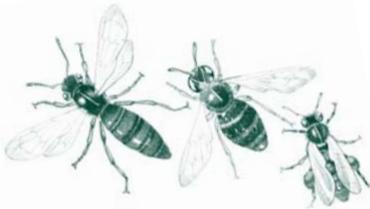


## BEE PRODUCTS

### World honey trade

**World production.** Total annual world honey production is somewhere around 1.2 million tonnes. Reliable statistics are difficult to obtain because beekeeping is very widely practised on a small scale. In every country, small-scale beekeepers trade honey locally, and their produce is unlikely to be included in global production figures. No world organization can provide reliable statistics for the extent of honey production in Africa, in the Middle East or in Asia. It is known that there is considerable production and that this honey flows, through the hands of numerous traders and intermediaries, from producers in remote areas to consumers in industrialized countries. For example, honey flows from the forested mountains of Ethiopia eastwards towards the sea and the Middle East; from villages high in the Himalayas through ports such as Calcutta and Karachi, to markets in the Middle and Far East. In many cases, the honey has been harvested by some of the world's poorest and most remote people yet,



### DEFINITIONS OF HONEY

**Definition of honey according to Codex Alimentarius.** Honey is the natural sweet substance produced by honeybees from the nectar of plants or from secretions of living parts of plants, or excretions of plant-sucking insects on the living parts of plants, which the bees collect, transform by combining with specific substances of their own, deposit, dehydrate, store and leave in honeycombs to ripen and mature.

**Definition of honey according to the European Union.** The EU definition differs in one respect from the above in that it states that honey is only honey according to the Codex definition when produced by *Apis mellifera* honeybees.

ultimately, some of it graces the tables of the most affluent people.

**World trade.** About 300 000 tonnes, around one-third of total recorded world honey production, enter the world market and are traded internationally. China, Argentina and Mexico together produce about 60 percent of world-traded honey. The EU, United States and Japan account for about 70 percent of the import trade. (*Source: Bees and their role in forest livelihoods, FAO Non-Wood Forest Products series, 19 [in press].*)

### German scientist identifies special properties in manuka honey

Manuka Health New Zealand said today that it had launched the first manuka honey products certified to contain specified levels of a special antibacterial ingredient. This follows publication by a German technical university scientist of a paper that identifies the natural compound, methylglyoxal, which is responsible for manuka honey's unique properties. Manuka Health chief executive Kerry Paul said that the scientific paper was significant for the honey industry and for consumers.

Institute of Food Chemistry head, Professor Thomas Henle, the Dresden Technical University in Germany, found methylglyoxal was the dominant antibacterial constituent in manuka honey. Prof. Henle wrote in his paper that the high amounts of methylglyoxal in manuka honey have not been found in any other food. His research analysed 40 samples of honey from various sources around the world, including six New Zealand manuka honeys. Methylglyoxal levels in the manuka honeys were up to 1 000-fold higher than in the non-manuka products. Tests found a median methylglyoxal level in non-manuka honeys of 3.1 mg/kg. Concentrations of the compound in manuka honey ranged from 38 to 761 mg/kg. A minimum of 100 mg/kg is required for effective antibacterial activity. (*Source: TV3 News [New Zealand], 23 January 2008.*)

### Honey-based cosmetics manufactured in the Russian Federation

In December 2007, the Apitherapy and Beekeeping Centre in Bashkiria launched a production site to manufacture cosmetics based on honey and api-products. Over 20 stock keeping units (skus) of shampoos, shower gels, facial and body creams,

aftershave products and even home care products are manufactured at the plant under the Volshebnaya Pchela (Fairy Bee) trademark. The general director of the centre claims that only purely natural ingredients are used and that they are as effective as professional cosmetics.

The manufacturer says that Bashkir honey, propolis and royal jelly are especially good for skin recondition. Volshebnaya Pchela cosmetics will be distributed in 35 regions in the Russian Federation. In addition, the first batch of the products will be supplied to Germany in mid-2008. It is the company's first step on the cosmetics market. Since 2001, it has been supplying Bashkir honey to Moscow, Saint Petersburg, Siberia and the United States. (*Source: Cosmetics in Russia [Russian Federation], 24 January 2008.*)

### A tree full of honey

Bangalore. The banyan tree near Nandagudi, Bangalore rural district in India has the "world's largest number of beehives" – this unique tree has as many as 600 beehives. The Institute for Natural Resources Conservation, Education, Research and Training (INCERT) is making efforts to get this matchless tree recognized as an International Heritage Site so as to create awareness about the importance of its bee colony.

M.S. Reddy, Reader at Bangalore University said that the banyan tree had been monitored by apiculturists for more than a decade and their records show that there were approximately 625 bee colonies in November 2005. A survey conducted in October 2007 revealed the number of hives in the tree to be around 575.

The banyan tree is largely surrounded by eucalyptus trees whose flowers are a major source of nectar for the bees. During the monsoon season, the size of the colony reduces as the rock bees migrate because of lack of flowering in the eucalyptus trees. To prevent this migration, the villagers in the vicinity are being encouraged to undertake agricultural activities such as planting coconuts and floriculture, which may help create sustenance for the bee colony. This is so that the bees may thrive all year around.

For the past three years even the villagers have stopped extracting honey after they had been informed that their unskilled methods of extraction had led to the decline in the number of beehives. (*Source: The Hindu [India], 4 January 2008.*)

### Honey hunting of honeybees

Honey hunting – plundering wild nests of honeybees to obtain crops of honey and beeswax – is still widely practised where people are poor and living at the subsistence level and where wild honeybee colonies are abundant. Honey hunting may be seen as part of the lives of the world's remaining hunter-gatherers, often at the margin of the farming world. The colonies of honeybees nest in the wild and, depending on species, may be nesting in tree cavities, in trees or rocks, in termite mounds or underground. Where bees are plentiful, honey hunting may be a common practice. Wild honeybee colonies are sometimes regarded as "hole in the wall" automated cash machines of industrialized countries. When a family or individual needs some cash, they can plunder it quickly by honey hunting from a known colony for some honey or some cash or "barter value". The products from honey hunting may be indistinguishable from the products from beekeeping in hives.

- **Positive aspect**

- For hunter-gatherers, honey hunting is a quick way of obtaining high carbohydrate (honey) and high protein (pollen and bee larvae) foods with no financial cost. When a buyer is available, honey hunting is often seen by the very poor as an easy way to raise ready cash.

- **Negative aspects**

- Honey hunting kills bees.
- For some bee species and in some areas honey hunting may now cause a non-sustainable depletion of honeybee colonies and habitat.
- Honey hunters may cause forest fires.

Because honey hunting usually takes place under difficult circumstances (such as swinging from a rope on a cliff face or high in trees at night time), the product from honey hunting is usually a mixture of ripe and unripe (i.e. high water content) honey, beeswax, dead bees and other debris. However, this does not mean that the product is of low value: it will often ferment quickly but has high local value as a cultural food, a tonic, an aphrodisiac or medicine. In Africa, honey from honey hunting is mainly made into honey beer. In this case, the various impurities help it to ferment all the more quickly. However, not all honey ends up this way; for example, in India, large volumes of honey are harvested from *Apis dorsata* colonies and reach the domestic honey market. There are no statistics available on the volumes of honey

harvested from wild bees. (*Source: Bees and their role in forest livelihoods*, FAO Non-Wood Forest Products series, 19 [in press].)



### Sustainable honey collection boosts returns to Cambodian communities

Honey collection provides an important source of income for Cambodian rural communities, but the current system of harvesting damages the nests and dramatically reduces production. WWF Cambodia's Srepok Wilderness Area (SWA) project Community Extension Team (CET) has been teaching villages to harvest honey more sustainably – with encouraging results.

"I collect honey from 12 honey nests. Now I can collect honey from the same nest, two to three times. I am really happy." These were the words of indigenous Bunong villager, Sean Tha, who lives in Pu Rapet village, Krongtes commune, Pech Chrada district in Monduliri province. Tha had just completed a training course on sustainable honey collection, delivered by SWA, with the technical assistance of Dr Phung Huu Chinh of Hanoi-based Viet Nam Bee Research and Development Centre, a linkage facilitated by the Non-Timber Forest Products Exchange Programme. The course focused on a collection technique that leaves the honey-producing portion of the hive intact.

In the Monduliri Protected Forest where CET works, honey collection and sale can contribute up to 30 percent of total family income. This harvest season (April to May), for example, Tha collected honey worth about 200 000 riel (US\$50). Unfortunately the honey price is not stable because it depends on brokers to set the price. The price for selling in the village is 10 000–12 000 riel per litre but, if sold directly to tourists, it can reach up to 20 000 riel per litre.

CET leader Amy Maling said that the next step for CET is to set targets for honey

production within the Krongtes commune, help maintain quality and find additional honey markets.

The honey harvesting training course is just one of the many initiatives that the SWA CET is using to build a relationship with community members and assist them in conserving their natural heritage through the process of sustainable natural resource use. (*Source: Insert to Voices from the Forest*, 13.)

### Turkey is second in honey production

Turkish Apiarists' Union chair Bahri Yilmaz reported that the EU imported some 200 000 tonnes of honey each year and Turkey, which produces 70 000 tonnes of honey annually, exports only 18 000 to Europe. At the meeting on "Beekeeping and Honey Production in Turkey", the point was raised that Turkey was second after China in honey production yet there were serious problems regarding honey exports, advertising and marketing.

The head of the Turkish Apiarists' Union complained about the inadequacy of legal regulations. He said that illegal honey commerce was a significant problem for producers in Turkey since this illegal honey was being exported with a "Turkish honey" label and it was all being sent back to Turkey when various chemicals were found in the honey. He said that some 40 000 people in Turkey were professional beekeepers and about 180 000 families earn a living from beekeeping. "If the honey producers are supported, this production can expand to become a very important source of economic income." (*Source: Biamag [Turkey]*, 1 January 2008.)

### Beeswax

Beeswax is the creamy coloured substance used by bees to build the comb that forms the structure of their nest. Very pure beeswax is white, but the presence of pollen and other substances causes it to become yellow.

**Production and trade.** Beeswax is a valuable product that can provide a worthwhile income in addition to honey. One kg of beeswax is worth more than 1 kg of honey and, unlike honey, beeswax is not a food product and is simpler to deal with since it does not require careful packaging, which simplifies storage and transport. However, beeswax as an income-generating resource is neglected in certain areas of the tropics. Some African countries such as Ethiopia and Angola, where fixed comb beekeeping is still the norm, have significant beeswax exports,

while in other countries the trade is neglected and beeswax is discarded. Worldwide, many honey hunters and beekeepers do not know that beeswax can be sold or used for locally made, high-value products. Knowledge about the value of beeswax and how to process it is often lacking. It is impossible to give statistics, but perhaps only half of the world production of beeswax comes on the market, with the rest being discarded and lost.

**Uses of beeswax.** Beeswax has hundreds of uses, of which the following are but a few examples.

- **In cosmetics.** About 40 percent of the world trade in beeswax is for the cosmetics industry, which requires first-class beeswax that has not been overheated, is pure and free from propolis. The world price is usually US\$4–10 per kg. At a local level, making skin ointment from beeswax can be one of the most profitable beekeeping activities.
- **In pharmaceutical preparations.** About 30 percent of the world trade in beeswax is for the pharmaceutical industry that, like the cosmetic industry, requires good-quality wax.
- **Candle-making.** About 20 percent of the beeswax trade is for candle-making. Beeswax candles are less common and more expensive than candles made from paraffin wax. In the past, church candles had to be made of 100 percent beeswax, and this is still followed in some societies.

[Source: *Bees and their role in forest livelihoods*, FAO Non-Wood Forest Products series, 19 [in press].]

#### **A Cameroon body cream using beeswax**

In Cameroon, many beekeepers and honey hunters did not know the value of the honey comb. Many would burn the combs to drive away evil spirits (as the belief goes) or discard them as waste. Since I introduced them to harvesting beeswax from the combs, beekeepers and non-beekeepers have developed a great deal of interest in honey and other bee products.

One example is my recipe for body cream. This wonderful lotion has not only increased the demand for beeswax, but has solved a major problem among babies, especially in the Kom tribe of the northwest province where newborn babies were taken to special traditional healers to be protected or treated against skin diseases. Adults and babies who use this lotion do not suffer from

scabies, tinia, dandruff, chapped lips, sunburned skin, hard skin on their hands, or any of the common skin diseases. Three honest traditional doctors have confirmed the positive effect of this lotion for skin problems. [Source: Aaron Ndichia in *Bees for Development Journal*, 85.]

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#### **HONEY AND BEE PRODUCTS IN CAMEROON**

In 2006, honey and bee products from the main producing areas (northwest, southwest and Adamoua provinces, also known as the western Cameroon Highlands) had a value of at least €3 million, comprising approximately 3 225 tonnes of honey and 50 000 kg of wax. [Source: *Market access for Cameroon honey: an opportunity for income and employment for the rural poor*. Available from FAO's NWFP Web site ([www.fao.org/forestry/site/35667/en](http://www.fao.org/forestry/site/35667/en))

#### **Propolis**

*Apis mellifera* honeybees collect resins and gums from buds or injured areas of plants. This glue-like substance, usually dark brown in colour but also sometimes varying in yellow, green or red, is called propolis. Just as with honey and pollen, propolis differs in composition according to the plants from which bees have been collecting.

Stingless bees use large amounts of resin in the construction of their nests. The constituents of these materials remain unknown and this "propolis" cannot be used by the pharmaceutical industry.

Propolis has antiseptic and anaesthetic properties and is commonly used as an ingredient in medicines, toothpaste, oral sprays and chewing gum, and in shampoos, soap, skin ointments and cosmetics. It is mainly sold as a tincture of propolis made by dissolving it in alcohol.

In forest societies, propolis is still used for many purposes. Kikuyu beekeepers in Kenya carry with them a lump of propolis to rub inside empty hives to make them

attractive to a colony in search of a nesting place. Propolis is used in traditional medicines and also as an effective glue to mend or seal containers of wood, metal or clay, and to seal up knots in wood.

Propolis has long been used for making wood varnishes, famously as a varnish for violins made by Stradivarius, in Cremona in northern Italy. The propolis in this region is gathered by bees from poplar trees. [Source: *Bees and their role in forest livelihoods*, FAO Non-Wood Forest Products series, 19 [in press].]

#### NWFPs AND CLIMATE CHANGE

##### **Climate change and indigenous peoples**

Many unique livelihood systems have been developed by indigenous peoples and provide examples not only of the human capacity to adapt to specific and often inhospitable environments, but also often of resilience, i.e. an ability to adapt to changing circumstances. The uniquely adapted lifestyles of many indigenous peoples and the very fact that they tend to be highly dependent on traditional knowledge, living in symbiosis with their natural environment and often acting as stewards of biocultural diversity, make them inherently perceptive of any signs of threats to the production landscape in which they live; moreover, their insight and experience may also provide alternative paradigms to address emerging threats from climate change.

Several indigenous communities make their living within vulnerable environments – in mountainous areas, in the Arctic, in jungles or in dry lands – and are thus often the first to discern and suffer the effects of climate change.

Similar disruptions in livelihoods occur in other areas where indigenous peoples make their living – the disappearance of atolls, glacier melts and forest fires impact their livelihoods. Even though they are not responsible for climate change, indigenous peoples are excessively affected by it. Additionally, they are disproportionately represented in both developed and developing countries among the poor and food insecure.

However, these peoples are not just victims of global warming; they have a critical role to play in supporting global adaptation to climate change. Several indigenous populations possess a unique knowledge of plant genetic diversity that may

be needed to fight plant and animal diseases, or they know how to breed varieties that can cope with stressed environments. The Amazon River basin is home to about 400 different indigenous groups. Although this territory accounts for just 7 percent of the world's surface area, it harbours more than half its biodiversity; indigenous knowledge and livelihoods depend on an intimate familiarity with a wide range of these unique species. Intense research is being carried out on traditional medicines and many pharmaceutical products derived from plants have been discovered through interaction with indigenous peoples.

Another valuable feature of indigenous knowledge is the ability to discern and interpret natural phenomena to forecast weather changes or identify livelihood-supporting resources.

During this century, tropical rain forests are predicted to experience a 2–8°C temperature rise and alarming changes in rainfall caused by sea surface temperature anomalies, in particular the El Niño-Southern Oscillation (ENSO). Forecasts indicate at least a 20 percent decrease in Amazonian rainfall. Negative effects will be exacerbated by deforestation and forest fragmentation.

Tropical rain forests are home to several indigenous peoples. Living from nature and depending on technologies that do not dominate their environment, they have learned to watch their surroundings and understand the intricacies of the rain forest, relying on the renewable benefits it provides. However, forest property rights are not always clear and indigenous communities often experience severe difficulties in defending their traditional rights against outside forces encroaching on their territories.

Surging demand for biofuels, timber and pulpwood is driving a large-scale destruction of carbon-rich peat lands and rain forests. For example, according to FAO, Africa lost the highest percentage of rain forest (10.5 percent) during the 1980s and the first half of the 1990s. To date, legal land titles have not been granted to forest peoples by Central African governments.

The Clean Development Mechanism (CDM) of the Kyoto Protocol is intended to oblige industrialized member countries to meet a part of their greenhouse gas reduction commitments by supporting projects in developing countries through direct investment and knowledge and technology transfer. FAO is active in

implementing and adapting CDM in forest regions, endeavouring to secure that indigenous peoples and other forest communities benefit from the initiative.

Financial incentives are supposed to compensate landowners for "environmental services" such as carbon storage and watershed protection. Nevertheless, perverse subsidies that provide incentives for clearing forests, combined with insecure property rights of local forest communities, may position industrial interests behind the current deforestation to profit from the REDD (reducing emissions from deforestation and ecosystem degradation) initiative and other ecosystem payment schemes, excluding rural forest communities. Accordingly, efforts to reduce forest-based carbon emissions must be combined with the protection of the rights of forest communities to realize the income potential of their environment. Trade-offs between reducing carbon emissions and reducing poverty have to be pursued.

The Global Forest Resources Assessment, which is continuously carried out by FAO, is now including global biomass and carbon data, at the same time as CDM small-scale forestry projects, which have the potential to provide immediate benefits to low-income smallholders and indigenous communities, are receiving particular attention. Descriptions of the FAO Forestry Department's activities related to climate change are given at [www.fao.org/forestry/site/17827/en/](http://www.fao.org/forestry/site/17827/en/) [Source: FAO's contribution to an interagency paper on climate change and indigenous peoples submitted to the Seventh Session of the United Nations Permanent Forum on Indigenous Issues (UNPFII)].

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#### **Canada must adapt to climate impact on forests**

Vancouver. Canada must prepare for the impact of global warming on its forests, such as increased fires in the west and ice storms in the east, the country's forest ministers said on Tuesday. Canada's lumber and paper industry must also address its declining competitiveness and use of trees for NTFPs such as biochemicals, the provincial and federal officials said in a draft report on the future of the country's forests.

Canada is home to about 10 percent of the world's forests and more than 90 percent of the country's forest land is government-owned.

The report, which was light on specifics, said the forests will feel the impact of global warming even if steps are taken internationally to reduce emissions of greenhouse gases linked to climate change. [Source: Reuters UK, 1 April 2008.]

#### **Bark cuts methane emission from cows**

The Australian Department of Primary Industries (DPI) staff jointly with University of Melbourne scientists have made a breakthrough in reducing bovine emissions by feeding an extract from the bark of black wattle (*Acacia mollissima*). The scientists

#### **CALL FOR INCREASING THE RESILIENCE OF THE WORLD'S FOOD SYSTEMS TO CLIMATE CHANGE**

The summit on soaring food prices, convened in June by FAO, concluded with the adoption by acclamation of a declaration calling on the international community to increase assistance to developing countries, in particular the least developed countries and those that are most negatively affected by high food prices.

On climate change, the Declaration said: "It is essential to address the question of how to increase the resilience of present food production systems to challenges posed by climate change ... We urge governments to assign appropriate priority to the agriculture, forestry and fisheries sectors, in order to create opportunities to enable the world's smallholder farmers and fishers, including indigenous people, in particular vulnerable areas, to participate in, and benefit from financial mechanisms and investment flows to support climate change adaptation, mitigation and technology development, transfer and dissemination. We support the establishment of agricultural systems and sustainable management practices that positively contribute to the mitigation of climate change and ecological balance." [Source: FAO Newsroom, 6 June 2008.]

found that feeding the crystallized powder not only reduced methane but also nitrogen emissions, and increased milk production.

DPI "Greenhouse in Agriculture" programme leader Dr Richard Eckard said in an interview "A tannin in the bark is combined with nitrogen in the rumen making it easier to digest and giving more benefit to the animal. The nitrogen goes out in the dung and then released slowly into the environment. The tannin stopped the nitrogen going into the bloodstream, where the animal had to work hard to process it."

"A problem is that there were no commercial suppliers of the supplement in Australia and we are importing it from Brazil or South Africa where it is used to tan leather," Dr Eckard added. (*Source: AllAboutFeed [the Netherlands], 19 February 2008.*)

#### Development should not affect forests

The debate on whether to conserve natural forests or clear them for investment and development projects is intensifying. At the recent international conference on climate change in Bali, Indonesia, proposals were made to look beyond development and commit more resources towards environment and forest conservation.

How do developing countries such as Uganda industrialize and transform their economies in the wake of increasing calls for the conservation of forests to mitigate global warming? Sustainable development, a development paradigm that makes the case for maximizing the benefits of investment while minimizing environmental degradation, is the way to go.

Credible development projects should have comprehensive guidelines on environmental conservation. Projects should be subjected to environmental impact assessments to mitigate degradation. There are certain conservation ecosystems that must remain intact because of their role in life-supporting systems. Substantial forest cover is a proven ingredient in stabilizing temperatures and climate. Trees suck up large quantities of carbon dioxide, a major contributor to global warming and a hazard for numerous ecosystems.

Uganda's forest reserves were gazetted around strategic locations such as mountains, waterbodies and areas with unique vegetation and wildlife species. Forests cannot be transferred because they are associated with these permanent features that cannot be replicated. Forests must cover a significant portion of the



country to be effective in their natural safeguard duty. Uganda's declining current forest cover, which is now about 22 percent of the land area, compares poorly with other developing countries such as Cameroon (47 percent) and the United Republic of Tanzania (45 percent).

Development projects should, therefore, not cause a serious threat to the declining forest cover in Uganda. There are non-destructive investments that can be undertaken within and around forests such as tree planting, ecotourism, research and beekeeping. These ventures have potentially lucrative returns but are friendly to conservation of both the environment and forests.

Climate-related negative effects of deforestation unfolding in Uganda have already had a retrogressive impact on production. With the persistent encroachment on central forest reserves and the rapid depletion of trees on private land, erratic weather is likely to get worse and could be replicated in other parts of Uganda.

Mitigating and reversing this climate trend requires improving planning to maximize investment while conserving forests and the environment.

On 3 December 2007, the Government launched a US\$653 million Natural Resources Sector Investment Plan. This seeks to increase forest cover to 30 percent of the land area by 2012. The plan is ambitious but, if implemented, will buttress efforts towards stabilizing temperature and climate, which will in turn be a vital ingredient for sustainable agricultural and industrial production and for posterity. (*Source: New Vision [Uganda], 14 January 2008.*)

#### Carbon traders, not conservationists, could save the Cameroon rain forest

The Government of Cameroon is looking to lease 830 000 ha of biodiverse tropical forest to conservationists for an annual sum of

US\$1.6 million. The problem? No conservation groups are interested. Apparently the asking price is too high, according to *The Economist*.

Ngoyla-Mintom forest, as the concession is known, borders the Republic of the Congo and serves as a corridor of habitat between three national parks in Cameroon, Gabon and the Republic of the Congo. Ngoyla-Mintom is home to forest animals including elephants and gorillas.

Without offers to meet its asking price, Cameroon Minister of Forestry Joseph Matta says that he has little choice but to auction the land to loggers. As *The Economist* puts it, "Ngoyla-Mintom is thus turning into an interesting test of what the conservation market will bear".

One possibility is that carbon traders will look at the value of carbon stored in the vegetation of Ngoyla-Mintom and conclude that it is worth protecting for the stream of offsets it could generate under REDD, a nascent mechanism for fighting climate change by protecting tropical forests. While REDD is only in its earliest incarnation, there are signs that it is progressing. Last week, Aceh province in Indonesia signed the first official REDD deal and the World Bank has committed US\$300 million to its newly created Forest Carbon Partnership Facility, a scheme that will offer tropical countries carbon offset credits to preserve forests.

A conservative look at Ngoyla-Mintom shows that its 830 000 ha of forest store over 200 million tonnes of carbon dioxide (assuming 250 tonnes of carbon dioxide/ha – actual values may exceed 700 tonnes). Should Ngoyla-Mintom qualify for REDD, the forest protection scheme would seem likely to offer competitive returns relative to logging concessions.

**REDD calculations.** From 2000 to 2005, Cameroon lost an average of 1 percent of its forest cover each year. For calculating the potential revenue generated from REDD, this figure is applied to the 830 000 ha of Ngoyla-Mintom forest cover, amounting to a forecast annual loss of 8 300 ha.

Assuming emissions of 160 tonnes of carbon dioxide/ha from logging, at US\$3 /tonne of CO<sub>2</sub>, REDD would generate credits worth US\$64 million (net present value over 30 years using a 5 percent discount rate), well in excess of the US\$26 million in concession fees (net present value over 30 years at a 5 percent discount rate). The US\$38 million difference seems more than likely to make up the opportunity costs

of foregoing the jobs and local development from timber harvesting.

These calculations err on the side of caution. Carbon emissions from the logging or deforestation of Ngoyla-Mintom would probably be considerably higher than the figures used, particularly if the land was later converted for agriculture. Furthermore, REDD credits are at present higher than US\$3 and European ETS credits currently trade for more than US\$90 per tonne. Even so, the current model suggests that at a price point of US\$1.21, REDD credits would break even with revenue from logging concessions.

Carbon traders, not conservationists, could become the saviours of the Ngoyla-Mintom forest. (Source: The price of conservation: the unkindest cut, in *The Economist* print edition, 14 February 2008; mongabay.com, 15 February 2008.)

### Bamboo as carbon sequester and income booster

Benguet. Should it prosper, bamboo production may yet be an alternative for environmental protection and as a source of livelihood since intensive production is being encouraged in the Cordillera region of the Philippines. A Memorandum of Understanding (MOU) has been forged by the Rotary Club of Makati Central, Centre of Excellence for Regional Cooperation (CERC) and Cordillera Bamboo Development (CORBAMDEV) to implement the Bamboo for Life project, in undertaking advocacy, propagation and likewise for commercialization purposes. Other signatories to the MOU were the provincial government, Baguio diocese and the Indigenous Peoples' Organization.

A bamboo advocate, Under-Secretary Edgar Manda, President of the Rotary Club of Makati Central, said that bamboo is important for socio-economic development and ecology, which are seemingly being neglected and ignored. Bamboo is also known as a "carbon sequester" since 1 ha of bamboo plantation sequesters 12 tonnes of carbon dioxide each year. In watershed protection, Manda said that a bamboo plant typically binds 6 cm<sup>3</sup> of soil and yields six times more cellulose than the fast-growing pine tree.

Bamboo has a wide range of uses from its shoots to its rhizomes. Its waste materials can also be used to produce bamboo powder, dust for fuel, charcoal, bricks, fibreboard, paper, lumber and clothing.

Bamboo, the so-called "grass of hope", has various features that should be taken into account, according to Manda: bamboo grows more rapidly than trees – as much as 400 mm or approximately 16 inches per day. With a maturity of four to five years, multiple harvests are expected every second year up to 120 years. It can also easily be intercropped with vegetables. The establishment of a bamboo plantation requires a minimal capital investment. (Source: Philippine Information Agency [the Philippines], 25 January 2008.)



### Biodiversity key to fighting climate change

Scientists from Brown University have discovered that an ecosystem's productivity is directly linked to its diversity of plant species. The discovery has granted biodiversity new importance in the fight against climate change: the more productive the ecosystem the more carbon it captures. "It's a double whammy," Osvaldo Sala explained. "We not only are disturbing our planet by putting more carbon into the atmosphere, but we're reducing the ability of ecosystems to capture and store it." Sala is the director of the Environmental Change Initiative and the Sloan Lindemann Professor of Biology at Brown University.

The Brown University scientists conducted their study for six years in Patagonia. They divided an area into 90 plots and then began systematically to remove native species from each plot and chart the changes in the plot's productivity. Productivity dropped as species were removed.

The scientists believe that productivity is linked to the diversity of species because of "niche complementarity". In other words, in an intact environment each species has evolved its own niche without interrupting

those of other species. This harmony between species allows them to interact positively with each other and fully utilize the resources of a given space. Artificial landscapes proved far less productive than natural ones.

The findings appear to have important ramifications beyond plant species, since the high biodiversity of plants depends on non-plant species. Insects, birds and bats are major pollinators for plant species; some plant species depend on a single insect or animal species for pollination. Therefore, to have a truly productive ecosystem all of the region's biodiversity must be retained.

According to the study, "this result supports previous findings and also suggests that the effect of biodiversity in natural ecosystems may be much larger than currently thought". The findings give wildlife conservationists a new powerful argument for species protection. Many biologists believe that we are currently entering a mass extinction, entitled the Holocene extinction event. Estimations range from 20 to 50 percent of species becoming extinct within approximately one hundred years. The reasons are varied for species extinction but include climate change, habitat loss, pollution, bush trade, invasive species and the trafficking of species for medicinal products.

Citation: Pedro Flombaum and Osvaldo E. Sala. 2008. "Higher effect of plant species diversity on productivity in natural than artificial ecosystems". *Proceedings of the National Academy of Science in the United States of America*, 22 April 2008. (Source: Mongabay.com [United States of America], 29 April 2008.)

### Climate focus neglects biodiversity and poverty issues

Many efforts to curb climate change have paid little attention to conservation or to helping the world's poor, a think tank has warned. A paper by the International Institute for Environment and Development (IIED) said that bad policy threatened biodiversity and made poor nations more vulnerable. The authors called for projects tackling global problems to work more closely together in the future.

"Pro-poor, biodiversity friendly ways to adapt and mitigate climate change are clearly the way forward," said co-author Krystyna Swiderska. "But for them to work, local communities must be involved in decisions about how biodiversity is used.

Good governance and fair access to land and resources must be at the heart of these efforts." She warned that "bad polices" could accelerate biodiversity loss and increase the vulnerability of the world's poorest communities.

Ms Swiderska and co-author Hannah Reid wrote that poor communities heavily depended upon biodiversity for food, medicine and sustaining livelihoods. Protecting diversity would give these communities more options to adapt to a warming world, they added.

While global agreements, such as the CBD (Convention on Biological Diversity), the UN Framework Convention on Climate Change and the Millennium Development Goals, acknowledged the impact of climate change on biodiversity and poor nations, the authors said there were no shared or common goals to ensure that strategies did not conflict. "Policy-makers have focused on mitigating greenhouse gas emissions but biodiversity is also key," observed Ms Swiderska. "For centuries, traditional farmers have used the diversity within both domesticated and wild species to adapt to changing conditions." She said that greater recognition of local knowledge could help deliver results on a global scale. [Source: BBC News [United Kingdom], 18 February 2008.]

#### Chinese biofuel "could endanger biodiversity"

Beijing. Using China's forests and "idle land" to produce biofuels could pose a threat to biodiversity, experts warned at an international meeting. Spike Millington, chief technical advisor to the European Union-China Biodiversity Programme, raised the problem earlier this month (7 March) at the International Workshop on Biodiversity and Climate Change, held in Beijing, China.

In July 2007, China released its middle- and long-term plan for renewable energy. The plan encourages the development of non-grain biofuels, including cassava- and sorghum-based ethanol in northeast and south China, and *jatropha*-based biodiesel in southwest China's Guizhou, Sichuan and Yunnan provinces. But, according to Millington, the region of southwest China targeted coincides with the home of the last remaining intact natural forests in China. He added that the degraded forests in the area also play an important role in biodiversity. Liu Xuehua, an associate professor of environment at Tsinghua

University said that land classed as idle is often not empty land, and can be home to diverse undomesticated species.

To cope with potential risks, Millington recommends that environmental assessment is carried out to distinguish high biodiversity areas from low biodiversity areas that are suitable for *jatropha* trees or other biofuel plants. [Source: SciDev.Net Weekly Update, 17-24 March 2008.]

#### International Alliance will unite the forest peoples of the world

The forest peoples of the world are joining forces in order to have access to resources deriving from the thriving green market, based on future mechanisms for the reduction of emissions from REDD, to be created through the UN Climate Convention. They want to use this opportunity so that their fundamental rights may be fulfilled: the right to land and to natural resources and respect for their traditional livelihoods.

Gathered in Manaus, in the heart of the Brazilian Amazon, the participants of the Peoples of the Forest and Climate Change Workshop have just set the basis for an international alliance, based on a Brazilian model with a 20-year long history that brings together indigenous peoples, extractive producers and riverine populations, inspired by the efforts of Chico Mendes. The new alliance will function as a network and transnational forum for the exchange of experiences among forest populations and mostly for influencing international discussions on climate, deforestation and mechanisms for the reduction of greenhouse gas emissions.

The International Alliance of Forest Peoples was unanimously approved on 4 April by the 11 countries that signed the Manaus Declaration: Brazil, Colombia, Costa Rica, Ecuador, Guyana, French Guiana, Paraguay, Nicaragua, the Bolivarian Republic of Venezuela, Suriname and Panama and by the members of delegations from Africa (Democratic Republic of the Congo) and Asia (Indonesia). The document was approved with the participation of UN observers and observers of Non-governmental Organizations (NGOs) from Brazil, the United Kingdom and the United States.

In spite of the differences in legislation regarding the use and conservation of forests that exist in these countries still hosting major extensions of rain forests, they share common problems and already feel the negative effects of climate change upon the planet in similar ways: severe droughts,

floods, changes in the natural biological cycles, with interferences in farming and fishing.

"The indigenous peoples need to understand exactly what is happening to their forests. They have always been forgotten when it is time for decision-making and the time has come for them to be taken into account because their ancestral knowledge on nature enables them to provide important inputs for the climate debate," said Yolanda Hernández, the indigenous representative of the Maya Kakchiquel people of Guatemala.

The differences that exist both within and among these countries may be better addressed in their quest for common solutions to ensure the worthy survival of the people and the conservation of forests, i.e. to maintain the environmental services required for the balance of the planet. "Therefore, the scenario provided by the REDD mechanism brings together the interests of forest communities and the interests of scientists, environmentalists and members of social movements throughout the world," says Paulo Moutinho, from the Amazon Institute for Environmental Research (IPAM). According to the coordinator of Instituto Socioambiental, Márcio Santilli, this is also an economic opportunity capable of changing the balance of forces on behalf of the acknowledgement of the territorial rights of the traditional and indigenous peoples. [Source: ForestNewsWire [press release] [Canada], April 2008.] ♣

#### CORRECTION: SAGO PALM (METROXYLON SPP.)

Unfortunately, during typesetting one line was omitted from the text in the first column of page 10 of *Non-Wood News* 16. The sentence should have read: "The two primary uses are for the production of edible starch and durable leaf thatch". In addition, in order to clarify the text in the box on Edible starch on the same page, the author has advised that: "This synopsis is for the lesser known species of sago palms found to the east and northeast of New Guinea and does not include the most important economic species *M. sago*".