



AÇAÍ

Açaí gives energy and strength

Rio de Janeiro is the city that worships health and beauty and where the healthy and the beautiful drink açai. Pronounced ah-sah-yee, açai is more of a lifestyle option than a foodstuff.

The berry juice is served half-frozen and its thick gloopiness means that you slurp it up with a spoon. The way it looks is integral to its appeal. It is made from dark violet berries about the size of a raspberry and has a deep, dense colour. It is fruity with a chocolaty kick.

The nutritional breakdown of açai is prodigious. It has high levels of iron, calcium, carbohydrates, fibre and antioxidants: and energy. A small 100 g cup has almost 300 calories. Combined with the mystique of its Amazonian origins, açai's contents have made it the beverage of choice for Rio's sporty élite.

Açai is indigenous to the flood plains of the Amazon estuary. The açai palm regenerates with ease and in areas where human development has destroyed natural vegetation the first tree that grows in its place is açai. (Açai palms cover an area equivalent to half the size of Switzerland.) In this region, its abundance and role as a primary nutritional resource cannot be overestimated: it is literally the fruit that has saved many poor families from starvation.

Açai is the main food staple of river communities in the Amazon estuary. It is drunk at every meal – in much the same way as bread or rice are eaten in other cultures.

Belém is the main city in the Amazon estuary and world centre of açai. In Belém more of the fruit is drunk than milk. An estimated 200 000 litres of the purple liquid is consumed per day among a population of 1.3 million.

Açai is highly perishable and the only way it gets to Rio is in frozen packages. In Belém, the fruit is always consumed fresh since it goes off within 24 hours. In order to service the population with fresh açai on a daily basis, an enormous

infrastructure has grown in Belém that employs an estimated 30 000 people.

The cycle starts in the rain forest. The açai palm has a long thin trunk up to 25 m tall and a clutch of branches at the top from which hang ribbon-like leaves. Hundreds of açai fruits dangle from branches in clusters.

The fruit picking is done by hand. In the afternoons, river-dwellers scramble up the trees, cut off the branches and climb back down again exactly as they have done for hundreds of years. In the evening, boats containing baskets of açai leave the rain forest heading for Belém's market, where they arrive in the middle of the night.

The açai market is a dockside next to the city market. By the early hours small boats have started arriving with baskets of the fruit which quickly fill the quay and by 3 a.m. the traders and açai vendors arrive. There are about 3 000 açai points where the fruit is pulped into juice. Customer demand for açai is mainly at lunchtime, when it is prepared fresh.

Açai is not a versatile fruit since it can only be stored frozen and cannot be cooked, so for the most part it continues to be drunk just as the Indians have drunk it for centuries.

Scientists have discovered that açai is rich in anthocyanins, the group of chemicals in red wine that are believed to lower the risk of heart disease; açai contains more than ten times of them than red wine. It is also rich in essential fatty acids, calcium and vitamins. Açai's recent success is also changing the nature of agriculture in the Amazon estuary. Agronomists have been successful in developing ways of cultivating açai sustainably with high yield. In the last five years, açai production has tripled and brought work to poor rural areas.

Belém now has more than 60 factories exporting açai.

Açai was an Amazonian secret that conquered Brazil. A company in California now imports it to the United States and next month it will be introduced to British palates. (Source: Alex Bellos, *Observer*, 18 April 2004 [in *Amazon News*, 22 April 2004].)

Açai berry sales to United States brings security to Amazon farmers

For more than 30 years, Raimundo Julião da Costa has eked out a living by selling a dazzling array of wild tropical fruits that grow naturally on his land in the lush floodplains of the Amazon rain forest. His biggest seller has always been açai. But, like thousands of other poor farmers, until recently Mr da Costa found himself at the mercy of traders who have had a strong hold on the local fruit market for generations.

That started to change two years ago, when a few environmentally conscious surfers from a small California company called Sambazon (short for Saving and Managing the Brazilian Amazon) offered to buy Mr da Costa's açai harvest at a 25 percent premium over the market price. The only catch – he had to designate a piece of his land as an ecological reserve and carefully manage the rest of his terrain to protect the biodiversity of the rain forest.

Because Sambazon offers guaranteed contracts, hundreds of peasant families are able, for the first time, to lock in a price for the bulk of their crop before the harvest. And as their sales become more lucrative, people have an incentive to preserve their habitat instead of abandoning it in search of work in nearby cities such as Belém, where many former river-dwellers live in poverty in crime-ridden shanty towns.

Rich in antioxidants and amino acids, açai is thought to be one of the most nutritional fruits of the Amazon Basin.

Sambazon açai is now carried by thousands of juice bars and grocery stores across the United States. However, in most Brazilian cities, açai is a recent phenomenon, even though it has been a staple for indigenous communities in the Amazon for centuries.

The rising demand for açai is good news for both Sambazon, and the families along the Amazon who depend on the palm berry for their livelihood. Sambazon buys açai from more than 750 families organized into four fruit cooperatives in the Várzea Flooded Forest, an unusual microclimate in Pará state where the Amazon river rises about 10 m every year

PRODUCTS AND MARKETS



and floods the surrounding jungle. As word travels that a foreign company is paying a hefty premium for açai, many families are rushing to join the cooperatives.

However, a few local fruit processors complain that the company is artificially forcing up açai prices. And entrepreneurs, who often work for fruit merchants in nearby cities, are starting to put pressure on açai pickers to stop selling their crops to Sambazon. Despite the complaints, Sambazon represents only a sliver of the market, around 2 percent of the region's crop. (Source: *The New York Times*, 4 August 2004 [in *Amazon News*, 5 August 2004].)

Açai in Australia

At the beach, parties and bars, açai is becoming popular in Australia. Behind the fascination of this dark-skinned fruit is Amazon Mix, created three years by a Brazilian and an Australian. Moises Rodrigues Oliveira and Richard Jardine today sell 1.5 tonnes of açai per month, principally in Sydney and the Gold Coast region.

Oliveira believes that part of the success should be credited to the product's social marketing. "Our açai is bought from rural communities in Igarape-Mirim, Pará state, which are supported by Amazonia's Environmental and Poverty Programme (POEMA)." (Source: *O Estado de S. Paulo*, 26 August 2004 [in *Amazon News*, 2 September 2004].)

Açai used to create orthodontic solutions

From the natural dye of the açai, a typical Brazilian fruit, researchers from the Brazilian Company of Agribusiness Research (EMBRAPA) have developed a substance that will be useful for revealing the existence of bacterial plaque on teeth. In addition to being natural, the orthodontic substance is easy to remove, tasteless and not harmful to health. The researchers stated that the next step is to construct a factory to process açai, which will contribute to new job sources in Amazonia. (Source: *O Estado de S. Paulo*, 21 May 2004 [in *Amazon News*, 27 May 2004].)



BAMBOO

Bamboo – money that grows as you watch

A giant bamboo, introduced into Kenya last year which achieves the phenomenal growth rate of one metre per day, could be a possible money-spinner for local farmers.

The World Agroforestry Centre has already distributed more than 800 seedlings of the giant bamboo, *Dendrocalamus giganteus*, to farmers in Kericho, Kisii, Nandi South, Nyamira, Nyando, Siaya and Vihiga districts. The giant bamboo is nature's fastest growing woody plant. Its culms (poles) are the strongest, lightest natural material known. A square metre of flooring derived from this plant will sell for as much as KSh 8 000, while in southern Asia it is used for reinforcing concrete and for scaffolding on skyscrapers.

It absorbs water faster than most plants and is used in some parts of the world for cleaning sewage. Even more important, it soaks up heavy metals. It is a potential answer to polluted waters in Kenya, including Lake Victoria whose shores are dotted with large urban centres that discharge domestic and industrial waste into its waters. Working with municipal authorities, the International Center for Research in Agroforestry (ICRAF) has plans to introduce the bamboo for waste water treatment in Kisumu and Kakamega. Further afield, ICRAF is also looking at local authorities in Nairobi, Mwanza and other towns dotting Lake Victoria's shores.

No other woody plant matches bamboo's versatility in environmental conservation and commerce. It is a viable replacement for both hardwoods and

softwoods. Its growth rate is three times that of eucalyptus, and it matures in just three years. Thereafter, harvests are possible every second year for up to 120 years.

India has some 8 million hectares of commercial bamboo that account for 60 percent of the country's massive paper requirements and much of its commercial timber needs. More than 2 million tonnes of edible bamboo shoots – rich in vitamins and low in carbohydrates, fats and proteins – are consumed worldwide every year, mostly in Asia.

However, bamboo remains an untapped resource in Africa, a state of affairs ICRAF is addressing through a pilot project in Kenya. The project aims to create awareness on the environmental and economic benefits of bamboo in the Lake Victoria basin, and hopefully popularize it throughout the region.

Interestingly, bamboo, a member of the grass family, is not new in Kenya. According to Professor Chin Ong, a hydrologist with ICRAF, Kenya's water catchments were once covered in bamboo, but most of these forests have since been cleared.

This commercially attractive species can grow in areas traditionally used for sugar cane and coffee cultivation, thus providing an alternative or additional cash crop. *Arundinaria alpina*, a species of bamboo native to Kenya, will yield as many as 20 000 culms per hectare per year – with each culm growing to a height of 12 m. Most species, in fact, grow to over 30 m at full maturity.

Kenya has few privately owned commercial timber plantations. Most of the country's timber comes from government forests managed by the Forest Department. However, these forests have been severely overexploited with only limited replanting. Timber firms are now reportedly forced to import timber from the Congo and the United Republic of Tanzania to manufacture hard and soft board. The country's leading paper manufacturer, PanPaper of Webuye, is also reportedly using plantation softwoods to fuel its boilers and make paper pulp. With its rapid growth and high woody fibre



production, bamboo would supply both industrial needs.

At the household level, bamboo would be a valuable source of fuelwood and charcoal. It yields more than 7 000 kilocalories per kilogram, equivalent to half the yield from an equivalent amount of petroleum. Some species of the plant have large thorns, making them ideal for security hedges. Others grow tall, straight culms that form ideal windbreaks that can be sustainably harvested annually. And, of course, edible bamboo shoots would be a nutritious addition to the family table. These shoots, mild and very crunchy, can be eaten raw or cooked. The Kenya Forestry Research Institute already grows several high-quality edible varieties.

Bamboo rhizomes anchor topsoil along steep slopes and riverbanks, very effectively controlling erosion. Bamboo leaves, sheaves and old culms that die and fall to the ground decompose and create a thick humus layer that enriches the soil. Studies in Southeast Asia and Kenya have also shown that natural bamboo forests have excellent hydrological functions that promote soil health. Some species of bamboo absorb as much 12 tonnes of atmospheric carbon dioxide per hectare, a valuable asset to deploy against global warming.

Bamboo can be propagated from seeds, although most species flower just once every 15 to 120 years. More viable mass propagation techniques include tissue culture. (*Source: The Nation [Nairobi], 10 June 2004.*)

Earthquake-proof house shakes bamboo world

The bamboo-based building system developed by TRADA International in partnership with the Indian Plywood Industries Research and Training Institute (IPIRTI) has passed a full-scale earthquake resistance testing programme with no damage whatsoever. The testing programme was carried out in collaboration with the Central Power Research Institute (CPRI) in Bangalore.

The work is part of an ongoing project in India, Bangladesh and Sri Lanka, funded by the United Kingdom Department for

International Development (DFID). "The project demonstrates a sustainable livelihoods approach to bamboo development for economic, environmental, social and infrastructure improvement," said Lionel Jayanetti, head of TRADA International. The building system, under development since 1998, has already shown that it is "affordable, safe, durable and sustainable".

Mr Jayanetti added, "This latest phase of the project, some four years in the planning, has confirmed that buildings constructed in bamboo using this method are able to withstand the highest levels of earthquake loading likely to be experienced in India, and probably worldwide."

A 2.7 m² test building, complete down to the last detail including surface finishes, was constructed on site and craned into position on the state-of-the-art shake table.

The test building resisted seven repetitions of a typical Zone 5 earthquake, the highest in India and equivalent to 7 on the Richter scale, as well as a replication of the notorious Japanese Kobe earthquake (Richter 7.8), "without any damage whatsoever", said TRADA International's Paul Follett. "This means that such buildings could easily have withstood the recent earthquakes in Gujarat, Maharashtra and Bam which caused such devastation and loss of life."

One week after the test, on 27 February 2004, the work was presented at the VII World Bamboo Congress in Delhi, which was inaugurated by Prime Minister Vajpayee and attended by Mr Michael Parkes, who is the Senior Adviser responsible for the DFID project.

Bamboo development in India is now a national goal, as evidenced by the establishment of the National Mission on Bamboo Applications, under the country's Technology, Information, Forecasting and Assessment Council, Department of Science and Technology. "Given the acknowledged demand for affordable, safe and secure housing, it is hoped that the positive results of this international collaboration will bring benefits to some of the poorest and most vulnerable members of society," said Mr Follett.

Details of the building system can be found in the training manual "Building with Bamboo", prepared by Paul Follett for the Indian National Mission on Bamboo Applications.

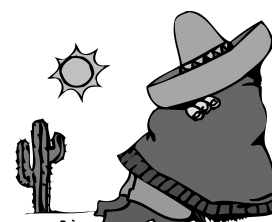
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Mexican farmers eyeing international bamboo market

Mexican farmers are taking an interest in bamboo production, according to a recent Associated Press report. Bambuver, a private group in Mexico that was formed to promote the bamboo industry, receives government funds and coordinates its activities with private organizations and universities. It is also talking with private Mexican industries about using bamboo in construction and paper production and as a fuel. A type of grass that thrives in diverse climates, bamboo can grow into 30 m timber stalks. It also grows quickly, taking only three years for a farmer to develop a bamboo plantation.

China currently claims about half the global bamboo market, which is valued at approximately US\$10 billion. Analysts predict the market could be worth US\$20 billion by 2015, led by the United States demand for paper.

Bamboo from Mexico could reach Europe in 11 days versus the 44 days required to transport imports from China and Thailand. Mexican bamboo producers also see their efforts as one way to reclaim the United States market share that has been lost to China over textiles, television sets, cars and computer parts. (*Source: Linkages Update, 13 November 2004.*)





The proceedings of the October 2003 International Workshop on Bamboo Industrial Utilization are now available from INBAR.

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Bamboo under extinction threat

As much as half of the world's 1 200 woody bamboo species are in danger of extinction, a United Nations report has revealed. Urgent action is needed to protect the plants and the species that depend on them, the study's authors conclude.

Deforestation is known to be robbing many bamboo species of their native habitat. Yet, the effect this is actually having on their distribution is not well understood, as many of the areas where the plants live are extremely remote.

To get a better idea of how much bamboo is left, researchers at the International Network for Bamboo and Rattan and the United Nations Environment Programme World Conservation Monitoring Centre combined hundreds of academic reports about the distribution of different bamboo species with global maps of forest cover, and have produced a colour-coded chart of bamboo hot spots.

They found that about 600 species are "endangered", with less than 20 000 km² of native habitat. And some 250 varieties have less than 2 000 km² of land (the size of London) left to live in. "A few of these species have virtually no forest left," says ecologist Valerie Kapos, who helped draw up the report.

One reason bamboo has been hit so hard is because of its distinctive cycle of

mass flowering and death. Individuals in any one species tend to flower together, once every 10 to 100 years, and then die. [See next story.] If a forest is cleared at this time, the bamboo will not grow back.

The report's findings mean the many vulnerable species that rely almost entirely on bamboo for food and shelter, such as lemurs, giant pandas and mountain gorillas, face an even greater struggle for survival. (Source: Helen R. Pilche, *Nature*, 11 May 2004.)

India braces for fallout from flowering bamboos

Northeastern India is gearing up to protect itself from possible famine triggered by a huge surge in the rat population, itself the result of the flowering of bamboo plantations that began in April and is expected to peak in 2007.

Most species of bamboo in India – home to the world's largest bamboo forests – flower simultaneously every 50 years, then set seed and die. In previous years, the simultaneous production of seeds by millions of bamboo plants has caused a surge in the number of seed-eating rodents. The rodents then move to nearby paddy and potato fields in search of food, with a devastating effect on staple crops.

Furthermore, the lack of adequate storage facilities needed to cope with the glut of harvested bamboo in the remote hills of northeastern India means that most of the bamboo that is harvested quickly rots. And the soil, which was previously bound together by bamboo roots, erodes away.

India's Ministry of Environment and Forests has set up two committees to recommend ways to limit crop losses. One has suggested that bamboo is extracted before it flowers, and that mixed vegetation is planted immediately after flowering to stop soil erosion. The second recommends improving harvesting and storage facilities for the extracted bamboo, and removing export restrictions to find additional outlets for harvested bamboo.

In a separate proposal, the Centre for Indian Bamboo Resource and Technology (CIBART) is exploring a pilot project with

the Ministry of Rural Development and Manipur state government, which involves creating a buffer zone – in which bamboo would be completely removed to deter rats – around bamboo-growing villages in the state's Tamenglong district.

CIBART says that in areas in which bamboo has already flowered, the seeds could be collected and immediately planted in the buffer zone. This would limit the number of seeds available to rats and would also reduce the time during which bamboo would not be available to local communities.

Most scientists agree that it is too early to gauge how effective the measures will be. They also agree that a lack of detailed information on bamboo plantations is one of the biggest hurdles in the management of bamboo resources in India.

According to the National Technology Mission on Bamboo Technology and Trade Development, more research is urgently needed into the best way to manage bamboo flowering in a way that provides economic security to those rural people and small-scale industrial workers who depend on bamboo for their livelihood.

The Ministry of Environment and Forests says that 26 million tonnes of bamboo, spread over more than 10 million hectares, will be affected by the imminent bamboo flowering. Only 10 percent of this bamboo grows in accessible areas and can be retrieved for industrial use.

Bamboo last flowered 48 years ago in northeastern India, where Mizoram state was particularly hard hit by widespread crop losses. Famines in 1911–1912 and 1861 in Mizoram have also been linked with bamboo flowering.

The exact reason for the synchronized bamboo flowering is unclear, but some scientists believe that it is triggered by a genetically programmed internal clock. (Source: SciDev.Net Weekly Update, 19–25 April 2004.)

Utilization, marketing and socio-economics of bamboo in Nepal

A recent paper by Chhote Lal Chowdhary explains the current pattern of the



utilization, marketing and socio-economics of bamboo growing in Nepal and its income-generation aspect. Bamboo is one of the most important renewable, natural, fast-growing woody perennials contributing to the rural economy. It is one of the best substitutes for timber since the forest is degrading rapidly in Nepal. Fifty-three species of 12 genera bamboos are reported in Nepal. Bamboos are domesticated in a large number of bamboo farms, with an area of 1.25 to 2.5 ha each, in the eastern Tarai. Natural stands are mixed with deciduous subtropical forest vegetation in the lowland. Bamboo represents 1 to 2 percent of the 12 percent that the forestry sector contributes to the national GDP.

Because of its multiplicity of uses, bamboo has been an important source of income, sustaining the livelihoods of bamboo-grower households, craftworkers and traders. Bamboos are used in more than 180 ways in Nepal, the most popular being house construction, rafters, pillars, fence posts, weaving material and basketry. People in 53 districts manufacture traditional baskets for domestic utilization as well as for sale. The supply of and demand for bamboo and rattan are irregular, demand being about three times the supply.

Some 4 604 buildings were approved for construction from 1989 to 1991 in Kathmandu, Lalitpur and Bhaktapur. At least 25 bamboo culms are required to construct one house; 115 100 would be required to construct all the houses. Since each culm costs NRs 60, the total cost of bamboo would be NRs 6 906 000. The monthly expenditure on bamboo equals NRs 402 057, and the bamboo requirement is approximately 6 700 culms per month.

Despite the wide uses of bamboo in Nepal, the actual status of utilization and commercialization has not yet been explored to its full potential. Bamboo and rattan utilization in Nepal needs promotion of traditional uses with modern technology.

Uses of bamboo

Local name	Scientific name	Diameter	Major uses
Bhalu bans	<i>Dendrocalamus giganteus</i>	≥30	Buckets, water containers, posts
Dhanu bans, Bhalu bans	<i>Bambusa balcooa</i>	12-16	Scaffolding, storage bins, fencing, roofing
Kalo bans, Bhalu bans	<i>Dendrocalamus hookeri</i>	≥8	Small poles, weaving, fodder, construction
Kante bans	<i>Bambusa arundinacea</i>		Construction
Kath bans, Lathi bans	<i>Dendrocalamus strictus</i>	≥7	Rafters, posts, walking sticks, fuel, charcoal, fodder, construction
Koraicho bans	<i>Bambusa oxytenathera</i>		Fencing, construction, weaving
Mal bans	<i>Bambusa nutan</i>	9-12	Construction, fencing, fodder
Nigalo	<i>Drepanostachyum</i> sp.	2-5	Weaving, low-grade shoots, basketry, furniture
Malingo, Nigalo	<i>Drepanostachyum</i>	2-4	Weaving, construction, mats, fodder, sticks
Mokla bans	<i>Bambusa</i> sp.		Construction, woven mats
Nibha bans, Lyas bans	<i>Dendrocalamus patellaris</i>	≤4	Flutes, weaving
Pahelo bans	<i>Bambusa glauscens</i>	medium	Ornamental uses
Phusre bans, Khasre bans	<i>Dendrocalamus</i> sp.	2-5	Weaving, basketry, fodder
Tama bans, Ban bans, Choya bans	<i>Dendrocalamus hamiltoni</i>	8-10	Multipurpose bamboo: construction, weaving, bamboo shoots (edible)
Tharu bans, Seti bans	<i>Bambusa tulda</i>		Basketry, scaffolding, low-grade weaving

Price of bamboo in its different forms

Type of bamboo	Farmgate price (NRs)	Retail price (eastern Nepal) (NRs)	Kathmandu (NRs)
Weaving bamboo	30	60	100
Construction	25	56	88
Bamboo	43	70	113
Scaffolding	10	26	46

After the Government of Nepal enforced the Forest Policy Act of 1995, a large part of forestlands was handed over to communities for reforestation and utilization. However, the government is unable to meet the administrative, institutional and technical support needed for the successful and timely implementation of the recently enacted policy reforms and institutional mechanisms.

The government should provide strong leadership and financial support to bamboo-based enterprises; the private sector should invest in the bamboo plantations and processing activities; a coordination mechanism should be

developed between growers, collectors and processors; a good marketing infrastructure should be developed; and skills-oriented training should be organized for forestry stakeholders.

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BRAZIL NUTS

Contraband lowers production

The contraband of Brazil nuts leaving Brazil for Bolivia has caused Brazil to lose its position as the world leader in exports of this product. First place has been taken by Bolivia, which has tripled its commerce in Brazil nuts which are being sold in their natural state in the European Union, the United States and Asia. According to the Brazilian Association for Brazil Nut Exports, in 2003 approximately 16 000 tonnes were removed from Brazilian forests and transported across the frontier with Bolivia, at a loss of US\$20 million, which does not include federal tax evasion.

Assisted by Brazilian traders, the Bolivian smugglers enter Brazil through its borders with the states of Acre and Rondonia, where monitoring is almost non-existent. They also operate in the Amazonia territory, principally in the Purus River area – a region that has nuts that have hardly been explored, and where the product is much larger than in other areas. It is due to this difference in size that the Brazilian exporters discovered the smuggled goods. It was noted that Bolivia was selling much larger nuts, similar to those that are found in Acre, while the nuts from Bolivia are small. Although the nut is of good quality, its shell is fragile, making its export more difficult. (Source: *O Liberal*, 25 January 2004 [in *Amazon News*, 29 January 2004].)

Production of Brazil nut decreases

Biscuits, flour, oils, soap, Brazil nut milk, ice-cream and wood: these are some of the products that the seed of the Brazil nut, popularly known as the para nut, could produce when processed. According to the Brazilian Institute of Geography and Statistics (IBGE), the Amazonia region is responsible for 98 percent of the national production of this nut, an activity that employs directly and indirectly one million people in the region. Despite its importance for the regional economy, Brazil nut production

is falling. This year, Bolivia became the world's major exporter of Brazil nuts, a title once held by Brazil.

According to IBGE, total Brazil nut production fell 20 percent between 2000 and 2002. EMBRAPA believes that the decline in production is related to the lack of governmental incentives for extractivist producers and to the organizational problems in the cooperatives, the principal Brazil nut producers.

According to investigators from the University of Campinas, the drop in production could also be related to the deforestation of the Amazonia region and the consequent reduction of areas of Brazil nut plantations to offer space to new cultivars, despite the prohibition on cutting native species. A new cultivar in the area, which is stimulating deforestation, is soybean production. (Source: *ComCiencia*, 15 April 2004 [in *Amazon News*, 22 April 2004].)



Devastation of Brazil nut trees presents challenge to IBAMA

From January to March 2004, agents of the Brazilian Institute for the Environment (IBAMA) in Pará state have confiscated 1 140 m of both processed and trunks of wood of the Brazil nut (popularly known as the para nut) tree. The cutting of this tree species is prohibited by law. However, with an average of three trees per day this year, IBAMA's regional director, Ademir Martins dos Reis, is worried. Pará state is enormous, with 37 municipalities, 281 km² and 1.2 million inhabitants; Reis has 18 agents, but he needs at least 50.

Bertholletia excelsa, whose burs hold the nutritious and valuable Brazil nut, is,

ironically, the most legally protected tree in Amazonia. Notwithstanding that, in the south and southeast of Pará, more than 70 percent of the stock has been destroyed.

EMBRAPA agronomist, Alfredo Homma, describes incalculable socio-environmental prejudice in addition to the reduction in production of the Brazil nut. He states that in 1990 production throughout the Amazonia region reached 50 500 tonnes; in 2000 it fell to 33 400 tonnes; and in 2002 to 27 300 tonnes.

On top of this, the European market (a major consumer) imposed rigid health restrictions in 2000 when, according to the Brazilian Ministry of Agriculture, many batches presented a toxic fungal substance that occurs with incorrect storage procedures and which can provoke vomiting, allergies and, in some cases, cancer.

The continued devastation in the south and southeast of Pará is exacerbating the situation. "Sawmills continue to fell live and dead Brazil nut trees", says Homma.

Maria do Espírito Santo da Silva, president of the Agro-extractivist Small Producers Association, Praia Alta Piranheiras, located about 50 km from Marabá, is one of the majority who are affected. *Bertholletia excelsa* are scattered throughout the 22 000 ha divided between 400 families. Some families that are members of the association continue to sell wood from what should be a sanctuary. Individuals with chainsaws and connections to sawmills visit families and offer \$R 50 per adult tree, and the families accept.

The Mayor, IBAMA and the association believe that the destruction could be deterred but it depends upon a true commitment by the federal government and its plan for Amazonia, with its \$R 349 million budget.

With no solution in sight, dos Reis is donating the confiscated timber to churches, schools, day cares and military bases before it rots. Last year more than 176 trees were donated. (Source: *O Estado de S. Paulo*, 9 May 2004 [in *Amazon News*, 13 May 2004].)



Ministerio de agricultura del Brasil establece nuevas reglas para la certificación de la castaña

El Ministerio de Agricultura del Brasil publicará en los próximos días un reglamento en el Diario Oficial del Brasil, para establecer las nuevas reglas para la certificación sanitaria de la castaña del Brasil con cáscara. Según el Ministerio, la medida tiene como objetivo atender a los requerimientos que la Comunidad Europea exige para la adopción de nuevos procedimientos técnicos para el manejo de la castaña con cáscara, con el fin de reactivar las exportaciones hacia el mercado europeo, que se encuentran suspendidas desde julio de 2003.

De acuerdo con el Ministerio, el objetivo es prevenir la contaminación por aflatoxina, toxina que puede traer riesgos para la salud del consumidor.

La Unión Europea importa aproximadamente el 65 por ciento de la producción brasilera de las castañas con cáscara. En la última cosecha, la producción total (con cáscara y en almendra) fue de 26 000 toneladas. De esa cantidad, aproximadamente 19 000 toneladas, fueron destinadas al mercado exterior. Se espera que para el 2004 la producción de castaña con cáscara sea de 30 000 toneladas y las exportaciones asciendan a 20 000 toneladas. (*Fuente:* Sitio web de Brasil Ecología [en *Bosques amazónicos virtual*, Año 4, Nº 9].) [Para más información sobre la castaña del Brasil, véase la pág. 9.]

BUSHMEAT

Bushmeat commodity chain

Bushmeat, the meat of wild animals, is a highly valuable non-timber forest product in West and Central Africa. The trade in this commodity is currently of great interest to development and conservation agencies, owing to concern over the sustainability of its use and the implications of its loss for poor rural households. Based on semistructured interviews and participant observations undertaken in January and February 2000, the authors of a recent article



describe the bushmeat commodity chain that supplies the city of Sekondi-Takoradi in Ghana. There are five primary actors in the trade: commercial hunters and farmer hunters, all of whom are men based in local rural areas; and wholesalers, market traders and chopbar owners, all of whom are women based in the city. Bushmeat is freely traded between all actors and actor groups, but the main trade route is from commercial hunters to wholesalers to chopbars. Wholesalers are the smallest actor group but handle the largest per capita market share, while chopbars are the most numerous group and together account for 85 percent of retail sales. The costs of participating in the trade appear to be lowest for hunters and highest for chopbar owners. Kin support networks play an important role in minimizing these costs, especially with respect to entry costs (nearly half of all bushmeat traders inherit their business) and labour costs (many employees are family members); kin also assist in other ways, especially through sharing knowledge and supplying credit. Among the urban actors, the bushmeat trade as a whole is perceived as a low-status occupation, although individual reputation remains important. In Takoradi, the bushmeat trade is largely unregulated by either state or local institutions, and there is no evidence of any individual actors or actor groups exerting control over the market. Hunters make significant profits, indicating that the bushmeat trade has the potential to make a substantial economic contribution to rural households. In contrast, urban actors appear to make relatively small profits. Comparison with the existing literature suggests that the structure and

operation of the bushmeat trade in Takoradi is typical of the trade in many other parts of West Africa. (*Source:* Mendelson, S., Cowlshaw, G. & Rowcliffe, J.M. 2003. Anatomy of a bushmeat commodity chain in Takoradi, Ghana. *Journal of Peasant Studies*, 31[1]: 73–100.)

Anthrax now jumps to wild chimpanzees

Anthrax has killed several wild chimpanzees in the tropical rain forest of Côte d'Ivoire – the first time the disease has been seen in these animals and in this type of habitat. As well as threatening great ape populations, the discovery raises fears that the disease could spread to humans through the illegal trade in bushmeat.

"Finding anthrax was a big surprise," says Georg Pauli from the Robert Koch Institute in Berlin, Germany, who studied the primates. There have been no previous reports of anthrax in wild chimpanzees, and the bacterium, which also infects humans and hoofed animals, has not been found in Africa's tropical rain forests before.

The disease could also spread to humans. Although illegal, the bushmeat trade continues to thrive, so hunters could catch anthrax when handling infected corpses. The threat of the disease affecting humans is real with the current levels of illegal bushmeat trade. Although monkey and chimpanzee are not the delicacies in East Africa that they are in West Africa, the proliferation of bushmeat trade in Kenya cannot rule out the presence of these meats in the local outlets.

An ongoing analysis of meat sold in Nairobi markets indicates that more than a third of samples analysed so far are not from beef, mutton or goat. They are from bushmeat. [See story below.] The preliminary analysis so far only differentiates between bushmeat and the three mentioned but a further analysis that identifies the bushmeat up to the species level is under way and will be released soon.

The analysis, which is supported by the Kenya Wildlife Coalition, is bound to

PRODUCTS AND MARKETS



send out shockwaves in Kenya's conservation circles, as well as to nyama choma (roasted meat) enthusiasts.

Statistics indicate that after drugs, the bushmeat trade is the second largest illegal trade in the world, worth in excess of US\$5.5 billion. Fifteen million animals are killed each year in the Brazilian Amazon alone.

Statistics indicate that after drugs, bushmeat trade is the second largest illegal trade in the world, worth in excess of US\$5.5 billion.

Forty-four tonnes of bushmeat are consumed in logging camps in Peru.

Ghana trades in approximately US\$260 million worth per annum of bushmeat. Twenty-one tonnes of bushmeat are sold in Ghana in one month at more than US\$50 000.

In Côte d'Ivoire, about US\$117 million is received from the bushmeat trade per year.

In total, 2 million tonnes of illegal bushmeat are harvested each year in Africa, with an estimated 300 000 tonnes being consumed in Kenya.

Nigeria is the largest exporter of bushmeat in Africa, yet it has a low wildlife population and thus may be obtaining the bushmeat from other countries.

Wildlife experts fear that the trade is getting out of the hands of poor people and is financed by fairly wealthy people. The bushmeat trade is now recognized as a major direct cause of wildlife decline in eastern and southern Africa.

A recent survey shows that 58 percent of Kenya's wildlife has been lost in the last 20 years and most of this is attributed to the bushmeat trade. (Source: *The Nation* [Nairobi], 29 July 2004.)



Beware, that juicy meat could be from the bush!

The chances of the sizzling, mouth-watering meat served to Nairobi's residents being from wild game are as high as 30 percent, a report revealed yesterday. And the experts who carried out the survey say they do not know from what animal species the meats used in their samples were extracted.

The survey, conducted by a youth lobby, Youth For Conservation (YFC), and the Kenya Wildlife Service (KWS), showed that Nairobians unknowingly buy bushmeat from butchers across the city. According to the report, 25 percent of the meat being sold is bushmeat, while 19 percent is domestic meat mixed with bushmeat. It further states that only 42 percent of the meat is domestic meat, while 13 percent could not be identified.

This shocking report was developed and funded by the globally renowned Born Free Foundation of the United Kingdom.

The report says it is vital to educate Kenyans on the impacts of the bushmeat trade and its effects on people's health and the wildlife.

The YFC will now start to identify the specific animals from which the meats are extracted in order to determine the areas from which the animals were poached. (Source: *The East African Standard* [Nairobi], 10 November 2004.)

AIDS warning over bushmeat trade

A study of African hunters has shown that a virus similar to HIV has passed from apes to humans from bushmeat of the kind that is being sold illegally in the United Kingdom.

A leading scientist has told the BBC File On 4 programme that the virus was probably passed on to tribespeople via body fluids when the animals were slaughtered and butchered. Assistant Professor Nathan Wolfe, who tested more than 1 000 hunters for Johns Hopkins University, United States, found a retrovirus from the same family as HIV in a number of them.

Although the full public health implications are still unknown, the fear is

that the new virus could result in a new disease which would have global impact.

United Kingdom imports. The File On 4 team accompanied environmental health officers to spot inspections at London shops where they found illegal bushmeat from West and Central Africa. About five million tonnes of bushmeat, originating from animals such as antelope, snakes, gorillas and elephants, is eaten in these regions of Africa every year. It is estimated that 12 000 tonnes of all manner of illegal meat is smuggled into the United Kingdom annually, a significant proportion of which is thought likely to be bushmeat. There may also be serious implications for the health of British domestic livestock as the foot-and-mouth outbreak was linked to illegal meat imports in 2001.

Under cover. Posing as rich white loggers and accompanied by an undercover worker from the Last Great Ape project, File On 4 journalists travelled to Cameroon where pygmy hunters offered to kill gorillas, seen as the best meat. All they wanted in return was the ammunition and the meat of the gorilla to eat. One pygmy said they had lost count of the number of gorillas they had killed. Abject poverty forces such hunters to kill any animal, no matter how rare or unfit for human consumption, and transport it out of the country through black markets.

It is not known whether anybody has become sick from the virus. (Source: File On 4, BBC, 26 October 2004.)

Fewer fish means more bushmeat eaten in Ghana

Declines in fish catches lead directly to increased hunting and consumption of wildlife, according to a study published on 12 November in *Science*. The research shows that unsustainable fishing practices can have far-reaching consequences for poverty alleviation, food security and biodiversity conservation.

By comparing fish catches in Ghana between 1970 and 1998 with mammal



populations in six of the country's nature reserves, researchers from Ghana, Canada, the United Kingdom and the United States found that when fish were plentiful, mammal populations increased. When fish were scarce, the numbers of mammals fell.

The increased consumption of bushmeat in apparent compensation for declines in other foods has long been suspected, but this is the first time this "protein limitation hypothesis" has been tested. It suggests that wildlife is not consumed as a luxury good but as an essential source of protein in Ghana.

"Bushmeat is an important contributor to household income and food supply not only in much of Africa but also in South and Central America, and parts of Asia," says Justin Brashares, lead author of the *Science* paper. "Ongoing work in other parts of West and Central Africa and the Americas and Asia suggests a strong link between fish supply and people's reliance on wildlife on land for food and income." (Source: *Science* 306: 1180 [2004], in [SciDev.Net Weekly Update, 8-14 November 2004].)

Hunting to extinction

The project "Hunting to extinction: addressing the threat of the bushmeat trade to wildlife in the Upper Guinea Forest" was carried out by Conservation International from January 2001 to April 2004. The project has been extremely successful in increasing the public's awareness of the crisis created by the bushmeat trade for biodiversity conservation in the country. It established a National Stakeholders task force which mobilized stakeholders (chiefs, elders, non-governmental organizations, government officials, bushmeat traders and representatives of development organizations) to adopt a concerted effort and a multifaceted approach to deal with the crisis. During the National Conference on the bushmeat crisis, stakeholders adopted a National Bushmeat Extinction Declaration as a guiding principle for the conservation of wildlife in Ghana, which is now known as the Accra Declaration.

The project has been instrumental in

the drafting of new legislation to control bushmeat trade and indiscriminate hunting which is currently under parliamentary review.

Owing to research conducted by the project, and results publicized through national media campaigns, the general public has now been alerted to the public health implications of consuming bushmeat caught with pesticides, and has reduced public demand.

Project reports and resource documents are available upon request. (Source: CEPF E-News, November 2004.)

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CAMU CAMU



Camu camu (*Myrciaria* spp.)

El camu camu ya es fruta de exportación

¿Sabía Usted que el camu camu (*Myrciaria dubia*), una fruta exótica de la Amazonía, contiene entre 40 y 60 veces más vitamina C que el limón y la naranja?

Es gracias a esta cualidad que el camu camu se sitúa en los últimos tiempos como el producto estrella de la exportación agroindustrial del Perú y se está abriendo paso en el competitivo mercado internacional sobre todo porque se trata de la mayor fuente natural de vitamina C.

Durante los primeros cuatro meses del presente año las exportaciones de esta fruta se incrementaron en más del 96 por ciento, si se comparan las ventas registradas el mismo período del 2003. Entre enero y mayo del 2003 las exportaciones ascendieron a 137 544 dólares EE.UU. En el mismo período del 2004, totalizaron 269 261 dólares.

Múltiples propiedades

Esta fruta no sólo tiene demanda por su alta concentración de vitamina C, sino también por sus propiedades para la prevención del cáncer. Además se la utiliza en la industria para la elaboración de jugos naturales.

El país que concentra la mayor demanda es el Japón. El 91 por ciento del producto exportado entre enero y mayo de este año va a ese país. El segundo importador es Estados Unidos, seguido de Alemania.

"Las cifras son alentadoras y significa que hay un interés creciente en el mercado internacional. Los análisis e investigaciones que realizan estos países están dando resultados positivos con relación a este producto", afirma José Ordóñez Chávez, gerente del sector agro de la Asociación de Exportadores (ADEX).

¿Y el valor agregado?

Ordóñez Chávez sostiene que el producto está en proceso de "despegue", pero que aún hace falta exportar el camu camu con mayor valor agregado. En la actualidad la producción de camu camu en pulpa o en polvo destinado a la exportación se limita a unas diez empresas.

Ello evidencia que falta más trabajo conjunto y coordinación comercial entre los Ministerios de Agricultura, Relaciones Exteriores y los productores. Sin embargo, las propias empresas buscan nuevos mercados.

Se estima que en la región Loreto se cultivan aproximadamente 630 hectáreas de camu camu. En la región Ucayali se prevé la producción de 133 hectáreas, según información del Cite Frutas y Plantas de Loreto, una asociación



conformada por el Instituto de Investigaciones de la Amazonía Peruana (IIAP) y el Ministerio de la Producción.

Comercialización

El camu camu de Loreto es vendido como fruta fresca en los centros de abastos de la zona. En Iquitos se lo consume principalmente en refrescos, chupetes, mermelada y néctar. Los rendimientos varían según la edad de la plantación y el manejo del cultivo. Las plantaciones tienen un rendimiento de entre una y dos toneladas por hectárea. El objetivo primordial ahora es el de articular la oferta con la demanda.

(Por: Rossana Manrique, según el Diario *La República*.) (Fuente: *Bosques amazónicos virtual*, Año 4, N° 11.)

Camu camu (*Myrciaria* spp.): a conservation and development issue in Peru

Camu camu is a small tree native to the wetlands of the Amazon Basin. It is especially abundant in the Peruvian Amazonia. Although very high in vitamin C, until recently camu camu was used almost exclusively in Peru as fish bait and a convenient source of fuelwood when dead. The fruit is now popular in drinks, popsicles, sweets and even cosmetics. Trees of this genus can also grow to be very large (e.g. the "shahuinto" variety). Camu camu fruit pulp is exported from Peru, with most of it going to Japan.

As most *Myrciaria dubia* has at least 2 700 mg of ascorbic acid per 100 g of fruit, this small tree has been planted in experimental agroforestry systems since the 1960s. Some *riberaños* were also planting it on their own because it soon had a demand in urban markets. Large-scale planting has now begun throughout the region owing to the current export of the fruit. However, the results of recent planting programmes have often been poor. Many non-governmental organization projects have been overly concerned about signing up large numbers of people and quickly planting fields in order to impress funding agencies and governments with the number of plants and participants. Meanwhile, poor

execution of the projects and a lack of proper field maintenance have limited fruit production from projects with communities in the region of Loreto. At the same time, the harvesting of wild camu camu has increased in intensity.

There is concern over how much harvesting the wild stands can endure. Fish, such as the large *Colossoma macropomum* (gamitana, tambaqui) feed on the fruits, and they have disappeared from places where camu camu fruit is no longer available to them. Sustained and equitable programmes are needed to assist the people with the cultivation and management of camu camu. Unfortunately, discrimination against rural people of the Amazon frequently ruins conservation and development plans.

In spite of the current situation, there is reason to be optimistic. Camu camu is relatively easy to cultivate, and in six years can bring excellent returns. If prices for the fruit remain high, more rural people will dedicate their time and efforts to growing camu camu. As is the case with aguaje (*Mauritia flexuosa*), camu camu is becoming an important component of floodplain agroforestry systems in the region of Loreto, Peru. Meanwhile, there is a need to improve extension work, as well as access to processing facilities and markets. (Source: Rainforest Conservation Fund, www.rainforestconservation.org/articles/camu-camu.html)

Camu camu: la Unión Europea y otros cooperantes internacionales

La Unión Europea y otros cooperantes internacionales impulsan la cadena productiva del camu camu (*Myrciaria dubia*), mediante el «Programa integral para el aprovechamiento sostenible del camu camu en cuencas seleccionadas del departamento de Loreto». La Unión Europea en alianza estratégica con Agro Acción Alemana, CESVI de Italia e Hivos de Holanda se proponen así impulsar uno de los recursos de la biodiversidad amazónica con mayores perspectivas en los mercados internacionales. Esta fruta, además de otras propiedades medicinales, posee 30 veces más vitamina C que el limón.

El monto de financiamiento de este importante proyecto para el desarrollo de la Amazonía asciende a 1 164 084 Euros. La ejecución está a cargo del Centro de Desarrollo para la Competitividad de la Amazonía (CEDECAM), organización que tiene como misión formular y ejecutar proyectos de desarrollo con enfoque de sostenibilidad.

La principal característica de este proyecto es su enfoque integral orientado a desarrollar la cadena de valor de un producto altamente aceptado a nivel internacional. La concepción integral del proyecto se sustenta en apoyar los temas clave en las tres fases de la cadena productiva: agrícola, industrial y comercial. En la primera etapa, se promoverá una sólida, homogénea y permanente oferta exportable de la fruta. En la siguiente fase, se preocupará de generar valor agregado para ser competitivos. Finalmente, se buscará posicionar el camu camu en el mercado nacional e internacional.

Es proyecto constituye una valiosa oportunidad pero al mismo tiempo un reto. Una oportunidad, porque ofrece a los agricultores e instituciones directamente vinculadas a este cultivo la posibilidad de utilizar eficientemente los recursos económicos y materiales disponibles; de formar alianzas estratégicas con inversionistas e instituciones internacionales académicas; y de investigación, a fin de superar los cuellos de botella que confronta el camu camu y que actualmente impiden su despegue. Un reto porque coloca a los beneficiarios y los agentes económicos involucrados en la cadena productiva frente al desafío de realizar los mejores esfuerzos para, de una vez por todas, comercializar el camu camu en sus diferentes formas tanto en el mercado nacional como en el internacional.

Sin duda alguna, por su magnitud y trascendencia, el proyecto dinamizará la economía regional, especialmente en los caseríos que se dedican a este cultivo en las cuencas de los ríos Ucayali, Napo, Mazán y otros. (Fuente: *Bosques amazónicos virtual*, Año 4, N° 16 [mateluf@terra.com.pe].)



GUM ARABIC

Nigeria export to United States begins
Jigawa Gum Arabic Processing Company has concluded arrangements to export more than 120 tonnes of gum arabic to the United States. Some 145 professionals in 15 local government areas of the state have already commenced tapping the product.

The Managing Director of the company, Alhaji Imam Mohammed, said the state expected more than US\$240 000 from the sale of the product. He said efforts were being made to secure new agreements with more United States companies to supply gum arabic. Mohammed commended the renewed interest of the Jigawa government in expanding gum arabic plantations. He said the plantations would earn the government foreign exchange and help curb desert encroachment.

The company has already set up a gum arabic processing laboratory with the assistance of USAID. (Source: *This Day* [Lagos], 20 October 2004.)

Uganda may export gum to the United States

Uganda may benefit from the export of gum arabic to the United States under the African Growth Opportunity Act (AGOA) if the samples there pass the functionality tests. The success of the tests will open an automatic door for Uganda to export directly to the United States duty- and quota-free market under AGOA.

This information is contained in a paper by Ugandan scientists (Dr W. Kakuru of ICRAF, Mr J. Okorio of the Forestry Resources Research Institute [FORRI] and Mr C. Okia of the Uganda Agroforestry Development Network), entitled "Agroforestry development in Uganda's drylands". which was presented recently at a workshop at the International Center for Research in Agroforestry (ICRAF) in Nairobi. According to the paper, it has been confirmed that Uganda has reasonable quantities of *Acacia senegal* and *Acacia seyal* trees used for

the production of gum arabic, which is in high demand in the United States.

The trees grow in the wild in Uganda's dryland regions, especially in Teso and Karamoja, stretching up to the Sudan. The trees grow in about 36 districts of northern, southwestern and central Uganda, most of which are relatively dry areas. (Source: *The Monitor* [Kampala], 18 October 2004.)



Acacia senegal (gum arabic)

MEDICINAL PLANTS

Sutherlandia frutescens

With its scarlet flowers and strange, swollen seed pods, the so-called "cancer bush" is a distinctive plant in the three Cape provinces of South Africa. It is an attractive small shrub, with silvery-grey foliage and is cultivated as a popular garden plant in many countries around the world.

This plant has been used as a traditional medicine for hundreds of years, but it is only recently that its true pharmacological values have come to light. The Khoi and Nama people of the southwestern Cape and Karoo used parts of this plant to treat fevers and other ailments, and its medicinal uses were quickly adopted by the Dutch settlers. The traditional procedure has been to boil the leaves, or other parts of the *Sutherlandia* plant, to make a decoction or powdered herb. A modern and commercially available product, Promune, claims to be the first supplement made from the extract of the plant rather than from the powder, for it is known that plant extract is many times more concentrated than dried particles.

Studies by the Medical Research Council of South Africa and other bodies have demonstrated that *Sutherlandia*

extract is safe, and that it is almost certainly the most profound and multipurpose of the medicinal plants in southern Africa. Taken as a tonic, *Sutherlandia* assists the human body to mobilize its own resources to cope with diverse physical and mental stresses. Because it boosts the immune system, it can assist those suffering from cancer and tuberculosis, and is also being increasingly used by people with AIDS. One particular compound in the plant – pinitol – has a hypoglycaemic effect with the ability to reduce blood sugar levels, and can therefore benefit diabetics. The tonic is also widely used to treat chronic fatigue syndrome and "yuppie flu".

Sutherlandia is inextricably linked to the natural habitat in which it has evolved, where it is pollinated by sunbirds and carpenter bees. Although it is now cultivated, the future viability of domesticated stock is likely to rely on the genetic make-up of wild plants. We need, therefore, to recognize that representative areas of natural habitats should be conserved worldwide, not only for the wild species we know that are there, but also for the potential values which exist in species that remain to be studied. (Source: *WildWatch*, 21 May 2004 [on African Conservation Forums Web site, www.africanconservation.org/dcforum/DCForumID27/29.html].)

Cancer bush has medicinal properties

An indigenous plant used for centuries as a tonic and treatment for cancer has been scientifically shown to have medicinal properties, according to researchers.

Two independent studies at South African universities have demonstrated the stress-relieving and anti-oxidant properties of *Sutherlandia frutescens*, otherwise known as the cancer bush, "the one that dispels darkness", said Phyto Nova, a company that produces medicines from the plant.

"The plant is very variable. It grows wild all over the country," said botany professor and medicinal plant expert Ben-Erik van Wyk. He said the particular strain used in the research had been



developed by his company from plants that had been cultivated for medicine for many generations. This strain (Sutherlandia SU1) is already available at pharmacies and health stores, costing about R 35 to R 50 for a month's treatment. It had been tested and shown to be safe by the Medical Research Council, van Wyk said.

Medicines made from the small red-flowered legume are used by people from many different cultures, and there are several companies that produce, and even export, *Sutherlandia* products.

However, until these two studies, and another study by Canadian researchers, were accepted for publication earlier this year, there was no scientific evidence of the plant's curative effect. (Source: Sapa, 15 November 2004 [on African Conservation Forums Web site].)

Namibia seeks to commercialize hoodia

Namibia has requested CITES to list the Carrion Flower (hoodia) in Appendix II, to enable it to sell the natural resource. Plants and animal species classified in the Convention on International Trade In Endangered Species of Wild Fauna and Flora (CITES) Appendix II can be sold in controlled commercial trade. Appendix I contains highly endangered species and no trade in them is allowed.

Namibia made the proposal as hoodia was not at present listed at all. Botswana and South Africa have also made the same proposal.

Hoodia has appetite-suppressing properties and is found only in the arid regions of Namibia, Botswana and South Africa. It has dominated discussions in the pharmaceutical industry in Europe and the United States over the past five years.

In February, the Environment Minister told a CITES' Plants Committee in Windhoek that Namibia was conducting cultivation trials to get small-scale farmers involved in the growing of hoodia for commercial purposes. He said that the cultivation of hoodia for commercial purposes would reduce the pressure on wild harvesting and prevent overutilization. (Source: *The Namibian* [Windhoek], 3 June 2004.)

Research confirms medicinal promise of Kenyan plants

Kenyan plants used in traditional herbal medicine are showing promising medicinal properties in scientific assessments of their ability to treat diseases such as herpes and malaria, according to presentations made at the 25th African Health Science Congress in Nairobi earlier this month (4–8 October).

The Kenya Medical Research Institute (KEMRI) is assessing how two Kenyan medicinal plants work against the herpes simplex virus (HSV). When the researchers treated mice with extracts from the African cherry (*Prunus africana*) and the chinaberry (*Melia azedarach*) trees, then infected them with HSV, both infection and disease progression were slower than in untreated mice.

KEMRI scientists are also investigating the antimalarial effects of other Kenyan medicinal plants, either alone or in combination with chloroquine – the drug widely used to treat the disease in Africa.

KEMRI's researchers have screened 60 extracts of 11 plants, used for the control of malaria by local communities in Kenya's Kisii district, for activity against the malaria parasite. Four plants – *Ekebergia capensis*, *Stephania abyssinica*, *Ajuga remota* and *Clerodendrum myricoides* – gave encouraging results against both chloroquine-sensitive and chloroquine-resistant strains of the parasite. In later studies, the researchers found that using extracts of *E. capensis* and *C. myricoides* in combination with chloroquine was more effective than using the drug on its own.

KEMRI's researchers are continuing to document and collect data on medicinal plants used in areas of Kenya where malaria is endemic. (Source: SciDev.Net Weekly Update, 18–24 October 2004.)



Prunus africana

HIV research in danger

The Head of the Virology Department at the Noguchi Memorial Institute for Medical Research (NMIMR), Ghana, Professor Nana Kofi Ayisi has warned that he is closing research on eight Ghanaian medicinal plants which have the potential of being developed into an HIV and other sexually transmitted infections preventive drug as a result of lack of funding.

He said that although USAID funded the initial research that led to the discovery of the plants, further funding which will make clinical research possible had not been forthcoming. He also said he had to abandon a patent right he was pursuing for the drugs after spending US\$7 000 of his own money in vain.

Prof. Ayisi said the eight selected plants include: *Ficus polita* – HIV, HSV, GHX-36-HIV, HVS; *Ocimum gratissimum* – HIV, HVS; *Alchornea cordifolia* – HIV, HVS; and *Elaeophorbium drupifera* – HIV. Three of them, he said, have the potential of being developed into vaginal microbicides which is widely accepted as the best form of HIV and vaginal herpes prevention.

Prof. Ayisi, who is also an expert in microbiology and toxicology, said that big pharmaceutical companies are making millions out of a single drug that is discovered. Although the research now appears to be expensive, only societies that invest in science will reap from the benefits of science. "It is not an exaggeration to say that a single medicinal plant that is moved into mainstream medical practice has the potential to pay for the entire health budget of the nation and make the cash and carry system redundant," he said. "We owe it to ourselves, our country and our children yet unborn to develop our medicinal plants," Prof. Ayisi said, adding, "We are losing our forests and plants at a faster rate and the people with knowledge in medicinal plants are dying without leaving any knowledge behind." (Source: *Public Agenda* [Accra], 26 April 2004.)

Treating malaria with herbal medicines

More than 1 200 plants are used to treat malaria and fevers, and the two main



WILD HARVESTING VERSUS CULTIVATION OF MEDICINAL AND AROMATIC PLANTS

A summary of: ▲ advantages; ▼ disadvantages.

FOR SPECIES AND ECOSYSTEMS IT IS BETTER TO...

WILD HARVEST BECAUSE...

- ▲ it puts wild plant populations in the continuing interest of local people
- ▲ it provides an incentive to protect and maintain wild populations and their habitats and the genetic diversity of MAP populations
- but...
- ▼ uncontrolled harvesting may lead to the extinction of ecotypes and even species
- ▼ common access to the resource makes it difficult to adhere to quotas and the precautionary principle
- ▼ in most cases knowledge about the biology of the resource is poor and the annual sustained yields are not known
- ▼ in most cases resource inventories and accompanying management plans do not exist

CULTIVATE BECAUSE...

- ▲ it relieves harvesting pressure on very rare and slow-growing species which are most susceptible to threat but...
- ▼ it devaluates wild plant resources and their habitats economically and reduces the incentive to conserve ecosystems
- ▼ it narrows the genetic diversity of the gene pool of the resource because wild relatives of cultivated species become neglected
- ▼ it may lead to conversion of habitat for cultivation
- ▼ cultivated species may become invasive and have negative impacts on the ecosystem
- ▼ reintroducing plants can lead to genetic pollution of wild populations

THE MARKET DEMANDS...

WILD HARVESTED PLANTS BECAUSE...

- ▲ they are cheaper since they do not require infrastructure and investment
- ▲ many species are only required in small quantities that do not make cultivation economically viable
- ▲ for some plant parts extra-large cultivation areas are required (e.g. arnica production for flowers)
- ▲ successful cultivation techniques do not exist, e.g. for slow-growing, habitat-specific taxa
- ▲ no pesticides are used
- ▲ it is often believed that wild plants are more powerful
- but...
- ▼ there is a risk of adulterations
- ▼ there is a risk of contaminations through non-hygienic harvest or post-harvest conditions

CULTIVATED MATERIAL BECAUSE...

- ▲ it guarantees a continuing supply of raw material
- ▲ it makes reliable botanical identification possible
- ▲ genotypes can be standardized or improved
- ▲ quality standards are easy to maintain
- ▲ controlled post-harvest handling is possible
- ▲ production volume and price can be agreed for longer periods
- ▲ resource price is relatively stable over time certification as organic production is possible
- but...
- ▼ it is more expensive than wild harvest
- ▼ it needs substantial investment before and during production

FROM A PEOPLE'S PERSPECTIVE IT IS BETTER TO...

WILD HARVEST BECAUSE...

- ▲ it provides access to cash income without prior investment
- ▲ it provides herbal medicines for health care needs
- ▲ it maintains the resources for rural populations on a long-term basis (if done sustainably)
- but...
- ▼ unclear land rights create ownership problems
- ▼ this income and health care resource is becoming scarce through overharvesting

CULTIVATE BECAUSE...

- ▲ it secures a steady supply of herbal medicines (home gardens)
- ▲ it provides in-country value-adding
- but...
- ▼ capital investment for small farmers is high
- ▼ competition from large-scale production puts pressure on small farmers and on wild harvesters
- ▼ benefits are made elsewhere and traditional resource users have no benefit return (IPR)

(Source: Schippmann, U., Leaman, D.J. & Cunningham, A.B. 2003. Impact of cultivation and gathering of medicinal plants on biodiversity: global trends and issues. In *FAO. Biodiversity and the ecosystem approach in agriculture, forestry and fisheries*. Rome, FAO [www.fao.org/DOCREP/005/Y4586E/y4586e08.htm#P1_0].)

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sources of antimalarial drugs used today are derived from plants that have been used traditionally for hundreds or thousands of years.

In an article in the *British Medical Journal*, Merlin L. Willcox and Gerard Bodeker provide an overview of research on herbal medicines used to treat malaria. Few trials of antimalarial plants have been conducted, and studies often do not have enough detail on how medicines are prepared or sufficient data on the efficacy of such plants. Although most studies provide little information on side effects, some patients in one trial stopped the treatment because of minor side effects.

Prioritizing species for future research can be facilitated using the researchers' "Ivml" index of how widely used different plants are. This allowed the identification of 11 species of plants used to treat malaria in all three tropical regions – Latin America, Africa and Asia. Although such plants may be the best targets for future research, the authors suggest that variations between formulations of individual remedies – rather than the species they are derived from – should also be considered. (Source: *British Medical Journal* [in SciDev.Net Weekly Update, 8–14 November 2004].)

Nepal's Maoist insurgent movement has apparently funded rebel activities with profits from products such as marijuana and medicinal herbs harvested in forest lands. (Source: Taylor, D. 2004. Abuse, scarcity and insecurity. *Environmental Health Perspectives*, 112[3]: 172–175.)

Back to medicinal roots in Hawaii

There was a time when someone's backyard, including the mountains and wild pastures beyond, was the common person's pharmacy, says Malcolm Naea Chun, a translator of Hawaiian historical documents and a cultural specialist at the University of Hawaii-Manoa College of Education and the Department of Education Pihana na Mamo programme.

Almost 20 years ago, Chun discovered a treasure trove of native plant potions. The original records of

these remedies were written in longhand and stashed in an old cardboard box in the Office of Hawaiian Health.

His main reason for translating these documents was not to publish recipes for people to try, but to "show how earlier generations and native Hawaiians used these plants," he said. But it takes more than just learning the language to translate them [the documents], Chun said. "You have to know the culture to get an understanding of what the writer meant. People today would find the language secretive, esoteric and boring. But it's our culture, and if we don't understand it, it will be lost forever."

The publication of Chun's three-volume series, based on work by three authors, releases "primary source material, never published before for the general public."

"Native Hawaiian Medicine Vol. III", written by the Rev. David Kaluna M. Ka'aiakamanu, of Kipahulu, Maui, from 1917 to 1921, is the last in Chun's translated series. It is the culmination of work that he began on an old-fashioned typewriter in 1990. (Extracted from: Starbulletin.com, 5 July 2004.)

Amazonia loses medicinal plants and knowledge

Chainsaws that advance into the Amazonia forest not only knock down trees. With the loss of plants, knowledge about them, principally their medicinal characteristics, is also being lost. This has been confirmed by researchers from the Federal University at Minas Gerais, Brazil, who are comparing two studies, one conducted in 1984 and the other in 2001, on the use of medicinal plants, specifically those used against malaria, for the population in the south of Pará state.

According to one of the study's authors, through deforestation Brazil is losing a wealth of which no one is aware of the dimensions. "We are not only talking about material wealth, our work has shown that we are also actually losing the culture/knowledge related to these medicinal plants," the author stated. "For us it was horrendous to confirm that in such a short period of

time they no longer know the medicinal plants of the region." The intention was to collect more data and samples of plants that were used against malaria. "But there was nothing left. When the plants disappear, traditional knowledge becomes forgotten. Future generations do not learn about their properties", the study concluded. (Source: *O Estado de S. Paulo*, 9 August 2004 [in *Amazon News*, 12 August 2004].)

Amapá offers treatment with medicinal plants

Amapá (Brazil) is one of the four federal states that have an agency dedicated exclusively to the use of natural medicine – the Reference Centre for Natural Treatment (CRTN). The centre will take patients referred by public and private hospitals and from health centres. Local people testify the great success of home remedies using natural medicines. When asked about the CRTN, one interviewee responded, "We cannot underestimate nature. This Centre is good. What are we without nature?" (Source: *Diário do Amapá*, 13 May 2004 [in *Amazon News*, 20 May 2004].)

MUSHROOMS



Matsutake and exports to Japan

In Japan, *Tricholoma matsutake* is highly regarded and eating ceremonies are culturally important. Originally collected from Japan's forests, production declined steeply in the 1980s. The search for new sources identified American matsutake (*Tricholoma magnivelare*) as an acceptable substitute and it was quickly realized that substantial amounts could be harvested from the Pacific northwest of North America, where local use was minimal. The burgeoning trade with



Japan coincided with a downturn in jobs in logging and timber extraction. Export businesses based on *T. matsutake* have also been established in Sichuan, China, Bhutan and notably the Democratic People's Republic of Korea.

Exports of *T. magnivelare* and other closely related species occur from North Africa, Turkey and Mexico, but details are sketchy. The amounts earned by these countries are small compared with Asia and North America. The prices paid by the Japanese vary considerably depending on the available supply each year and the quality of mushrooms when they arrive at market.

Matsutake is particularly valuable at an early stage of development and this requires careful searching in the upper humus layers of forests. Some collectors are not so careful: they rake the ground to uncover emerging fruit bodies, damaging the humus layer and affecting future harvests.

Matsutake is a mycorrhizal fungus and efforts have been made to "manage" natural ecosystems in the Republic of Korea and North America in an attempt to maximize production. Annual yields are still heavily influenced by available rainfall and ambient temperature at key times during the year. (Source: *Wild edible fungi. A global overview of their use and importance to people*. FAO, Rome [2004].)

United States mushroom pickers protesting plummeting prices

Matsutake mushroom pickers in Oregon, United States are protesting plummeting prices for the delicacy by staying off the job for five days. Their hope is they can turn back a global economic tide that has pushed down the price they receive from local buyers to US\$3 a pound (405 g) from about US\$30 two weeks ago. The matsutakes retail for US\$35 to \$45 a pound in United States markets, and more in Japan.

A good picker can harvest anywhere from 5 to 20 pounds (2 to 8 kg) of the firm, white mushrooms daily, bringing good money in normal times and small fortunes when prices hit the hundreds of dollars a pound, as they have in years past.

It is unclear whether the walkout can make a difference. Buyers contend they simply take their marching orders from bosses whose eyes are fixed on the Japanese auction markets, where the global price of matsutakes is set. A global glut of matsutakes has forced down prices, they say.

Cheap supplies of matsutakes are available from China, the Korean peninsula and British Columbia.

The pickers' protest appears to be unprecedented, said Denise Smith, director of the Alliance for Forest Workers and Harvesters, a Californian group that advocates fair treatment of harvesters. (Source: SF-Gate.com, 28 September 2004.)

Mushrooms offer opportunities in Africa

African communities are growing mushrooms and harvesting seaweed, water hyacinth and other biological resources that were ignored or considered waste as part of an effort to improve livelihoods and help conserve the environment.

The United Nations Development Programme ZERI regional project on sustainable development from Africa's biodiversity, based at the University of Namibia, is promoting these activities. It is based on the Zero Emissions Research Initiative (ZERI) pioneered at the United Nations University, which has focused on using waste products as raw materials.

Namibia's President Sam Nujoma calls the concept a "win-win situation, where the private sector will improve their profits and even create new employment opportunities, while at the same time contributing to the sustainable conservation of our environment." He spoke at a recent donor conference in Windhoek, the capital, to discuss the project's next phase. Namibia has hosted the project since 2001. Other participating countries are Gambia, Lesotho, Malawi, Senegal, Swaziland, the United Republic of Tanzania and Zambia.

The project provided training in mushroom growing, mainly for women, leading to profitable businesses in

Namibia, the United Republic of Tanzania and Zambia that supply mushrooms to local markets, restaurants and hotels. Communities in Zambia are gathering water hyacinths and exchanging them for banana and orange seedlings. A ZERI pilot project with the University of Zambia and other partners is showing how the hyacinths, rich in nutrients, can be made into fertilizer and used for growing mushrooms.

For its next phase, the project is looking at other potential resources such as ganoderma mushrooms for medication to strengthen the immune system, possibly for treating HIV/AIDS. *Termitomyces titanicus*, the world's largest umbrella mushroom, with an edible cap up to one metre in diameter, and the edible goliath frog, the largest in the world, from the Congo region could become marketable products.

The project's emphasis on improving livelihoods makes it an effective instrument for reinforcing democratization, economic reform and poverty reduction, the president said. (Source: Newsfront [newsfront@undp.org], 11 May 2004.)

Giant mushroom baffles experts in the Republic of the Congo

A giant three-tiered mushroom, which measures one metre across, was found in the tropical forests of the Republic of the Congo. The giant fungus stands 45 cm high and has three tiered caps on top of a broad stem. The bottom cap measures one metre across, the second one 60 cm and the top one is 24 cm wide. "It's the first time we've ever seen a mushroom like this so it's difficult for us to classify. But we are going to determine what it is scientifically," said the head of the Congolese veterinary and zoology centre.

The bizarre-looking mushroom was found in the village of Mvoula about 60 km from Brazzaville and transported carefully to the capital by the local chief. (Source: *Planet Ark*, 5 June 2004.)

Scientists discover Europe's largest fungus

Swiss scientists have discovered what they believe is Europe's biggest fungus, stretching wide under an Alpine forest.

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The "honey mushroom", also known by its Latin species name *Armillaria ostoyae*, was found lurking in the Engadine national park in the eastern Swiss Alps, said the Federal Institute for Forest, Snow and Landscape Research. Spanning 35 ha (86 acres), the fungus is believed to be 1 000 years old, the institute added.

The underground fungus is only visible in the autumn, when its mushrooms break through the earth and grow around the roots of trees, the institute said.

Although harmless to humans – its mushrooms are edible – the parasitic fungus can colonize trees, killing off swaths of pine forest.

In terms of size, the Swiss fungus is beaten by another honey mushroom growing in the United States. Found in the Malheur National Forest, in eastern Oregon, that fungus covers 890 ha (2 200 acres) – making it the largest living organism ever discovered. (Source: Associated Press, quoted in *Daily Times* [Pakistan], 28 September 2004.)

RESINS



Nouveau procédé de gemmage – «le gemmage en vase clos» – dans le cadre du développement durable des forêts de résineux

Le développement durable, dont l'origine du principe remonte à la Conférence de Stockholm de 1972 sur le développement humain, a été bien défini en 1987 dans le rapport Brundtland.

Il s'agit «d'un développement qui satisfait les besoins du présent sans compromettre l'aptitude des générations futures à satisfaire leur propre besoin».

Comment peut-on appliquer le principe de développement durable dans

l'exploitation des forêts de résineux formées de différentes espèces de pins?

Le pin fournit comme tous les arbres du bois pour différentes utilisations (bois d'œuvre, de chauffage et pour le charbon), mais il a également la particularité de produire de la résine. Ces deux possibilités de production (bois et résine) firent appeler le pin maritime «arbre d'or» en France au 20^{ème} siècle.

La production de résine par le pin provient d'une blessure («la pique») faite à l'arbre. La réalisation de cette blessure et le ramassage de la résine produite s'appellent «le gemmage».

La production de résine est indispensable aux grands pays industriels comme l'Union Européenne, les États-Unis, le Japon et la République de Corée.

Cette production est assurée dans de nombreux pays par le gemmage de plusieurs espèces de pins.

Ainsi sont gemmés actuellement d'après la FAO:

le pin maritime – au Portugal et en Espagne;

le pin sylvestre – en Pologne, Bulgarie, dans l'ex-Tchécoslovaquie, dans l'ex-Yougoslavie et dans la Fédération de Russie;

le pin halepensis – en Grèce;

le pin oocarpa – au Mexique, au Honduras et au Brésil;

le pin elliotii – aux États-Unis, au Brésil, en Argentine, au Zimbabwe, au Kenya, en Afrique du Sud et au Malawi;

le pin caribaea – au Honduras, au Brésil, au Venezuela, à Cuba, au Kenya, en Afrique du Sud, en Ouganda et au Sri-Lanka;

le pin tadea – au Brésil;

le pin radiata – au Chili et au Kenya;

le pin patula – au Malawi;

le pin massoniana – en Chine;

le pin yunnanensis – en Chine;

le pin latteri – en Chine;

le pin tabulaciformis – en Chine;

le pin kesiya – en Chine;

le pin merkusii – en Indonésie et au Viet Nam;

le pin roxburghii – en Inde, au Pakistan, au Népal et au Bhoutan;

le pin wallichiana – en Inde.

Actuellement le gemmage consiste à faire de très larges blessures aux pins afin de retirer un maximum de résine. Cette façon de gemmer porte une très grave atteinte à la vitalité des résineux ainsi traités.

En 1994, j'ai mis au point un nouveau procédé de gemmage, le «gemmage en vase clos» (Brevet Français FR 2.746582). Avec une poche à bavette en matière plastique j'ai récolté la résine à l'abri de l'air et de toutes salissures. Puis l'entreprise landaise DRT (dérivés résiniques et terpéniques) a mécanisé le procédé manuel que j'avais mis au point. Après plusieurs années d'expérimentation, DRT a déposé deux brevets internationaux: Brevets WO 99/39565 et WO 99/39566.

Ainsi les carres ou entailles très larges très souvent pratiquées sont remplacées avec le nouveau procédé de gemmage par une entaille circulaire de 8 cm de diamètre.

Après l'aspersion d'un activant, un boîtier auquel est raccordé une poche en plastique est fixé à l'entaille.

La blessure faite au pin avec le nouveau procédé de gemmage ne gêne en rien la croissance des arbres.

Cela permet donc de récolter de la résine de bien meilleure qualité tout en préservant la croissance des arbres.

Cette nouvelle technique de gemmage entre bien dans les perspectives de la gestion durable des forêts de résineux dans le monde qui sont d'une très grande utilité pour l'équilibre écologique de la planète terre. Ce point de vue est vivement soutenu par l'association Nature-Environnement-Bassin-Versant d'Arcachon, qui lutte pour la défense de la forêt landaise en France.

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El hombre se complace en enumerar sus pesares, pero no enumera sus alegrías.
Fyodor Dostoevsky