 hectares of forest had already been sold five different times. In these cases the sales were made selectively; only ten species were sold. The results showed that even after these sales, although families had to walk farther to find forest products, they still consumed an average of 96 kg of game, 20 kg of vine and 89 kg of fruit per family that year. If a family had to purchase all of those resources, it would have cost them US\$300.



From compatibility to conflict

In 1993, each of the families of the three villages studied in the Capim River region consumed an average of 383 fruits. By type of fruit, this signified an average of 161 bacuris, 150 uxis and 72 piquiás per family. But even with a solid understanding of the value of the standing forest, it is easy to sell wood or land cheaply. From 1993 to 2003 the Capim villagers sold wood eight more times.⁷ When sales became frequent and intense, involving more than 50 species, the availability of fruits and other forest products diminished significantly.⁸






Furthermore, studies have shown that for each tree extracted for wood, an additional 27 either die or are damaged in the process.⁹ As the structure of the forest changed with more extensive logging, fuel loads increased on the forest floor and the forest became prone to fire.¹⁰ After multiple logging events in the Capim region, fire raged through the forest in 1997, lasting weeks. After the forest fire, the average consumption of piquiá fell from 72 fruits (14.5 kg) to 14 fruits (2.8 kg) per family – an 80% drop. At this point, conflict ensued between the industrial harvest of wood and the communal harvest of non-timber forest products.

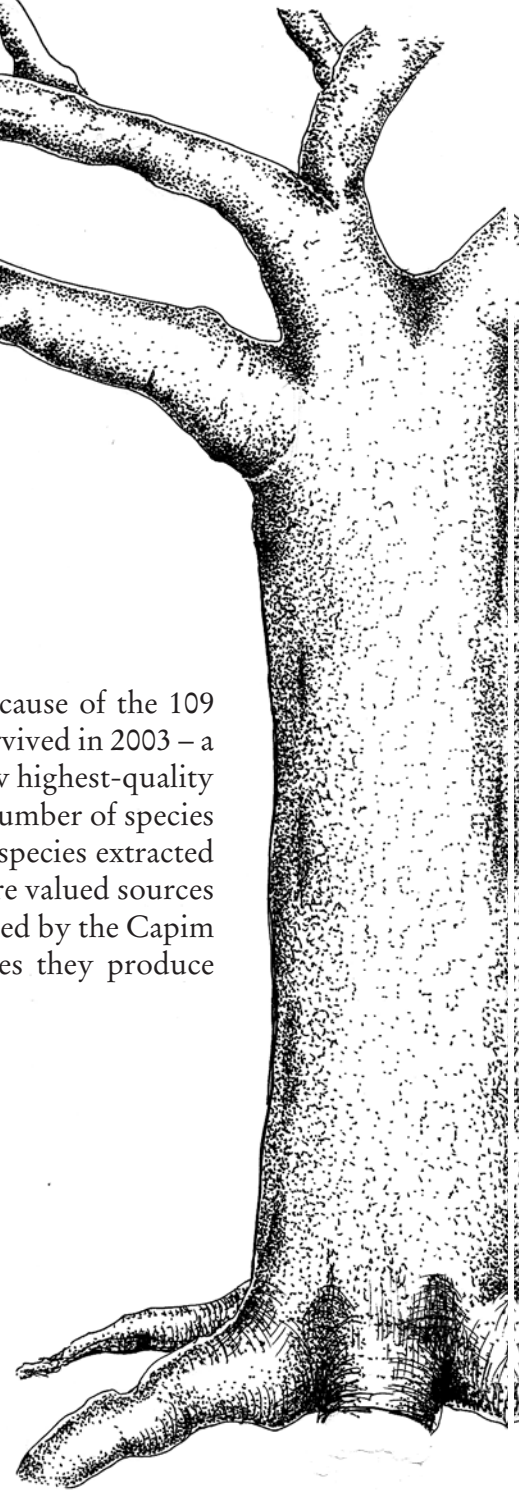


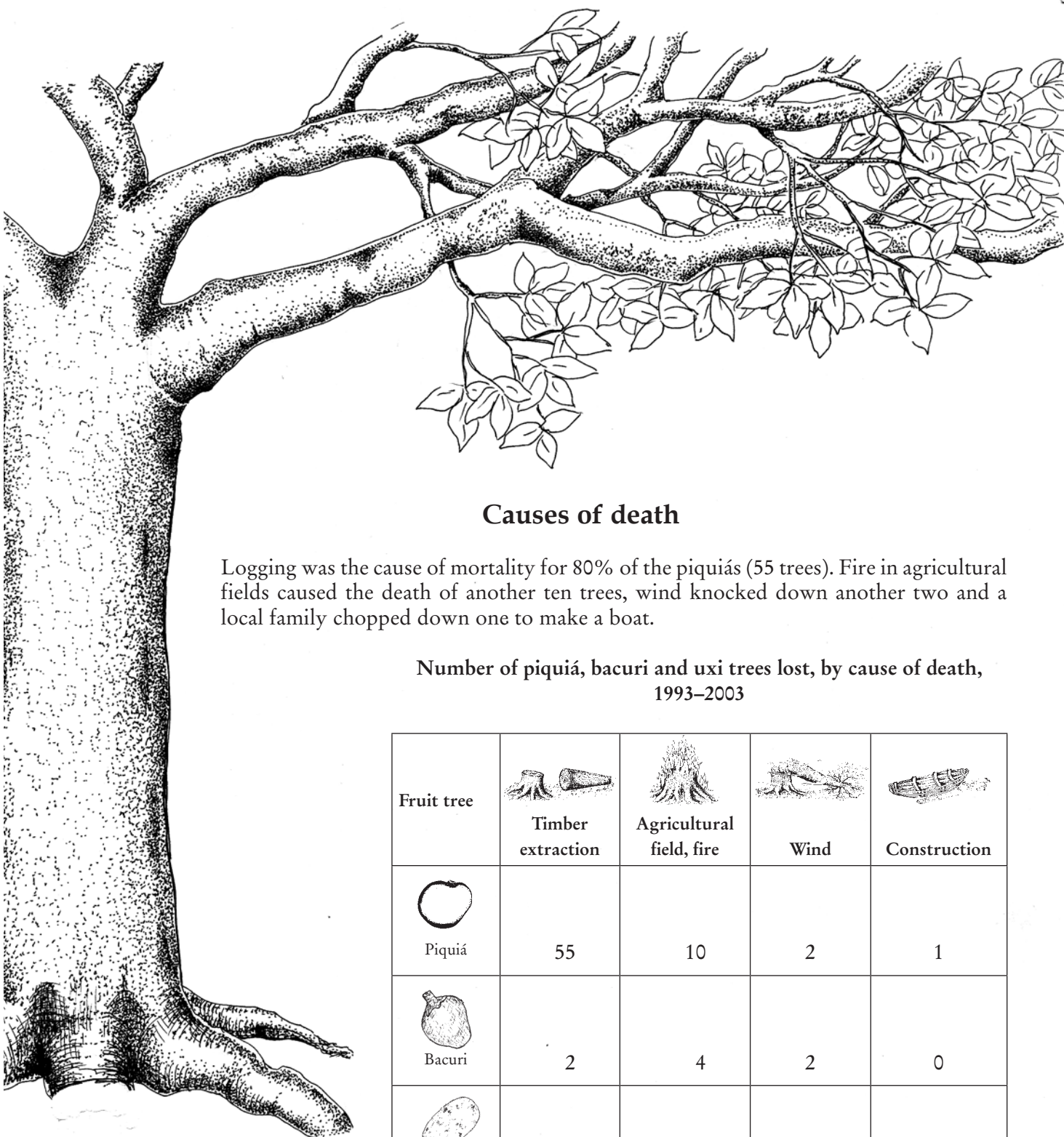
Loss of fruit trees

Why did the consumption of piquiá fruit fall so dramatically? Because of the 109 piquiá trees the community collected fruit from in 1993, only 41 survived in 2003 – a loss of 63%. During the first few sales, loggers only took out the few highest-quality timber species, and the fruit trees were spared. But after 1996, the number of species logged escalated to over 50. In the last few decades, the number of species extracted by loggers has shot up from 12 to more than 300. A third of these are valued sources of food, medicine, gum and resin.¹¹ In 1996, the 15 species most valued by the Capim communities for the game they attract and the fruit and remedies they produce began to be logged, and piquiá was among them.¹²

Number of piquiá, bacuri and uxi trees and percentage lost, 1993–2003

Fruit tree	1993	1998	2003	% lost
 Piquiá	109	98	41	63
 Bacuri	16	14	3	81
 Uxi	24	12	4	83












Causes of death

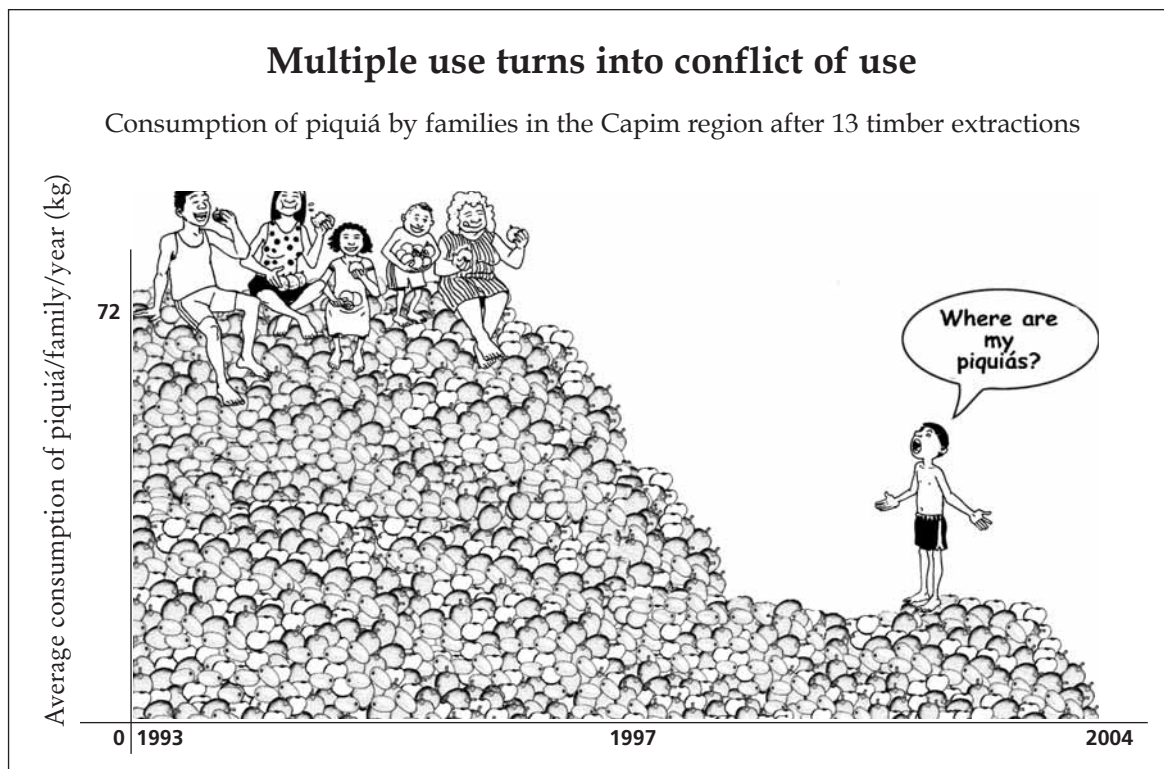
Logging was the cause of mortality for 80% of the piquiás (55 trees). Fire in agricultural fields caused the death of another ten trees, wind knocked down another two and a local family chopped down one to make a boat.

Number of piquiá, bacuri and uxi trees lost, by cause of death, 1993–2003

Fruit tree	 Timber extraction	 Agricultural field, fire	 Wind	 Construction
 Piquiá	55	10	2	1
 Bacuri	2	4	2	0
 Uxi	3	12	4	0

Threshold

There are three types of timber sales in the Capim region, with each successive type having an increasingly dramatic impact on forest communities. In the first type of sale, the logger extracts only the most valuable species. In the next, the logger takes out a much larger number of species, including the fruit and oil producing trees. And finally, the loggers buy wood by area (alqueire), extracting all the trees they want that are left. When the rate of extraction of timber surpasses the ability of the forest to regenerate, the production of fruit declines, medicinal plants are less available and animals become scarce. This story is repeated continually throughout the Amazon. However, if communities are aware of the costs and benefits of logging, they can sell wood conscientiously and maintain the trees they want to meet their needs.



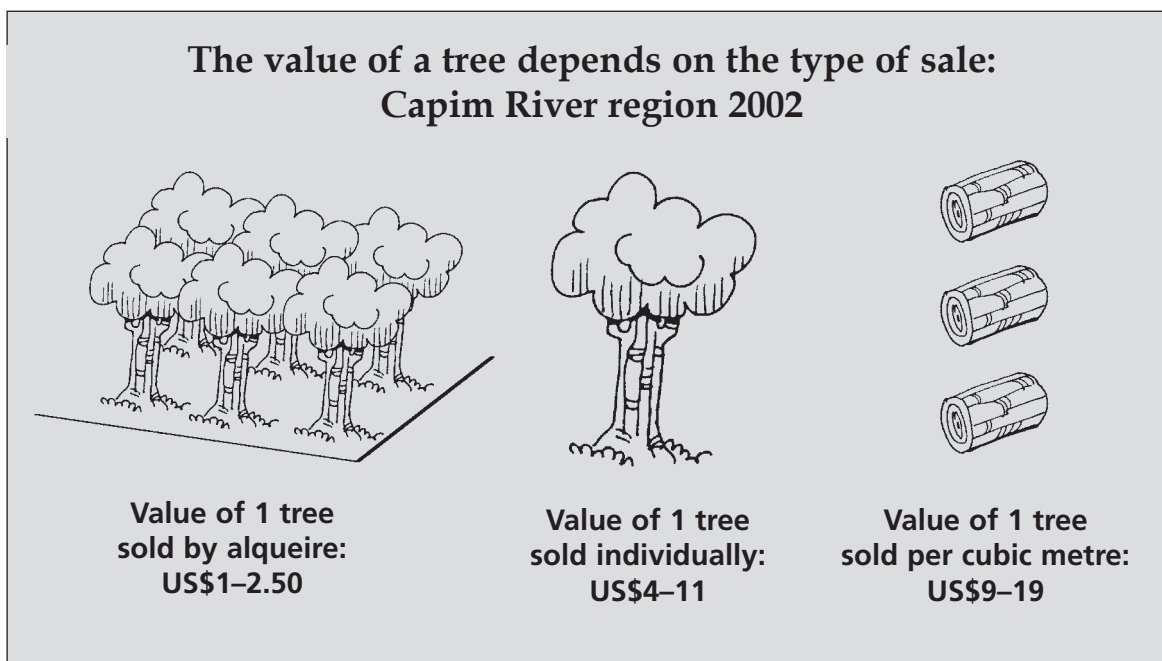
The Capim River example illustrates that:

- The use of timber can be compatible with the use of other forest products, depending on the frequency and intensity of extraction. Logging events by outside companies occurred in the Capim communities from approximately 1988 until the present. During the initial decade, only a few adult trees were extracted from a limited number of species.
- There is an irreversible point after which a forest does not readily recover from losses due to logging. In 1997 in the Capim region, a large number of trees from a variety of species were extracted and then an accidental fire burned one-quarter of the area surrounding the communities. After that, fruit consumption dropped significantly.
- To evaluate the costs and benefits of selling wood, communities and industries need ecological, economic and cultural information. In addition, villagers need planning and training to manage their forests for lowest impact and multiple uses.
- In addition to market values, it is important to consider the local importance and invisible income of non-timber forest products (fruit, game, medicine and vines).

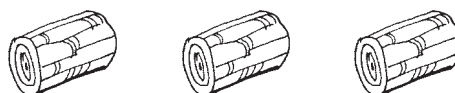
Tree, alqueire or cubic metre?

If a community or individual plans to sell timber, what is the best way to go about it? Is it preferable to sell by the tree, by alqueire (4.8 hectares) or by cubic metre? Remember that if a villager sells wood by alqueire, a logger can take out as many trees as he wants. Generally, loggers extract between 25 and 50 trees when the timber deal is selective and up to 200 using conventional methods.

Selling timber by tree rather than by area gives a greater measure of control to communities over what is harvested. Selling timber by cubic metre is more profitable, earning many times what could be made by alqueire. Using the example of what people from the Capim River were paid by loggers, we can determine which method is most lucrative. In the mid-1990s, the price for a tree when sold per alqueire varied between US\$2 and US\$6 (US\$100–150 total per alqueire). At the time, individual trees were being sold for between US\$11 and US\$27. Whereas, selling wood by cubic metre to a sawmill, it is possible to make between US\$21 and US\$48/tree (US\$7–16/m³).

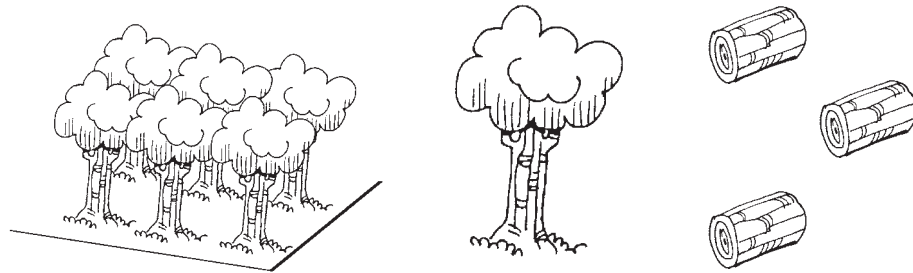


Reviewing these prices, it is clear that a producer can earn more selling timber by tree and by cubic metre than by alqueire. In Pará, communities feel pressured to sell by alqueire. In Mato Grosso, on the other hand, they often sell by cubic metre, valuing the product and earning more.



When broken down mathematically, the difference in price is clearly significant. In 2004, one piquiá tree went for US\$1 when sold by alqueire. When it was sold individually, the price jumped by more than 400% to US\$4 per tree. When a piquiá tree was sold by cubic metre, it earned approximately US\$9 (US\$3/m³), 900% more than if it were sold by alqueire. In the case of maçaranduba, the difference is even more extreme. One maçaranduba tree was worth US\$1 when sold by alqueire; individually it was worth US\$7; and finally when it was sold by cubic metre it fetched US\$12 (US\$4/m³).

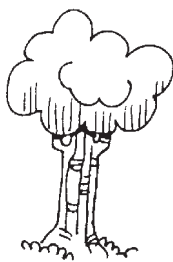
Prices of trees sold by the community, Paragominas, 2004



	Value of 1 tree sold per alqueire	Value of 1 tree sold individually	Value of 1 tree sold per cubic metre
Piquiá	US\$1	US\$4	US\$9
Maçaranduba	US\$1	US\$7	US\$12
Ipê-roxo	US\$1.50	US\$8.50	US\$15

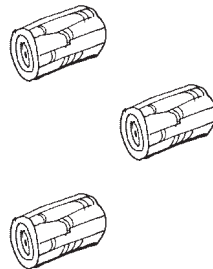
It is useful to try to find out how much sawmills pay for each species and how much they sell wood for after it has been sawn. One maçaranduba tree is purchased in the Capim region for US\$1.40. The logger resells it to the sawmill in Tomé-Açu for US\$51, or US\$17/m³. Real costs will discount extraction, transportation and management expenses, reducing net profit by half to about US\$8.50/m³.¹³

Gross earnings per maçaranduba tree sold in 2004



US\$1.40

Sold by community



US\$51

Sold by logger



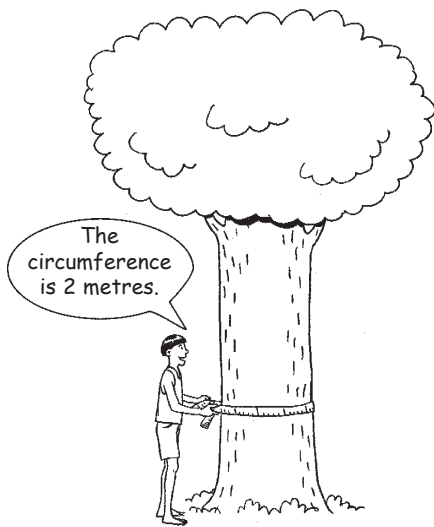
US\$510

Sold by the sawmill

Caboclos learn the language of loggers

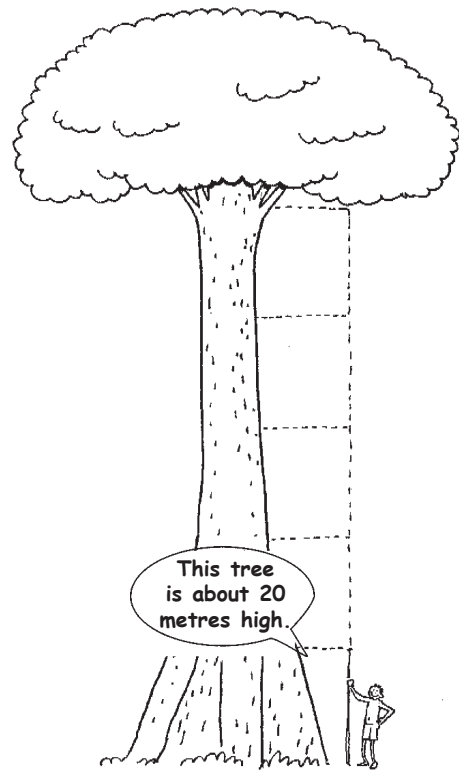
André Dias and Marli Mattos

To find out the amount of wood a tree contains, loggers calculate its volume in cubic metres. In order to negotiate effectively with a logger, communities need to learn the language of logging. To calculate the volume of a standing tree, loggers use a geometric volume equation similar to the volume of a cone, which takes into account the tapering nature of the tree's trunk. For the equation, you need to know the distance around the tree (its circumference) and its height. The circumference is measured at chest level (approximately 1.3 m from the ground) using a metric measuring tape. If the tree has low buttress roots, it is better to measure the trunk just above them. If the tree has high buttress roots, you just have to eye it. The length of the trunk can be estimated using a 4-m stick. As planks sawn at the mills are about 4 m long, it's possible to calculate how many 4-m planks you can get from the trunk. Just hold the stick alongside the trunk to estimate how many times higher the tree is than the stick. The height and circumference should be calculated in metres.



Just hold the stick alongside the trunk to estimate how many times higher the tree is than the stick. The height and circumference should be calculated in metres.

If you know the circumference and the height of the tree, it is easy to calculate its volume. Just multiply the terms using the formula below:¹⁴



$$V = \text{Circumference} \times \text{Circumference} \times \text{HEIGHT} \times 0.06$$

For example, a tree that is 2 m around and has a 20-m long trunk has 4.8 cubic metres of timber:

$$\begin{aligned} \text{Volume} &= \text{circumference} \times \text{circumference} \times \text{height} \times 0.06 \\ \text{Volume} &= 2 \times 2 \times 20 \times 0.06 \\ \text{Volume} &= \mathbf{4.8 \text{ cubic metres}} \end{aligned}$$

The volume of cubic metres in a tree can also be calculated using the table below. To use the table you need to locate the tree's circumference in the top row of the table and then locate the tree's height in the first column. Then simply connect the circumference's column with the height's row to find the number of cubic metres of the tree.

		CIRCUMFERENCE															
		1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	4	4.2	4.4
HEIGHT	4	0.5	0.6	0.8	1.0	1.2	1.4	1.6	1.9	2.2	2.5	2.8	3.1	3.5	3.8	4.2	4.6
	6	0.7	0.9	1.2	1.4	1.7	2.1	2.4	2.8	3.2	3.7	4.2	4.7	5.2	5.8	6.4	7.0
	8	0.9	1.2	1.6	1.9	2.3	2.8	3.2	3.8	4.3	4.9	5.5	6.2	6.9	7.7	8.5	9.3
	10	1.2	1.5	1.9	2.4	2.9	3.5	4.1	4.7	5.4	6.1	6.9	7.8	8.7	9.6	10.6	11.6
	12	1.4	1.8	2.3	2.9	3.5	4.1	4.9	5.6	6.5	7.4	8.3	9.3	10.4	11.5	12.7	13.9
	14	1.6	2.2	2.7	3.4	4.1	4.8	5.7	6.6	7.6	8.6	9.7	10.9	12.1	13.4	14.8	16.3
	16	1.9	2.5	3.1	3.8	4.6	5.5	6.5	7.5	8.6	9.8	11.1	12.4	13.9	15.4	16.9	18.6
	18	2.1	2.8	3.5	4.3	5.2	6.2	7.3	8.5	9.7	11.1	12.5	14.0	15.6	17.3	19.1	20.9
	20	2.4	3.1	3.9	4.8	5.8	6.9	7.3	9.4	10.8	12.3	13.9	15.6	17.3	19.2	21.2	23.2
	22	2.6	3.4	4.3	5.3	6.4	7.6	8.9	10.3	11.9	13.5	15.3	17.1	19.1	21.1	23.3	25.6
	24	2.8	3.7	4.7	5.8	7.0	8.3	9.7	11.3	13.0	14.7	16.6	18.7	20.8	23.0	25.4	27.9
	26	3.1	4.0	5.1	6.2	7.6	9.0	10.5	12.2	14.0	16.0	18.0	20.2	22.5	25.0	27.5	30.2
	28	3.3	4.3	5.4	6.7	8.1	9.7	11.4	13.2	15.1	17.2	19.4	21.8	24.3	26.9	29.6	32.5
	30	3.5	4.6	5.8	7.2	8.7	10.4	12.2	14.1	16.2	18.4	20.8	23.3	26.0	28.8	31.8	34.8

Volume of wood in management plans

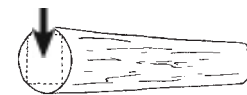
Natalino Silva

Forest engineers calculate the volume of standing trees for forest inventories using a formula with constants specially designed for the tree species being harvested. It is called geometric volume, and it is used by IBAMA, the Brazilian Environmental and Renewable Resource Institute, as a basis to determine authorizations for loggers seeking permission to harvest wood.

When the trees have already been cut and transformed into logs, their volume can be calculated in one of two ways: the cylindrical volume or the Francon volume. The cylindrical volume is calculated on the deck holding the cut logs to estimate volume harvested. The logs are measured as if they were cylinders. In this case the circumference is measured in the centre of the log.

In contrast, the Francon volume tells you how many cubic metres (transformed into planks) can be obtained from each log. In this method, all parts of the trunk that are not used by the mill are discounted, including the bark and any internal defects (such as knots and rot). The accounting of logging operations done by IBAMA uses the Francon method.

Francon volume



Francon volume is roughly 78% of cylindrical (or geometric) volume. To transform the cylindrical volume (V_c) into Francon volume (V_f), just multiply the cylindrical volume by 0.7854, as shown in the formula: $V_f = V_c \times 0.7854$

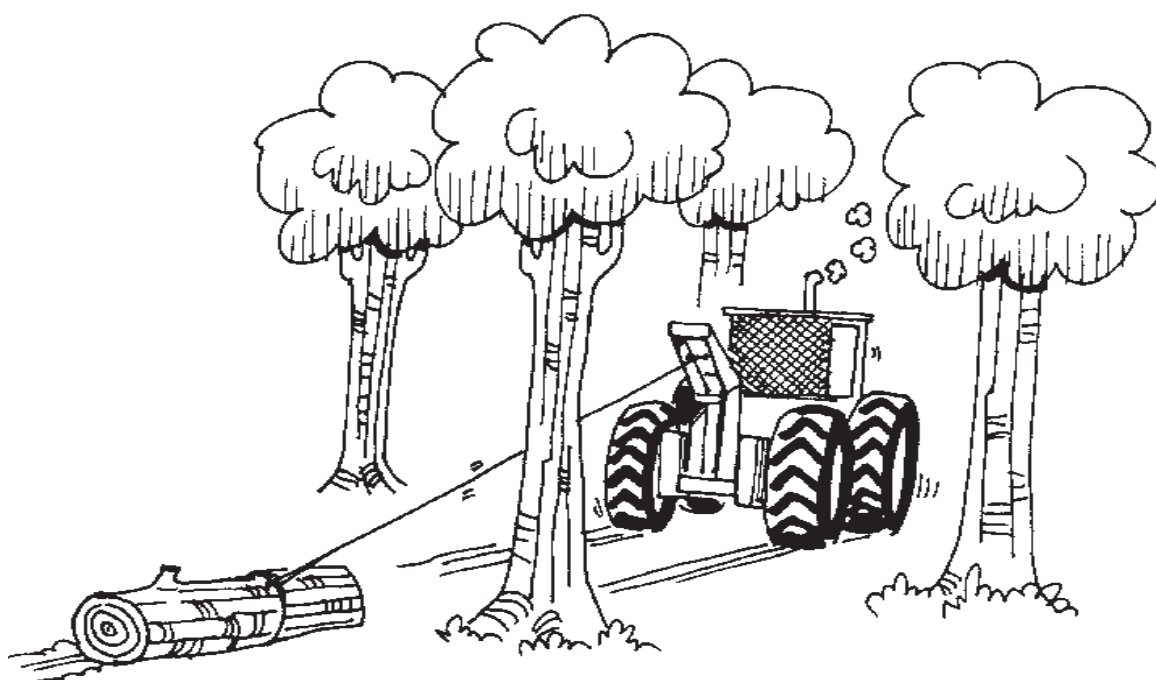
For example, a tree with a cylindrical volume of 4.8 would have:

$$V_f = 4.8 \times 0.7854$$

$V_f = 3.77$ cubic metres of wood planks.

Tips for negotiating the sale of wood

- Research the prices. In 2003, the Capim communities sold the right to log on their lands for US\$33/alqueire (US\$7/ha).
- Identify and mark the useful trees that should not be taken out (fruit trees, game-attracting trees and those which supply oils and resins).
- Create a forest reserve based on the density and distribution of useful trees and the presence of game. Mark and show the boundaries of the reserve to the logger.
- The logger should contract a forest engineer to oversee the operation. The engineer makes a map based on the distribution of trees he or she plans to harvest and creates a management plan based on this map, showing where the roads and the clearings should be. This practice avoids the opening of unnecessary roads that destroy a larger area of forest.
- Sell wood only to loggers that remove logs with a skidder instead of a tractor. Skidders that use a cable system are able to remove logs without getting close to the area where they fell, causing less damage to the forest.
- Ask the logger to build a road after the harvest. This is more likely to happen if you ask before the last load of wood is extracted.
- Insist on being paid on a specific day and renegotiate if the work takes longer than one year.
- Accompany the extraction and note the volume that is being extracted from the forest.
- Have a written and signed contract that includes all of the important points.



“He tricked me!” It happens all over the world

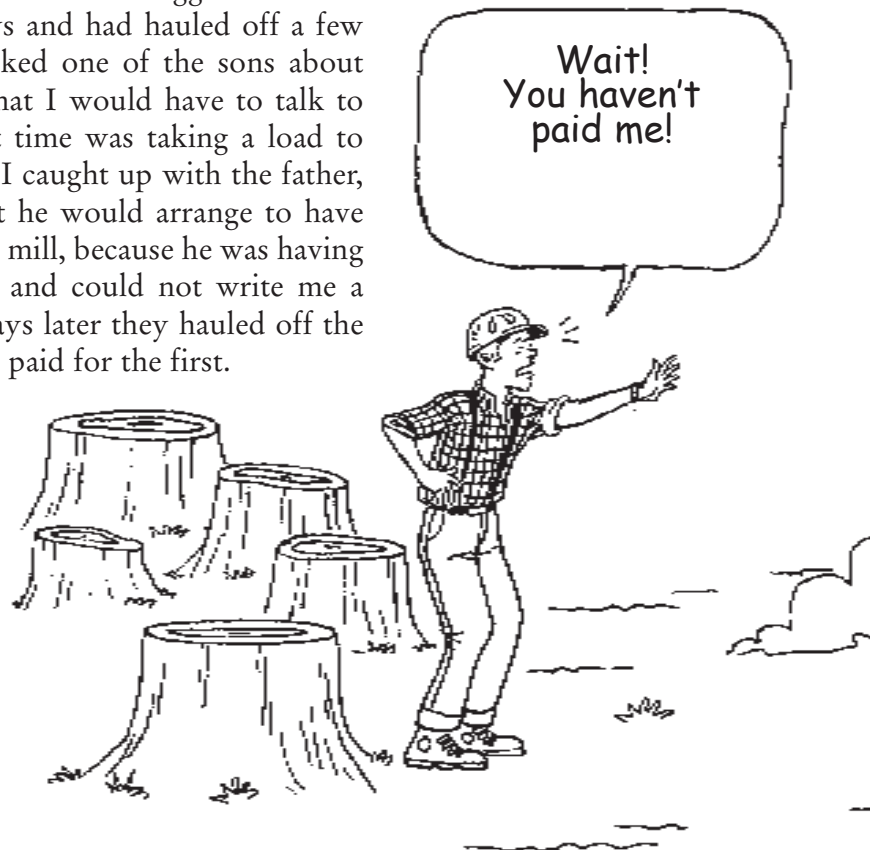
Francis E. Putz

This autobiographical story by a well-known forester shows how easy it is to be fooled all over the world.

As a forestry researcher and ardent advocate of forest management for conservation and income generation, it does my reputation little good to admit that in selling timber from my own property, I was cheated not once, but twice. Granted that my second venture into timber marketing failed for different reasons than the first, but in both cases I did not receive all of the income I deserved. What makes these experiences even more painful, is that close colleagues have written extensively on marketing timber, but I did not take advantage of their readily available publications on the topic.¹⁵

I own about 50 hectares of pine-dominated forest outside Gainesville, Florida. Early in 2000s an outbreak of Southern pine beetles threatened my unthinned stands, so I hired a local logger to harvest some pulpwood logs. When we met to negotiate the deal, the logger drove up in one of the most dilapidated pickup trucks I have ever seen. I had considered asking him for an advance or to post a performance bond, but did not bother given his obvious financial limitations. We agreed that he would pay me for the timber as he sold the logs to the mill. About a week later he returned with his two sons in another beat-up old truck, this one with a winch for loading logs. I was occupied with teaching at the time and could not supervise the logging operation very closely.

I started to wonder about when I was going to be paid for my timber after the logger had been working for a few days and had hauled off a few truckloads. When I asked one of the sons about getting paid, he said that I would have to talk to his father, who at that time was taking a load to the mill. The next day I caught up with the father, who promised me that he would arrange to have me paid directly by the mill, because he was having trouble with his bank and could not write me a check himself. Two days later they hauled off the last log without having paid for the first.

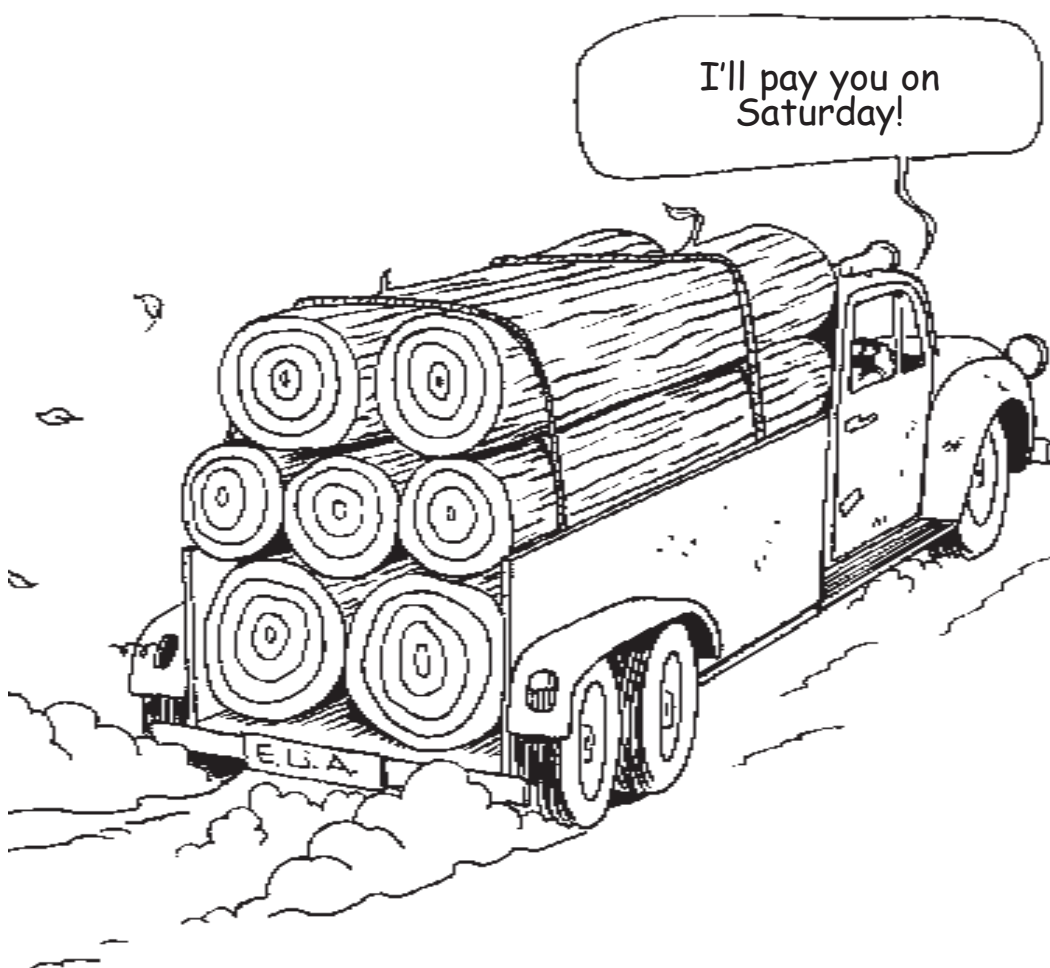


Realizing that I was unlikely to be paid unless I took some action, I considered the courses of action open to me. Unfortunately, the best approach I came up with was to hire a lawyer and take the logger to court. Because lawyers cost a lot of money and I could not expect to get much from the logger anyway, I decided that I would accept the loss and learn from my mistake.

In 2003, it was dry again and the beetles were on the rampage, so despite low prices for saw timber and pulpwood, it was time to hire another logger. This time I chose to hire a more reputable company. Because the market was bad and getting worse, no loggers in my region were willing to buy timber in advance, so again I was locked into a pay-as-cut deal. This time I was careful to cordon off areas that I did not want the logger to enter and flagged trees that I wanted protected during felling and extraction operations.

Unfortunately, my elaborate environmental protection requirements, which made it more difficult to log, coupled with plummeting pulpwood prices resulted in my contractor going elsewhere for his logs. He paid for what he hauled off site and followed the guidelines I set, but ended up harvesting only about half of what I needed to be removed, which meant that my profit was much lower than expected.

What these experiences taught me is that arranging timber sales is not a trivial undertaking and that there are a multitude of ways a deal can go sour. In the future, I will follow the advice available on various web sites¹⁶ or hire a professional to broker the deal.



Helpful hints on how to sell your fruit

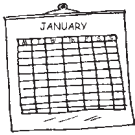
When you negotiate a good timber sale, you can conserve the fruit and oil trees that are useful to your family. As it isn't easy for producers who are far from the market to sell their fruit, let's have a look at some tips from communities who have learned from trial and error how to make a good sale.

Select and protect

Identify the fruit trees that the community likes best and that produce well. When you know a tree is going to produce a lot, clear the brush out from beneath the tree so that you will not lose any fruit.



Pay attention: production varies



Fruit trees often rest on alternating years. Remember where they are, and be aware of their cycles of production so that you can plan to collect, eat and sell during productive seasons. Making note of the flowering of your trees will help you remember when they will come into season. If you have trees that produce between seasons, you can often get a better price (2–6 times higher).

Packaging

After you collect and carry a bunch of heavy and perishable fruit, think carefully about how you will package them to take to market. If you throw all the fruits in a sack, they can easily spoil. Use a sack only for the fruits with a thick rind. For the others, use ventilated containers such as baskets.



Research the price and join a cooperative



Research the market prices so that you don't end up losing money. And to get a good spot at the market, be sure to get there early. In addition, if you sell your products together with your neighbours or in the cooperative, it is possible you will earn more.

Transportation

For many communities, reaching the market is difficult. The fact that the harvest often takes place in the rainy season makes matters even more complicated. That's why it is important to plan well before the harvest. Negotiate with people who have transportation (boat owners, mayors, loggers and ranchers). Allow for extra travel time due to mud and bad weather.



Profits for partying or paying the bills?

If you send someone to sell your product in the market, make sure you know whom you are dealing with. If he or she is not a trustworthy person, you may see your profits quickly transformed into a bottle of booze.



Processing: make more money



Do you want to increase your profit from fruit? Make sweets, jam, frozen ice treats, pulp or soap. The more products you make, the more you may earn. But remember: to make these products you first need to train people well in hygiene and quality control and consider issues such as storage and preservation.



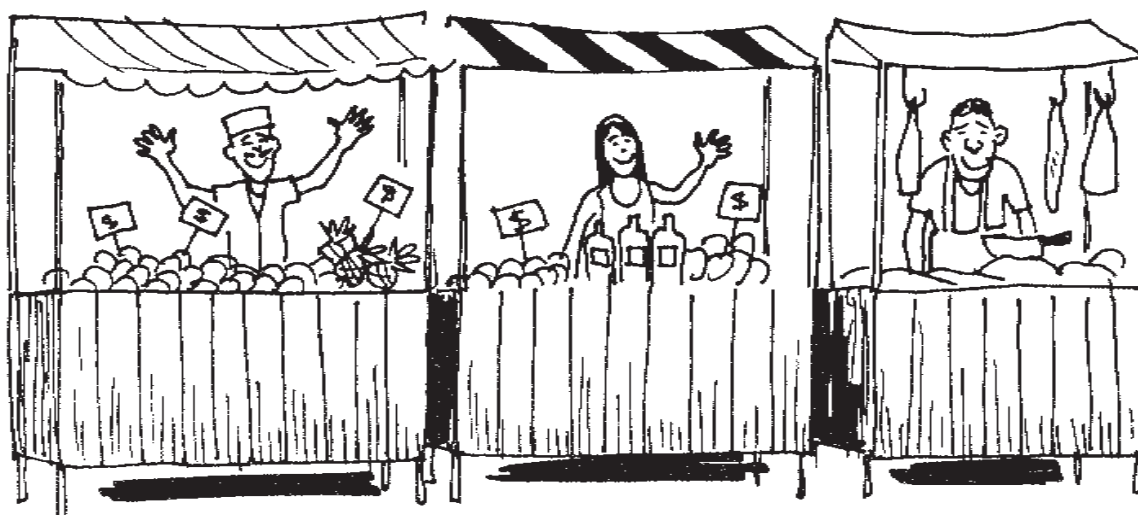
Green seal

Various seals of quality exist which guarantee to the consumer that your product was made in a sustainable way adhering to rigorous standards of quality. This can increase demand for your product and, subsequently, your profit. Adherence to the standards of certification is often more easily accomplished if the producers are organized into cooperatives or associations.



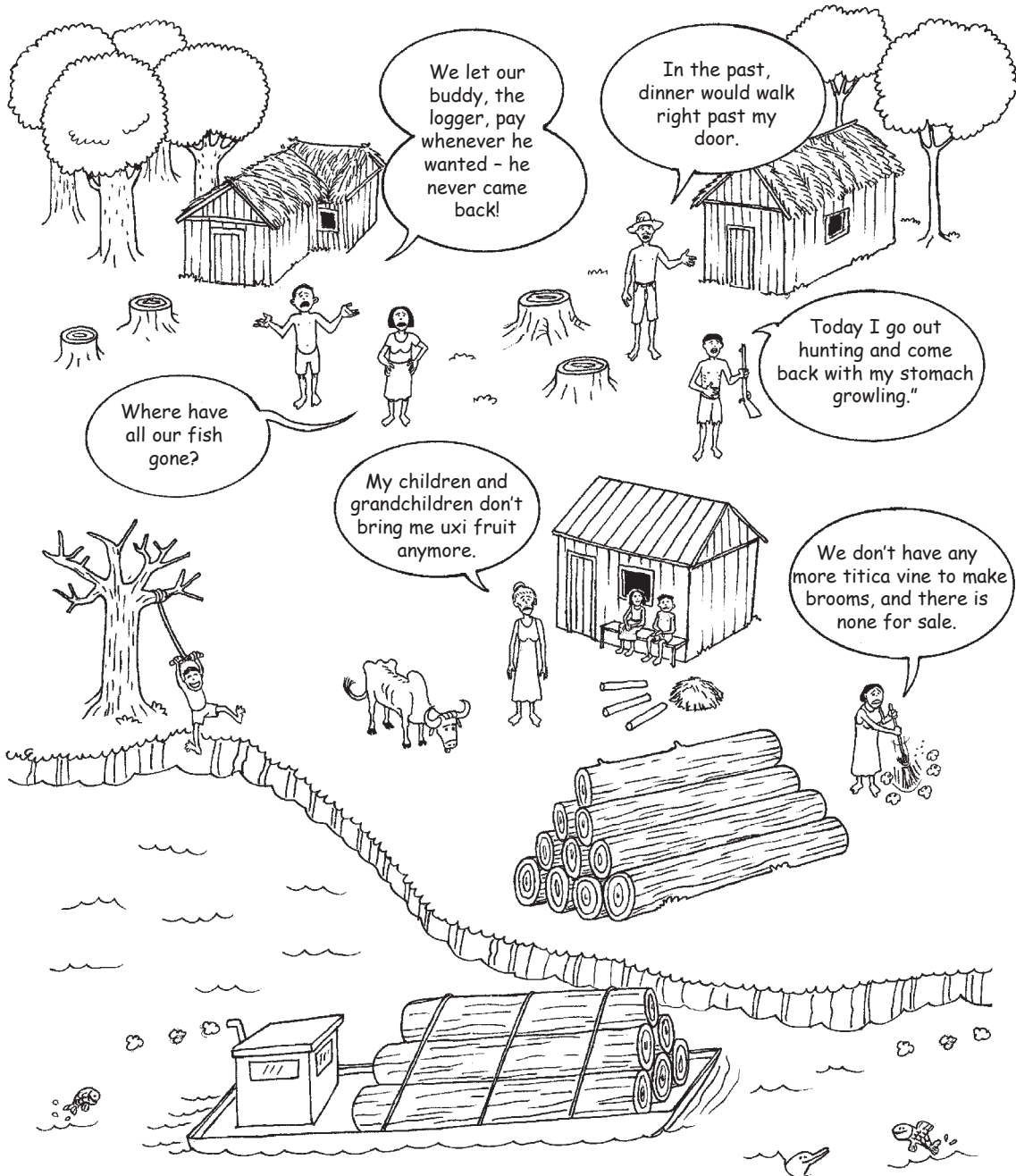
Diversification - less risk, more gain

When the fruit seasons are over, what then? A few women hold onto the pulp, sweets and jam to sell between seasons. In addition, they make home remedies, products from vines and hammocks, all for sale. Instead of dividing the total profit between them, some prefer to use at least 20% for the association to buy more primary material (fabric, line, fruit, etc.). They are intelligent: they are following the rules of big businesses – diversify to run less risk and earn more money.

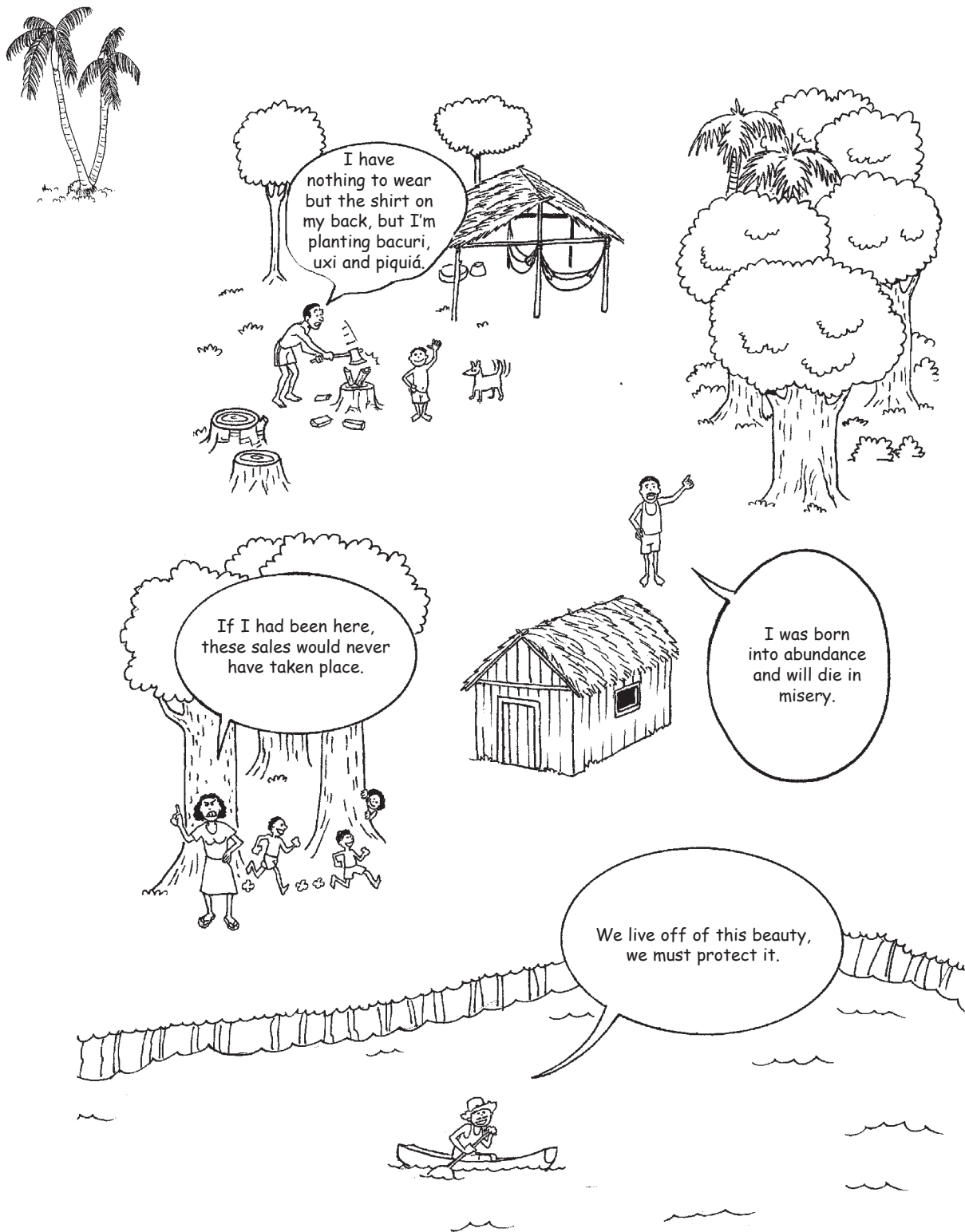


As a farm woman from the Tocantins relates: **"The best way to save money for the whole family is being able to eat without having to go to the store."**

Ten years later: Communities reflect on their timber sales



Capim Region, community members (Dona Ana Mendes, Benedito de Souza, João Brito, José Maria Pantoja)



Contract for selling wood

Date

Period of extraction (beginning and end)

Boundaries of the area to be logged

Number of trees to be extracted

Number of hectares or alqueires to be logged

Trees that cannot be cut

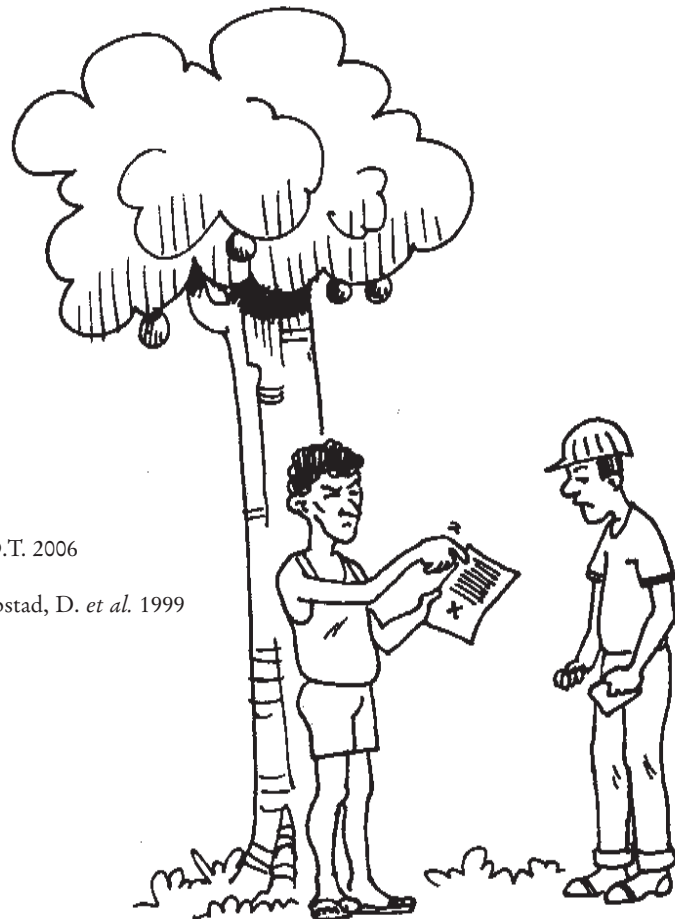
Form of payment (amount of down payment and the other instalments)

The complete name of the buyer, ID number, telephone number and address

Name of company

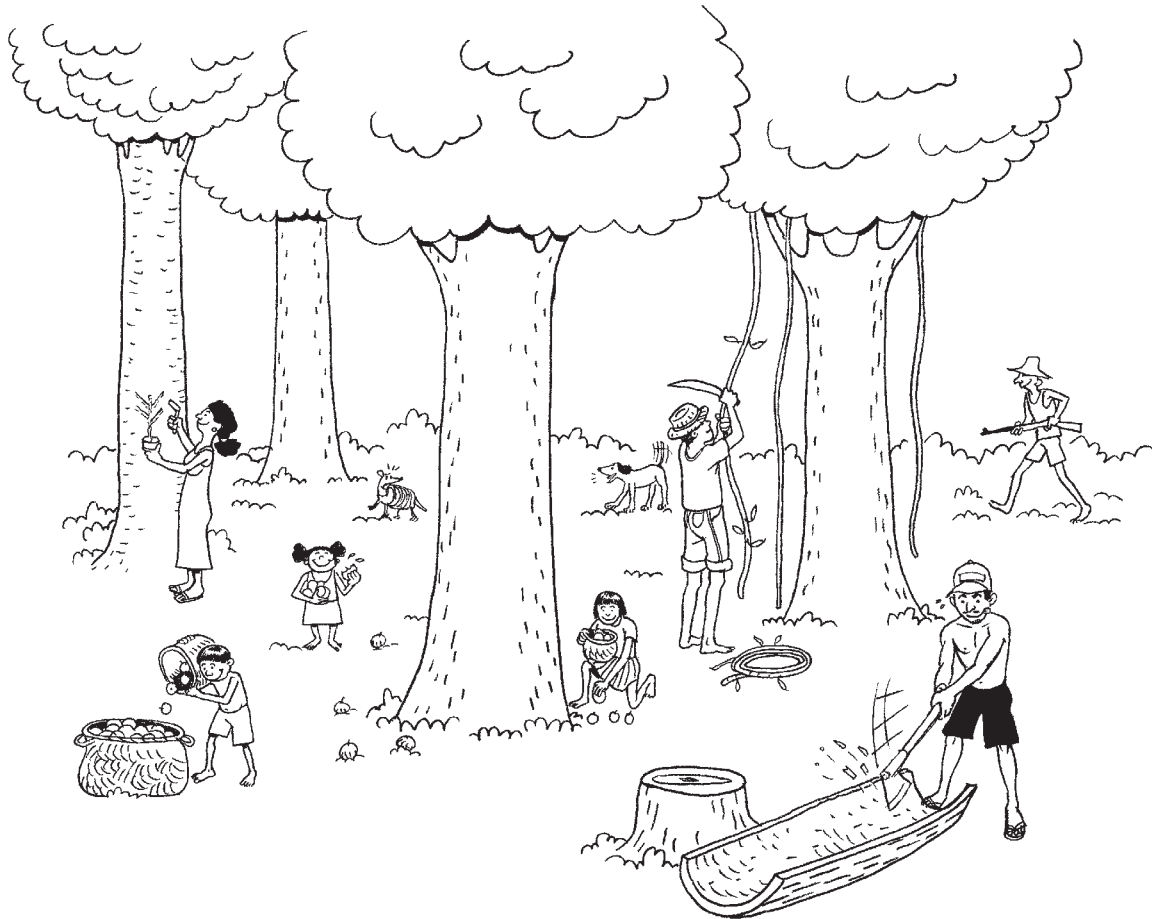
Signature of two people from the community (witnesses)

Always remember to keep a copy in a safe place.



- ¹ Schmink, M. & Wood, C.H., 1992
- ² Simmons *et al.* 2007
- ³ Nepstad, D.C.; Stickler, C.M. & Almdeida, O.T. 2006
- ⁴ Nepstad, D. *et al.* 2004
- ⁵ Cochrane, M.A. & Laurence, W.F. 2002 / Nepstad, D. *et al.* 1999
- ⁶ Vieira, I.; Nepstad, D. & Roma, J.C. 1996
- ⁷ Medina, G. 2004
- ⁸ Shanley, P.; Luz, L. & Cymerys, M. 2002
- ⁹ Johns, J.; Barreto, P. & Uhl, C. 1998
- ¹⁰ Nepstad, D. *et al.* 1999
- ¹¹ Martini, A.; Rosa, N. A. & Uhl, C. 1998
- ¹² Shanley, P. & Rosa, N. 2004
- ¹³ Amaral, P. *et al.* 1998
- ¹⁴ Mattos, M.; Nepstad, D. & Vieira, I.C. 1992
- ¹⁵ Demers, C. & Long, A. 2006
- ¹⁶ Savelle, W. & Eshee, W.D. 2002

Multiple-use management



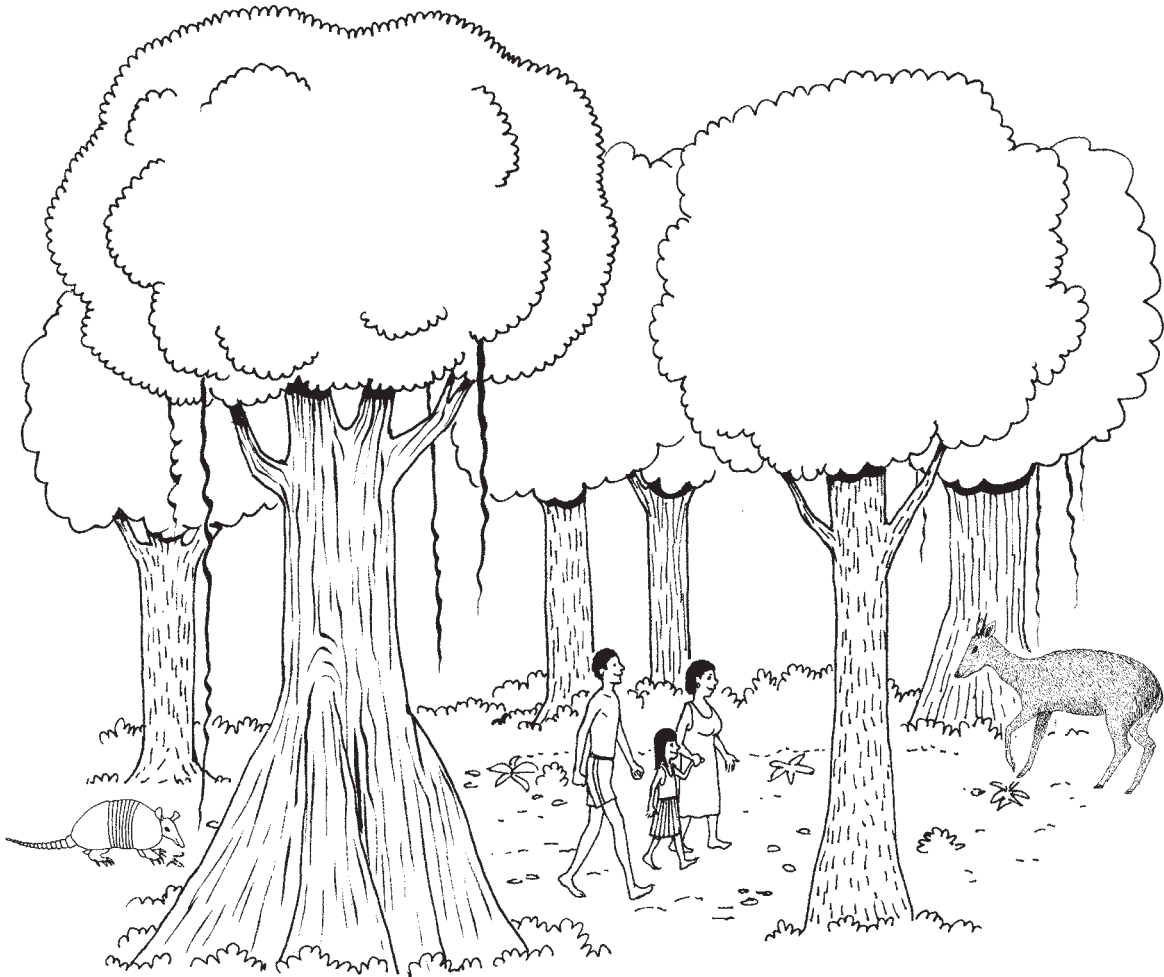
Murilo Serra
Gabriel Medina

Managing the forest means using it with care. Many rural communities, especially traditional ones, have a long history of using their forest management skills and practices to guarantee the availability of certain resources. Community forest management should generally encompass the multiple uses of the forest and take into account the diversity of forest resources, including not only wood but also fruit, fibre, game and medicinal plants, collectively known as non-wood forest products (NWFPs).

Community forest reserves

A few communities and ranchers put the needs of their families first and create forest reserves where game can reproduce. By creating reserves, they guarantee the good nutrition of their grandchildren and great-grandchildren. They have not sold their forests for short term gain because keeping the fruit trees ensures that no one will go hungry. Having a community forest is like having money in a savings account: its value always goes up.

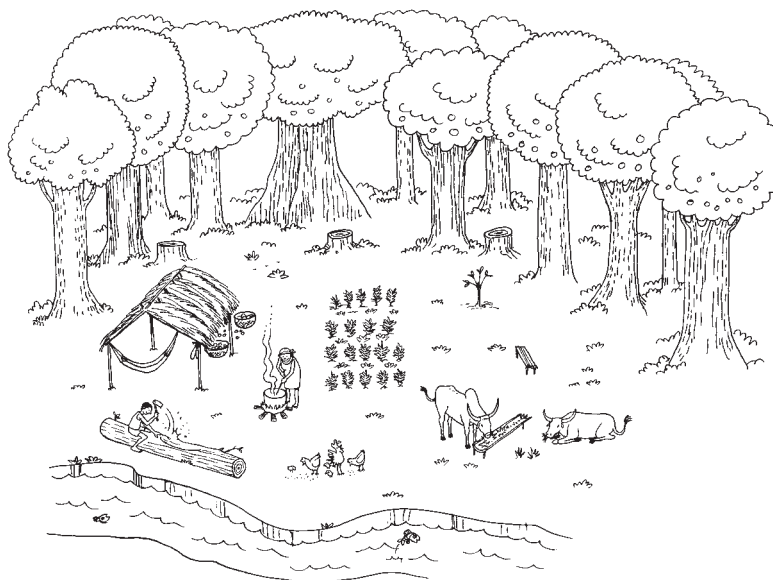
Forest reserves are of greater value to a community if the people know what kind of trees and animals live there. To maintain a community forest, it is necessary to establish a few rules about the use and management of its resources, such as whether to allow logging or where to place shifting cultivation plots. Part of the land can be set aside as a forest reserve for the reproduction of plants and animals, where limited or no extraction takes place. To ensure fruit production, an area with a high number of fruit trees favoured by the community and animals can be set aside. To maximize the reproductive potential of reserves, it is useful to plan carefully and to choose an area connected to other forests, creating a corridor that permits the movement and reproduction of wildlife.



A dynamic reserve

M. Almeida, E. Costa, S. Dewi, M. Pantoja,
A. Postigo, A. Puntodewo, M. Ruiz

The first extractive reserve, created in Brazil in 1990, was the Extractive Reserve of Alto Juruá, in Acre, with half a million hectares and approximately 5 000 people. Rubber has been their principal cash crop for the last 100 years. The crash in rubber prices, however, challenged the local population's livelihood. In response, they developed new sources of income to supplement the subsistence income they have always earned from farming and extractivism.



During the 1990s, part of the population moved to the centre of the reserve, where the concentration of rubber trees is greatest along the margins of the rivers. The movement of the population resulted in greater pressure on the forest along the riversides and a decrease in pressure in the terra firme areas. Altogether, deforestation in the reserve has reached only 0.2%, and 98.5% of the reserve has maintained its forest cover.

By 2004, only 21% of families harvested rubber. This shift has resulted in a decrease in rubber production by 82%. Among the new sources of income are NWFPs, such as soap made from murumuru, bags and clothes made of natural rubber and brooms made from piaçava. In addition, beans grown along the margins of the rivers have replaced rubber as the primary cash crop. Forty-one percent of families are involved in the rearing of cattle, with, on average, two cows/family. However, a small number of residents have gathered their herds and created ranches in the interior of the reserve.

Municipal salaries, pensions and administrative positions in the reserve are transforming the local economy, contributing to greater stability for families. Following global trends, the economy of the reserve is shifting from the agricultural sector to the service sector.

During the first decade of the reserve, the community adapted to changing economic conditions, keeping a relatively stable population and maintaining forest cover. New trends will bring new challenges for the residents of the reserve. Among these are the expansion of cattle ranching, the increased presence of the state, political changes and the influence of other countries.

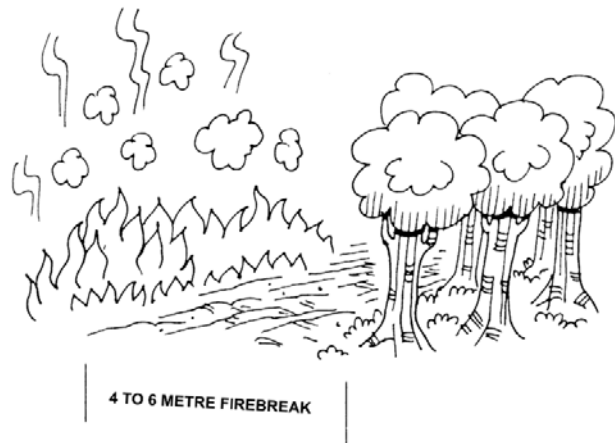
João recreates a forest

Unfortunately, for some communities it is too late for a reserve: they don't have any forest left. People are living in the middle of the scrub without *maçaranduba* to make shingles, *bacuri* to eat or tortoises to capture. This happened to Senhor João Paulo. He lived on a beautiful farm with Brazil nuts, mangos, cashews and *bacaba*, but one day he received a visit from a rancher, and guess what happened? João sold his farm and moved with his family into the shrublands, with no trees and no water. But even at 60 years old, João was on top of things and started planting again. He enriched the secondary forest with trees that produced fruit, resins, wood and other valuable products, both for his family and for the market. Today, he has trees like *ipê-roxo*, *mururé*, *cedro*, *sucupira*, *ameixa*, *graviola*, *uxi*, *piquiá* and many other species.

Tips for protecting a forest

Firebreaks

About 12% of the Amazonian forest was destroyed by deforestation and fire between 1970 and 2002. In addition to the huge loss of plant and animal life, the burning causes local fluctuations in temperature and rainfall patterns, and contributes to global climate change. Hence it is increasingly important to create barriers against fire. To create a firebreak, you must clear all the vegetation from the forest floor along a strip. Anything that could possibly catch fire, like trees, bushes, dry branches and grass, must be removed. Because there is nothing to burn in the firebreak, the fire should stop when it reaches it. Generally, barriers are from 4 m to 6 m wide. The wider they are, the lower the risk of fire jumping the firebreak and spreading into the forest. In planning when and how to burn your fields, pay attention to the air temperature, the force and direction of the wind, the time of year the burning takes place, the kind of vegetation and the inclination of the terrain, in addition to respecting any agreements you may have with your neighbours.



Agricultural fields in the capoeira

Remember to plant your fields in the secondary forest. In this way you avoid destroying the more valuable primary forest. Using the secondary forest is a wise way of reducing deforestation while obtaining useful products. But be careful with the fire: burning a field for planting in secondary forest is like dropping a match on gunpowder.



Managing secondary forests can yield good fruits

Socorro Ferreira, Marli Mattos and Cesar Sabogal

Secondary forests generally grow on agricultural fields left fallow after cultivating the soil for crops. The farmer allows the forest to grow back so that the ground can rest and recuperate for 4–10 years, when it can be cultivated again. While the secondary forest is “resting the earth,” it serves many useful purposes: producing wood for houses, boats, fences and pigsties; keeping the air cool; and sheltering birds like tinamous and quail-doves and many other animals including paca, armadillos and agoutis.

Many farmers also leave part of their property as forest reserves, allowing the forest to fully mature and thereby offer more products. Research conducted in the northeast of the state of Pará revealed that more than 20% of secondary forests on farmers’ lots are middle to advanced in age. Secondary forest more than ten years old can be managed to encourage the production of favoured species useful for construction and valuable for fruit, medicine, fibres and resins.

Some of the species encouraged in secondary forests managed by agricultural families are:

- **Medicinal uses**

- Açaita cavalo (*Lueheopsis duckeana*)
- Paricazinho (*Stryphnodendron guianense*)
- Sucuúba (*Himatanthus sucuuba*)

- **Wood for various uses**

- Amaparana (*Thyrsodium paraense*)
- Anani (*Symphonia globulifera*)
- Cumarú (*Dipteryx odorata*)
- Cumatê (*Myrcia atramentifidera*)
- Cupiúba (*Goupia glabra*)
- Ingá vermelho (*Inga alba*)
- Jarana (*Lecythis lurida*)
- Louro prata (*Ocotea guianensis*)
- Parapará (*Jacaranda copaia*)
- Pau jacaré (*Laetia procera*)
- Sapucaia (*Lecythis usitata* var. *paraensis*)

- **Edible fruits**

- Bacuri (*Platonia insignis*)
- Bacuripari (*Garcinia (Rheedia) macrophylla*)



Bacuri is one example of a tree species that can be managed in secondary forest. When natural regeneration begins, knowledgeable farmers select the more vigorous bacuri saplings and thin the surrounding vegetation. When the secondary forest is formed, farmers eliminate the plants and vines competing for light and nutrients with the desired bacuri saplings. By giving bacuri sufficient room to grow, the young trees can develop straight trunks and form canopies.

By managing the secondary forest, farming families can develop and produce desirable plant species more quickly, making useful products available for consumption and sale in local and regional markets.

Benefits of plants in secondary forest

Montserrat Rios

Scientists estimate that 30% of forest cover in Amazonia is now secondary forest. In the northeast of Pará, after a century of swidden agriculture, secondary forest represents the predominant vegetation in the region. Ecological and ethnobotanical research reveals that, historically, secondary forest has been used by many human populations that lived in Amazonia. Secondary forests at various stages of growth are capable of providing plants for nutrition, medicine, construction and fuel, helping with the daily sustenance of families.

A study in the community of Benjamin Constant, in the municipality of Bragança, in Pará, shows that the families of small farmers know and use approximately 135 species from secondary forests. These many plants provide a variety of useful products. Amapá (*Parahancornia fasciculata*), for example, produces latex which is used in the treatment of anaemia, worms, liver diseases, diarrhoea, stomach inflammation, and gastritis. In addition to its medicinal power, amapá's high-quality wood is used in construction. As the extent of secondary growth increases, it is important to encourage research about the potential of plant products found in secondary forests, developing sustainable management programs for these areas and disseminating scientific knowledge to communities in practical and productive ways.

New uses for dead wood

Antônio José, David McGrath and Charles Peters

On the margins of the Tapajós River, in Pará, artisans have formed six community workshops that make use of the wood of downed trees from forests and agricultural fields to create simple, rustic furniture (benches, chairs and tables) that brings out the natural beauty of Amazon hardwoods. The defects and variations in the wood are incorporated into the furniture's design, contributing to the unique beauty and utility of each piece. The artisans have formed a cooperative, Oficinas Caboclas do Tapajós (Caboclo Workshops of the Tapajós), which now has over 50 members.

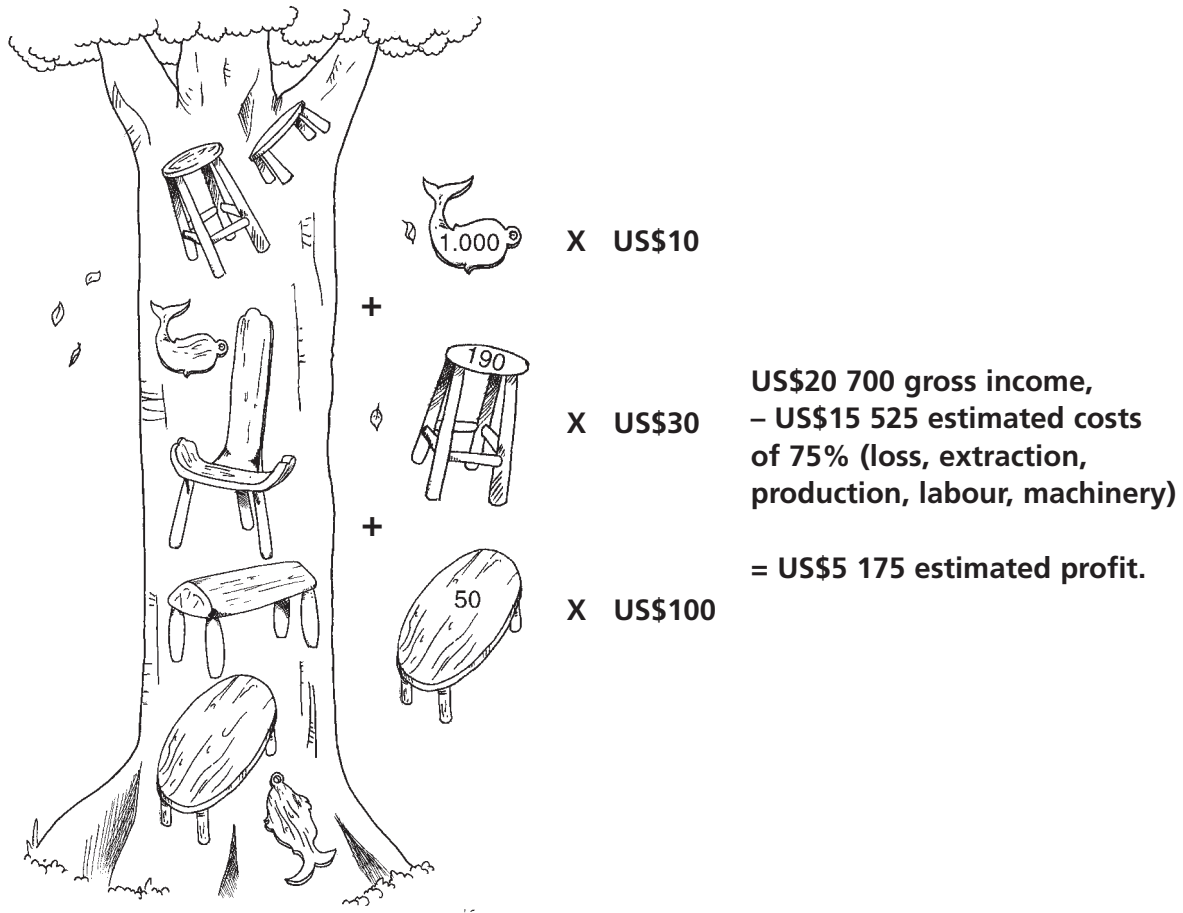


Groups began using dead wood to avoid felling trees from prospective community reserves until a management plan could be put into action. To develop management plans for sustainable extraction of wood from community forest reserves of 100 and 200 ha, the artisans inventoried a wide variety of tree species. Forest inventories were conducted to determine the number and location of commercial size trees and the volume of timber for each of some 40 species or species groups, though in practice most groups use only part of this diversity. The artisan groups also monitor the growth of each species of tree to determine the volume of wood that can be taken out without affecting the original stock. Installed in simple sheds, artisans use saws, hammers, chisels, planes and chip axes to carve stools, benches, chairs and tables. Each workshop produces an average of 80 pieces per year. For each large tree (with about 3 m³ of wood) they can produce about 1 000 cutting boards, 190 stools, and 50 coffee tables. Many of the bench designs are based on animals from the surrounding forests and rivers, such as peccaries, caiman, anteaters, boa

constrictors, and aquatic species such as river turtles, pirarucu, tambaqui and stingrays. Artisans are also using titica vine, to weave seats for benches and shelves for coffee tables. In 2008, the price of the pieces varied from US\$10 per carving board to US\$177 for a large animal bench. The following diagram shows how one tree may generate the equivalent of US\$10 if sold to a logger or the profit that can be generated from working one dead tree of 3 m³ into cutting boards, benches and coffee tables.

Increasing value: one tree can generate either US\$10 or US\$5 000

Tree of 3 m³



Because the workshops use only small volumes of timber, 3-6 m³ per year, forest reserves provide far more timber than they currently need, there is great potential for expanding production in response to demand. The limited volume of timber combined with the use of simple, readily available hand tools means that this system is well suited to the rural conditions of traditional peoples surrounded by primary forest and even colonists whose forests have been exploited by commercial loggers. In fact, exploited forests provide an abundance of useful wood because the kinds of trees that loggers reject: hollow, split or twisted, are the most interesting from the artisan's perspective. As a result, this approach is being adopted by caboclo and colonist communities throughout the region.

What is certification?

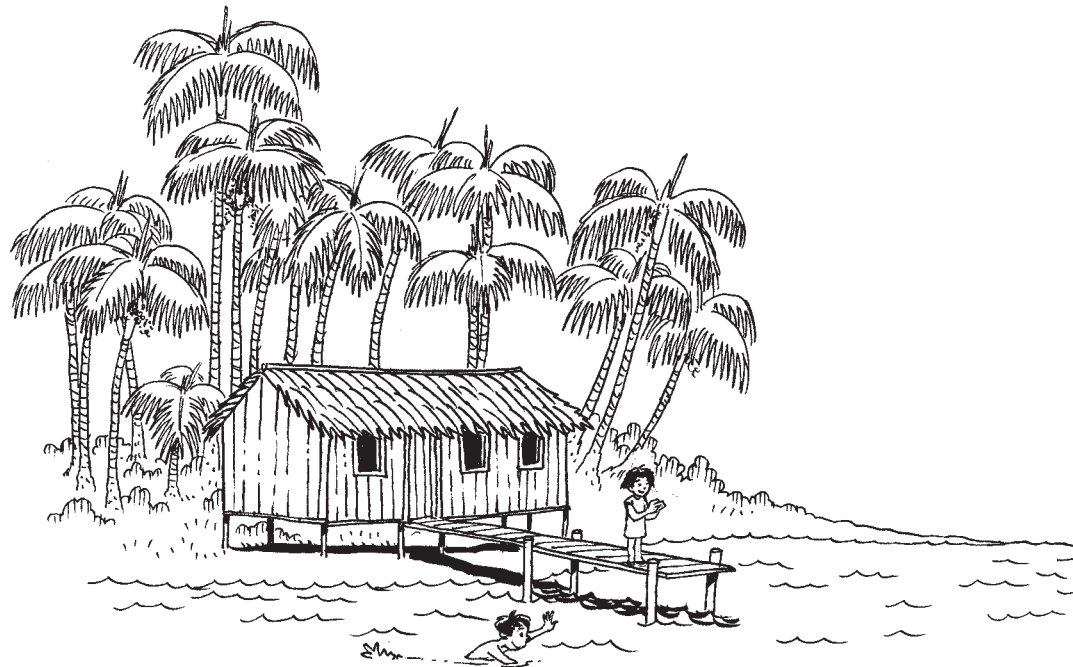
Tasso Rezende de Azevedo

When people buy forest products, they like to know that they are helping to conserve the forest in addition to supporting small producers. Perhaps the consumer could be assured of this by visiting the production site. However, it is impossible for consumers to visit all of the factories and workplaces where the various products they purchase are made and where the raw materials are collected. And even if they could visit the production sites, many people still wouldn't know whether or not the purchase of a certain product benefited a community or promoted forest conservation.

The certification system was created to help the consumer make good decisions at the time of purchase by guaranteeing that a product was made in a sustainable manner. In this system, a third-party independent team goes to a producer and evaluates the work that is being done. The team determines if the company is following the norms of sustainability that were developed by a working group involving consumers, producers, technical organizations, unions, companies, governments and researchers.

If the producer complies with these regulations, he or she receives a certification that permits him or her to put a seal on the product. The seal guarantees buyers that the product was constructed or extracted following the rules of good forest management. There are three main kinds of certification for NWFPs.¹

- The Forest Stewardship Council (FSC) certification guarantees that the forest and harvest is being sustainably managed, the producers are benefiting from the sales, and the production is able to continue over the long term.²
- Organic certification guarantees that the products are grown without the use of pesticides or chemical fertilizers thus are not contaminated by agrotoxins generally making them healthier.
- Fair trade certification ensures workers' rights, decent working conditions and an equitable sharing of profits among producers.



Certified products

On the island of Marajó, in Pará, a food company works together with the riverine community to produce açai (both heart of palm and pulp) using sustainable management techniques. Sustainable management guarantees that the harvesting of heart of palm and the production of açai pulp can be maintained, using a form of extraction that does not destroy the forest. Furthermore, it benefits the producers. Saying that a product is certified by the FSC means that it “comes from forests that are managed to meet the social, economic and ecological needs of present and future generations”.²

Management of açai on the island of Marajó

The açai palm is the main source of nutrition for the families of Marajó Island. For many years, however, the açai palms were threatened by excessive cutting of palm stems for heart of palm production. Care was not taken to see that new palms grew to replace those that were harvested. In response, communities and companies jointly developed a management plan to extract only a number of stems from each palm cluster, allowing the palm to continue to produce. In this plan, palm stems are harvested every four years. In each harvest, only the adult stems are taken, leaving the young ones to grow for future harvests and to produce fruit to establish new palms. Using this system, the fruit can also be collected every year to be consumed and marketed by the community.

This system of management has transformed many forests into plantations of açai, causing shortages of other valuable products such as medicinal plants, game, fronds and oils. To avoid the loss of biodiversity, companies and communities are working together to maintain a minimum and maximum number of açai palms/ha, so that other flora and fauna can continue to survive.

But it is no use to only take care of the forest; people also need to benefit from the conservation of forests and wildlife. A company must include in its business plan health care and education programmes for its employees, and for the people living adjacent to the managed forests. Unless businesses pay attention to social concerns and provide some services, it is difficult for them to receive FSC certification.

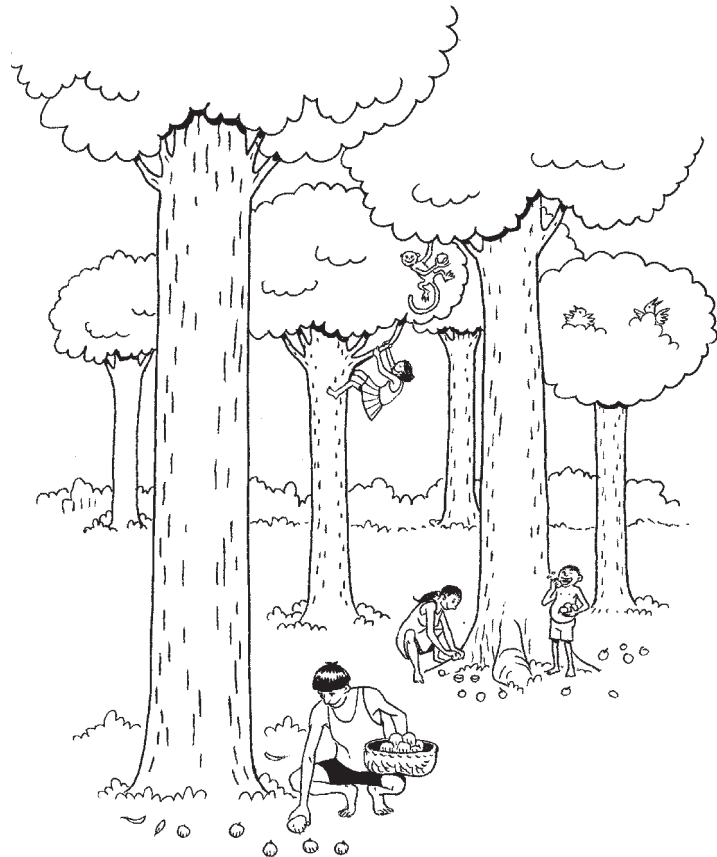


Managing the forest to fill the pocket and the belly

Paulo Amaral and Manuel Amaral Neto

The Amazonian forest is so big that, in the past, loggers, politicians and communities never imagined that it could one day disappear. Exploiting the forest with no thought to the future led to losses, both for small communities and big businesses. In the 1990s, the public, the government and researchers all began to realize that forests could be managed for the local consumption of goods and for the sale of forest products. Initially, the focus was on managing the forest for timber sales, but soon thinking shifted to multiple-use management.

In Amazonia, 18 formal Community Forest Management (CFM) initiatives with external financial support of a nationally developed project for the Amazon region existed by 2001.³ Because of these initiatives, a great part of the forest in the region remained in the hands of populations that have traditionally managed it. In addition, other communities were already receiving project assistance from certain institutions. However, although numerous communities naturally practice multiple-use forest management, many new CFM projects still focus only on timber extraction. Among the obstacles to successful community management are: unfavourable public policies, lack of credit and weak technical assistance. In 2000, of the 14 projects that existed, 45% were planned by NGOs, 44% by donors and 11% by technical extension workers.⁴ The difficulties are greatest when the inspiration for forest management comes from outside the community. The following table details the challenges and opportunities of community forest management. It is important to remember that in the process of establishing this type of management, both the government and the community have essential roles.



Opportunities and difficulties	Possible solutions
<p>For communities</p> <p><i>Opportunities</i></p> <ul style="list-style-type: none"> • Knowledge of the forest and interest in management • Labour available in the community • Assistance from NGOs <p><i>Difficulties</i></p> <ul style="list-style-type: none"> • Lack of local infrastructure for production and marketing • Low educational level and technical capacity • Limited knowledge of regulations 	<ul style="list-style-type: none"> • Discuss and implement long-term proposals for CFM • Promote local capacity and strengthening of institutions • Recognize and document locally crafted management innovations
<p>For local organizations</p> <p><i>Opportunities</i></p> <ul style="list-style-type: none"> • Some communities have informal organization and internal rules for forest use • Local institutions strengthened by linking with social movements demonstrating interest in conservation <p><i>Difficulties</i></p> <ul style="list-style-type: none"> • Lack of access to information • Long delay in benefits of CFM • Partnering institutions have insufficient management capacity 	<ul style="list-style-type: none"> • Promote the social organization of local communities • Clearly define the responsibilities and benefits of management • Empower community members involved with management activities • Develop entrepreneurial spirit
<p>For the government</p> <p><i>Opportunities</i></p> <ul style="list-style-type: none"> • Government supports Conservation Units in Amazonia • Possibility for community participation in conservation • Interest on the part of national and international partners in CFM <p><i>Difficulties</i></p> <ul style="list-style-type: none"> • Many areas are not legally defined • Long delays in the legalization of management plans • Lack of funds and no access to credit for CFM 	<ul style="list-style-type: none"> • Promote incentives for forest management, such as educational programs, credit programs, information and legalization of land titles • Support forestry training and technical programs in multiple-use management • Promote gender-sensitive programs to ensure the participation of women in community forest management

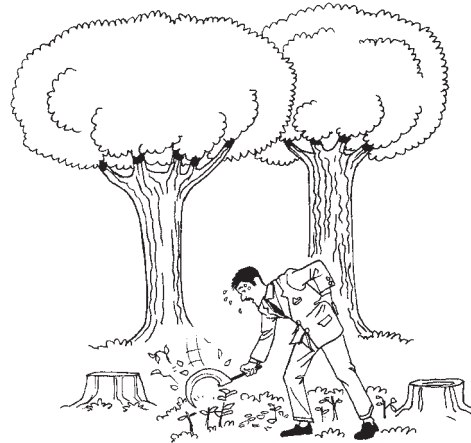
Challenges for communities

Magna Cunha

Community forest management for timber is being increasingly recognized and supported. Many financing agencies recognize the importance of sustainable forest management in the conservation of Amazonia. However, the complexity and the dynamic nature of the technical management models present a few risks and uncertainties, especially when you analyse their sustainability.

A few of the challenges include:

- **Understanding nature** – The various timber species have different ecological characteristics that need to be understood in order to manage them effectively.
- **Sales risk** – Even though wood has a high one-time value in comparison to other forest products (such as açai, Brazil nuts and other fruits), its immediate commercialization and price are not guaranteed.
- **Inattentive consumers** – Only some buyers pay attention to the origin of forest products. It is necessary to educate the consumer regarding the importance of purchasing community-managed sustainable wood products.
- **Technical difficulties** – The search for unique, high-quality timber species makes projects difficult. In some cases, the extraction costs can outweigh the benefits.
- **Farmer or administrator?** – It is difficult for a farmer to become an administrator from one day to the next. When administrators try to learn about forest management, they encounter similar difficulties. It takes time. While a forest farmer needs to take care of the fields, collect fruit, hunt and fish, other projects demand that he or she abandon the hoe and pick up a pen to write a management plan and market study. If farmers develop these planning skills, however, they gain greater control over their businesses.



Diversity is security

Decisions about the best way to manage natural resources in communities depend on the knowledge of the function and interrelationship of various traditional production systems. As the risks and uncertainties of community forest management for timber production are many, one option is to integrate non-timber forest products into this system. In this way, the community continues to have a security net – game, fruit, fibre and medicinal plants – while learning how to negotiate timber sales.

¹ Shanley, P *et al.* 2008

² <http://www.fsc.org/>

³ Rios, M. *et al.* 2001

⁴ Smith, J. *et al.* 2000

Forest culture



Gloria Gaia
Patricia Shanley

Nature is generous, supplying medicine, vines, game, fruit, water and wood. But nature is more than the sum of its parts. Nature can also help to restore our vigour and improve our health as it lowers blood pressure and calms nerves. When some Indians get tired after walking a long ways in the forest, they sit down on roots or touch a tree to replenish their strength so they can continue their journey. All over the world, people also protect sacred trees, forests and gardens for spiritual and health benefits. It is easy to forget, especially for urbanites, but all of our actions affect the natural world and the natural world affects us. Compelling myths, stories, legends and songs were created, in part, to protect nature from humankind's insatiable appetite. Sadly, these tales are being lost from many cultures, even though their messages are more crucial than ever. In the past, legends were passed from parent to child. As even remote villages gain access to television, the oral storytelling tradition is fading, and today few young people are able to recount the legends. Elders will gladly share stories like those of the Curupira, the great snake, the jaguar, matita pereira, saci, the mapinguari and the hunter if they are asked. We dedicate this chapter to remembering some of the best-known tales from the forests of the Brazilian Amazon.

Legends: respecting nature

Carla Panzer and Eliete Timóteo, SOS Amazonia

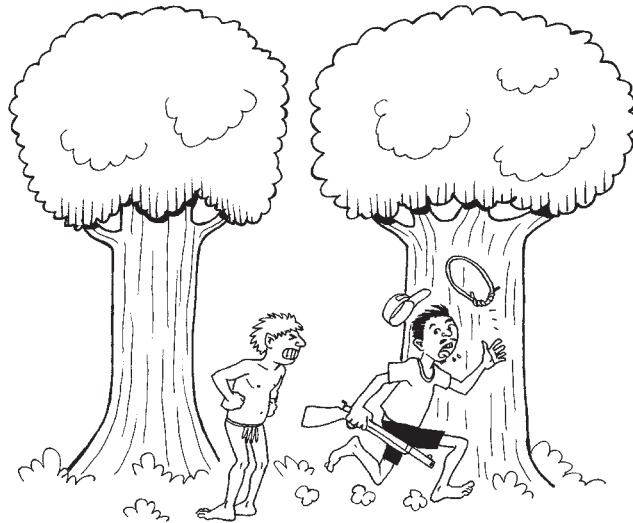
In the dark of night all over the world, adults tell scary stories that make children tremble with a delicious terror, and go run and hide under the blankets of their beds. What do the legends and myths of Amazonia signify? Are they merely entertainment, or, as in many lands, do these myths hold a deeper psychological and ecological meaning?

Together with her students, Professor Eliete Timóteo studied some Amazonian legends and discovered that most of them had ugly, frightening and vengeful characters. According to the professor and her students, these stories were invented by people who live in the forest and are meant to intimidate anyone who might through ignorance or greed threaten the forest, the river and the animals that the forest peoples depend on to survive. These stories are not just for children; in Amazonia, many hunters, professors and scientists listen to and respect these stories as well.

The professor tells us that community forest preservation has been going on since the early days of human habitation. Long before Extractive Reserves existed, the people of Acre had already developed their own systems of natural resource conservation. Who knows how much forest has been protected, due to the many beliefs and mysteries that surround this immense wilderness of green?¹

Curupira: guardian of the forest

The Curupira is well known by all city and country folk in Amazonia. He has curly hair and feet turned backwards; he is the guardian of the forest. Whenever someone gets lost in the woods, walking in circles and ending up in the same spot, this is the trickery of the Curupira. They have surely done something to make him angry. Curupira's feet are turned backwards to trick terrified hunters fleeing from him in the wrong direction and to make them lost.² To get on the right track again, leave a



cigarette for him, or wrap a vine into a tangled knot, hiding the point within. Toss the knotted-up vine over your left shoulder and run like mad. While the Curupira tries to unravel the complicated knot, you will have time to find your way again. The Curupira protects the trees, the plants and the animals in the forest, so those who show disrespect or take more than their share of forest goods, beware: he will seek his revenge and you may never find your way out again.

Mapinguari: friend of the forest

Mapinguari is the name of a monstrous, mysterious animal that lives in the wilds of Amazonia, known to rubber tappers, Indians and hunters of olden times. Like the giant sloths who roamed the forests long ago, he is considered a terror by the people who live in the jungle. He is enormous, has a mouth in his navel and one eye in the middle of his forehead. Wherever he goes, his tracks are recognized. The Mapinguari makes blood-curdling howls, his breath can knock down a tree, and his stench can kill.

Where the Mapinguari roams, there are always stories of people who pee in their pants or run naked through the forest in terror. Sr. José Paraíso, a rubber tapper in Santarém, tells his story³:

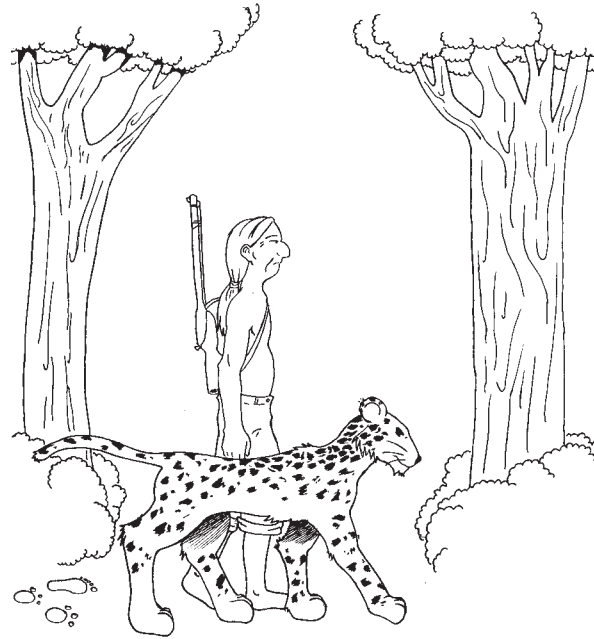
I was sleeping alone one night when I heard a voice in my dream saying, "Wake up! Wake up! The beast is coming!" I woke up, it was pitch black and I could just hear his footsteps. Then I heard that howl, "iiiiiiiiii". I was petrified and remembered that I was all alone in that place. If that monster got me, who would know? His scream grew louder; he was coming closer. "UUUUUUUUuuuuuuuuÉégh." If the beast was really on his way, my only resort was to climb high in a tree. The horrible cry came closer, it was right behind me. It was like a tempest. "Rouooooou-rouoooouuu!" He rustled the leaves in the woods and snorted like a giant boar. I looked for a tree to race up. And suddenly, that smell: a repulsive, fetid, animal funk. I felt his power up close. I was desperate. I thought it was the end of me. But then the noise grew more distant. I heard, "Uuuuuuu" farther off. Then, "uuuu". Thank goodness, he went away. If I wasn't so lucky, maybe I wouldn't be here, to tell you this story.



Nature spirits

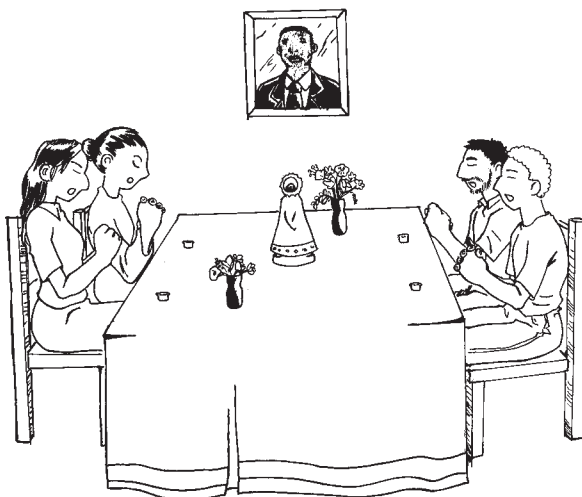
Gabriel Medina

The Indians have various customs and celebrations designed to facilitate communication with their gods. To hear the gods more clearly, some tribes discovered a special tea, called ayahuasca. The tea is made from a mixture of the jagube vine (*Banisteriopsis caapi*) with leaves of a shrub called chacrona (*Psychotria viridis*). The most common negative side effects of the tea are vomiting, tremors and dizziness. When the power of the tea is at its height, it inspires fantastic visions that can be profound and even frightening. People seek this tea to gain personal insight and come to a greater understanding of the meaning of life and their relationship with nature.



Traditionally, ayahuasca was used only in tribal rituals associated with health and religion. Giving thanks to nature formed a part of these rituals, respecting the links among the plants and animals of the forest. The Maku Indians, in the far reaches of the Negro River, use it as medicine and to consult ancestors in the selection of names for newborns. And when the elderly begin to lose their vision and strength to hunt, they go alone to a hunting camp and take the tea. Under its effects, they enter the body of a jaguar and go hunting in the forest. This is why it is dangerous to hunt jaguars and considered taboo.⁴

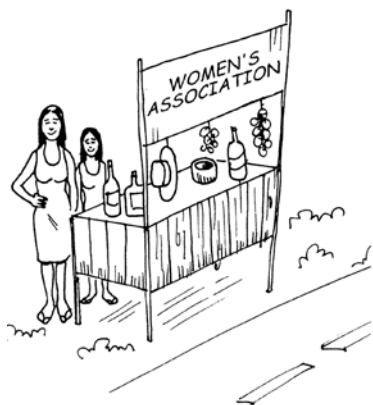
In the last few decades, use of the tea has increased dramatically. The consumption of ayahuasca is legal in Brazil and is taken regularly by practitioners of the religious sects Santo Daime, União Vegetal, and Barquinho, which include more than 10 000 people.⁵ Practitioners say ayahuasca inspires a spiritual awakening that brings them closer to God. More recently, middle- and upper-class urbanites are taking it as a psychedelic drug that they



believe helps them to grow spiritually and come into closer communion with nature.⁶ In recent years there has been an explosion in the ayahuasca tourist industry in Peru, Ecuador and Brazil, as people from around the world seek its transformative powers for both spiritual and recreational purposes.⁷ To ensure a reliable supply of the tea, some religious groups plant and manage jagube and chacrona. Because these plants are potent and potentially toxic, extreme caution should be used in their preparation and consumption.

Women's participation

Lygia Constantina da Silva
 Maria Inês S. Evangelista
Sisters of the Good Shepherd



In rural Brazil, women are generally responsible for the health care and nutrition of their families, and for this reason they often feel the effects of forest loss more acutely than men. In addition to having the techniques and beliefs necessary to care for the forest and its fruit trees, the communities which often function best are those which have women who are united, organized and active. When women participate and express their ideas, they can bring different perspectives and draw attention to diverse aspects of the importance of the forest.

Women rubber tappers, who have a history of struggle and resistance, have broken down old stereotypes and shown that women's activism benefits the community as a whole.⁸ In degraded areas in Pará, the Margarita Barbosa Women's Association of Nova Timboteua took the initiative to replant native species like andiroba, copaíba, mahogany, pupunha and sapucaia (*Lecythis* spp.). Through reforestation, seminars on health, adult literacy classes and various other workshops, these women are establishing new familial, social, political and economic relationships. Through these groups, women from Acre to Maranhão are using various materials from their forests to make crafts, to earn money selling these products, and to attend to the nutrition and health care of their families.

Guardians of the forest: midwives' perspective from Alto Juruá

Concita Maia and Luciana Pinheiro

Midwives can signify the difference between life and death for mothers and for the infants who are born in rural forest communities. The forest's near-isolation from the rest of the world helps make it possible for midwives to assume a position of respect within their communities. They are often the only skilled practitioners available to assist a woman during pregnancy and childbirth. They conduct their work with deep care and respect.



In Acre, the age-old wisdom of midwives incorporates the knowledge, experiences and improvisations of a culture that arose out of the interactions of northerners and Indians. The great majority learned the art of midwifery from a mother, grandmother, mother-in-law or aunt, very often out of necessity. They also know the "medicines of the forest", the "plants that cure" and the prayers and the incantations that help a birth along. She who has "caught many babies" and knows how to deal with a "dangerous woman" is called a "fine midwife", and usually is also a "prayer-giver" and a "healer".

Dona Zenaide from Marechal Thaumaturgo, Acre, tells her story:

I was ten years old when I assisted my first birth. I did it out of necessity! And I decided at that young age that I would become a midwife. I learned from my grandmother, Maria Correla. She was my mother's midwife. I spent most of my time training with her. The midwife works practically from dawn to dusk. Works in the fields and works at home. Sometimes she stays awake for three days running, accompanying a woman when the birth takes a while.

In Acre, the midwives are beginning to organize themselves. The struggle for recognition by the midwives in Alto Juruá began in 1996.⁹ The empowerment project for midwives is growing and there have already been meetings in indigenous communities in the municipalities of Sena Madureira and Freijó, in Acre, and Pauini in Amazonas.

Babassu breakers

Gabriel Medina

Traditionally in the state of Maranhão, the babassu trees (*Attalea speciosa*) grew on public lands and everyone could collect the palm nuts to make oil and other products, because "the palm nuts were free". But as time went by, state land passed into private hands and a few people ended up with most of the babassus. By 1985, 14 private ranches possessed twice as much land as all the small farmers in Maranhão combined. The ranchers cut down most of the babassus to make pastures, and the rural people who needed the oil ended up with scant access to the palm. As a result, there were more than 100 protests for the right to collect babassu in 1985 alone.

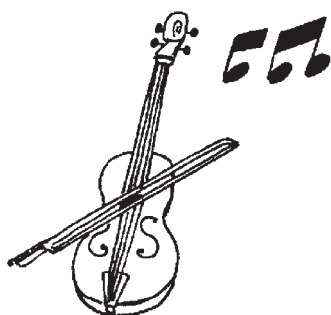
The babassu breakers came to be identified as a movement during this period and became intensely organized in defence of their right to access the palms which formed the centre of their livelihoods. The majority of babassu breakers are women, and consequently the movement has become one of the largest and most powerful women's movements in Latin America. The heart of the movement is in Maranhão, in which babassu occurs on 71% of the land. In 1991 there was a huge meeting of the babassu breakers, including those from the states of Pará and Piauí. The movement has continued to grow and recently expanded beyond areas that have babassu trees to incorporate resource-dependent communities throughout Maranhão.



Today, with oil produced from the white flesh of the babassu coconut, the movement is making bars of soap, which in 2002 were sold for US\$0.22 each. The outer skin of the fruit is made into flakes and powder used in a nutritious porridge. The fibrous husks are used to make animal feed, and families use the outer shell of the coconut as fuel for kitchen fires. The movement of the babassu coconut breakers receives strong political support, and the day-to-day cooperation of friends that live and work together also remains strong. Women go in groups to the babassu trees and sit in a circle, breaking the babassus and talking, always close to one another.¹⁰

Music of the forest

Rubens Gomes



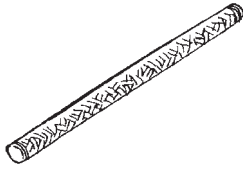
Without trees we would not have many of our best-loved instruments like the guitar, the ukulele or the mandolin, and we would never know the enchanting music that they inspire. The wood needed to make instruments is unique, not just any tree can be used. The colour, texture, density, shape and direction of the wood's grain must have certain qualities to be suitable for making instruments. Different parts of diverse species are used in the fabrication of various parts of a stringed instrument. For example, the weight of the wood used for the front has to be less than the wood used for the back. In addition, instruments traditionally have certain colour combinations. For the front, light colours are generally used; for the back and the sides, dark brown; and for the neck, black.

The species typically used to make an instrument like the guitar are Brazilian ebony (*Diospyros* spp.) for the fretboard, jacarandá-da-Bahia (*Dalbergia nigra*) for the back and the sides, and mahogany for the neck. In some regions, all of these species are being logged intensively. In Manaus, the Workshop School of Instrument Making of Amazonia is searching for Amazonian species for the manufacture of stringed instruments. They are comparing the physical characteristics, the mechanics and the acoustics of each wood to discover which species can substitute the now rare woods that were used traditionally (Brazilian ebony, jacarandá and mahogany). A few of the Amazonian species that are currently being used are shown below.



	Use	Common name	Scientific name
	Headstock	Cedro Breu branco	<i>Cedrela odorata</i> <i>Protium</i> spp.
	Fretboard	Preciosa Louro preto	<i>Aniba canelilla</i> <i>Ocotea fragrantissima</i>
	Body: Top	Marupá Freijó Morototó	<i>Simarouba amara</i> <i>Cordia goeldiana</i> <i>Schefflera morototoni</i>
	Body: Back/Sides	Pau-rainha	<i>Brosimum rubescens</i>

Messengers of the forest

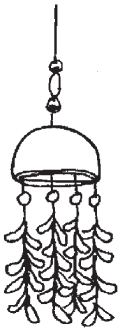


Wood is not the only material used from the Amazon to make music. The forest is a treasure trove of seeds, barks, pods and shells that make wonderful sounds. For 15 years, the musician and artist Ronaldo Farias, from Pará, has walked through terra firme and flooded forests



looking for materials to make musical instruments. Like a magician, he transforms seeds into musical rattles that sound like rain, a stream or birds taking flight. Using different combinations of seeds, pods and wood, Ronaldo can imitate the call of dozens of animals in the forest. He is always searching for ways to make new sounds, which he uses to compose carimbó songs about Amazonian culture.

For instruments like the maracas and the rainstick, he uses a combination of gourds, nuts and seeds such as: cuia, imbaúba, coconut, pregos de acapu and buffalo leather. For the shakers, he uses sapucaia, Brazil nut, imbaúba, jatobá, rubber or rubber tree, uxirana, buiuçu and mata-matá seeds.



“Looking for seeds is part of my work all year round. I have to go after the inajá and the tucumã seeds right after they fall because they rot quickly. Jupati and murumuru are in the swamp, and I have to walk in the mud and search with my hands, being careful to avoid the spines of the murumuru. Sometimes it’s more practical to use gloves. After collecting the seeds, it’s important to wash them. With the tucumã and the inajá, soak them for a week and then scrub them with sand so that the fibres come off more easily. The next step is to cut them with an electric saw. Finally, I sterilize, pierce, mould and sand the seeds three times until they are done.”



In addition to making instruments, Ronaldo works to revive Amazonian culture by offering workshops in instrument building and regional rhythms.

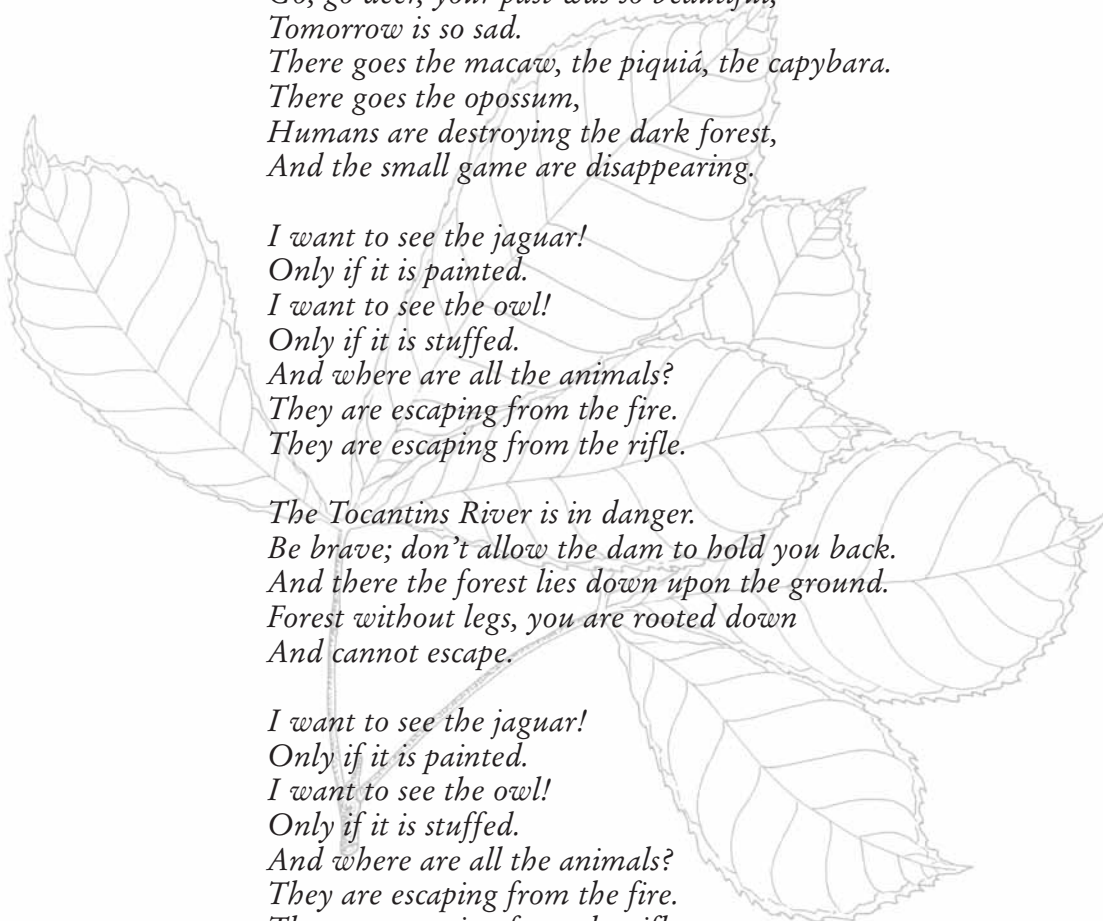


Songs

Music reflects the lives and dreams of each person. A song can be a rallying cry for the oppressed, a cautionary tale to help others avoid tragic mistakes and a way to keep the links to history and culture alive. In Portuguese, the songs below carry rhyme and rhythm, inspiring people to dance and sing; however, even in English, their sentiment can be felt. Here we share the lyrics of a few classic Portuguese folk songs, written by Brazilian farmers, rubber tappers, and activists, to show the power of regional music to communicate the rich experiences of Amazonian people today.

Ecological logic

Author unknown



*There goes the paca, the agouti, the chachalaca.
Go, go deer, your past was so beautiful,
Tomorrow is so sad.
There goes the macaw, the piquiá, the capybara.
There goes the opossum,
Humans are destroying the dark forest,
And the small game are disappearing.*

*I want to see the jaguar!
Only if it is painted.
I want to see the owl!
Only if it is stuffed.
And where are all the animals?
They are escaping from the fire.
They are escaping from the rifle.*

*The Tocantins River is in danger.
Be brave; don't allow the dam to hold you back.
And there the forest lies down upon the ground.
Forest without legs, you are rooted down
And cannot escape.*

*I want to see the jaguar!
Only if it is painted.
I want to see the owl!
Only if it is stuffed.
And where are all the animals?
They are escaping from the fire.
They are escaping from the rifle.*

*There the man is being forced off of his land.
The cattle, the money and the fences have come to take over.
And now the locals live on the periphery.
So many people, hungry and sick,
Tasting the bitterness of pain.*

Ecological brega

By Limoeiro de Ajuru

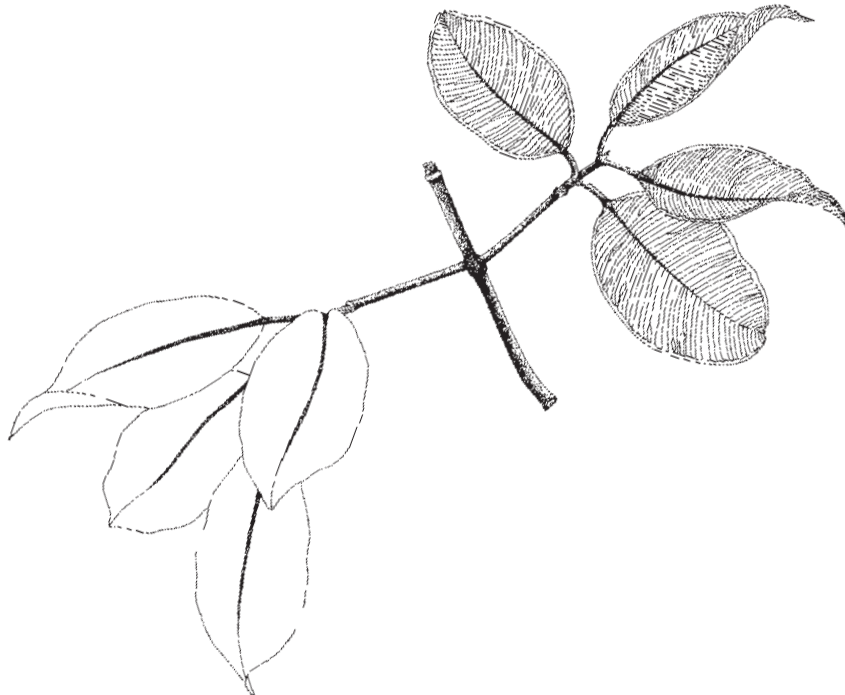
*Where have all our fish gone, that used to live in the sea?
And where is the bacuri, sweet fruit of Pará?
Already the wood is gone, nothing left to take.
And while everything has disappeared, only hunger comes to stay.*

*Everything is different than in years past.
I remember it well. It was another story – everything has changed.
They talk of abundance, but only greed increases.
Before there was fine quality wood, today there is no more.*

*Where have all our fish gone, that used to live in the sea?
And where is the bacuri, sweet fruit of Pará?
Already the wood is gone, nothing left to take.
And while everything has disappeared, only hunger comes to stay.*

*I am already worried, looking at the past and considering the future.
I see that nature – the source of beauty and pure air –
Is being attacked by fire and dams.
It is so sad to see the Earth lose her beautiful landscapes.*

*Where have all our fish gone, that used to live in the sea?
And where is the bacuri, sweet fruit of Pará?
Already the wood is gone, nothing left to take.
And while everything has disappeared, only hunger comes to stay.*



The farmer sold his land

By Pedro Gaia from Oeiras, Pará

*The farmer sold his land,
And went to live in the city.
His poor children are suffering.*

*When he lived with them,
On this piece of land,
He planted rice and corn, manioc and
beans.
Now he sold the land – it's in the hands
of the baron.
Now he can't go back.*



*The farmer sold his land,
And went to live in the city.
His poor children are suffering.*

*Now the money is spent –
The money from this land.
His wife fights with him.
The house is a battlefield.
He is full of regret, thinking about returning.
His wife says, "Over my dead body!"*



*The farmer sold his land,
And went to live in the city.
His poor children are suffering.*

*His wife tells him, "You have to find a way.
First thing in the morning, go talk to the Mayor."
But the Mayor says he has no work to give.
The job we had was to weed by the roadside.*



Ecological xote

By Aguinaldo Batista and Luiz Gonzaga

*I can't breathe, I can't swim anymore!
The earth is dying, it's impossible to plant!
And if you plant, nothing grows.
And if it grows, it doesn't give fruit.
Even good liquor is hard to find!
Where are the flowers –
Pollution consumed them!
The fish in the sea –
Pollution consumed them!
Where is the green –
Pollution consumed it!
Not even Chico Mendes survived!*



Without fear to be a woman
Author unknown

*To change the world,
The way people want to,
Can only happen through participation,
Without fear of being a woman.*

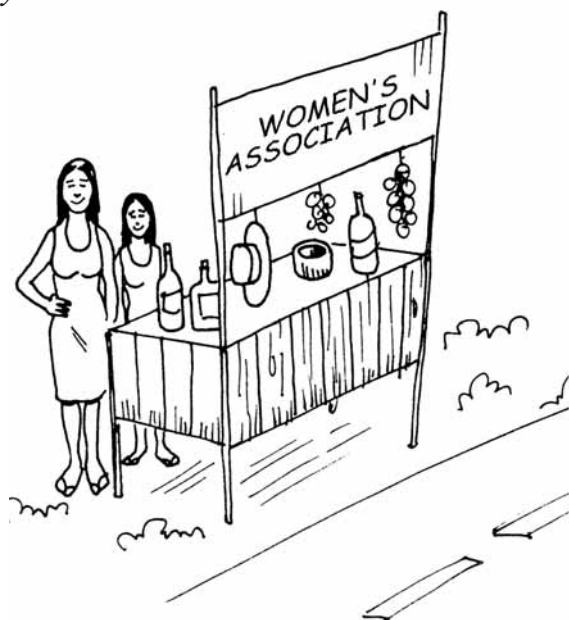
*Because without women, the fight is only half fought.
When we participate without fear of being a woman.
We strengthen popular movements
When we participate without fear of being a woman.*

*To change the world,
The way people want to
Can only happen participating,
Without fear of being a woman.*

*Because the struggle does not only belong to men,
When we participate without fear of being a woman.
We stand firm without making a secret of it,
When we participate without fear of being a woman.*

*To change the world,
The way people want to
Can only happen through participation,
Without fear of being a woman.*

*In the workers' alliance of the countryside,
When we participate without fear of being a woman.
Because victory will be ours without a doubt,
Participating without fear of being happy.*



Anthem of the rubber tappers

Author unknown

*Let us be proud of our rubber tappers.
Let us be proud of our nation.
Because it is the work of these people
That gives us the wheels of cars
And the wheels of planes.*

*They make little sandals.
They make big sandals.
They make boots that the snake can't bite through.
So many things are made from rubber,
I can't begin to tell you.
I even found some on my pressure cooker!*

*Let us be proud of our rubber tappers.
Let us be proud of our nation.
Because it is the work of these people
That gives us the wheels of cars
And the wheels of planes.*

*Bicycle tyres aren't made from soft cheese.
It isn't leather on airplane tyres.
You can't use cattle horn as an eraser.
These are rubber products made by our own hands.*

*Let us be proud of our rubber tappers.
Let us be proud of our nation.
Because it is the work of these people
That gives us the wheels of cars
And the wheels of planes.*

*Bicycle tyres aren't made from soft cheese.
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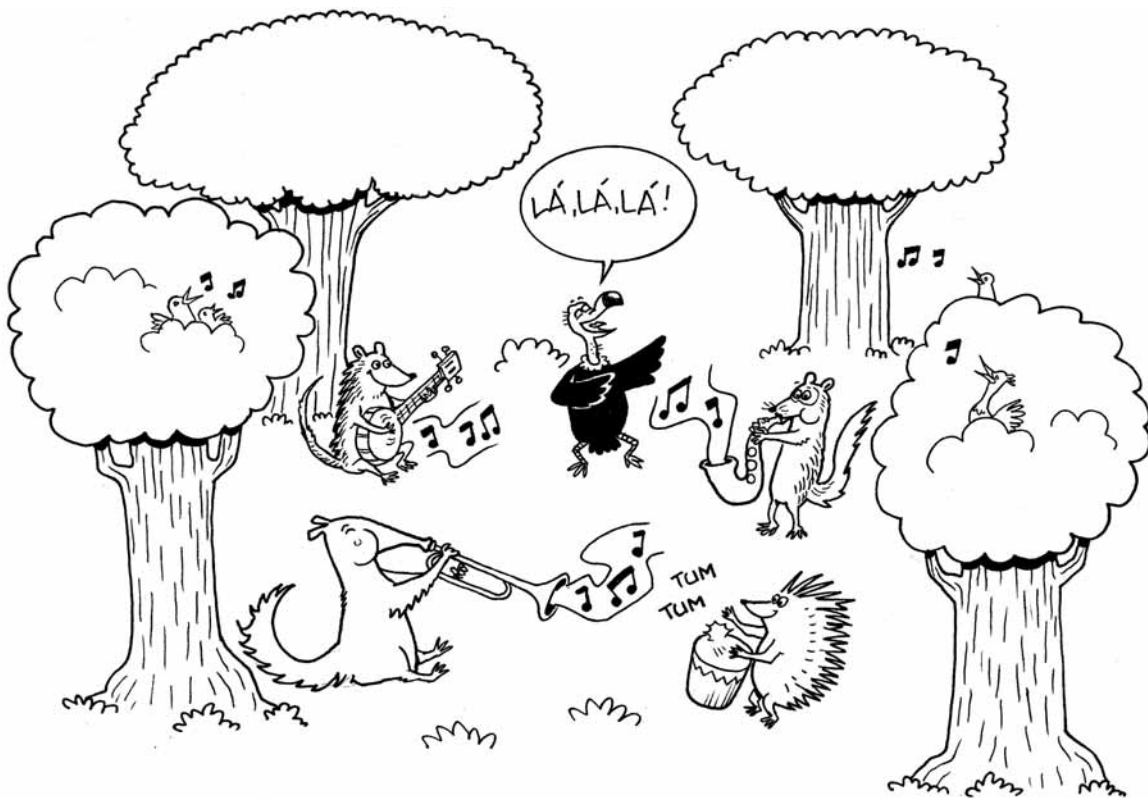


The vulture's carimbó

By Originais de Peixe-Boi

*The opossum formed a carimbó group to play.
She played the banjo herself.
On the drum was the anteater
Coati was on the saxophone.
Porcupine on the ganzá.*

*After the group was assembled, she called a vulture to sing
Just like this: chem chem chem.
Vultures are useless.
The vulture was invited to sing, not to gossip about anyone.*



The way we are

By Ronaldo Farias and José Felix, Grupo Curuperé

*I wake up early in the morning,
Take the path to the stream.
I look in the mirror of the water,
Flowers of mururé.*

*Singing about the forest fruits,
I hear a bird sing.
Sowing seeds in the field and várzea,
Before life wanes.*

*In the spirit of the day, I take a canoe
And go out with the tide.
To happily say –
This is the way we are.*



Hunting

By Ronaldo Farias, José Félix and Negro Rai

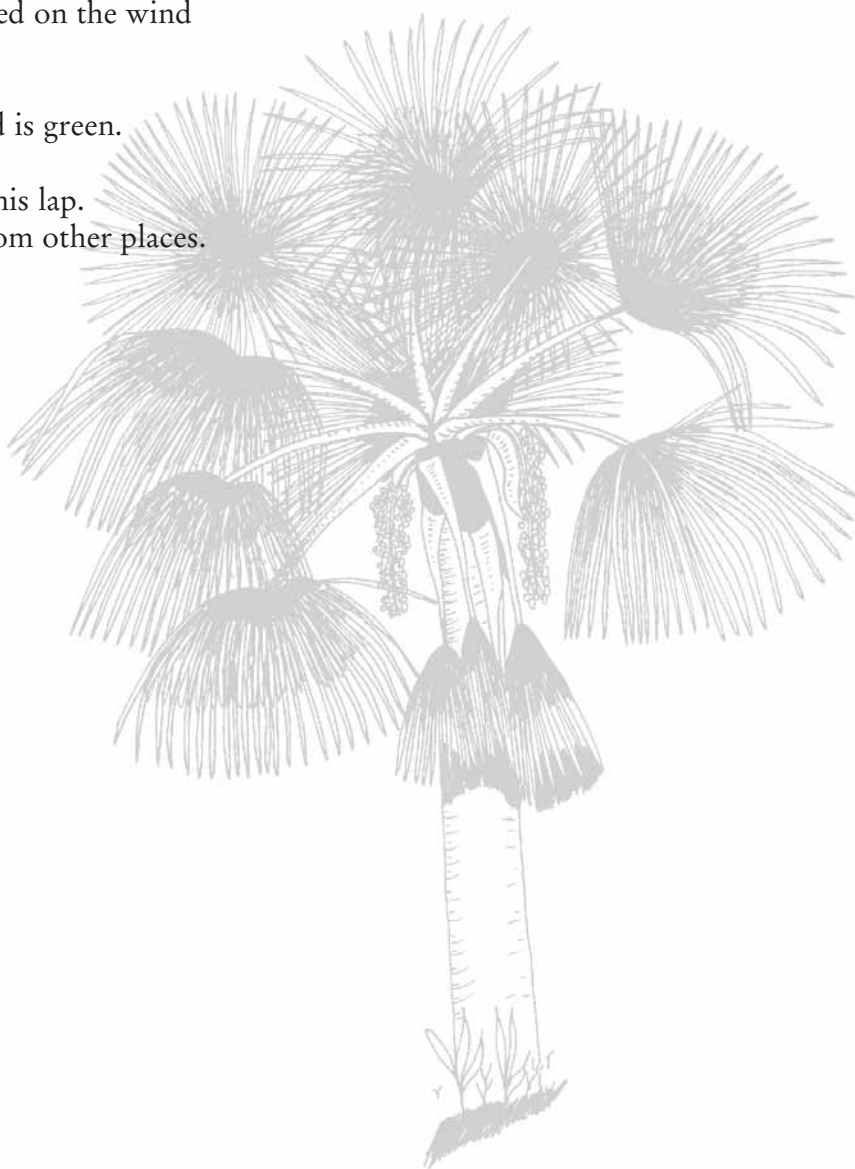
*When I arrived at the hunting blind by the stream,
Saci said, "Come see how it is."
Curupira showed up, wanted to hypnotize me..
The mother of the water went up the Maguari and Guamá rivers
Far away the Matita Pereira began to whistle.
From out of the forest the Mapinguari spied.
In the footprints of the sunbeams,
And the scent of the moonlight,
Sitting beside the stream, enjoying the moonlight,
Admiring these infinite things and the creator,
I don't know where they are going to stop.
The evil disappears because I know
What is my place and what is mine to sing.*

Besides delighting our stomachs, fruit trees, herbs and vines feed our imaginations. Life would be cheerless and sombre without the magnificence of nature. See how insightful this classic Brazilian verse about buriti palms is:

The great hinterland: paths

By João Guimarães Rosa

“...It made me long for the buriti groves,
Coming along the path through the grass,
It has you, that green, that local jargon.
I miss the ones who respond to the wind.
I long for Minas Gerais; God is carried on the wind
In the fronds of all the buriti palms,
When it is threatening to storm.
Someone could forget this? The wind is green.
There, during the calm,
God takes the silence and puts it on his lap.
I am from where I was born. I am from other places.



¹ Zannini, I. C.C. 1989

² Smith, N.J.H. 1996

³ Adapted from: Wawzyniak, J.V. 2001

⁴ Pozzobon, J. 2002

⁵ Labate. B.C. & Araújo, W.S. 2002

⁶ Alexiades, M.N. 2002b

⁷ Gruenwald, J. 1998

⁸ Cruz, T.A. 2000

⁹ Associação dos seringueiros e agricultores da reserva extractivista do Juruá. 1998.

¹⁰ Almeida, A.W.B. 1995