An information bulletin on Non-Wood Forest Products

MAY 2012

24

ISSN 1020-3435

non-wood news

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EDITORIAL

This is my last issue of *Non-Wood News* as your editor so I am glad that it is such a special one! It is special because it highlights the exceptional partnerships we have made and the truly rich information that has been generated.

The first important partnership is with Rainforest Alliance, which is celebrating its 25th anniversary this year. Deanna Newsom, the manager of the Rainforest Alliance's Kleinhans Fellowship contacted *Non-Wood News* last year to see if we would like to be involved in their anniversary celebrations by highlighting the work of the Kleinhans Fellowships, which are two-year fellowships dedicated exclusively to research into non-wood forest products. The Special Feature in the present issue is a direct result of this collaboration, and includes nine original essays from researchers past and present who have been awarded such a fellowship.

The second partnership highlighted in this issue is the one with the Center for International Forestry Research (CIFOR) and People and Plants International. I was contacted by Patricia Shanley, Senior Research Associate at CIFOR, some years ago, to see how we could collaborate together to co-produce an updated English version of a unique publication that had then only been published in Portuguese. Its uniqueness lies in its emphasis on communicating scientific information and results in a way that non-scientists – for example, local people who have interacted with the scientists – can understand and use: a form of "respectful research". Our partnership culminated in the publication of *Fruit trees and useful plants in Amazonian life*, which was launched in December 2011 at a ceremony at FAO headquarters marking the close of the International Year of Forests with Patricia, who was lead editor of the publication, as the guest speaker. Her speech (which was truly inspirational and met with lengthy applause), together with extracts from the publication are featured in this issue.

The third partnership covered concerns the collaboration on edible insects with Wageningen University of the Netherlands, which led to the workshop – "Assessing the potential of insects as food and feed in assuring food security"– that took place in January at FAO headquarters. This was the first time that the many different actors in the sector came together to discuss the varied role of edible insects in food security issues. A report on the workshop, together with coverage on different aspects of edible insects – for example, food or feed – can be found in this issue.

NON-WOOD NEWS

is compiled and coordinated by Tina Etherington, FAO Forest Economics, Policy and Products Division. Language editing by Roberta Mitchell and Anouchka Lazarev; design, graphics and desktop publishing by Claudia Tonini.

Non-Wood News **is open to contributions by readers. Contributions are welcomed in English, French and Spanish and may be edited to fit the appropriate size and focus of the bulletin.**
If you have any material that could be included in the next issue of *Non-Wood News* for the benefit of other readers, kindly send it, before 31 August 2012, to:
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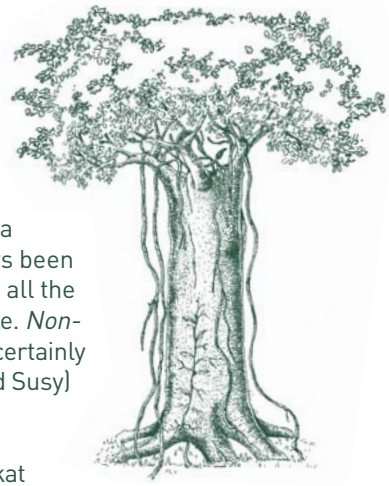


And this brings me to the last partnership – the partnership between *Non-Wood News* and you, its readers. After being involved in 21 issues of *Non-Wood News*, and having worked in FAO since 1978, it is time for me to "move on". I would like, therefore, to thank the many people with whom I have been in contact over the years, those of you who have kindly shared their research or written articles, those who have sent an interesting link or provided me with a copy of their latest publication – or those of you who have just sent kind words. It has always been encouraging to know that *Non-Wood News* has such an active readership. Thank you also to all the scientists and researchers who have willingly shared their viewpoints through the guest article. *Non-Wood News* has been a joy and a real privilege for me to produce because of you all and I will certainly miss that! Final thanks go to my great team (Roberta, Claudia, Anouchka, Deliana, Giulia and Susy) who have helped me over the years.

I would like to end by remembering the founder and first editor of *Non-Wood News*: Dr Cherukat Chandrasekharan (1933–2007). It was his recognition of the vital role and importance of NWFPs in the lives and livelihoods of many people worldwide that led him to create *Non-Wood News* in 1994 as a vehicle to raise awareness and disseminate the latest thinking from the world of NWFPs. The importance of NWFPs remains – as you, the readers of *Non-Wood News*, well know. I would like to close by wishing you all the best in the future.

Tina Etherington

Non-wood forest products (NWFPs) are goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests. Non-timber forest products (NTFPs), another term frequently used to cover this vast array of animal and plant products, also include small wood and fuelwood. However, these two terms are used synonymously throughout this bulletin. Other terms, such as "minor", "secondary" or "speciality" forest products, are sometimes used to keep original names and/or titles.

ECOLOGICAL, SOCIAL AND ECONOMIC SUSTAINABILITY: A RETURN TO AGROFORESTRY

Agroforestry has been the primary land management system for food, fibre, fuel and medicine production in the Pacific Islands for thousands of years. Traditional agroforestry systems throughout the tropics are models for sustainable production that preserve biodiversity, fulfil necessary ecosystem functions, provide wildlife habitat and conserve natural resources. Anyone who has lived in the Pacific Islands has also experienced that indigenous cultures are deeply rooted not only in individual crops but, more important, the worldview that all living things work together in an entirely interconnected universe. For example, a traditional Pacific Island agroforestry system may include breadfruits, bananas, coconuts, taro, sweet potatoes and many other traditional plants, which are all considered to be connected to each other as well as to soil, atmosphere, the ocean and so on.

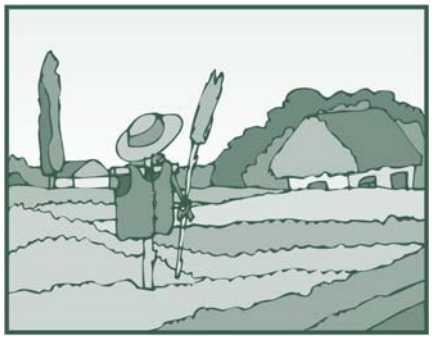
Over the past century, traditional agroforestry systems in the Pacific have been increasingly displaced by mechanized, chemical-intensive monoculture. This process – known as agrodeforestation – has occurred to a greater degree in island nations such as Hawai'i and Guam and to a lesser degree in places such as Samoa and Yap. As commercial interests, often foreign, direct island farmers towards single-species, high-input plantings, the agricultural knowledge of countless past generations is vanishing. Sadly and ironically, as the age-old knowledge behind indigenous Pacific polyculture systems is being lost, today's consumers, farmers and policy-makers are increasingly interested in sustainable agricultural systems. Sustainability solutions are often suggested that are devised by the same mindset that has nearly obliterated proven sustainable systems in many regions of the Pacific.

How can today's small family farms be ecologically, socially and economically sustainable? An approach that can work in many places combines traditional multistorey agroforestry and well-planned family business practices. The traditional practice includes three-dimensional space, time (crop successions) and biodiversity, which together can provide ecological sustainability by building soil, reducing erosion, balancing pest-predator populations, and much more. Socially, agroforestry systems can provide a range of culturally significant foods and non-wood forest products, e.g. medicines and craft materials, as well as spiritual places that are essential for rituals, healing and other practices.

Fortunately, family farms can exploit many commercial advantages that naturally extend from agroforestry systems. The inherent diversity of agroforestry systems leads to a potentially broad crop portfolio, allowing farmers to reduce the market risks of single-crop systems, distribute labour more evenly over the year, and derive income from different crops over short-, medium- and long-term time horizons after planting. Having various crops available throughout the year supports opportunities in a wide range of markets: wholesale, retail, local, export, etc., which can increase overall income. Agroforestry lends itself to trials of new crops and crop varieties. Enterprising agroforestry practitioners are well positioned to add value to their products through small-scale local processing, appropriate packaging and branding, and certifications (e.g. bird friendly, organic, etc.). Finally, farmers can reduce risk of losses by cultivating in diverse systems that are less prone to pests and diseases and buffer against the effects of climate change.

A return to agroforestry modelled on traditional systems holds promise for today's family farmers who are seeking the multifaceted benefits that agroforestry has provided for millennia.

The following two crop examples are excerpted from: C.R. Elevitch and K. Love. 2011. Farm and forestry production and marketing profiles: highlighting value-added strategies. *In* C.R. Elevitch (ed.). *Specialty Crops for Pacific Island Agroforestry*. Permanent Agriculture Resources (PAR), Holualoa, Hawai'i. http://agroforestry.net/ scps/strategies-highlights-7-crops.pdf/



Vaccinium reticulatum

***'Ōhelo* berry (*Vaccinium reticulatum*)**

Native plant domestication and variety selection. *'Ōhelo* berry is a small native Hawaiian shrub related to cranberry and blueberry. It is endemic to Hawai'i, i.e. found nowhere else in the world, but now being introduced into Oregon, United States of America. It had not been domesticated until recently. A project undertaken by the United States Department of Agriculture (USDA) has developed types both for berry production and for ornamental use. As a native plant, *'ōhelo* berry has unique appeal to chefs and others who are always looking for speciality ingredients with a Hawaiian character.

Description. The small shrub reaches 10–130 cm in height. Berries vary widely in colour from yellow to red to dull black.

Uses. The cranberry-like fruit is used primarily to make jam and jelly, but is also used in various dishes and baked goods. New markets for *'ōhelo* as an indigenous ornamental plant are also being developed.

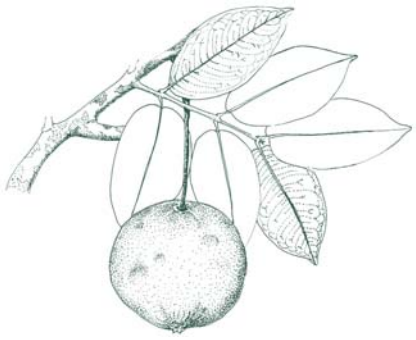
Agroforestry. Because *'ōhelo* berry has only recently been brought into cultivation, there are no examples of integrating the plant in agroforestry systems. However, because of its natural tendency to colonize disturbed or exposed drier lava sites, it has potential to be grown as an understorey crop in an open orchard on such sites.

Markets. *'Ōhelo* berry is usually processed into jam or jelly and sold in farmers' markets and grocery stores throughout Hawai'i. One market is higher-end restaurants that aspire to diversify their offerings by incorporating uniquely Hawaiian ingredients. In this case, the fruit is used both as a sweet and a savoury.

Adding value. *'Ōhelo* is sold unprocessed to hotel chefs and jam manufacturers, and

is usually sold as preserves on the retail market. A wide range of products incorporating the fruit can be envisaged: sauces, flavourings and fruit mixes. Its status as the only endemic Hawaiian fruit that is used commercially imparts a unique identity, which adds significantly to its value compared with similar exotic fruits.

Environment. *ʻŌhelo* berry is commonly found at 640–3 700 m on Maui and Hawaiʻi islands, but also grows on Kauaʻi, Oʻahu and Molokaʻi. It usually grows as a pioneer on exposed lava flows, such as alpine or subalpine shrubland. Hawaiʻi residents gather *ʻōhelo* berries when in season from the national parks and high elevations to process into jam, jelly and pie filling. Potential negative impacts of wild-gathering activities may include spreading of invasive weed species and competing for berries with the endemic nene goose (*Branta sandvicensis*).



Eugenia uniflora

Surinam cherry (*Eugenia uniflora*)

Chef-driven demand. Surinam cherry is a juicy, sweet-tart fruit generally considered "kids' food" for picking and eating immediately. In Hawaiʻi tasting trials of unusual fruits several years ago, chefs were attracted to the strong, resinous flavours of Surinam cherry and began developing unusual dishes highlighting it. By developing a market among chefs over a few years, Surinam cherry has increased in price from US$1.25/lb (0.45 kg) to 6.50/lb.

Description. Surinam cherry is a large shrub that can achieve heights in excess of 8 m, but because of its slow growth it can take decades to reach this height. It is often referred to as a tree. A member of the Myrtaceae family, the plant is related to guava, *jaboticaba*, mountain apple and other members of the genus *Eugenia*, which includes many edible species. There are two distinct variations found in Surinam cherry, a common red-coloured fruit and a less resinous dark purple to black, often sweeter fruit. The shrub produces fruit in full sun or partial shade.

Uses. Surinam cherry fruits are usually eaten at once, but are also often processed into jam, jelly and relish. The fruit can be pickled and the juice fermented in wine or vinegar. Some chefs use the fruit as the base for exotic curries. Whole fruit or pieces can be used in pies, puddings, salads and ice cream. The leaves contain a pungent oil that repels insects. Infused or decocted leaves have several medicinal uses.

Agroforestry. The tree can produce fruit well even in partial shade and, because of its small stature, it makes a good understorey tree. It is also planted in hedges which, when regularly pruned, can become dense and serve as living fences or boundary barriers in edible landscaping.

Markets. Surinam cherry sold as fresh fruit is generally harvested when fully ripe as the fruit then contains more sugar and less resin. The fruit is edible, somewhat firmer and less susceptible to damage when the colour is orange or orange-red, but has a more resinous flavour. Fruit harvested for processing can be picked as soon as it becomes orange. Chefs and jam manufacturers have expressed a desire for fruit at this stage.

Adding value. Because of the quick degradation of the fruit at ambient temperatures, the faster it can move from field to refrigeration, the longer its shelf-life. Fresh fruit packaged for the consumer should be in vented clamshell containers with no more than a double layer of fruit. Packed fruit should be even coloured and inspected carefully for defects and possible infestation. Fruit that leaks juice should be discarded or kept for processing. Fruit harvested for sale to processors should be washed. Freshly picked Surinam cherry chilled within an hour of harvest can maintain its integrity in the produce section of a supermarket for up to 14 days.

Environment. The Surinam cherry is a tropical plant that can be grown at sea level up to 1 500 m in elevation, in tropical or subtropical regions. It has a long taproot and can survive periods of drought. The plant thrives in most soils, but produces more fruit in deep loamy soil. It is intolerant of saline conditions.

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Craig Elevitch is an agroforestry educator based on Hawaiʻi Island and project director for Specialty Crops for Pacific Islands and Food-producing Urban and Rural Agroforestry Landscapes in Hawaiʻi.
(*Please also see pages 29 and 42–43 for more information.*) ♣

An infinity of forests lies dormant within the dreams of one acorn.
Wayne Dyer

NTFP RESEARCH – FUNDED BY THE KLEINHANS FELLOWSHIP PROGRAM OF RAINFOREST ALLIANCE

RAINFOREST ALLIANCE'S KLEINHANS FELLOWSHIP: REFLECTIONS FROM OVER 20 YEARS OF NTFP RESEARCH

Biennially since 1989, the Rainforest Alliance has offered two years of financial support to a graduate-level scientist whose research strives to understand and enhance the role of non-timber forest products (NTFPs) in community development and forest conservation. Funded through the generosity of Elysabeth Kleinhans, to date the Rainforest Alliance has awarded 12 Kleinhans Fellowships to a diverse group of researchers whose scientific rigour, curiosity and dedication to the well-being of forest-dependent communities is second to none. Post fellowship, these researchers have stayed remarkably active in the field of NTFPs and forest conservation.

As part of Rainforest Alliance's 25th anniversary celebration this year and as a tribute to Elysabeth Kleinhans, we have asked past Kleinhans Fellows to reflect on the current field of NTFPs and the changes they have observed since the time of their Kleinhans-supported research. Nine of the 12 past fellows were available to do so. The essays that they have written are as diverse as their authors and, it is our hope, will contribute to ongoing discussions of the current and future role of NTFPs in the fields of forest conservation and community development.

In his essay, *Wil De Jong* provides the historical context and argues that the positioning of NTFPs greatly depends on the broader forestry discourse in which it is immersed. He traces how the dominant forestry discourse changed from tropical deforestation in the 1980s to forest-based poverty reduction in the 1990s to climate change around 2007. De Jong warns that current REDD+ initiatives must be structured so that the gains achieved during the earlier phases of NTFP discourse – such as community autonomy and acquired rights to resources – are maintained and enhanced.

Amy Duchelle describes two new REDD+ projects that incorporate NTFPs and have been designed to improve local livelihoods in efforts to reduce emissions from deforestation and forest degradation. Located in a 300 000 km^2 region comprised of the states of Madre de Dios (Peru), Acre (Brazil) and Pando (Plurinational State of Bolivia), the first of these projects involves government support for the commercialization of diverse NTFPs as a way to increase the value of standing forests. The second project aims to increase the economic value of Brazil nut-rich forests through improved processing facilities, while simultaneously enhancing local governance through participatory forest monitoring and capacity building.

In her essay, *Carla Morsello* describes her concerns about the long-term viability of REDD+ and other schemes involving payments for environmental services (PES).

What was the inspiration for the Kleinhans Fellowship? In the late 1980s, Elysabeth Kleinhans felt that tropical forest conservation was focused too narrowly on trees – and not enough on alternative forest uses. After hearing a lecture by Rainforest Alliance co-founder Daniel Katz about the innovative ways that his new organization was working with forest owners, Ms Kleinhans woke late at night with an idea: she could help give forest-dependent communities alternatives to logging by supporting NTFP research. And the Kleinhans Fellowship for Non-Timber Forest Products was born.

Rainforest Alliance

While such programmes have some advantages over NTFPs – forest owners are only paid if forests are conserved and no labour-intensive training on trade and marketing is required – Morsello reminds us of some potential drawbacks of the PES concept. First, the indefinite monitoring requirements are costly and may ultimately restrict the ability of conservation organizations to conserve large tracts of land. Second, as forests are conserved, increasing opportunity costs in the face of lucrative competing land uses may make the conversion of additional forest lands cost prohibitive.

In her work on epiphytic bromeliads in the cloud forests of Mexico, *Tarin Toledo Aceves* has seen firsthand how lucrative and devastating competing land uses can be. There, the cultivation of epiphytic bromeliads to increase community income and reduce pressure on forests is challenged not only by sharp declines in bromeliad populations, but also by insufficient support to sustainable forestry operations and forest restoration. Toledo observes that a narrow focus on NTFPs alone will not be sufficient to conserve the cloud forests. However, recent changes in attitudes of community members give her hope that NTFPs might act as a trigger to prompt other activities geared towards cloud forest recovery.

As with epiphytic bromeliads, many of the primary forests on which rattan plants depend have been destroyed by competing land uses. As described by *Steve Siebert*, the loss of primary forests in Southeast Asia, combined with overharvesting and government refusal to recognize the rights of local rattan harvesters, has reduced the availability and use of this NTFP. Despite these challenges, rattan use and management persist in many areas, and the increasing demand for palm hearts may encourage smallholders to cultivate rattan for both canes and shoots.

A different kind of governmental barrier to NTFP production is described by *Catarina Illsley Granich* – one that, she argues, has dire consequences for the small communities in Mexico that have grown agave as an NTFP for artisanal mezcal production for centuries. In her essay, Illsley describes how three proposed Appellations of Origin designations will favour mezcals made from a narrow range of agave species that are grown in monocultures, and will ultimately create insurmountable barriers to market access for small mezcal producers. This, just as the demand for artisanal mezcals is rising both in Mexico and abroad.

One essay, however, provided concrete examples of government actions that have breathed new life into NTFP commercialization efforts. *Richard Wallace* describes how government investment in a Brazil nut factory in Acre, Brazil, has helped producers overcome many of the challenges that had hindered their earlier efforts, with current prices for unshelled Brazil nuts ten times higher than those in 1996. Similarly, a state-sponsored condom factory in the region has revived the rubber tapping industry, paying eight to 15 times the price per kg of rubber than rubber tappers received in 1996.

Research into the impacts of another realm of government – land tenure policies – is the subject of the research of current Kleinhans Fellow *Kennedy de Souza*. In his essay, de Souza presents the first results of his analysis of how different land tenure policies in Acre, Brazil, affect deforestation rates and the percentage of household income from NTFPs. He finds an inverse relationship between these two variables, with communities in which NTFPs contribute most to the total family income having the lowest deforestation rates.

The final essay in the series takes a very personal look at one researcher's experiences working with indigenous communities in the Brazilian and Peruvian Amazon. With keen insight and refreshing humility, *Campbell Plowden* distils 15 years of successes (and a few false steps) into a set of seven guidelines that anyone working with indigenous communities would do well to follow.

Do any themes emerge from the perspectives of these diverse scientists, whose combined research spans six countries and at least a dozen NTFPs? I believe they do.

First, the essays illustrate how the viability of any given NTFP as a tool for forest conservation and improved livelihoods can change quickly and dramatically depending on the context. Whether that context is the tenure system and its associated ease of access to NTFPs, the presence of government-sponsored processing facilities, lucrative competing land uses, or the presence of technical market barriers, the essays show just how difficult it is to generalize about the success or failure of an NTFP without reflecting on these immediate factors. Encouragingly, many of these factors lie within the sphere of influence of national governments and the conservation community. The question is whether the political will to influence them exists.

The essays also illustrate how the conservation and development toolbox – and the relative position of NTFPs within that toolbox – has changed over time. New initiatives such as REDD+ and other payment for environmental services schemes hold promise, although they are not without their own unique risks. Past fellows seem to agree that NTFPs can and should be incorporated into new approaches when possible, but that we must not forget what three decades of research and projects have taught us: community autonomy and rights to resources must be kept front and centre. Given the continued socio-economic importance of NTFPs for the lives and livelihoods of millions of people around the world, forgetting this lesson would be shortsighted indeed.

(***Contributed by:*** Deanna Newsom, Manager, Kleinhans Fellowship, Evaluation and Research Program, Rainforest Alliance, 665 Broadway, Suite 500, New York, NY 10012, United States of America. E-mail: dnewsom@ra.org)

THE NTFP WALK THROUGH FOREST DISCOURSES

Fellow: Wil de Jong
Fellowship years: 1991–1993
Fellowship topic: Alternatives to deforestation: forest management practices of Dayaks in West Kalimantan, Indonesia.

Non-timber forest products (NTFPs) became of particular interest in the late 1980s, but this was not the first time that foresters had paid attention to them. As early as the nineteenth century, foresters talked about "minor" or "secondary" forest products, referring to essentially the same thing: NTFPs. The adjective "non-timber" illustrates that NTFPs supposedly provide profitable alternatives to the logging of (mostly) tropical forests. In the prevalent discourse of the late 1980s, NTFPs also provided profitable alternatives to the conversion of forests to agriculture. The launching of the term NTFP and its conjectured potential to save tropical forests from destruction concurred with international concern for tropical deforestation. The tropical deforestation discourse shaped the international NTFP discourse in important ways: its focus, justification and the funding of related forestry projects.

Nowadays, evolving issues of societal concerns are often projected as "discourses", and (environmental) discourse analyses contribute to the understanding of how issues, including proposed solutions to environmental problems, are shaped by other discourses of larger magnitudes. An analysis of the evolution of NTFPs or related discourses shows how much these were influenced by dominant forest discourses.

Since the 1980s, when the NTFP discussion was imbedded in a tropical deforestation discourse, forestry discourses have evolved significantly. The focus on NTFPs appeared to decline in the early 1990s, when the community of experts started to question the high expectations of NTFPs. It was during this time that I conducted research on local forest management by Dayak groups in West Kalimantan, Indonesia – work supported by the Kleinhans Fellowship which I had received in 1991. After the fellowship, the focus on NTFPs declined in my work and among many researchers worldwide, because the dominant forest discourse had shifted. The tropical deforestation focus was replaced by a focus on forest-based poverty reduction. As a result, the discussions shifted from NTFPs to the contribution of the forest to rural incomes. It was still widely recognized that much forest income resulted from the harvesting of NTFPs, either for sale or personal consumption. In a sense, a discourse of community forestry replaced the NTFP discourse. One important change in that shift from NTFP to community forestry has been the focus on timber as a possible source of rural income. Some community forestry researchers have argued that the wider community forestry project will only work when communities focus on high-value forest products that have international market demand, and timber remains the most promising candidate.

The shifts in dominant forest discourse and related NTFP and community forestry discourses have strongly influenced how

people talk about the issues and, just as important, have affected field level praxis. During the early years of the NTFP discourse, practitioners invested much effort into the marketing of NTFPs, directly as harvested from the field, or after a process of transformation. Often these activities were carried out in so-called integrated development and conservation projects. Once the focus shifted to community forestry and timber, the scope of support activities expanded and began to include titling of communal forest lands, assuring a legal communal status, and building forest management and administrative skills, often under a banner of communal enterprises.

Since 2007, the dominant forest discourse has changed once more, this time to climate change mitigation. The conservation of tropical forests is now considered one of the most promising options to reduce a prospective increase in atmospheric carbon dioxide, the gas that traps heat in the world's atmosphere. This is to be achieved by encouraging the reduction of emissions from deforestation and forest degradation, which can include any sustainable forest management initiative and is called REDD+. This can also happen in locations where a zero intervention scenario would not include massive future deforestation; hence, there would be little net carbon gain.

REDD+ provides payments for maintaining carbon stocks by maintaining forest cover. Some observers have pointed out that NTFPs have been nearly absent from the discussions on forests and climate, and the same can be said for community forestry. There is widespread concern about how the shifting focus to climate change mitigation will affect local communities. Communities will have the opportunity to derive forest-based incomes from REDD+ payments; however, the mechanisms to make this happen, and the actors and interests involved, are perceived to pose significant threats to the local communities that were to benefit from NTFPs and community forestry. On the other hand, it can conceivably be argued that the accumulated experiences of NTFP commercialization and community forestry will be useful for implementing REDD+ initiatives that actually benefit communities and do not require them to relinquish the two achievements of the NTFP and community forest discourses: acquired rights and autonomy. (***Contributed by:*** Wil de Jong, Professor, Center for Integrated Area Studies, Kyoto University, 46 Shimoadachi-cho, Yoshida, Sakyo-ku, Kyoto, Japan 606-8501. Fax: 81-75-753 9602; e-mail: wdejong@cias.kyoto-u.ac.jp; www.cias.kyoto-u.ac.jp/)

MULTIPLE USE OF NON-TIMBER FOREST PRODUCTS AND ENVIRONMENTAL SERVICES: THE CASE OF THE MAP REGION IN SOUTHWESTERN AMAZONIA

Fellow: Amy Duchelle
Fellowship years: 2005–2007
Fellowship topic: Study of the production of Brazil nuts in the face of major landscape changes in the western Amazon.

Multiple-use forestry, which includes NTFPs, timber and environmental services, has gained momentum among researchers, practitioners and policy-makers as a way to promote forest conservation and livelihood development in the tropics. There have been a multitude of initiatives towards integrated management of NTFPs and timber, but less of a focus on environmental services in these multiple-use systems. Recent strategies (REDD+) to reduce carbon emissions through avoided deforestation and forest degradation and enhancement of carbon stocks have opened up new opportunities for integrated management of NTFPs and environmental services.

As a Kleinhans Fellow from 2005 to 2007, I conducted research on the conservation and livelihood outcomes of Brazil nut (*Bertholletia excelsa*) management by rural communities in the MAP trinational frontier region of southwestern Amazonia. The approximately 300 000 km^2 MAP region is comprised of the states of **M**adre de Dios, Peru; **A**cre, Brazil; and **P**ando, the Plurinational State of Bolivia. I focused my comparison on Brazil nut production in these three adjacent areas, because while resident communities have a similar natural resource base, the forest management regimes, property rights systems and specific livelihood strategies in the three countries are different. Many communities in the MAP region collect Brazil nuts, and the combined ecological and economic characteristics of this species give it the potential to promote forest conservation while contributing to rural livelihoods. My research results highlighted minimal deforestation and high forest income dependence in regional Brazil nut-producing communities. Also, I observed a much greater incidence of reported nut thefts in Pando, which likely resulted from the Bolivian producers' insecure property rights and extremely high income dependence on Brazil nuts. Finally, organic and fairtrade nut certification schemes were associated with post-harvest management and financial benefits, while Forest Stewardship Council certification promoted pre-harvest and tree health practices, despite its lack of market benefits.

Since my Kleinhans research, the increase in community timber management initiatives throughout the MAP region has highlighted opportunities and limitations associated with multiple-use forestry systems that are focused on Brazil nuts and timber. For instance, while Brazil nut regeneration may be unaffected by low logging intensities, complicated legal requirements and high operational costs may prevent communities from assuming authority over formal timber operations. Additionally, despite the positive perceptions of a diversity of regional stakeholders about integrated timber and Brazil nut management, policy and economic constraints, along with threats of logging damage to Brazil nut stands in Pando and Madre de Dios and reinvestment of forestry income into cattle in Acre, are notable barriers to adoption of this multiple-use forestry model.

More recently, the emergence of subnational REDD+ projects in the MAP region shows potential for multiple-use management of Brazil nuts (and other NTFPs) and forest carbon. There are two

interesting examples of REDD+ projects that have incorporated NTFP management in their plans to reduce deforestation and forest degradation. The first is Acre's state System of Incentives for Environmental Services (locally known as SISA), which was passed into law in 2010, and the second is a private-sector REDD+ project in Madre de Dios led by BAM (Bosques Amazónicos S.A.C.), which focuses on the conservation of Brazil nut concessions. In Acre's SISA, support for multiple-use forestry projects is explicitly included as a way to increase the value of standing forests. In one area with high potential for SISA activities, Acre's government has already invested in the cultivation of *açaí* (*Euterpe precatoria*) seedlings in local communities to simultaneously enrich degraded forests and promote livelihood development through the sale of this other regionally important NTFP. In the Chico Mendes Extractive Reserve, another important focal area for SISA, enhanced opportunities for commercialization of a diversity of NTFPs – including Brazil nuts – by local extractivists will likely be supported through SISA. In Madre de Dios, BAM is working with the local Brazil nut producers' federation to promote sustainable management of Brazil nut concessions, which face threats of illegal logging and forest fires, largely because of the development of the Interoceanic Highway through this Brazil nut-producing area. The BAM REDD+ project intends to increase the economic value of these Brazil nut-rich forests by installing a local nut processing plant and helping harvesters develop secondary products, such as Brazil nut oil and soap. Additionally, BAM intends to enhance local governance through participatory forest monitoring and building the capacity of the local Brazil nut producers' federation to promote forest conservation.

These experiences from the MAP region are clear examples of potential ways to bolster the promised conservation and livelihood benefits of NTFPs through linking their management to emerging markets for environmental services on a broader scale. It is yet to be seen whether such synergies can actually be achieved.

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NTFPs ARE DEAD, LONG LIVE NTFPs!

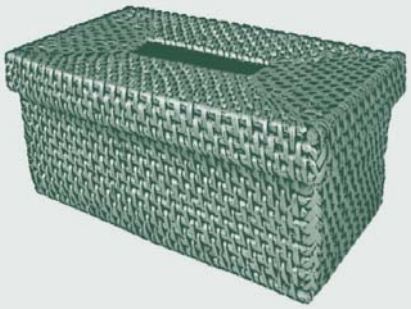
Fellow: Carla Morsello
Fellowship years: 2003–2005
Fellowship topic: Company-community partnerships for commercializing non-timber forest products in the Brazilian Amazon: drivers, problems and consequences.

Around 30 years ago, we thought we'd found a match made in heaven: we could promote forest conservation and local people's development through the trade of NTFPs. With NTFPs we could win on both sides, conserving forests for humankind while improving the well-being of poor forest inhabitants. So, why is the academic discussion of NTFPs dying while the trade in NTFPs is booming in some regions such as the Amazon?

NTFP trade as a conservation strategy has lost momentum as a win-win solution because, rather than heaven, it has become purgatory for both development and conservation. For development, accumulated evidence suggests that NTFPs often increase cash incomes and may work as a safety net, but they are unable to decrease poverty in a meaningful way, may generate inequalities and induce conflicts over resource use. From a conservation perspective, NTFP extraction can negatively impact the species exploited and their dispersers or predators, and may cause landscape transformations due to trail opening and road building. More important, people can adopt NTFP extraction without abandoning other land uses more harmful to forests, such as agriculture or timber extraction. NTFP trade can even serve as a stepping stone to capital accumulation before converting to other more harmful land uses.

For a while, the unconvincing results of NTFP trade drove a new wave of projects and research on strategies that could improve outcomes, such as adding value by product processing or certification, targeting niche markets, or establishing partnerships with companies to facilitate trade and increase the value received. For instance, findings from my Kleinhans Fellowship research on partnerships and product processing in the Amazon indicated that these strategies tend to be associated with increased total income, NTFP income, food consumption and gender equality, but are also associated with a decrease in leisure time and, in some cases, with less cooperation among households. Partnerships and product processing may further contribute to decrease deforestation but, on the contrary, are associated with higher rates of hunting. Other research has shown that most of these strategies are able to improve the outcomes of NTFP trade in economic terms, but some problems in the conservation domain often persist. Confidence in the ability of the NTFP approach to conserve forests has therefore shrunk further and, consequently, the interest in projects and the number of scientific articles on NTFPs have been steadily decreasing since 2005.

The reduced emphasis on NTFPs in the academic debate is, however, in direct opposition to the reality of NTFPs in some forested regions of the world. In the Brazilian Amazon, initiatives for commercializing NTFPs have proliferated in the last decade. Traditional Amazonian products such as Brazil nuts have gained new markets, as have a plethora of new NTFP-based products such as handicrafts (using various fibres to create baskets, bags and mats, and artisanal paper [e.g. *Orbignya phalerata* Mart., *Ischnosiphon* sp., *Heteropsis* spp.] and seeds for biojewellery [e.g. *Bagassa guianensis* Aubl.]); car parts (e.g. using natural rubber for seats and vegetable leather [*Hevea brasiliensis* (Willd. ex A. Juss.) Müll. Arg.]) and ice cream (e.g. made with Brazil nuts [*Bertholletia excelsa* Humb. & Bonp.], *açaí* [*Euterpe oleracea* Mart.], *cupuaçu* [*Theobroma grandiflorum* (Willd. ex



Spreng.) K. Schum.]). In the cosmetics and food industries, demand for herbal products has boomed and gone mainstream, no longer restricted to niche markets. For instance, ten years ago, handmade soaps from Amazonian vegetable oils could only be found in fairtrade or boutique cosmetic shops; today, most large companies produce at least one type of bath soap based on Amazonian NTFPs.

The mismatch between academic interest and on-the-ground reality has occurred because conservationists and academics alike are chasing a new fad to avoid tropical forest loss: payments for environmental services (PES). As with NTFPs long ago, these are believed to be a win-win strategy that avoids the main pitfalls of NTFPs. The logic of NTFP extraction is that trading depends on standing forests, so people's reliance on NTFPs will conserve forests for life. But people may trade NTFPs and, concurrently, sell timber or agricultural products. Moreover, teaching people how to trade takes more effort and resources than previously thought. PES, on the other hand, are a more direct and efficient way of achieving conservation because people benefit only *if* and *when* they conserve.

In a sense, the logic is straightforward. Yet, might PES become the new purgatory in 30 years if we do not learn from the lessons of NTFPs? NTFPs and PES share many characteristics. People's incomes rise, so they may accumulate and later switch to more harmful land uses. If you monitor their territory, there is a chance they will perform harmful activities somewhere else since the demand for products persists, simply displacing the problem. Moreover, PES have problems that are absent with NTFPs. For instance, because of their recurring costs and reliance on monitoring, PES are unlikely to be implemented in vast tracts of forested regions because the total cost would likely be out of reach of most conservation organizations. Yet this is exactly what must be done to prevent dramatic ecological and climatic disasters. Moreover, the costs of PES are ongoing and likely to increase in the future because the larger the area under PES and conservation, the higher the opportunity costs to conserve new areas. Each new economic crisis will thus imperil PES continuity.

We must therefore stop discarding one panacea for the next and start combining different approaches. We also need to go back to the field and understand the impact of the increased demand for NTFPs: are people still combining NTFP extraction with more harmful activities, or has the increased demand for a variety of NTFPs removed the incentives to do so? And what are the ecological impacts of extracting multiple NTFP products at the local level? There are still many questions to answer, and the fact that conservation science periodically coalesces around fashionable topics is counterproductive to biological conservation. (***Contributed by:*** Carla Morsello, Escola de Artes, Ciências e Humanidades, Universidade de São Paulo, Rua Arlindo Bettio 1000, CEP03828-000, São Paulo (SP), Brazil.
E-mail: morsello@usp.br;
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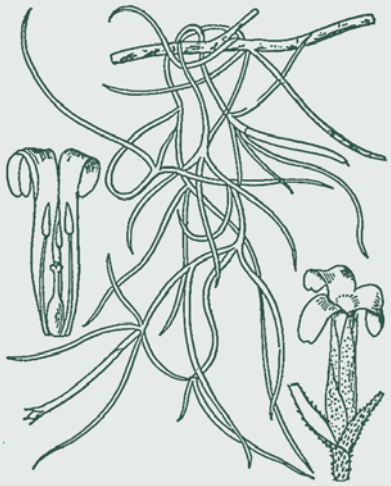

Tillandsia multicaulis

EPIPHYTE MANAGEMENT? THE ANSWER IS YES

Fellow: Tarin Toledo Aceves
Fellowship years: 2009–2011
Fellowship topic: Harvesting of epiphytic bromeliads: an opportunity for cloud forest conservation.

Cloud forests are of great strategic value for sustainable development because they play a key role in the maintenance of hydrological cycles and act as reservoirs of biodiversity. Despite their importance, these are among the most rare and threatened ecosystems globally, occupying only 2.5 percent of the total area of the world's tropical forests. The main threats to cloud forests are conversion to pasturelands and global warming. Given their location within a narrow belt in the mountains where clouds frequently cover the vegetation, cloud forests are unsuitable for timber production because of their relatively low productivity, low resilience, low wood quality and poor access.

Although the high species diversity of cloud forests means that most non-wood forest products (NWFPs) are unavailable in the quantities required for commercial purposes, there is an exception: epiphytic bromeliads, which are conspicuous, abundant and aesthetically attractive plants. The leaves and inflorescences of many epiphytic bromeliad species are sold in important international horticultural markets and have been used in traditional ceremonies in Latin America for centuries. From an ecological perspective, epiphytic bromeliads are an essential source of food and habitat for a great variety of animals within the canopy. They also contribute significantly to nutrient and water cycling in the forest. Unfortunately, bromeliad overexploitation threatens their survival in the remaining patches of cloud forest. In various Central American countries, bromeliads have been the subject of illegal trade, precipitating the depletion of their populations.

As a Kleinhans fellow, I examined whether the science-based management of epiphytic bromeliads in southern Mexico could simultaneously increase rural income, preserve local traditions and foster the conservation of the plants and the forests they inhabit. In order to establish harvesting potential, analysis of population dynamics is a key tool with which to determine whether the population growth rate (λ) of a given species is at or above its equilibrium value, i.e. whether the population is in growth, stasis or decline. Such studies are very useful for designing sustainable harvest guidelines for NWFPs, but are time consuming and complex: hundreds of plants within the forest canopy must be identified and monitored for a minimum of two years in order to obtain a representative picture of the population status. In my study, I found the populations of each of the three species evaluated (*Tillandsia multicaulis* Steudel. [*tencho trencita*], *T. punctulata* Schldl. & Cham [*tencho camarón*] and *T. butzii* Mez.) to be in decline. Recent studies in Mexico show that 15 out of 16 populations of epiphytic bromeliads analysed in cloud forests, including those of my study, are declining even in the absence of extraction. Whether climate

The logo depicts water in the centre, from which liquid ambar trees emerge, supporting different lifecycle stages of epiphytic bromeliads. Each leaf in the crown was designed by a different child from the community of Rancho Viejo.

change, fragmentation, illegal logging and/or forest disturbance are responsible, the outcome is the same: in their current condition, cloud forests cannot sustain viable populations of epiphytic bromeliads. If this is the case for the most abundant species, the less common ones are at even greater risk.

Given these pressures, can epiphyte management really contribute to cloud forest conservation? If the remnant fragments cannot sustain viable populations, what are the alternatives? My results show that because of the small contribution of seed production and early establishment to population growth, the reintroduction of seeds and seedlings into the forest canopy would have a very low impact in terms of population recovery. Most species have low rates of growth, making it very expensive to cultivate plants for reintroduction as adults – and this is before taking into account the practical challenges of working in the canopy. In the short term, one strategy for producing income while increasing forest conservation is the collection and utilization of fallen plants. One of the main causes of natural death in epiphytes is detachment from the support tree. I found that from the floor of a relatively modest forest fragment of less than 5 ha, thousands of plants may be recovered in good condition for commercial purposes with no impact on the population.

Ultimately, however, what is needed in the long term is the management and restoration of the cloud forest ecosystem as a whole. The challenge is complex, but an isolated attempt to manage one resource is only likely to fail. If epiphytic bromeliads are considered to be indicators of forest condition, then recovery of the whole system requires investment in the collection of native tree seeds for reforestation in the most fragile and degraded areas, fencing to impede livestock grazing within the forest, and the education and cooperation of the local landowners. The list is long and each of these activities requires a considerable investment. Profit from trade in epiphytes is currently insufficient to compete with other more lucrative enterprises such as construction and the illegal timber trade.

However, since I began working on this project, I have observed changes in the way the community views the forest, and that makes me optimistic that epiphytic bromeliads could function as a trigger to prompt other activities geared towards forest recovery. Forest owners no longer permit the illegal collection of plants by outsiders, students at the community school have painted bromeliads in a mural depicting the forest resources they value, and many community members have planted trees to rehabilitate deforested areas. If the goal is to contribute to the recovery of an enduring, respectful relationship between communities and forests, learning along the way and presenting alternatives is really the only option. Is there a role for epiphyte management in cloud forest? The answer is yes. (***Contributed by:*** Dr Tarin Toledo Aceves, Department of Functional Ecology, Instituto de Ecología A.C., Carretera antigua a Coatepec # 351, C.P. 91070, Xalapa, Veracruz, Mexico. E-mail: tarintoledo@gmail.com/)

THE CHANGING WORLD OF RATTAN

Fellow: Stephen F. Siebert
Fellowship years: 1989–1991
Fellowship topic: Rattan cultivation and management in hillside farms and forest preserve buffer zones of Kerinci-Seblat National Park, Indonesia.

Rattan, arguably the world's most important non-timber forest product, has been used by rural people for binding, basketry, home construction, food and many other domestic, non-market purposes for centuries throughout the Old World tropics. Rattan canes also fuelled the multibillion dollar international furniture, handicraft and mat-making industries during the twentieth century. E.J.H. Corner, one of the last of the great British naturalists, conveyed the socio-economic importance of rattan when he noted: "Ever since man had the means of cutting their stems, they have been exploited. ... rattans were so invaluable to village life that one can speak of the rattan civilizations of Southeast Asia".

Rattan is also ecologically important. It is often the most abundant plant on the ground as well as in the canopy of Asian tropical forests. In research supported by a Kleinhans Fellowship, for example, I recorded an average of 284 *Calamus exilis* with 1 910 m of harvestable cane per hectare in Kerinci, Sumatra and 38 *C. zollingeri* with 2 660 m of harvestable cane per hectare in northern Sulawesi, and these were only one of dozens of rattan species in each site. Quite simply, rattan is a defining component of moist tropical forests throughout Southeast Asia. In addition, insects, amphibians, reptiles and mammals use the long, sinuous canes of rattan as three-dimensional highways with largely unknown implications for population dispersal, foraging strategies, predator avoidance and countless other plant and animal interactions. Rattan canes

also bind trees to one another so stoutly that they alter tree fall and forest disturbance regimes, which in turn affect light, temperature and humidity conditions, plant germination, seedling establishment, insect and fungal populations, organic matter decomposition rates and other basic ecological processes, including forest succession. In addition, most rattans are rapid growing, disturbance/gap-associated species and many can reproduce vegetatively (i.e. coppice). If seeds or coppicing species are present, rattan can quickly re-establish in even small patches of disturbed forest.

The diverse economic, cultural and ecological values provided by rattan are associated with trees, particularly primary forests. However, primary forests are increasingly a memory in Asia as a result of decades of rapacious timber harvesting and forest conversion to oil palm and other export cash crop plantations. In addition, excessive cane harvesting for the furniture industry, government refusal to acknowledge or respect the traditional rights of local residents to rattan and other forest resources, and fortress conservation practices that separate humans from nature have reduced supplies of and access to rattan resources. At the same time, cultural change and modernization, specifically a desire for less arduous work and the loss of traditional ecological knowledge among young people, have transformed social life throughout the tropical world.

Nevertheless, rattan continues to be valued and used by local communities and the world at large. The ready availability of strong, durable and inexpensive or free canes encourages their use as cordage and in basketry, particularly as nylon, plastics and other petrochemical products become more costly. Rattan handicrafts continue to be widely produced for domestic and international markets and there is growing interest in rattan as a food.

Rattan shoots (i.e. palm hearts) have been eaten by rural people for generations. For example, wild shoots of *Daemonorops robusta* and *Calamus zollingeri* are eaten on a daily basis throughout much of rural Sulawesi, Indonesia, while *Plectocomia himalayana* collected from lowland subtropical forests is marketed throughout Bhutan. Even more impressive has been the emergence of commercial rattan shoot cultivation in mainland Southeast Asia. In Thailand and the Lao People's Democratic Republic, thousands of hectares of *C. viminalis*, *C. siamensis* and *C. tenuis* are cultivated by smallholders to supply growing domestic and international markets. The cultivation of shoots is attractive to farmers because they can be harvested on an annual basis after just one or two years, in contrast with a decade or longer to produce marketable canes. In addition, shoots can be cultivated more intensively than canes and do not require trees for support.

Despite rapid and profound socio-economic, political and ecological change, rattan persists and its use by rural and urban populations continues, albeit in very different ways from those described by Corner five decades ago. Many commercially important rattan species used in the furniture, handicraft and mat-making industries can be repeatedly harvested on a sustainable basis given at least some trees upon which to grow and the presence of locally appropriate and respected management regimes. Furthermore, growing market demand for palm hearts offers smallholders the opportunity to cultivate and manage rattan for both canes and shoots.

Harun, a rattan artisan from Kerinci, Sumatra, aptly captures the enduring importance of these remarkable plants when he notes that "rattan is like *sambal*; we prefer fish *sambal*, but if there is no fish, we will have vegetable *sambal*, if there is no vegetable, we will just have *sambal*, but we must have *sambal*". (*Author's note: sambal* is a fiery hot chilli paste consumed by the Kerincinese at every meal.) (***Contributed by:*** Stephen F. Siebert, Professor and Coordinator, International Conservation and Development, College of Forestry and Conservation, University of Montana, Missoula, MT 59812, United States of America. E-mail: Steve.siebert@cfc.umt.edu/) (*Please see pages 40 and 74 for information on Professor Siebert's new book* The nature and culture of rattan.)

Agave

AGAVES AS NTFPs AND MEZCALS IN MEXICO: AN OPPORTUNITY FOR SUSTAINABILITY?

Fellow: Catarina Illsley Granich
Fellowship years: 2001–2003
Fellowship topic: Development of a management plan for the production of mezcal from *maguey papalotl* (*Agave cupreata*) in peasant communities of the Montaña de Guerrero, Mexico.

Mezcal is a generic name given in Mexico to agave distillates. Traditional artisanal mezcals are part of Mexico's biological and cultural heritage. Their production is part of a gastronomic culture that began at least 11 000 years ago, when agaves were baked for food. Later, perhaps even in pre-Hispanic times, distillation of the agave's fermented juices created mezcals. Thirty-nine *Agave* species and close to 50 varieties are currently used for mezcal production in 24 states of the country.

Most *Agave* species are wild, succulent plants that inhabit temperate and semi-dry forests of the country. Others are cultivated varieties, differentiated from their wild relatives by the human selection carried out over centuries by diverse native peoples of Mexico. The extreme case of domestication is the blue variety of *Agave tequilana* Weber, used to make the most famous mezcal, tequila. This variety has been cloned for 200 years and is now cultivated in intensive monocrop systems that have high environmental impacts, including the eradication of other *Agave* species and varieties, deforestation and soil erosion. Also, because this variety contains no genetic variability, it is highly vulnerable to diseases and pests, leading to excessive agrochemical use and, ultimately, soil and water contamination.

The tendency in Mexico has been to promote the most commercialized and domesticated *Agave* species and their industrialized products, leaving the vast majority of agaves virtually invisible and relegated to poor, "backward" communities. Yet, over the past ten years, we have witnessed a sharp rise in demand for traditional, artisanal mezcal and recognition of the quality and amazing diversity of these distillates, now ranked among the best in the world. A set of terms and indicators has been established that allows for the differentiation and characterization of quality of the many mezcals.

Public policies related to mezcals have had controversial effects. Three Appellations of Origin (AO) have been declared, protecting only six *Agave* species in ten states. Barriers to markets have been created for mezcals from regions not protected by an AO. Most critically, only one AO may use the generic name "mezcal", preventing hundreds of producers in 19 states (who use 34 *Agave* species) from using a term with centuries-old historical and cultural associations.

At present, there are two legal initiatives under consideration that, if passed, would strengthen these barriers, putting traditional artisanal producers at a serious disadvantage in the marketplace and, in some cases, providing incentives for the eradication of species and varieties not under AO protection. Both initiatives seek to regulate the term "agave" for the exclusive use of producers under AO. They would also prohibit all other producers from using the set of terms and indicators that have evolved over the years to denote the characteristics of mezcal differentiation and quality. By banning non-AO mezcal producers from offering information to consumers, these regulations would create strong commercial advantages for the established AO producers.

There is much debate at the national and international levels over the impacts of these regulations on the rights of producers to access markets and the rights of consumers to precise and consistent information. Debate has also focused on social justice and the protection of the country's biological and cultural heritage. Sustainability has hardly been mentioned. Yet, especially in times of climate change, it should also be part of the discourse. Is it wise to foster an increasingly intensive monocrop cultivation? What are the alternatives? Are poor peasants capable of responsible management of their resources? Could these resources – which their cultures created and have guarded over centuries – trigger development processes that combine sustainability and social justice? What policies are needed to do this?

Between 2001 and 2003, a Kleinhans Fellowship allowed me to study wild agaves and the people who use them, researching basic agave biology as well as local knowledge and management, including practices, rules and organization. The Group for Environmental Studies has been working over the past ten years on a case study of one species, *Agave cupreata*, in highly marginalized communities in the state of Guerrero, one of the three poorest in the country. Research has shown that, at the community level, agaves are a common resource that is managed using practices that maintain stable populations and are articulated with strong rules and organizations to enforce them.

Research and a process of participatory monitoring over several years have led to the first community-based agave management plan. Later, in a farmer-to-farmer process, other communities from Guerrero, and more recently from other states such as Oaxaca, have come to learn from the project and in some cases have created their own management plans. The farmer-to-farmer exchanges have brought about discussions on the pros and cons of the different ways of producing agaves: as NTFPs, as elements of complex agrosilvopastoral systems, as monocrops. One conclusion is that productivity may be lower when agave is treated as an NTFP, but so are environmental costs; managing agaves as one of many resources in a diversified system decreases both economic and environmental risks.

These incipient initiatives, together with the growing number of bars and restaurants willing to buy differentiated, high-quality, limited production mezcals, show that, with proper coordination, it is possible to establish fair partnerships that benefit producers and their communities. With political will, agaves could sustain processes that promote food and water security in marginalized areas, and could contribute to the protection of the country's biological and cultural heritage. But, if the regulations now under consultation pass, it will be much more difficult to foster this type of development in the future. (***Contributed by:*** Catarina Illsley Granich, Biologist, Coordinator, Program for Peasant Management of Natural Resources Group for Environmental Studies, GEA Allende 7, Santa Ursula Coapa, Coyoacán, México DF 04650, Mexico. E-mail: catillsley@gmail.com; gea@laneta.apc.org/)

THE EVOLUTION OF A TRADITIONAL RESOURCE: NEW PRODUCTS AND NEW QUESTIONS FOR RUBBER TAPPERS IN THE CHICO MENDES EXTRACTIVE RESERVE IN THE BRAZILIAN AMAZON

Fellow: Richard Wallace
Fellowship years: 1995–1997
Fellowship topic: Building sustainable marketing models for non-timber forest products: a critical link to environmentally benign socio-economic development in extractive reserves in Acre, Brazil.

I first ventured into the Chico Mendes Extractive Reserve in Acre, Brazil in March 1996. It was still in the thick of the rainy season and there was a light drizzle. Accompanied by a handful of rubber tappers from the community of Rio Branco, my destination, I slogged through the shin-deep mud of *Estrada Petrópolis*,

the feeder road that rises and falls relentlessly as it heads north out of Xapuri, then veered on to a path that snaked through the forest to arrive at the community centre. I did my best to keep up. Even in the dry season, *Estrada Petrópolis*, with crevices often several feet deep, was nearly impassable by vehicles, and only tractors (and then rarely) could make their way up the road. After a five-hour-plus hike, I was exhausted on my arrival at Rio Branco.

With support from a Kleinhans Fellowship, I spent the next 18 months exploring the role of NTFPs in the lives of people living in the Reserve. Just six years after its creation, many families had abandoned rubber tapping because of the low price paid for rubber (*Hevea brasiliensis*) and CAEX, the rubber tappers' cooperative created in the late1980s to help them obtain higher prices for their products (and pay less for supplies), was struggling to remain financially viable. With CAEX and its in-forest trading posts experiencing capital problems, it was not uncommon to see itinerant traders with mule trains ambling through the forest laden with either dry goods to sell to households or rubber to take to the city. While these traders provided households with an outlet for their extractive goods, their prices (both buying and selling) were often seen as exploitive. Yet without them, households deep into the forest would have no market outlet.

Despite these challenges, rubber and, to a greater extent, Brazil nuts (*Bertholletia excelsa*), remained an important source of income for households and provided critical access to credit from itinerant traders. Many households spoke enthusiastically about identifying and developing other products for sale; however, relative isolation, low prices for products, and a lack of interest by state government leaders to creatively engage the extractive sector left many rubber tappers eyeing a future based on agriculture and off-farm labour.

Many changes have occurred since 1996 that have brought both great optimism to NTFP development as well as new challenges to regional conservation and development. The Acre "Forest Government", led by the Worker's Party, was elected in 1998 and implemented a number of policies aimed at promoting sustainable development and aiding the non-timber extractive sector. These included the establishment of a Secretary of Forestry and Extractivism; the enactment of

Bertholletia excelsa

a rubber subsidy payment called the Chico Mendes Law; the formation of COOPERACRE, a group of rural extractive cooperatives that infused new life into the extractive sector; and major investments in rural infrastructure, including the construction of feeder roads that enabled regular market access during the dry season. Follow-up research in 2001 and 2006 confirmed the continued importance of extraction for forest households for subsistence and the market, particularly for lower-income households. During these periods, I travelled to the community of Rio Branco by hired motorcycle or small pick-up, or hopped a ride on the municipal or state vehicle that travelled the feeder roads if not daily, at least on scheduled market days.

More recent changes are also transforming the extractive economy. Natex, a state-sponsored company that produces condoms made from locally extracted rubber, began operations just outside the city of Xapuri in 2008. Natex, with a contract to sell 100 million condoms to the Ministry of Health per year, has breathed new life into the rubber sector with many returning to tap rubber; approximately 500 Reserve families now extract and supply latex – the raw material used to make rubber – to the condom factory. Supported by a state subsidy for liquid latex production, households selling to the factory receive R$7.80/kg of latex. In comparison, in 1996 nearly all households received between R$0.50 and1.00/kg of latex. The factory itself employs approximately 180 workers.

Price increases are also evident in the Brazil nut sector. In 2011, the price for 12–14 kg of unshelled Brazil nuts (called a *lata*) reached approximately ten times that of 1996. The Xapuri Brazil nut factory, financed by the state and now managed by COOPERACRE, seems to have overcome the many sourcing, transport, processing and market challenges encountered by CAEX in the 1990s.

The resurgence of the rubber and Brazil nut economies suggests that with state support, new market opportunities can be developed that can reinforce traditional cultural activities, raise forest household incomes and boost urban employment (both managerial and labour jobs) while conserving the region's forests. Undoubtedly, forest families in these economies are also supporting urban enterprises as they make purchases in more accessible cities.

However, a number of important parallel questions also emerge. With increased returns from rubber and Brazil nut sales, how are households investing income and what are the implications of these investments for future development and conservation in the Reserve? What are the sociocultural implications of a resurgent extractive sector now coupled with increased cattle production and plans for community timber management in the Reserve? What other NTFPs present opportunities for Reserve households as COOPERACRE expands its operations to processing locally extracted fruits, such as *açaí* (*Euterpe precatoria*) and *cajá* (*Spondias mombin*)? And what will happen if a state government is elected that is less inclined to support the extractive sector and reduces subsidies and infrastructure investments in feeder roads, transport and factories? The changes in the non-timber forest economy in Acre make it both an exciting and critical time for research in the Chico Mendes Extractive Reserve.

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Cajá

DIVERSE PEOPLE, MULTIPLE STRATEGIES AND DIFFERENT OUTCOMES: A LONGITUDINAL ANALYSIS EVALUATING THE EFFECT OF NTFPs ON FOREST CONSERVATION IN AMAZONIA

Fellow: Kennedy de Souza
Fellowship years: 2011–2013
Fellowship topic: Working towards cooperative non-timber forest management: integrating economic, institutional and ecological analysis to balance community livelihoods and forest conservation in western Amazonia.

The Brazilian Amazon is not only one of the most biodiversity-rich biomes in the world, but is also home to thousands of people who depend on its resources to subsist. NTFPs are critical to rural livelihoods in the region. Over the past decades, local communities have consistently attempted to manage their forests and meet their economic needs by combining a set of NTFPs. However, in the state of Acre, the rate of deforestation of community-owned lands tripled between 1990 and 2010. To what extent have NTFPs led to reduced forest conversion among these communities? How do the incomes from NTFPs and deforestation relate to one another? How does this relationship change across land tenure arrangements and over time? These are critical aspects in the ongoing debate of the future of conservation in the region. With support from a Kleinhans Fellowship, I combine longitudinal data representing diverse land tenures together with economic and remote sensing/GIS methods to provide some insights on these questions.

This study examines the linkages between NTFPs and forest change in three different land tenure arrangements. The first is extractive reserves (ER), which are federal lands collectively managed by rubber tappers under concession regimes. Concession holders combine Brazil nut harvesting with the extraction of rubber, oils, seeds and herbs to support their livelihoods. Logging is prohibited in ER, and crops and cattle are limited to family subsistence. The second tenure arrangement I examine is agro-extractive reserves (AER), which are lands under a common property regime and governed by a local association. While timber management is allowed in these areas, inhabitants also include NTFPs, crops and livestock in their land uses. Third, I examine agrarian colonization settlements (ACS), which are privately owned lands. Cattle and crops are the main activities practised by inhabitants of these areas. However, as deforestation has increased, residents of ACS have attempted to expand the economic importance of NTFPs as a way to conserve their remaining forests.

In my research, seven communities, which represent these three land tenure policies, are compared over a 20-year period to evaluate how NTFPs, household economics and forest conservation are linked to one another. The communities are located in the state of Acre (western Amazonia) and include one ER (Chico Mendes), three AER (Porto Dias, São Luis do Remanso and Cachoeira), and three ACS (Peixoto, Humaitá and Boa Esperança). Taken together, approximately 9 000 people live in these seven areas and manage almost 2.95 million acres (approximately 1.194 million ha) of forests. Landsat images for 1990, 1995, 2000, 2005 and 2010 are being used to determine how land-use strategies have affected forest cover. Longitudinal socio-economic data were collected from approximately 300 families – a sample of the population for the seven areas – in 1996, 2005 and 2010. Econometrics and landscape ecology analyses have been combined to identify how family income varies within and across community categories and how this variation relates to forest cover change. A spatial econometric model was developed to illustrate the importance of NTFPs to counteract the human pressure to deforest under different policies.

Results illustrate the importance of NTFPs in the protection of local forests. My model estimates that as deforestation increases, the economic importance of NTFPs in the total family income decreases. In the Chico Mendes ER, where NTFPs provide almost 50 percent of residents' total income, deforestation rates were lowest (>5 percent of the total area). In contrast, while the economic importance of NTFPs among families is relatively lower in AER and ACS areas, deforestation is more intense. I found that even though deforestation tends to increase in AER communities, the forest conversion rate declines in areas where NTFPs have been economically more important. Most important, the model suggests that in ACS areas, which had the highest percent of deforestation over the period (18–70 percent of the total area), NTFPs had no significant importance in family income.

Like other researchers, I have found that deforestation is occurring in all land tenure systems. However, I do not support the contention that deforestation is an inevitable Amazonian tragedy; rather, my findings reaffirm the strategic importance of NTFPs for the future of forest conservation in the region. ER continues to be a worthy conservation policy and its elimination, when compared with colonization settlements, might contribute to increased deforestation in the state of Acre. Results for AER indicate that any policy or resource use strategy based on a single product (e.g. timber) tends to fail in its attempt to protect local forests and livelihoods. Diversification of families' economic sources must be an inevitable piece of the solution.

In fact, a hybrid resource management scheme might be the best approach in reducing forest degradation and supporting the economic welfare of communities in Amazonia. For example, in Cachoeira AER, where inhabitants have always combined multiple products in their resource strategies, the contribution of NTFPs to total family income increased from 19 to 52 percent between 1996 and 2010. Herein, from 2005 to 2010, I found a situation of reforestation, with total deforestation declining from 8.2 to 5.1 percent of its total area.

However, the picture is even more complicated. Which products are economically viable? How do profitability and costs vary within and across communities? How do these aspects affect land use and land cover change? Moreover, economics alone do not explain how people successfully or unsuccessfully manage their resources. Institutions and social and cultural attributes are equally important. In the next months, I will return to these Amazonian communities with the goal of presenting the results of this study. I will use participatory methods and linear programming modelling to plan how families can diversify their land-use strategies. Working with local resource users, grassroots organizations and government agencies, a number of land-use management plans will be developed. Resource users and community leaders will be trained to implement, monitor and revise these plans. State agencies and cooperatives will be involved as strategy for influencing public policies. (***Contributed by:*** F. Kennedy de Souza, Indiana University, School of Public and Environmental Affairs, Anthropological Center for Training and Research on Global Environmental Change, 701 East Kirkwood Ave., Student Building, Room 331, Bloomington, IN, United States of America 47405. E-mail: fksouza@imail.iu.edu/)

copaíba

THE HUMAN SIDE OF NTFP RESEARCH AND DEVELOPMENT

Fellow: Campbell Plowden
Fellowship years: 1997–1999
Fellowship topic: The ecology, management and marketing of non-timber forest products in the Alto Rio Guamá Indigenous Reserve (eastern Brazilian Amazon).

I studied five different NTFPs with the Tembé Indians in the Brazilian Amazon for my doctoral research with support from the Kleinhans Fellowship and hoped my work could identify new sustainable sources of income for the community. These products were *copaíba* oleoresin, *titica* vines, *breu* resin, *andiroba* oil and *amapa* latex. Graduate school well prepared me to sample forest plots and analyse the results with statistics, but I also had to learn how to install solar panels, avoid snakes, teach field assistants to count, cope with sickness and dodge webs of native politics. My work improved my understanding of these, but it also showed that sustainably harvesting NTFPs for profit is elusive because plants are often too rare, too fragile, spoil too quickly, produce too little, or take too long to process for the price available in local markets. I also learned that it was easier to deal with the scientific challenges of the field work than the social ones in the village.

My first summer studying *copaíba* in Tekohaw village was like a honeymoon with the Tembé, and they warmly welcomed my wife and two children when they came to live with me there for a year. As my research progressed, I hired dozens of men as field assistants, provided first aid and some medicines, loaned out tools, bought or traded extra goods for handicrafts, took family photos, and taught evening maths and science classes. In trips back home, I collected donations and sold handicrafts to help fix community boats, publish a collection of traditional chants, and sponsor a land rights project.

I wanted to be both a good researcher and a good citizen in the community that called me *Zu'izu* ("white frog") and seemed to have adopted me. Over time, though, this relationship eroded and eventually broke. I enjoyed being the person helping the villages and lost some vital measure of humility. When I offered an opinion in a public meeting that differed from the one asserted by a powerful young leader, I was quickly reminded I was still a guest and shouldn't have presumed to have the status of an elder. Failing to discuss all of my activities often with the whole community led to misunderstandings about my research and questions about my integrity. I began as a colleague to men who first walked with me in the forest and gradually became more of an employer when sickness and managing multiple studies kept me more in the village. People from Tekohaw, and other Tembé and Ka'apor villages who didn't work with me, resented that I couldn't provide equal benefits to all. Mistrust and rivalries between leaders and communities ultimately spilled on to me and forced my departure.

My time with the Tembé and subsequent work with other communities in Peru taught me several lessons about developing NTFPs in communities. First, I believe people can earn more money transforming NTFPs into value-added products than selling them as raw materials. This requires building capacity and commitment in the community to tasks such as sustainable harvest, making products with consistently high quality, and taking responsibility for management and

marketing. An outside party assisting this process also needs to follow certain guidelines: (i) clearly specify the goals and methods of the enterprise; (ii) develop and periodically review agreements about what each partner will give and expects to receive; (iii) listen carefully and develop a dialogue with the whole community, not just a few leaders; (iv) act with integrity (don't make promises you can't keep); (v) act with patience and perseverance, knowing you can't achieve long-lasting results in a short period of time; (vi) respect peoples' different points of view, culture and aspirations; and (vii) don't try to meet all the needs of the community on your own – only do what you can do well and work with trustworthy allies whenever possible.

I am now trying to follow these principles in my work with the Center for Amazon Community Ecology, which I founded in 2006. We strive to blend science, traditional knowledge and creativity to support conservation and local development with forest-based communities in the northern Peruvian Amazon. We first studied the ecology and sustainable harvest of copal resin (from Burseraceae trees) in a protected forest reserve on the Ucayali River. In 2009, we began assessing copal tree and resin abundance with a Bora native community along the Ampiyacu River and are now distilling resin samples with the goal of producing an aromatic essential oil that the community can sell to fragrance companies. We also work with artisans in this and two other watersheds to develop and market innovative handicrafts made from *chambira* palm fibre, natural plant dyes and rain forest seeds. These items include beautiful baskets, belts, bags, dog collars and leashes, guitar straps, Christmas tree ornaments, trivets and jewellery. We pay the artisans an agreed

price upfront and return 20 percent of the proceeds from our craft sales to the community to fund health, education and/or conservation needs of their choosing.

I have avoided many of the pitfalls I experienced with the Tembé, largely by entrusting much of our work with native communities to a capable Peruvian project manager who has visited our pilot project in Brillo Nuevo once a month for two years. She works closely with a local coordinator elected by the village, provides updates and consults with whole village assemblies, rotates the men who work as field assistants on a monthly basis, regularly meets with officials from the federation that represents all native villages in the area and sits on the management council of the regional conservation area. Yully's visits to the area have been frequent enough for the community to learn to trust her (and our organization), but not so long that she gets pulled into every local village drama. We have neither promised nor created an economic boom with our craft purchases, but the number of women artisans who work with us in Brillo Nuevo has grown from 12 to 29. New artisans joined us last year when we expanded the project to three other villages; this now gives us a base with each of the four ethnic groups in the area.

To be sure, we have encountered many challenges – some frustratingly familiar and others that are new. Artisans used to operating in an environment where demand for their products is very limited tend to view even their neighbours as competitors. Our perplexing task has been to show them that they can all make more money if they all make high-quality handicrafts. This means that the most skilled artisans need to help the beginners improve their weaving and share their knowledge of plant dyes. They also need to learn how to exchange constructive criticism with their peers. These are the types of cultural challenges that can make the difference between making crafts as an occasional source of income and transforming this activity into a viable means of supporting a family without burning extra forest for cash crops, engaging in illegal logging or processing coca leaves for the drug trade. We are not going to solve these problems overnight, but I feel confident that paying attention to the human side of NTFP development will at least give us a chance to do so.

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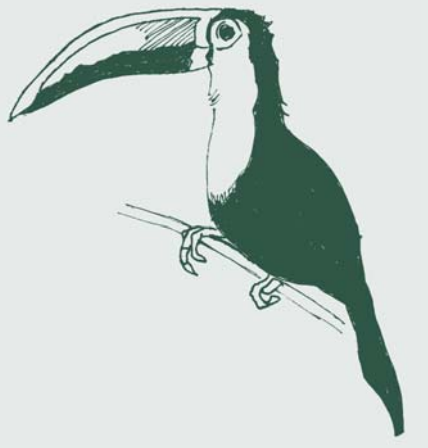


Work joyfully and peacefully, knowing that right thoughts and right efforts will inevitably bring about right results.
James Allen

"Non-Wood Forest Products (NWFPs) consist of goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests."
«Les produits forestiers non ligneux sont des biens d'origine biologique autres que le bois, dérivés des forêts, des autres terres boisées, et des arbres hors forêts.»
«Productos forestales no madereros son los bienes de origen biológico distintos de la madera derivados de los bosques, de otras tierras boscosas y de los árboles fuera de los bosques.»
(FAO's working definition)

AMAZONIAN SEEDS USED TO MAKE JEWELLERY

At the Macapá fair, in the Brazilian state of Amapá, a small, elderly woman carefully appraises a variety of seed necklaces for sale. She shows most interest in one in particular. The craftsperson, Delomarque Fernandes, comments that the large, central bead is *uxi*. Delighted, the woman places her weathered hand firmly over the *uxi* pit and proclaims, "Then this necklace is mine, as *uxi* has a special power!".

When the endocarp of an *uxi* (*Endopleura uchi* [Huber Cuatrec]) is cut through the middle, various star shapes are revealed. By cutting the seed into thin discs these can be used as beads to make attractive necklaces, earrings and belts.

In Belém, Delomarque makes beautiful jewellery (necklaces, rings, bracelets and earrings) using parts from various regional trees. The palm trees she uses are *tucumã, inajá, babaçu, dendê, murumuru, mucajá, jupati, mumbaca, açaí branco,* regional *açaí, bacaba* and coconut. In addition to palms, Delomarque likes to use *uxi, uxirana, tento, cedro* and Brazil nut. She says: "The *jupati* is our discovery, no-one worked with *jupati* or *uxi* before. It's a marvellous discovery that makes unique pieces".

Some small Amazonian seeds, such as *açaí*, are being purchased in bulk at low prices and shipped to São Paulo to be industrially processed into jewellery. But jewellery from hard-to-work, unique fruits such as *uxi* and *jupati* are still hand crafted in Belém. (*Source*: FAO, 2011. *Fruit trees and useful plants in Amazonian life.*) (*Please see page 76 for more information on* uxi.)

BIOPROSPECTING/ BENEFIT-SHARING OR BIOPIRACY?

Kenya: use the law to protect traditional knowledge

I sat through an interesting discussion on bioprospecting *vis-à-vis* protection of indigenous rights. Most people took the view that local communities lose in terms of revenues and opportunities of commercially exploiting the bioresources to larger corporate and foreign entities. It is alleged the big firms exploit traditional knowledge and obtain revenues and royalties from patenting information that does not belong to them.

This may seem to be the case but a quick analysis of the law shows that the state does indeed protect local communities from such exploitation. The Constitution expressly protects indigenous communities and the environment. It is enshrined in the Bill of Rights that every Kenyan citizen has a right to enjoy the environment and a right to have it protected for the benefit of future generations. Article 69 of the Constitution ensures protection of indigenous rights by imposing an obligation on the state to ensure sustainable exploitation of natural resources and equitable sharing of benefits. The article also provides for the protection of intellectual property in indigenous knowledge.

Even before the new Constitution, there were laws to protect indigenous communities from exploitive bioprospecting. The Environmental Management and Coordination Act of 1999 contains provisions in this regard. Under Section 50, the Authority shall prescribe measures to ensure protection of biodiversity and specifically provides for the protection of indigenous people's rights. Therefore, the indigenous community is adequately protected under statute from illegal bioprospecting.

Many potential bioprospectors engage the local community in the project and also set out the benefits available to the locals, including building of schools and other infrastructure. The Constitution makes it easy for a member of the community to challenge the prospecting activity on the grounds that the project does not guarantee equitable distribution of resources.

It has been argued that many corporate entities not only prospect illegally but go on to secure intellectual property rights in the form of patents, over illegally acquired information. Perhaps this might have happened in the past, but before a person is awarded a patent he/she must prove that there was an inventive step and the idea is new. Therefore, bioresources cannot be patented. The only thing that can be successfully patented is an invention linked to a bioresource. (*Source*: Cathy Mputhia, Business Daily, 15 January 2012 *in* Traditional Knowledge Bulletin.)

Biopiracy: depriving indigenous rights in Sri Lanka

The issue of biopiracy, commercially exploiting naturally occurring biochemical or genetic material, has once again become a talking point following the recent arrest of a group of six foreign "biopirates" in Kalpitiya. The group was taken into custody by officials from the Department of Wildlife Conservation (DWC) on 25 February. Vials containing DNA material and specimens of protected plants and animals were found in their possession. They were fined SR435 000 after pleading guilty.

The group, which included researchers and scientists, was part of Exo Terra, which styles itself as "the market leader in reptile products for the natural terrarium", according to its Web site. It is also engaged in a number of projects dealing with reptile conservation, it claims. However, Exo Terra also sends groups on "expeditions" to various countries, most of them in Africa. The group's latest venture, detailed at length on their Web site, is the "Sri Lanka Expedition".

According to Ranjan Marasinghe, Deputy Director of Law Enforcement, DWC, at the time of its arrest the group had several local frogs and a chameleon in their possession, in addition to DNA samples from a star tortoise, a protected animal. "It is illegal even for Sri

Lankans to capture such animals, let alone obtain DNA samples, without first obtaining a specific permit from the DWC," he said. Marasinghe explained that any foreigner who intends to conduct research on such animals in Sri Lanka needs first to submit a formal request to a research committee of the DWC.

"Among other things, the research committee is tasked with looking into what Sri Lanka stands to gain from such research. The last thing we want is for people securing patent rights to something discovered in our country and obtaining monetary rewards, while completely shutting Sri Lanka out of the process. Our country must also benefit," he explained. However, the Exo Terra group had made no such request and had no permits, he added. (*Source: Nation on Sunday* [Sri Lanka], 11 March 2012.)

Panama is first to benefit from fund to tackle biopiracy

The Nagoya Protocol Implementation Fund (NPIF) has announced its first beneficiary: a project exploring Panama's natural resources for use in the pharmaceutical and agrochemical industries. The Nagoya Protocol was agreed in October 2010 by 193 countries to tackle biopiracy and share the benefits of research into natural resources in an equitable manner. NPIF was set up by the UN funding agency, the Global Environment Facility (GEF), four months later, as a multidonor trust fund to help nations implement the protocol.

GEF announced on 12 January that Panama will receive US$1 million from NPIF to carry out a three-year project at the Coiba Island National Marine Park – one of the most important nature reserves in the country – located in the Gulf of Chiriqui. Researchers will collect samples of plants, fungi and algae that have symbiotic (mutually beneficial) relationships with corals, and bacteria in fresh- and seawater, according to Dario Luque, an officer at the country's National Environmental Authority (ANAM). The samples will then be analysed in the hope of discovering compounds to create new, natural insecticides or drugs to treat tropical diseases and cancer.

Other international partners are contributing the rest of the project's US$3.4 million budget, and will share its benefits. These include the United States-based University of California and University of Utah, and the United States National Institutes of Health, as well as private sector companies based in Japan and the United States of America.

As one of a number of partners, Panama will share the rights to any products that arise from the project. But the terms of the contract can be renegotiated "if biologically active compounds are obtained in the first year of the project". (*Source*: SciDev.Net Weekly Update, 30 January–5 February 2012.)

EUROPEAN FORESTS

Climate change could mean big changes for Europe's forests

Rather than wait until Europe's forests begin to die off, the European Union (EU) is taking steps to prevent such a catastrophe. It is supporting leading-edge research to help forest managers decide what kind of trees they should plant now, and what kind of pests and diseases should be monitored today, so they will not become a problem in a climate-changed future. "Forests are incredibly complicated ecosystems that climate change can disrupt in equally complicated ways," said Hervé Jactel of the French National Institute for Agricultural Research (INRA), leader of the EU-funded research project BACCARA.

Launched in 2009 with €3 million in support from the EU, BACCARA is a four-year project that is working to assess how climate change will affect the biodiversity and productivity of Europe's forests.

To remove some of the guesswork from managing Europe's forests, BACCARA's researchers are trying to predict how certain kinds of trees will fare in terms of growth and pest resistance in the decades and centuries to come. Among their findings, researchers have learned that the very complexity of forests might be the best insurance for coping with climate change. "Planting several different species of trees, for example, can protect forests from insect attacks better than planting just one type of tree," Jactel said. "So if climate change can cause harmful insects to thrive, this would be a good strategy to combat pests."

The economic stakes are high for Europe, whose forest industry is worth €25 billion a year and provides four million jobs. Totalling some one billion ha, Europe has more forest land than any other region in the world – from cork oak and cypress forests along the Mediterranean to the Scots pine taiga of Scandinavia and the mixed forests of the Caucasus. (*Source*: Teatro Naturale International, 19 February 2012.)

European tree species map released

The European Forest Institute, in cooperation with Alterra/Wageningen University, has released a set of 1 x 1 km tree species maps showing the distribution of 20 tree species over Europe. Basic dendrometric data were received for 260 000 national forest inventory plot locations from 17 countries to compile these maps. Forest plot data collected in a European-wide network (ICP Level I) were used to extend the available data for the remaining European countries. Furthermore, forest inventory statistics were applied. (*Source*: European Forest Institute, 10 December 2011.)

FOREST HEIGHT AFFECTS CLIMATE CHANGE

NASA says its scientists have helped create an accurate map of the height of the Earth's forests to help understand better the role forests play in climate change. The high-resolution map will also help researchers study how a forest's height influences wildlife habitats within it, while also helping them quantify the carbon stored in the Earth's vegetation, a NASA release said.

The map was created by scientists from NASA's Jet Propulsion Laboratory (JPL) in Pasadena, California, the University of Maryland and the Woods Hole Research Center in Massachusetts, using 2.5 million carefully screened, globally distributed laser pulse measurements from space.

"Knowing the height of the Earth's forests is critical to estimating their biomass, or the amount of carbon they contain," lead researcher Marc Simard of JPL said. "Our map can be used to improve global efforts to monitor carbon. In addition, forest height is an integral characteristic of the Earth's habitats, yet is poorly measured globally, so our results will also benefit studies of the varieties of life that are found in particular parts of the forest or habitats."

The map shows that, in general, forest heights decrease at higher elevations and are highest at low latitudes, decreasing in height the further they are from the tropics. (*Source*: UPI *in* Disaster News Network, 21 February 2012.)

FORESTS: MEDICINE FOR BODY AND SOUL

Imagine a doctor who, rather than advising the usual: "Take these pills daily for the next two weeks", says instead: "Take long walks in the forest daily for the next two weeks. That should get you back to normal". Okay, that's a bit fanciful. But it may not be too big a stretch.

There is a growing body of scientific research that suggests forests and other natural, green settings can reduce stress, improve moods, curtail aggressiveness and – possibly – even strengthen our immune systems.

Medical and health care costs are a skyrocketing financial burden in many, if not all, countries around the world. Policy-makers are increasingly looking at prevention as a cost-effective alternative to medical treatment. Anything that has the potential to reduce these costs – including long walks in the forest – deserves a long, hard look.

For example, numerous studies have shown that people recover more quickly and better after stressful situations in natural, green environments. Blood pressure, heart rate, muscle tension and the level of stress hormones are reduced in green environments and attention deficit hyperactivity disorder (ADHD) symptoms in children are similarly reduced when they play in green settings.

In a 2011 publication, *Forests, trees and human health*, 160 scientists from 24 European countries, with contributors from Asia, Australia, Canada and the United States of America have delved deeply into the question of whether forests and forest management help in the promotion of healthier lifestyles and improved mental health. The publication's focus is primarily on health priorities defined within Europe; however, it also draws on research from North America and elsewhere and has worldwide relevance.

While continued research is needed to further our knowledge in this area, it seems clear right now that anyone involved in making policy decisions in the medical, social, natural resources, forests or urban land-use planning areas cannot afford to ignore the relationship between a green environment and human health. (*Source*: Hannu Raitio, Coordinator of IUFRO Task Force for Health [DG Finnish Forest Research Institute, Metla] *in* IUFRO Spotlight, 3 February 2012.)

HEALTH AND NUTRITION: COMPLIMENTS OF THE FOREST

Throughout Amazonia, abundant benefits come from the tropical forest – fruit, fibres, wood, game and medicine, as well as ecosystem services such as pollination, seed dispersal, fresh air and clean water. The value of these services and of Amazonian products such as *açaí*, *bacuri* and *copaíba* is growing quickly. But it is often not possible for people who live in rural areas to bring forest products to the marketplace or to be compensated for conserving the forest's ecosystem services. Even without earning any money, however, people earn a substantial "invisible income" (see Box) from forest goods that enrich family health and nutrition. As one Amazonian mother says: "My family saves our meagre income by eating free from the forest".

Forest fruits provide essential nutrients, minerals and antioxidants that keep the body strong and resistant to disease. Rural families recount that during the season of forest fruits and nuts they do not catch colds, coughs or flu. Common deficiencies in the Brazilian diet, such as a lack of vitamin A, can be combated with forest foods. For example, *buriti* palm fruit contains the highest known levels of vitamin A of any plant in the world. *Açaí* fruit is being hailed as a superfood for its high antioxidant and omega fatty acid content.

Preventing disease through good nutrition can save income and lives. Even excellent sources of protein can be obtained from the forest for free. Brazil nuts are rich in a complete protein similar to the protein content of cow milk, which is why they are known as the "meat" of the plant kingdom. Families with game on their lands, particularly wildlife with high reproductive capacity such as rodents, can meet their protein needs without ever needing to set foot in a meat market. If a family member does become ill, cuts, fevers, skin ailments and coughs can often be treated with the remarkable array of Amazonian medicinal leaves, oils and barks. (*Source*: FAO, 2011. *Fruit trees and useful plants in Amazonian life*.)

INVISIBLE INCOME

To measure the importance of the forest in the household economy, 30 families in three communities along the Capim River in Amazonian Brazil weighed all the forest products they extracted during 1994.

The results showed that over the course of one year the vines, game and fruit that an average family extracted were equivalent to 25 percent of their average annual income. Expert hunters catch game for their families with a value equivalent to half the average annual income. Buying fruit, fibres and meat would be exorbitantly expensive for many rural families whose main source of income is the sale of *farinha* (cassava meal) and timber.

The primary forest provided 85 percent of the vines, 87 percent of the fruits and 82 percent of the game extracted.

It is advantageous that communities consider this invisible income before selling wood or forested land. They can negotiate with loggers to conserve areas of forest that have many useful tree species as well as conserving patches of forest that may serve as corridors for wildlife, linking them with other wooded areas. Villagers can also plan to preserve areas adjacent to the forests of neighbouring communities or ranchers, allowing for a higher biodiversity throughout. With planning, it is possible to manage the forest to extract wood as well as game, fruit, vines and oil. (*Source*: FAO, 2011. *Fruit trees and useful plants in Amazonian life*.)

IMPACTS OF SELECTIVE LOGGING ON NTFPs OF LIVELIHOOD IMPORTANCE

A recent paper has examined the potential for combining timber and NTFP extraction in the context of diversified forest management. Many tropical forests are exploited both commercially for timber and by forest-dependent communities for NTFPs. Divergences between these two uses may have significant implications for forest-dependent livelihoods.

The article gathers together existing examples of conflicts and complementarities between selective logging and non-timber uses of forest from the livelihood perspective. Additionally, it draws on three case studies from Brazil, Cameroon and Indonesia to examine by what mechanisms, and to what extent, logging impacts forest resources of livelihood importance, as well as considering how factors such as logging regime and forest management system may mediate such influences. By doing so, the authors aim to shed further light on a relatively unacknowledged issue in tropical forest management and conservation. Four specific mechanisms are identified – conflict of use and the indirect impacts of logging being those most commonly implicated in negative effects on livelihood-relevant NTFPs. Eighty-two percent of reviewed articles highlighted negative impacts on NTFP availability. Examples of positive impacts were restricted to light-demanding species that respond to the opening of forest structure and typically represent a small subset of those of livelihood value.

Despite considerable impacts on livelihoods, in all three case studies the authors found evidence to support the potential for enhanced compatibility between timber extraction and the subsistence use of NTFPs. Drawing on this evidence and findings from their review, they make specific recommendations for research, policy and management implementation. These findings have significant implications for reconciling timber and non-timber uses of tropical forests. (*Source*: L. Rist, P. Shanley, T. Sunderland, D. Sheil, O. Ndoye, N. Liswanti and J. Tieguhong. 2011. The impacts of selective logging on non-timber forest products of livelihood importance. *Forest Ecology and Management*, 268: 57–69 [2012].)

INDIGENOUS KNOWLEDGE OF FORESTS

Saving the forests with indigenous knowledge

For the Laibon community, a subtribe of Kenya's Maasai ethnic group, the 33 000 ha Loita Forest in the country's Rift Valley province is more than just a forest. It is a shrine. "It is our shrine. Our gods live there. We gather herbs from the place. We use it for beekeeping. It therefore forms part of our livelihood," said Olonana Ole Pulei, who is in Durban, South Africa, to represent his community at the 17th Conference of Parties under the United Nations Framework Convention on Climate Change.

According to Nigel Crawhall, Director of the Secretariat for the Indigenous Peoples of Africa Co-ordinating Committee (IPACC), different African communities have incredible indigenous knowledge that they use in the conservation of forests and biodiversity in general, and this should be recognized during negotiations in Durban.

Crawhall gave an example of how the Bambuti and Batwa pygmy communities, in the eastern Democratic Republic of the Congo, conserve the forest using traditional methods. Both communities depend on the biodiversity of animal life in the equatorial forests in order to survive. "Usually, they know how to identify particular trees that can be cut down in order to create a unique opening in the canopy, which attracts light in the closely packed Congo forests. The light then attracts animals, birds and insects, thus giving them an opportunity to hunt," Crawhall told IPS. This helps conserve biodiversity, as well as the forests, because such a method can only work if the forest canopy is intact.

In Kenya, the Maasai culture forbids any community member from cutting down a tree, either for fuelwood or any other purpose. People are also forbidden from interfering with the taproots or removing the entire bark of a tree for herbal extraction. According to their cultural belief, one can only use tree branches for fuelwood, and fibrous roots for herbs. If the bark of a tree has medicinal value, then only small portions of it can be removed by creating a "V" in the bark. The wound is then sealed using wet soil. "We believe that the soil helps in healing the wound on a tree. This is cultural, and we all believe that it is an abomination for one to injure a tree, and not help it heal," said Ole Pulei.

"All logging activities observed on Maasai land, including the destruction of the Mau Forest, are done by foreigners because the Maasai culture does not allow such activities. This is the indigenous knowledge that helps in forest conservation," Ole Pulei told IPS.

"We have several other communities all over the continent that coexist with forests. They include the Tuareg community in Algeria, Yiaku community in Kenya's Laikipia region, the Ogiek community also in Kenya, and the Kung community in Botswana among others," said Crawhall.

"We believe that African traditional ecological knowledge is the foundation for appropriate and effective national adaptation policies," said Crawhall. (*Source*: IPS, 9 December 2011.)

Indigenous knowledge complements scientific knowledge

Researchers working jointly with an indigenous tribe in Brazil wanted to help them calculate how many productive Amazon *tucumã* palms (*Astrocaryum aculeatum* G. Mey) were in their area. They used a mapping method with an excessively complicated name: "Post-exploratory systematized forest inventory with multiple beginnings". The researchers discovered that in an area where there should have been about 400 *tucumã* palms, their survey only located 16. While they asked themselves where the others were, a hard rain began to fall. As they stood around looking at each other and getting drenched, they decided that their method with the complicated name was worthless. One of them decided to inquire of the Indians:

"Do you know where the *tucumã* are?" The Indians swiftly proceeded to identify and map every *tucumã* palm in the project area.

The researchers planned to study how much each palm produced per year and multiply this amount by the number of *tucumã* palms in the area. The indigenous artisans could use this information to calculate how much material they would have to work with for the year and how much they could earn selling *tucumã* at the market. (*Source*: FAO, 2011. *Fruit trees and useful plants in Amazonian life*.)

NATURAL PRODUCTS CONFERENCE

The International Conference on Natural Products, which took place in Toulouse, France from 24 to 27 May 2011, gathered close to 100 participants from 21 different countries and was a great success. Highlights of the conference include the following.

- A group of pharmacists from Thailand showed that using natural plant extracts obtained better results against bacteria resistant to synthetic antibiotics when combining the antibiotics with plant extracts.
- Dr Benamara from Algeria gave a talk on how to use wood ash to fertilize plant production and return these elements to the soil, by growing algae in salt water amended with ashes.
- Dr Lila de Castro from Spain explained how antioxidants are particularly abundant in olive tree extracts and hold promising future applications, notably the use of olive mill waste waters in making natural preservatives for food packaging.
- Researchers from Germany and the Czech Republic demonstrated how the exact nature of natural products can be deduced from high-resolution mass spectroscopy.
- An engineer from Avignon, France, showed how plant extracts can be obtained with a new microwave extractor using no solvents but the downflow of the mist coming out of the direct microwave heating of the plants, which allows collecting of the natural oils by gravity, avoiding contamination with solvents.
- A business man from Toulouse, France, exhibited the cosmetics he had made from natural products with no artificial additives, but that had good preservation properties thanks to the natural oil combinations used.
- A chemist from the Pierre Fabre laboratories discussed the active mechanism of anticancer drugs extracted from the Madagascar *pervenche* (periwinkle).
- A chemist from Florida, United States of America, working on his thesis, explained how to grow fungi in order to isolate molecules made by the fungi to fight against toxic environments.
- Dr Chen from Boston discussed the benefits of eating nuts from the nutritional point of view; they present a better balanced composition than meat products.
- There were also other talks and posters illustrating the many diverse applications of natural products, which seem to be an endless library of molecules with extraordinary complexity and adaptability to harsh environments.

However, the pharmaceutical companies present explained that most industries are abandoning the search for active molecules from natural sources because there are too many components simply to identify the active ones that may in fact be combinations of substances difficult to isolate. Today, screening of artificial molecules still seems to be more expedient and profitable. The Food and Drug Administration (FDA) of the United States of America and official administrations want reproducible drugs, and natural products vary according to season, location of plant, age and atmospheric conditions, etc. (***Contributed by:*** Dr Patrick Sharrock (the main conference organizer), Département de Chimie, Institut Universitaire de Technologie Paul Sabatier, Avenue G. Pompidou, 81104 Castres, France. E-mail: patrick.sharrock@iut-tlse3.fr; www.naturalproducts.fr/2.html/)

NEW BIODIVERSITY MAP OF THE ANDES SHOWS SPECIES IN DIRE NEED OF PROTECTION

The Andes-Amazon basin of Peru and the Plurinational State of Bolivia is one of the most biologically rich and rapidly changing areas of the world. A new study published in BioMed Central's open access journal *BMC Ecology* has used information collected over the last 100 years by explorers and from satellite images that reveals detailed patterns of species and ecosystems that occur only in this region. Worryingly, the study also finds that many of these unique species and ecosystems are lacking vital national-level protection.

Endemic species are restricted to a specific area and occur nowhere else. These species are especially vulnerable to climate and environmental changes because they require unique climates and soil conditions. This makes them an ideal indicator for measuring biodiversity.

A multinational team from the United States of America, the Plurinational State of Bolivia, Peru and other countries mapped a wide range of ecosystems in Bolivia and Peru, from the wetlands of the Beni savannah and the Iquitos *várzea*, to the bone-dry xeric habitats of inter-Andean valleys, and the cool and humid montane forests along much of the eastern Andean slope. Over 7 000 individual records of endemic species locations for 115 birds, 55 mammals, 177 amphibians and 435 plants were combined with climate data (WorldClim), topography (NASA's Shuttle Radar Topography Mission [SRTM]), and vegetation (NASA's MODIS satellite sensor), resulting in species distribution maps, accurate to 1 km.

Disturbingly, the authors found that a total of 226 endemic species have no national protection and about half of the ecological systems have 10 percent or less of their range protected. Additionally, only 20 percent of the areas with high numbers of endemic species and 20 percent of the irreplaceable areas are currently protected.

Dr Jennifer Swenson, from Duke University, United States of America, who led the research said, "Biodiversity in the Andes is under threat from oil and gold mining, infrastructure projects, illegal crops, and many other activities. There is already evidence of species migrating upslope to keep up with climate change in this region. Conservation across the Andes needs urgent revising and we hope that our data will help protect this incredibly unique region". (*Source*: EurekAlert press release, 26 January 2012.)

NON-PROFIT ORGANIZATIONS AND NGOs

Maya Nut Institute
The Maya Nut Institute is a non-profit 501(c)3 public charity founded in 2001. While our mission remains the same, we changed our name from The Equilibrium Fund to The Maya Nut Institute in 2010. Our mission is to "find balance between people, food and forests" by teaching rural communities about the value of Maya nuts for food, fodder, ecosystem services and income.

FOR MORE INFORMATION, PLEASE CONTACT: Maya Nut Institute, PO Box 2371, Crested Butte, CO 81224, United States of America. http://mayanutinstitute.org/
(*Please see page 39 for more information.*)

Women Organizing for Change in Agriculture & NRM (WOCAN)
WOCAN is a women-led global network of professional women and men engaged in agriculture and natural resource management who are committed to organizational change for gender equality and environmentally sustainable development.

FOR MORE INFORMATION, PLEASE CONTACT: WOCAN, United Center, Level 41, 323 Silom Road, Bangkok 10500, Thailand. E-mail: info@wocan.org; www.wocan.org/

ON THE MENU: FORESTS

For almost as long as our species has lived on Earth, we have fed ourselves directly from the bounty of forests, grasslands and other wild places. Now a largely urban species, having multiplied greatly and changed the face of the Earth, we often forget or grossly misunderstand the continuing role of forests in feeding what are now the world's billions.

A special issue of the *International Forestry Review* on "Forests, biodiversity and food security" is taking a step towards rectifying this knowledge gap. Bringing together nine articles by a multidisciplinary and international group of authors – many of them pioneers in the field – editors Terry Sunderland and Alan Pottinger aim to dispel the common myth that forests have ceased to be important to food security, especially as our numbers and needs grow and change. They have put together articles that focus on

a variety of approaches and perspectives, as well as a wealth of data and analysis on the question of what forests contribute to food security, nutrition and human well-being. Together, these contributions demonstrate convincingly that two of today's greatest challenges are not irreconcilable goals: the need to protect forests and the multiple ecosystem services they provide, and the imperative to feed an increasing human population. But these articles, individually and as a group, also show that the links between forests and food security are multidimensional, complex and often difficult to see, to document and to measure. The key to understanding both the significance of the linkages and the difficulty of measuring them is appreciating diversity in its various forms and dimensions.

The editorial that opens the issue begins with the affirmation that "forests are a considerable source of biodiversity and, as such, are inextricably linked to people's food security, nutrition and health in a number of fundamental ways". Several of the articles that follow detail just how forest biodiversity – at genetic, species and system levels – contributes to feeding both the world's rural and urban populations. With around one billion people reliant on wild harvested products for food and income, the direct contribution of forests to diets is considerable and often crucial, even if often hidden from urban and official eyes. For instance, a study by Nasi, Taber and van Vliet provides data showing that approximately 4.5 million tonnes of bushmeat are extracted annually from the Congo Basin forests alone. This direct food contribution adds not only considerable calories but also much needed protein and micronutrients to the diets of local populations.

The importance of forests' direct contribution to food production may actually be eclipsed by the inputs they make to food production outside forests. As Sunderland suggests in the article entitled "Food security: why is biodiversity important?", much more needs to be understood about the "natural capital" that forests provide to agriculture, including documenting regulation of water flow and quality; provision of pollination services and germplasm for crop improvement; maintenance of nutrient cycling and soil fertility; mitigation of climatic extremes; control of agricultural pests and diseases; and other essential functions. These services "all rely to a greater or lesser extent on biodiversity, or components of it; processes that are critical to the maintenance of agricultural systems" including the most modern agribusinesses.

But fully understanding the links between forests and food security requires appreciation not only of biological diversity, but also of the social and cultural diversity of those who use, manage, manipulate and even create forests and agroforests. Several of the articles detail the complex, divergent and changing linkages between forests, nutrition and health among people of different cultural traditions, between groups who have long lived in a particular place and those newly arrived, and between men and women, with the gender issues surrounding food security comprehensively discussed by Wan, Colfer and Powell.

Appreciation of biological and cultural diversity is central to understanding forests and food, and the wealth of resources, services, knowledge and practice that diversity produces. This is the core message of most of the articles in this special issue. Yet this richness is also one reason why forests' crucial role in food security goes unappreciated. Waving fields of grain ripening in the sun and harvested in one brief season are far easier to see, measure and understand than the "more than 400 plant species ... sourced from a wide range of habitats and subject to varying degrees of management" identified by Laird, Awung, Lysinge and Ndive as the forest-derived resources that support communities around Mount Cameroon in Central Africa. This special issue illustrates one way to begin to understand the confounding diversity but crucial importance of forests' contributions to the food security of rural and urban populations alike. The compendium suggests that the answer lies again in diversity: a diversity of approaches, perspectives, methods and tools. (*Source*: Christine Padoch, Director, Forests and Livelihoods Programme, Center for International Forestry Research [CIFOR] in CIFOR POLEX, 10 February 2012.)

"PROTA 16: FIBRES": OVERVIEW OF AFRICAN FIBRE PLANTS COMPLETED!

In the International Year of Natural Fibres 2009, the Plant Resources of Tropical Africa (PROTA) programme (www.prota.org) began "PROTA 16: Fibres", a project to highlight the diversity and potential of the fibre plants of tropical Africa, funded mainly by the COFRA Foundation (Switzerland).

The project has led to about 250 review articles, written by 46 authors and dealing with more than 500 fibre plant species of tropical Africa. The articles include information on traditional and modern uses; production and trade; physical and chemical properties; identification; growth and development; ecology; management; processing; conservation status; and prospects.

Attention is paid to field crops such as cotton (*Gossypium* spp.), the most important fibre plant of tropical Africa, and sisal (*Agave sisalana*), but also to a wide range of forest plants from which fibrous parts are collected. Examples are: kapok (*Ceiba pentandra*), yielding a fruit fibre used for stuffing and insulation; *Raphia* species, with the leaves yielding piassava fibre for brooms and raffia fibre for plaiting and tying; and rattan palms such as *Eremospatha macrocarpa* and *Calamus deërratus*, the stems of which are used for construction, furniture, basketry and tying. A large number of lesser-known fibre plants with regional or local importance are also considered.

In early 2012, the articles were published in English and French handbook volumes and a bilingual CD-ROM. The English and French versions of the review articles are also accessible in the free Web database PROTA4U (www.prota4u.org/). (***Contributed by:*** Dr Martin Brink, Coordinator "PROTA 16: Fibres", PROTA Network Office Europe, Wageningen University, PO Box 341, 6700 AH Wageningen, the Netherlands. Fax: (31)(317)482206; e-mail: martin.brink@wur.nl; www.prota.org/)

Gossypium

RÉFLEXIONS SUR UN CADRE CONCEPTUEL POUR UNE GESTION DURABLE DES PFNL EN AFRIQUE CENTRALE

Impliquée dans le secteur des produits forestiers non ligneux (PFNL) en Afrique centrale depuis 10 ans, la FAO propose un cadre conceptuel qui reflète les principes directeurs guidant ses activités dans ce secteur. La finalité de ces dernières est l'amélioration de la sécurité alimentaire, la réduction de la pauvreté et la gestion durable des forêts.

Ce cadre conceptuel repose sur trois principes fondamentaux, à savoir (1) le respect des droits de l'homme – notamment participation, imputabilité, non discrimination, transparence, dignité humaine, autonomisation et état de droit –; (2) le droit à une alimentation adéquate, répondant à des obligations légales des Etats; et (3) le concept de gestion durable des forêts.

Ces trois éléments principaux se traduisent par des outils pratiques qui permettent d'orienter les activités concrètes sur le terrain en matière de PFNL en Afrique centrale, comme le développement des chaînes de valeurs des PFNL, la révision des cadres juridiques et réglementaires et l'élaboration de stratégies nationales sectorielles. Ces outils sont de divers ordres, en particulier:

(a) La Boîte à outils sur les PFNL, la sécurité alimentaire et le droit à une alimentation adéquate: il s'agit d'un document d'orientation en cours d'élaboration qui encourage une approche multi-acteurs et multisectorielle. De manière pratique, les aspects techniques relatifs à la sécurité alimentaire sont complétés par les aspects juridiques concernant les droits de l'homme. Chaque individu est reconnu comme détenteur des droits et non comme simple bénéficiaire.

(b) Le concept de gestion durable des forêts: celui-ci intègre les dimensions économique, environnementale et socioculturelle de l'utilisation des ressources forestières. L'évolution ou la régression de la gestion durable des forêts dans un pays peut être définie, évaluée et suivie en fonction d'un certain nombre de principes, critères et indicateurs (PCI). La gestion durable des PFNL n'est que partiellement reflétée dans les PCI pris en compte et nécessite donc des mesures additionnelles ainsi que la définition d'autres PCI. Ces derniers devraient refléter le caractère spécifique de l'utilisation des PFNL de la part des communautés locales et des petites entreprises, et s'appuyer sur le droit coutumier et l'application des textes législatifs régissant la récolte, la transformation et la commercialisation des PFNL.

(c) Les *Directives sous-régionales relatives à la gestion durable des produits forestiers non ligneux d'origine végétale en Afrique Centrale*: ces directives, adoptées par la Commission en charge des forêts d'Afrique centrale (COMIFAC) en 2008, visent à améliorer et harmoniser les cadres politiques, législatifs, fiscaux et institutionnels des pays membres de la COMIFAC en proposant des bases communes pour une prise en compte appropriée des PFNL au sein de ces cadres.

Les éléments cités ci-dessus sont présentés de manière détaillée dans une note d'information de la FAO disponible sur le site Internet mentionné ci-dessous.

POUR EN SAVOIR PLUS, CONTACTER: Ousseynou Ndoye, Coordonnateur régional du Projet PFNL GCP/RAF/441/GER, FAO, B.P. 281, Yaoundé, Cameroun. Courriel: Ousseynou.Ndoye@fao.org; http://www.fao.org/forestry/nwfp/55079/fr/ (*Please see pages 67–68 for more information.*)

SCIENCE IN THE HANDS OF PEOPLE

A new FAO study released today shows how plants and fruits from Amazon forests can be used to improve people's diets and livelihoods. The book – which is written in easy-to-grasp, accessible language – seeks to take science out of the ivory tower and put it to work on the ground, in the hands of people.

Fruit trees and useful plants in Amazonian life was co-produced by FAO, the Center for International Forestry Research (CIFOR) and People and Plants International. It was unveiled today during a ceremony at FAO marking the close of the International Year of Forests.

"During the International Year of Forests we have managed to highlight close ties between people and forests, as well as the numerous benefits that forests provide if they are managed by local communities in a sustainable way," said Eduardo Rojas-Briales, FAO's Assistant Director-General for Forestry. Some 80 percent of people living in the developing world rely on non-wood forest products such as fruits and medicinal plants for their nutritional and health needs. This new book provides comprehensive information on Amazon fruits and plants, and is a perfect example of how to make our knowledge accessible for poor people to help them maximize the benefits from forest products and services and improve their livelihoods. While the International Year of Forests is almost over, our efforts on promoting sustainable forest management and the importance of involving forest communities in development initiatives will continue, added Rojas-Briales.

The layout of FAO's new book aims at allowing readers lacking in formal education to extract knowledge using pictures and numbers, since 25 percent of people in developing countries are functionally illiterate, and in rural areas this figure can reach close to 40 percent.

"Some 90 Brazilian and international researchers who were willing to present their research to rural villagers in alternative formats, including jokes, recipes and pictures, collaborated in the production of this book," said Tina Etherington, who managed the publication project for FAO's Forestry Department. "And a number of farmers, midwives, hunters and musicians contributed valuable insights and experience as well. The book is of interest to a worldwide audience because of its truly innovative way of presenting science and how those techniques can be transferred to other areas in the world."

Patricia Shanley, Senior Research Associate at CIFOR and lead editor of the publication, said: "This is an unusual book. Written by and for semi-literate rural villagers, it weaves together a tapestry of voices about the myriad values forests contain".

"The book enables nutritional data and ecology to coexist alongside music and folklore, making the forest and its inhabitants come alive," she added.

The Amazon is the largest contiguous tropical forest remaining in the world, with 25 million people living in the Brazilian Amazon alone. However, deforestation, fire and climate change could destabilize the region and result in the forest shrinking to one-third of its size in 65 years, according to the publication.

In addition to the environmental services they provide, forests such as the Amazon are also a rich nutritional storehouse. Fruits provide essential nutrients, minerals and antioxidants that keep the body strong and resistant to disease. *Buriti* palm fruit, for example, contains the highest known levels of vitamin A of any plant in the world. And *açaí* fruit is being hailed as a "superfood" for its high antioxidant and omega fatty acid content. Brazil nuts are rich in a complete protein similar to the protein content of cow milk, which is why they are known as the "meat" of the plant kingdom, said the publication. (*Source*: FAO newsroom, 20 December 2011.)
(*Please see page 75 for more information.*)

SLASH-AND-BURN "IMPROVES TROPICAL FOREST BIODIVERSITY"

Mexico City. Slash-and-burn agricultural practices, banned by governments because of the risk of uncontrolled fires, provide better growing conditions for valuable new trees than more modern methods of forest clearance, a study suggests.

Starting in 1996, researchers cleared 24 half-hectare areas of tropical forest in Quintana Roo state, in southern Mexico, using three methods: clear-felling, where most of the trees are cut down; bulldozing; and slash-and-burn, a practice common among smallholders, in which trees are felled, left to dry and then burned, to prepare the land for agriculture.

Mahogany seeds and seedlings were then planted and, after 11 years, the researchers compared the sites and found that slash-and-burn techniques had provided the best growing conditions for mahogany. But, more interestingly, many valuable species had thrived in the slash-and-burn plots, said Laura Snook, one of the study authors and programme director at Bioversity International, which conducts research into agricultural biodiversity for the improvement of livelihoods.

In clear-felled areas, more than half of each area contained tree species of no commercial value, Snook said. In areas cleared by slash-and-burn, 60 percent of species were commercially valuable. Additionally, the largest trees in slash-and-

burn areas were 10 percent bigger than those in bulldozed areas.

Snook was presenting the results of the study – which ended last year – at the annual conference of the International Society of Tropical Foresters, at Yale University, United States of America, last month (26 January 2012). (*Source*: Aleida Rueda, Science and Development Network, 8 February 2012 in ENN Daily Newsletter)

WALES-AFRICA LINK CREATES WINNING TEAM: BEST NEW SMALL AND MEDIUM ENTERPRISE IN AFRICA

Bees *for* Development is pleased to announce that our partner organization Guiding Hope of Cameroon has won first prize in the prestigious Best New Business category at the 2011 Africa Small, Medium and Micro Enterprise Awards. The award is a major recognition for over five years of hard work from a team of six and over 1 000 beekeepers in the remote savannah and highland forests in the Congo Basin.

Now selling over 120 tonnes of beeswax, propolis and honey a year to buyers in the United Kingdom, across Europe and Canada, Guiding Hope can hardly keep up with demand. The skilled families that have been practising beekeeping and honey hunting for centuries, although largely illiterate and living on an average of just over US$2 a day, are now receiving up to 50 percent higher prices.

Guiding Hope's core trading principles are to support local communities, trade fairly and profitably, and look after the environment.

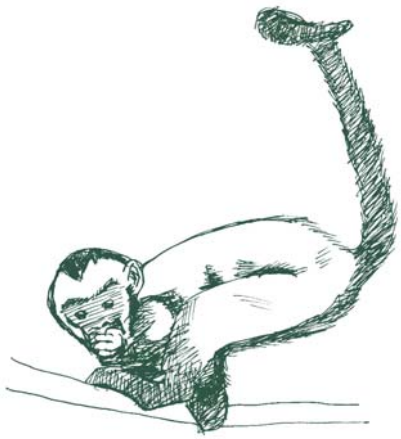
Bees *for* Development is a Welsh NGO based in Monmouth that supports beekeeping as an effective way for poor people to strengthen their livelihoods and fight poverty. It has recently been awarded prestigious Darwin Initiative funds for two years of work to ensure equitable access to pasture use for beekeepers in the Kyrgyz Republic.

Guiding Hope sells its honey through its Aberystwyth-based partner, Tropical Forest Products, a Welsh company specializing in the import and sale of honey and beeswax from Africa to British shops as certified organic. It is also sold online across Europe via the Ethical Community Web site. The Body Shop uses Guiding Hope's wax in its popular cosmetics. The Soil Association, which has the highest standards for organic products and processing in the world, has been certifying Guiding Hope's honey, wax and other bee products such as propolis, since 2008. This gives consumers assurance that the product is organic, pure and natural. Guiding Hope, which is currently on the way to becoming an Ethical Trade enterprise with the Soil Association, went for certification to prove the natural origins and quality of its products. (*Source*: Guiding Hope press release, 14 October 2011.)

FOR MORE INFORMATION, PLEASE CONTACT: Elizabeth McLeod, Project Officer, Bees *for* Development, PO Box 105, Monmouth NP25 9AA, United Kingdom. E-mail: info@beesfordevelopment.org; www.beesfordevelopment.org/ *or* Guiding Hope/GIC Guide d'Espoir, BP 15753 Yaoundé, Cameroon. E-mail: guidinghope@yahoo.fr; www.guidinghope.com/

WILD MONKEYS TO MEASURE CONTAMINATION LEVELS IN FORESTS

This new project, conducted by researchers at Fukushima University (Japan), will involve monkeys being fitted with collars containing radiation meters and GPS transmitters. Scientists will be able to monitor radiation levels deep across forest areas in Fukushima, home to the nuclear power plant severely damaged in the 11 March 2011 earthquake and tsunami. The collars will detach at the end of the experiment, which will last up to two months, according to a team of scientists led by Professor Takayuki Takahashi.



Forests in the Fukushima region are currently being monitored for radiation levels primarily from the air, with testing taking place most commonly from helicopters. However, scientists are keen to obtain more detailed data in relation to radiation levels in forest habitats and the subsequent contamination exposure of wild animals in the region. The range of elevations at which monkeys spend their time will also enable scientists to obtain a broad spectrum of radiation level data, from the forest floor to the treetops.

As many as 14 groups of monkeys are believed to reside in the mountain forests to the west of Minamisoma city, which is where the study will focus. (*Source*: The Telegraph [United Kingdom], 12 December 2011.) ♣

To be without some of the things you want is an indispensable part of happiness.

Bertrand Russell

ANDIROBA

The uses and economic value of *andiroba* (*Carapa guianensis* Aubl.)

Andiroba trees have straight trunks that can reach 30 m in height, often with buttress roots. Growing throughout the Amazon basin, Central America and Africa, *andiroba* prefers seasonally flooded forests and the margins of rivers, but is also found in terra firme forests.

A powerful anti-inflammatory medicinal oil extracted from the seeds of *andiroba* is one of the most widely used natural remedies in the Amazon. *Andiroba* oil can mend badly sprained ankles, repel mosquitoes and is used in veterinary medicine to cure the infected cuts of animals. Indigenous groups in Brazil have traditionally painted their skin with a mixture of *andiroba* oil and the bright red pigment from the seeds of *urucum* (*Bixa orellana*). *Andiroba* is also valued for its bark and wood. The bark can be made into a tea to fight fevers, worms, bacteria and tumours. In addition to its lightness and durability, *andiroba* wood is bitter and oily, deterring attacks by termites and caterpillars. Because the deep, golden-hued wood is of superior quality, *andiroba* is considered to be on a par with mahogany. For this reason, it is increasingly difficult to find in logged areas.

MOSQUITO REPELLENT AND DENGUE FEVER

Andiroba oil can be used as a repellent against gnats and mosquitoes. It also reduces inflammation caused by insect, snake and bat bites. Studies by the Research Institute of the State of Amapá (IEPA) discovered that candles made from the dry remnants of *andiroba* seeds repel the mosquito that carries dengue, *Aedes aegypti*.

Economic value

Andiroba oil is one of the most widely sold natural remedies in Amazonia. The oil industry has its origins in the city of Cametá, in the Brazilian state of Pará, and its commercialization generates significant employment and income throughout Amazonia. In Cametá, children eagerly collect and sell *andiroba* seeds. Street children relate that 4 kg earns them US$0.10 – enough to buy a packet of crackers. In Salvaterra, on Marajó Island, which lies at the mouth of the Amazon River, unemployed men, women and children comb the beach for seeds washed down from inland rivers. In 2004, they could sell 1 kg (about 55 seeds) for US$0.07 to companies in São Paulo. In 2009, in the Belém market, 1 litre of *andiroba* oil costs on average US$6. Stores often buy the oil during the harvest when prices are low, hold on to the oil and sell it out of season at a higher price.

The oil is also in demand internationally and is exported to Europe and the United States of America. From 1974 to 1985, between 200 and 350 tonnes of oil were exported annually, mainly from the Brazilian states of Maranhão, Pará and Amapá. In 2009, in the United States of America, an 8-oz (227-g) bottle of *andiroba* oil can be purchased over the Internet for between US$23 and US$40. One proof of *andiroba*'s popularity is the number of soaps, creams, oils and candles made from *andiroba* on the market in the Amazon region and throughout the world. In the supermarkets of Belém, the soaps can cost from US$1.50 to US$5, while body oil (50 ml) costs US$3. A 150 g bag of *andiroba* bark costs US$1.

Whereas supermarkets, pharmacies and corner vendors in Belém sell *andiroba*, in the western Amazonian state of Acre *andiroba* oil is hard to find on the market: few communities in Acre produce the oil, and those that do generally produce it for local consumption. (*Source*: FAO, 2011. *Fruit trees and useful plants in Amazonian life*.)

ARGAN OIL

Rare Moroccan argan oil – now made in Israel

Argan oil, rich in vitamin E and fatty acids, has become the sensation of the decade, sought after by chemists, dieticians, hair salons, chefs and cosmeticians. The only problem with argan is its availability: the argan tree takes 15 years to yield nuts and one tree can yield only a couple of litres of oil, making production costly and limited.

Until recently, argan was a rare product grown only in the Atlas Mountains and traditionally made by Moroccan tribes, as the argan tree could not flourish outside Morocco.

Today, the Israeli company Sivan is developing Argan 100 – a superstrain of argan that is tolerant of the Mediterranean climate and can produce ten times more nuts than the average tree in Morocco, the company says. Based on 25 years of field research, Sivan's agronomists found a way to produce the oil from their own groves and refuted the widespread legend associated with the production of the oil. According to this legend, argan oil can only be processed from the nut – which looks like an unripe olive – after its hard shell has been removed via a goat's digestive tract. Sivan's chief agronomist Chaim Oren says there is in fact no need for goats to perform the job of intermediaries. "I was exposed to argan trees many years ago, and we did a breeding session in Israel," Oren says. "We pollinated trees with other trees. Ours are resistant to soil disease, giving these trees a steady yield every year."

To date, about 2 500 argan trees have been planted in the Ashkelon, Arava and Negev regions in Israel.

This commercial endeavour may also be beneficial for the argan trees in Morocco, as competition with the local market could reduce the tree's chances of extinction. The UN conservation body United Nations Educational, Scientific and Cultural Organization (UNESCO) has set up reserves to protect the dwindling argan trees in Morocco.

Sivan, founded in 2007 and based in Ramat Hasharon, Israel, sells argan oil to wholesalers, with small quantities of leftovers sold online. Their eventual plan is to sell Argan 100 to other countries. (*Source*: NoCamels, 8 February 2012 *in* ENN Daily Newsletter.)

ARTEMISIA

Malaria hopes rise as chemists produce cheap artemisinin

The cost of the life-saving antimalarial drug artemisinin could be lowered by a third, with a new method that utilizes a waste product from the current plant extraction process, according to researchers.

Artemisinin is sourced from the cultivated plant *Artemisia annua* (sweet wormwood), but demand is outstripping supply because artemisinin combination therapies (ACTs) are now recommended as a frontline treatment for malaria by the World Health Organization (WHO).

The artemisinin extraction process produces around ten times as much artemisinic acid as it does artemisinin itself. But converting the artemisinic acid precursor into the chemically more complex artemisinin molecule has proved a "formidable challenge" for chemists, researchers noted. They have now found a quick and easy way of converting this acid into artemisinin. They used continuous flow chemistry, which involves passing chemicals down a tube to increase reaction times, efficiency and safety. This differs from traditional "batch" chemistry where chemicals are mixed together in a large pot, and it has allowed researchers to simplify one "crucial step" required to produce the molecule.

Peter Seeberger – director at the Max Planck Institute of Colloids and Interfaces, Germany, and co-author of the study published in *Angewandte Chemie International Edition* last week – told SciDev.Net that one refrigerator-sized chemical reactor can produce 200 g of artemisinin per day, and unpublished results indicate potential yields of up to 800 g per day. "If we scale this up, in six months we will be at a point where 400 reactors (that run continuously) will be sufficient to produce the entire world's supply. Our reactors ... could shave the total cost of the drug by a third."

Large-scale production could start in as early as six months' time if negotiations with pharmaceutical companies are successful, Seeberger said. (*Source*: SciDev.Net Weekly Update, 23–29 January 2012.)

Multiple uses of *Artemisia* spp. in Japan and Nepal

A recent study has investigated the multiple uses of *Artemisia* species in Japan and Nepal.

Artemisia, a shrubby species, is distributed widely in different geographic regions. The International Plant Names Index showed 2 058 entries for the genus *Artemisia*, reflecting the richness of the species and its varieties. *Artemisia vulgaris* and *A. montana* are widely distributed in the mountain regions of Nepal and Japan, respectively. These two species look alike in their appearance, size and overall site characteristics; however, genetic closeness cannot be claimed without further investigation.

The vernacular name for the *Artemisia* species is mugwort and the study considered that this represents both the species cited above. Mugwort is a common plant and has been a valuable species for spiritual and material uses. It is called *yomogi* in Japanese and *noya* in the Ainu language, and *pati* or *titepati* (bitter-leaf plant) in Nepal. The study listed the different uses of these plants in Japan (mainly in Hokkaido, the northernmost island of Japan) and Nepal.

Studies in Japan have confirmed that the chemical contents of mugwort are in line with indigenous practices, where certain foods and medicine are developed from the plant, clearly indicating the reliability of indigenous knowledge. Consequently, mugwort now has commercial uses in Japan whereas, because of lack of knowledge and technology, in Nepal it is still considered a weed and confined to traditional/household use. In this context, transferring Japanese knowledge and technology to Nepal could be instrumental in converting the so-called weed to commercial use, hereby boosting the economy of rural people in Nepal by generating employment and income. (***Contributed by:*** Krishna H. Gautam, Chieko Imakawa and Teiji Watanabe, Graduate School of Environmental Earth Science, Hokkaido University, Sapporo, Japan. Fax: + 81 11 706 2213; e-mail: khgautam@ees.hokudai.ac.jp/)

MUGWORT USES IN NEPAL

- Mugwort has a high spiritual value in Nepal; it is one of the most religious plants and is offered in almost all ritual celebrations. Mugwort and flower are synonyms. Whenever new houses are built, mugwort foliage is left on the ridge of the roof to protect the houses from evil. It is also used extensively in the spiritual treatment of patients; local healers use the foliage to chase evil away from the patient's body. The mugwort flower has a special importance during Dashain (the largest Hindu festival in September/October). Elderly people bless the young by putting mugwort flowers/foliage on their heads.
- Mugwort is the most reliable and accessible medicine for rural people in Nepal for the treatments of cuts and wounds. The fresh leaves are squeezed and applied.
- Mugwort is very effective against leeches. Those who have to walk or work in leech-prone areas rub the leaves on their skin. Mugwort foliage is kept in rooms to get rid of fleas.
- Brooms made from mugwort foliage are thought to be effective in maintaining a healthy environment by repelling insects.
- Mugwort is used as a green manure and also as an insecticide. The green foliage is used to mulch seedbeds. Stems are used as supports for young bean plants, probably presuming that they protect the young sprouts by their insecticidal element.
- Mugwort is goats' favourite fodder, and thus contributes to rural economy in the hilly regions of Nepal.

BAMBOO

Bamboo: a green biofuel for Africa?

Bamboo may be the key to combating soil degradation and massive deforestation in Africa as an alternative source of energy. Sub-Saharan Africa has over 2.75 million ha of bamboo forest, equivalent to roughly 4 percent of the continent's total forest cover. A partnership among African nations and communities, the International Network for Bamboo and Rattan (INBAR), and China are working to replace forest wood, on which 80 percent of the rural population in sub-Saharan Africa depends for its fuel needs, with bamboo charcoal and fuelwood.

At the 17th Conference of the Parties (COP17) to the United Nations Framework Convention on Climate Change (UNFCCC) in Durban, South Africa today, initial successes with bamboo charcoal in Ethiopia and Ghana have prompted calls across the continent for greater investment in this "green biofuel" that can fight deforestation and mitigate climate change. "Bamboo, the perfect biomass grass, grows naturally across Africa and presents a viable, cleaner and sustainable alternative to wood fuel," said Dr J. Coosje Hoogendoorn, Director General of INBAR. "Without such an alternative, wood charcoal will remain the primary household energy source for decades to come – with disastrous consequences," Dr Hoogendoorn said.

Burning wood has a significant impact on the climate, with African households releasing the equivalent of 6.7 billion tonnes of greenhouse gas into the atmosphere by 2050, according to estimates by scientists.

In terms of health, the burning of fuelwood claims the lives of an estimated two million people every year – mostly women and children – who inhale the smoke. Continued widespread indoor use of forest wood charcoal as a household fuel could cause ten million premature deaths by 2030.

While it takes 7–10 tonnes of raw wood to produce one tonne of wood charcoal, the entire bamboo plant, including the stem, branch and its rhizome, can be used to produce charcoal, making it highly resource efficient, with limited wastage. Its high heating value also makes it an efficient fuel. Furthermore, bamboo is one of the fastest-growing plants on the planet, and tropical bamboos can be harvested after just three years, rather than the two to six decades needed to generate a timber forest.

China is a global leader in the production and use of bamboo charcoal, made through the controlled burning of bamboo in kilns, whether traditional, metal or brick. The sector is worth an estimated US$1 billion/year and employs over 60 000 people in more than 1 000 businesses.

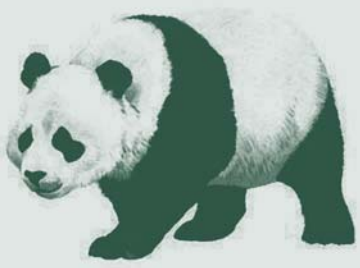
Together with Chinese partners, including Nanjing Forestry University and the Wenzhao Bamboo Charcoal Company, INBAR's Bamboo as Sustainable Biomass Energy initiative is now transferring China's advanced bamboo charcoal technologies to sub-Saharan Africa. (*Source*: Asian Scientist Newsroom, 2 December 2011.)

PANDAS FIND SCOTTISH BAMBOO JUST TOO HARD TO STOMACH

Two giant pandas removed from public display at Edinburgh Zoo are suffering from a Scottish form of "Delhi belly" as they adjust to eating bamboo grown outside their native China, according to a leading veterinary surgeon. The United Kingdom's only giant pandas arrived in the capital last month, but Yang Guang, the male, became ill two weeks ago with a bad bout of colic.

Mathew Brash, Vice-President of the British Veterinary Zoological Society, said last night that there was no great cause for concern and likened the pandas' medical problems to a "travel tummy bug". "Unlike some animals, pandas are complicated eaters and very particular about what they eat and need a high-fibre diet. Whatever the bamboo they were eating in China will be different from the bamboo they are eating in Scotland. In other words, their gut floor is adjusting to living in Scotland. They are getting used to Scottish bugs, which are not bad bugs, just different bugs."

It is expected that the pair will eat up to 18 000 kg of bamboo every year during their stay in the capital. In November, *The Scotsman* reported that Edinburgh Zoo will pay around £70 000 every year to import some 85 percent of that bamboo from a farm near Amsterdam in the Netherlands. The firm also provides bamboo for pandas in Vienna and Berlin. (*Source: The Scotsman,* 30 January 2012.)



Ghana Bamboo Bikes Initiative wins German Government award

The Ghana Bamboo Bikes Initiative has been selected as a winner of the 2011 Impact Business Award, in recognition of the innovativeness of its business model and environmental responsiveness. The award, initiated by the German Government through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), rewards enterprises that apply innovative business solutions in combating climate change.

The initiative seeks to break the status quo in the development of a bicycle industry in Ghana and train people with little or no education in the manufacturing and assembling of bamboo bikes. It is also spearheading the production of stable, cheaper and reliable bikes in Ghana to reduce the country's dependence on fossil fuels while increasing the economic activities of rural Ghanaians.

With the award, the German Government will complement the work of the Ghana Bamboo Bikes Initiative in promoting economic development in Ghana while providing substantial environmental benefits.

Co-founded by two students, Bernice Dapaah and Kwame Kyei of the Christian Service University College and Ternopil State Medical University, respectively, the initiative seeks to take advantage of the abundant raw bamboo materials in Ghana to manufacture high-quality bamboo bikes suitable for export markets as well as for the road conditions in Ghana, and affordable for the poor. The social enterprise project designs, develops and markets multipurpose bikes for the transportation of passengers, commodities or as an ambulance.

Through the provision of a sustainable and low-carbon transport solution, the Ghana Bamboo Bikes Initiative aims at raising awareness about environmentally friendly habits, while increasing the economic and employment opportunities of rural people – especially youth. (*Source*: JoyOnline [Ghana], 25 January 2012.)

Bamboo use in the Pacific

Bamboo has a range of benefits that make it excellent for developing small-scale productive enterprises. It is widely used throughout the Pacific for temporary building structures, rafts, harvesting poles, fishing

rods, food and water containers, food tongs and handicrafts. Bamboo species are most often harvested from the wild, such as the secondary forests in Melanesia. In Hawai'i, wild bamboo stands are commonly harvested for fishing poles, edible shoots and some construction applications, as well as for craft work and *kadomatsu* (traditional New Year decoration). It is little used for food except to a small extent by Southeast Asian immigrants. In the highlands of Papua New Guinea, the shoots of *Neololeba atra* are sometimes consumed. *Nastus elatus* (New Guinea sweet shoot) is an outstanding edible shoot that can be eaten with minimal preparation.

Local markets. With the exception of minor uses in packaging and handicrafts, bamboo products are not known to be sold in local markets in the Pacific (in Fiji or Polynesia). In Hawai'i, bamboo is utilized on a small scale for building and for human consumption.

Export markets. No export market from the Pacific islands is known to exist, but the potential is significant, with worldwide market in traded bamboo products at about US$2.5 billion.

The worldwide consumption of bamboo shoots is in excess of two million tonnes, mostly in Asia. The main potential export market for bamboo shoots is Japan. However, the preferred species in Japan is *Phyllostachys pubescens* (or *moso*), a monopodial type of subtropical bamboo with a rather unique flavour that cannot be readily substituted by any other tropical bamboo. *Dendrocalamus latiflorus* shoots are popular in Taiwan Province of China and large quantities are exported to Japan. *D. asper* shoots are a major canned export from Thailand to Japan. *D. giganteus* is favoured in Viet Nam and Southeast Asia. The greatest opportunities for exports of bamboo shoots from the Pacific islands would be for fresh bamboo shoots to Asian communities on the United States mainland and to Asian countries with direct flight links and available cargo capacity.

Economics. Competition with China, India or other nations that already have bamboo resources, culture and industrial technology is not likely to prove economically viable for most Pacific islands. If niche markets could be identified for which well-controlled, value-added products could be found, relatively small-scale production and processing might be economically viable. Even for local markets with little or no shipping costs, locally grown and processed bamboo products might cost more than imported. Marketing studies would be needed to define potential products with viable markets. (*Source*: A. Benton, L. Thomson, P. Berg and S. Ruskin. Bamboo (various species). *In* C.R. Elevitch (ed.). 2011. *Specialty crops for Pacific islands*. Permanent Agriculture Resources, Holualoa, Hawaii.)

BAMBOO SHOOTS

Bamboo shoots are usually harvested when they reach 30–60 cm and are peeled before cooking. Shoots of many of the clump-forming tropical species contain high levels of cyanogens, and must be boiled well prior to consumption.

Bamboo shoots may be consumed fresh on the day of harvest, in which case no post-harvest handling is required, beyond removing obviously damaged and below-par shoots prior to sale. In Hawai'i, fresh shoots are harvested and placed in cold water for rapid temperature reduction and stored at 4° C overnight. They are then trimmed and cleaned and packed in styrofoam boxes with an ice pack and transported to market at 10–12° C. For storage, shoots can be peeled and boiled for two to three hours, continually refreshing the water. They are then cooled as rapidly as possible to 30° C or less and stored in jars in brine (salt content of 5–8 percent of the weight of the cooked shoots).

Commercially, shoots are mainly canned, a complicated process involving drying the shoots, removing the sheaths, rinsing, dressing, classifying according to shape, grading, weighing, placing in cans, sterilizing, adding water, adjusting the pH, cooling, heat preservation, inspection and packing.

Nutritional content of bamboo shoots (per 100 g)

Water	89–93 g
Fat	0.3–0.4 g
Fibre	0.5–0.77 g
Ca	81–96 mg
Fe	0.5–1.7 mg
Vitamin C	3.2–5.7 mg
Protein	1.3–2.3 g
Carbohydrates	4.2–6.1 g
Ash	0.8–1.3 g
P	42–59 mg
Vitamin B_1	0.07–0.14 mg
Glucose	1.8–4.1 g

BARK

French maritime pine bark extract hailed as new beauty product

A new wonder cream containing tree bark extract may have just brought us one step closer to finding the secret to eternal youth. The extract, from French maritime pine, could slow down the signs of ageing, researchers say. It has shown to improve skin elasticity by 25 percent and hydration by 8 percent.

In tests reported in the journal *Skin Pharmacology and Physiology*, 20 healthy women aged 55 to 68 were treated with Pycnogenol®, a branded supplement containing the antioxidant. They were monitored for skin hydration, skin elasticity and skin fatigue by the Leibniz Research Institute in Dusseldorf over 12 weeks. At the end of the study, a biopsy was carried out to see the levels of hyaluronic acid, which is known to be beneficial to the skin. (*Source*: MailOnline, 27 January 2012.)

BUSHMEAT

Bushmeat – every man's protein until the forest is empty

Some call it the "African silence" when a forest is rendered silent by poaching and the bushmeat trade. Others call this phenomenon "dead zones" that have no birds, no monkeys, no small mammals, no snakes ... These places have been stripped bare by local communities that are struggling to feed their families and access medical care.

The Mbuti pygmy encampments photographed in the early 1980s depict a wire- and nylon-free lifestyle that saw them capture forest animals on a daily basis for local consumption. Today, most of the bushmeat is exported to distant markets by bicycle, 4×4 vehicles and on foot. No-one has the right to judge these people when they focus on bushmeat as their only source of protein. We must, however, restrict use of forest products, as far as possible, to people with heritage rights to

the land, as they are the custodians of these forests.

Terese and John Hart are committed to witnessing, studying, conserving and combating the atrocities of the bushmeat trade in the Democratic Republic of the Congo. Over the next few weeks, I will post a series of summary posts linking back to the blogs on their Web site: www.bonoboincongo.com/ (*Source*: Steve Boyes, Explorer's Journal, National Geographic, 9 February 2012.)

Game reveals complex links between poverty and threats to apes

There were 50 ape experts in the room and a quick game ensued to break the ice. "If you agree with the statement, go to the left side of the room," said the facilitator. "If you disagree, go to the right." She then unveiled eight simple words that split the room in two: "Local poverty is the main threat to apes".

On the right, speakers said that the primary problem for orangutans in Malaysia and Indonesia is not local people – hunters tend to target other species there. It is the private sector that destroys the forests on which both orangutans and local people depend, added a third speaker, and this deforestation itself creates poverty. Someone else added that it was the wealthier people from local populations, not the poor, who were encroaching on the national park he worked at in Indonesian Borneo.

A speaker from the Democratic Republic of the Congo said that it was rich people in urban areas – not poor communities near forests – who fuelled the market for ape meat. Another from Cameroon said that in some places local people do hunt chimpanzees for meat, but at such low levels that it is not a major threat; logging and mining activities that destroy ape habitat were bigger concerns.

The ape experts had gathered at the Center for International Forestry Research (CIFOR) in Bogor, Indonesia for a three-day workshop on the links between great ape conservation and poverty, because it just so happens that all of the world's great apes – gorillas, chimpanzees, bonobos and orangutans – live near people who are poor.

The workshop, organized by the International Institute for Environment and Development (IIED) (where I work) and hosted by CIFOR from 11 to 13 January 2012, was designed to share lessons learned in Africa and Asia and to identify practices that benefit both apes and local communities. And while the people on the right side of the room felt that local poverty was not the main threat to these apes, those on the left – mostly from Africa – disagreed.

People kill apes because they are poor, said one. Conservation creates costs for local people and this is an issue of justice, said another. If you solve local poverty, you solve a lot of problems for great apes, added a third.

Of course, the statement itself was flawed, as the workshop organizers designed it to be. In reality, the situation varies from location to location and the many threats apes face are all interconnected.

My favourite answer, though, came from one of the Indonesian experts. He said that if the "poverty" in the statement referred to a lack of money then the answer was no, but that if it referred to the mind and a lack of information, then the answer was yes.

As an ice-breaker, the contentious statement did its job well. It made me wonder ... if every poor person who lives near an endangered ape was suddenly ten times richer, would the apes be safer or would they just face new threats that affluence and indifference can bring?

The workshop was organized as part of IIED's Poverty and Conservation Learning Group initiative, with support from the Arcus Foundation, the United States Fish and Wildlife Service and the Great Apes Survival Partnership. (*Source*: Mike Shanahan blog, IIED, 13 January 2012.)

EDIBLE INSECTS

EU to spend €3 million to promote eating insects as "alternative source of protein"

The European Union (EU) will spend €3 million to research "the potential of insects as an alternative source of protein". Research projects will be selected this year. Food experts agree that insects would probably have to be disguised for European audiences, so that insect "food" could be used as an additive in burgers and other fast food.

The Food Standards Agency says of the research: "While insects have not traditionally been used for food in the United Kingdom or elsewhere in the European Union, it is estimated that about 2.5 billion people across the world have diets that routinely include insects. While many insects are regarded as pests, FAO is interested in promoting edible insects as a highly sustainable source of nutrition". Some worms contain three times as much protein as beef per ounce (28 g), while four crickets have as much calcium as a glass of milk.

Eighty percent of countries worldwide already eat insects, and more than 1 000 insect species are often eaten by human beings. Unlike conventional livestock, insects and bugs need little space and can be bred in sealed buildings under natural light where they live off waste, paper and algae. The idea has previously been backed by the United Nations and EU as a way to tackle food shortages. Some academics believe that the expense and environmental cost of raising livestock means that insect-eating will be inevitable – and it has been claimed that by the end of this decade, insect-eating will be widespread. (*Source*: MailOnline, 31 January 2012.)

***Hebo* – yellow-jacket baby wasps – a speciality in Japan**

All manner of insects have been eaten down the ages to the present day, and in all regions of the world. Many insects are eaten in Japan, including two species of *Vespula* and three species of *Vespa*. In particular, yellow-jacket larvae and pupae, known locally as *hachi-no-ko* (literally, "baby wasps") are eaten. People are often surprised at how dangerous, stinging insects such as wasps can be caught and eaten safely. However, in Nagan, Gifu, Aichi, Shizuoka and Yamanashi prefectures, the mountainous areas at the heart of the central region of Japan, these yellow-jackets are treasured as autumn's seasonal delicacies. Men enjoy going out in groups to catch them. It is also common for people to raise them near their homes. Every household prepares *hachi-no-ko* dishes in different ways, each bringing its own unique flavour to the autumn dinner table. Whole communities have been built, centred on these yellow-jackets – surely unique to this part of the world.

EATING WASPS: A RELATIONSHIP BETWEEN NATURE AND SOCIETY

The habit of wasp eating in Japan consists of a nature-society relationship, as shown in the illustration. The eagerness to eat wasps helps promote and makes people aware of both the wasp environment and indigenous knowledge on wasps. It is complicated, but the mutual relationship makes the cultural habit continue. Moreover, commercial use encourages people who have fewer economic opportunities to promote socio-economic activities with proper use. Wasps are thus regarded as an essential food resource for the sustainable development of rural mountain villages.

Catching *hebo*. *Hebo* nests are found below ground in fields and mountains. The wasps are attracted with bait and then given small pieces of meat, with tiny ribbons attached, to carry back to the nest. The ribbons make it easier subsequently to follow the wasps and locate the nest. Catching *hebo* requires teamwork – someone is needed to set the bait, someone to follow the wasps, and someone to dig out the nest. Seeing groups of like-minded friends, frantically chasing after *hebo* is like watching young boys totally absorbed in an exciting game.

Raising *hebo*. Some people even raise *hebo* at the bottom of their gardens. They are careful to place the nest where it will be sheltered from the elements. The wasps are protected from predators and given food. Raising *hebo* requires a certain combination of tender loving care, originality and ingenuity.

Eating *hebo*. The whole family gets together to remove the live larvae from the combs, taking great care not to squash the larvae in the process. It takes much time and effort, but this provides an opportunity for the family to enjoy chatting together. The larvae are boiled with soy, sugar and *sake*. The cooked wasp larvae are then mixed with rice. Various dishes use *Vespula* spp. Simple boiled wasp with soy sauce goes well with rice, accompanied by *sake*. Recipes for wasp larvae dishes vary greatly from household to household, bringing an autumn feast to the dinner table.

Gathering around *hebo*. The *Hebo* Festival is held every year, with people competing for the biggest nest, whether raised at home, or collected in the fields and mountains. People gather together for all manner of festivities celebrating *hebo*. Food products made from wasp larvae are popular delicacies, and make great souvenirs. (***Contributed by:*** Kenichi Nonaka, Department of Geography, Rikkyo University, 3-34-1 Nishi-Ikebukuro Toshima, Tokyo 171-8501, Japan.
E-mail: k-nonaka@za2.so-net.ne.jp/)

Researchers conduct studies on edible insects to fight food insecurity in Uganda

Edible insects such as white ants and crickets could have a permanent presence on dinner tables in Uganda if research being carried out by a group of researchers from Makerere University proves successful. The research project now under way in Lango subregion is focusing on the potential of edible insects in alleviating household food insecurity and fighting malnutrition.

In an interview with Uganda Radio Network, the research project's principal investigator Dr Jacob Agea said that they chose edible insects because they are currently disappearing from menus, but used to be valuable food alternatives. He said they want first to find out why edible insects such as white ants and crickets are fast disappearing, and then understand their breeding habits and explore how to breed them throughout the year.

Dr Agea said that the two-year study, costing 110 million Ugandan shillings, will examine the insect-eating culture of the people and document existing knowledge on insect harvesting, processing and marketing. The study also aims to assess the proportional contribution of edible insects consumed as household food and in calorie intake. This will determine the nutritional value of the insects. A number of students have been trained to help in the study, which will be extended to include other subregions such as West Nile, Acholi and Karamoja,

INSECTS ARE FOOD WEB SITE

The following Web site includes recipes, a full list of edible insects wordwide, and much more.
http://insectsarefood.com/faq.html/

FIELD CRICKETS

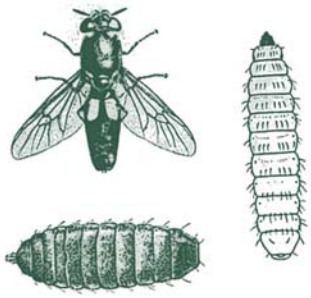
This is our first post in what we hope will be an ongoing series on insect foraging. While not a normal foraging food, insects could very well be one of the few foods available in a deep woods survival or famine situation. One of the easiest and most popular edible insects is the cricket. Cricket eating is gaining popularity these days in the United States of America.

For the record, 100 g of cricket has 121 calories, 12.9 g protein, 5.5 g fat, 5.1 g carbohydrates, 75.8 mg calcium, 185.3 mg phosphorus, 9.5 mg iron, 0.36 mg thiamin, 1.09 mg riboflavin, 3.10 mg niacin and 0.05 percent fat.

Finding field crickets is not a problem; the best places to catch them are under logs, rocks and in tall weeds that border fences and buildings. When we were kids, we commonly left pieces of plywood on the ground to make "cricket shelters" so we would have a quick and easy way to collect fishing bait.

Be sure that you know what you are eating! Always make a positive identification before eating any insect or plant. You never know how healthy the crickets are or if they are carrying any bacteria, so I highly recommend that they be cooked like any other meat before they are eaten. They can be oven roasted, sautéed or deep fried. Also, I've seen the indigenous cultures that eat crickets keep them in a container for a day or so to be sure that the crickets "poop" before they are cooked. Wings and legs are removed before cooking. Always rinse them with clean water. Some folks will throw them in the freezer for awhile if there's one available.

Dry roasted crickets have a nutty flavour and are very good eaten plain with a sprinkling of salt. They are also very tasty as a substitute for nuts in dessert and cookie recipes. Dry roasted crickets can be blended into flour to be added to bread flours. (*Source*: Foragers Digest Web site, http://foragersdigest.com/)



where edible insects have long been a delicacy. The study, if successful, will be used to formulate nutritional policies and be shared with local governments, food processors and institutions that would then be expected to apply it in practice. This research is being conducted by the same group of Makerere scientists who are exploring the possibility of breeding and rearing grasshoppers en masse. (*Source*: Uganda Radio Network Web site, 1 February 2012.)

Insect proteins for animal feed

Animal feed market pressure. In 2050, the planet will number approximately nine billion people. At the same time, a growing middle class will result in higher demand for fish and meat. In order to meet this demand sustainably, since current animal feed stocks are being overexploited or grown unsustainably, the livestock and fishery sectors will be forced to look for feed alternatives.

Land and forest depletion. The global consumption of meat will grow 173 percent by 2050 mainly as a result of the explosive growth of 209 percent in developing countries. In addition, feed production will need to grow by 180 percent by 2050 in order to feed all livestock. At present, 30 percent of land use is for livestock feed production. Greater and more intensive crop production results in deforestation and soil degradation and the subsequent use of fertilizers and pesticides leads to water pollution.

Fish depletion. Aquaculture – probably the fastest growing food-producing sector – now accounts for nearly 50 percent of the world's food fish. According to FAO's Fisheries and Aquaculture Department, commercial fish feed for aquaculture has increased by 400 percent over the past 25 years. The biggest aquaculture feed producers are from Asia; in Viet Nam, for example, fish feed production has increased by 700 percent over the last 25 years. Fishmeal as well as several grains (mainly maize) and soybean are nowadays traded unsustainably.

Insects as feed for aquaculture. The summary report of the Technical Consultation Meeting "Assessing the potential of insects as food and feed in assuring food security", which took place in Rome in January 2012 (*see pages 66 and 70 for more information*), states that the urgency to find alternative protein sources for feed has resulted in high market acceptance and market recognition for insects. For fish and poultry, insects are already a natural feed. In China, for example, silkworm pupae powder is used as feed. Costs, reliability of supply and the quality of the insect protein product will determine market demand. Costs include the possibility of using organic waste streams, labour involved, yield, investment needed and economies of scale.

Possibilities of edible insects. Researchers have been looking into the possibilities of edible insects for many years; today, the private sector is also investigating and undertaking research and development. The black soldier fly (*Hermetia illucens*) and the yellow mealworm (*Tenebrio molitor*) are considered to be optimal species for industrial mass production. There is a certain belief among new companies that production capacity is comparable with, or in some cases even more powerful than, other alternative resources such as soybean, sunflower and fishmeal. Although the use of insect proteins has many opportunities, it is still facing difficulties – legal issues on biodiversity and alien species, food safety in particular pathogen transfers, production capacity, and processing methods all need more investigation.

Is industrial mass production the future? Mass rearing of arthropods today is mainly performed for biocontrol of insect pests. Using

BLACK SOLDIER FLY (*HERMETIA ILLUCENS*)

Production. The innovative company Organic Nutrition in Florida, United States of America, focuses on black soldier fly rearing for use as an alternative protein – Ento-Protein™ – in fish feed. Ento-Protein could serve as a replacement for fishmeal on the aquaculture market. The business should operate on zero waste by using manure as feed for the insect. The company has already carried out economic and environmental feasibility studies in order to be both competitive and sustainable. As such, they ensure that their operations, processes and products are environmentally responsible. Future capacity perspectives are 6 000 tonnes of Ento-Proteins per year and a factory setup that enables capacity increase. The British entrepreneur, David Drew, has also set up a small pilot plant on black soldier fly rearing in South Africa. He predicts his Agri-Protein production will be around 7 300 tonnes per year. His "magmeal" would serve as a substitute for fishmeal both on the aquaculture market and to fatten chickens and pigs.

Current research. Manure management is a growing concern in intensive livestock facilities. The black soldier fly has been investigated for its manure bioconversion capabilities into high-quality proteins and fats. Scientists at the Swiss Federal Institute of Aquatic Science and Technology, Dübendorf, Switzerland are looking into the efficient conversion of organic material by black soldier fly larvae. Based on their study, a waste processing unit could yield a daily prepupal biomass of 145 g (dry mass) per m^2. They concluded that larvae of the black soldier fly are potentially capable of converting large amounts of organic waste into protein-rich biomass to substitute fishmeal, thereby contributing to sustainable aquaculture.

Black soldier fly in rainbow trout diet. Research on fishmeal and fish oil replacements has identified a variety of potential ingredients that when used in appropriate mixtures can promote good growth results for rainbow trout (*Oncorhynchus mykiss*). A study conducted in 2011 at the University of Idaho in the United States of America indicates that black soldier fly reared on dairy cattle manure and trout offal can be used to replace up to 50 percent of the fishmeal portion of a practical trout diet for eight weeks without significantly affecting fish growth or the sensory quality of rainbow trout fillets, However, the reduced growth observed in the current study indicates that additional research is needed to identify further the nutritional limitations of this ingredient.

YELLOW MEALWORM (*TENEBRIO MOLITOR*)

Production in China. In Hunan province in Changsa, the biggest insect manufacturer – Changshasaibang Lives Science and Technology Co. Ltd – produces 280 tonnes of yellow mealworms each year. For technical support, the company collaborates with Hunan Agricultural University, Hunan Institute of Entomology and the Hunan Food Institute. The company sells the yellow mealworms for feed for poultry, fish, turtles, frogs, birds, scorpions, centipedes and snakes.

Sixty km south of Changsa in Xiangtan, the Haocheng Mealworm Inc. company mass rears mealworms mainly for animal feed. In addition, the company also sells insect protein in a powdered form for supplementary use in human food products. The company is unique in their multipurpose marketing. "Mealworm as a source of high protein can be added to bread, flour, instant noodles, pastry, biscuits, sweets and condiments, as well as adding it directly to dishes on the dining table or processing it into health care nourishment. It is also a direct feed for birds, dogs, cats, frogs, turtles, shrimps, scorpions, chilopods, ants, goldfish, wild animals and other animals and livestock." (*Source*: www.hcmealworm.com/)

Production in the Netherlands. Yellow mealworms are also reared in temperate regions for pet feed for reptiles, birds and fish. For example, the Kreca farmer company produces yellow mealworms as a feed for exotic animals. Since 2006, the company has also begun to produce mealworms for human consumption. Researchers from the Department of Entomology of Wageningen University have provided technical support and scientific knowledge to develop the production process. They are still collaborating, and undertaking research and development to identify new uses. (*Source*: www.kreca.com/)

Many pet feed companies have the capacity to rear mealworms and other edible insects. Farming good practices and technical equipment can be used to extend edible insects for feed to the livestock and fishery feed sector and even the entire food industry. Therefore, the animal feed sector should be convinced of the nutritional and environmental benefits of introducing insects into animal diets.

sterilized predators that are not pests, pests can be kept under control in a biologically friendly way. Mass rearing for biocontrol uses the same techniques and technical equipment as those necessary to produce edible insects for feed and food. According to Karel Bolckmans, director of Koppert, one of the leading companies in biocontrol, good practices and expertise should be shared and practical cooperation encouraged. For instance, research and development lines on edible insects can be set up in existing mass-rearing factories for biocontrol.

Examples of informal integrated pest management carried out today

- Weaver ant (*Oecophylla smaragdina*). Weaver ant collectors in Indonesia carry out biocontrol by collecting ants on fruit fields and, as such, they are the inventors of a new agricultural system of pest control and provide protein food sources such as queen weaver ant bread to the community and their animals.
- Melon bug (*Agonoscelis pubescens*). An integrated pest management programme was designed by Elobied Agricultural Research Station (in the Northern Kordofan state of the Sudan) to control the melon bug. The community participated in a "handpicking of melon bug adults" campaign in four different areas of the state for two seasons. During these seasons, 15 tonnes of melon bug adults were collected in the first season, and 226 tonnes in the second. Melon bugs are edible and, in the last nymph stage, which is a relatively soft stage, the bugs are cooked and eaten. (***Contributed by:*** Esther Mertens, Intern, Edible Insect Programme, Forestry Department, FAO.)

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FRUITS

Five amazing fruits from the jungle

The Amazon rain forest is said to host half of the world's plant and animal species. While local indigenous people had a diet including thousands of jungle fruits, modern societies eat just a fraction of them, so there is plenty of room for growth. Here are five fruits that come from the jungle and could end up in supermarkets around the world.

Açaí. The *açaí* berry comes from the palm tree *Euterpe oleracea*, which grows abundantly in the Brazilian Amazon, but which can also be found in Peru. In the early 2000s, it was marketed as a miracle fruit, with incredible antioxidant properties. Health food companies sold the juice for upwards of US$40/bottle (see Box on page 34).

Aguaje. The *aguaje* fruit, and powders and extracts derived from it, is high in vitamin A content (five times greater than that of carrots). The fruit itself comes from the *aguaje* palm *Mauritia flexuosa*, a major component of the ecosystem in and around Amazonian wetlands, and tastes much like a carrot.

Arazá. *Arazá* is hard to find outside the jungle, because no-one has found a good way to ship it without spoiling the fruit. Its acidity makes it undesirable for eating off the tree (*Eugenia stipitata*), but it is delicious when converted into a juice, jam or dessert. Even better, *arazá* has more than twice as much vitamin C as an orange.

Camu camu. The *camu camu* berry is similar to *açaí* in actual nutritional value. *Camu camu* is being marketed around the world as the cure for everything from the common cold to arthritis. While such claims are probably overblown, the berry of the *Myrciaria dubia* tree does have the second-highest concentration of vitamin C of any known fruit in the world. A small-scale study in Japan showed that it reduced the risk of hardened arteries. (*See page 58 for more information.*)

Arazà

AÇAÍ (*EUTERPE OLERACEA* MART.)

In the darkness before dawn, thousands of Amazonian river dwellers fill their large woven baskets with purple, pebble-sized *açaí* fruit and make the trip in small canoes or large boats to the scattered outdoor markets of the city of Belém, Brazil. As the boats near Ver-o-Peso, the largest market at the mouth of the Amazon River, a seller shouts, "blood of the cow!". Buyers run to the boat, pressing their nails into the fruits to see if they are of good quality. "Blood of the cow" is a local reference to the meaty *açaí* fruit with its wine-coloured pulp. From the age of six months, children in the eastern Amazon drink *açaí* juice. And with great benefits – *açaí* is being touted as a "superfruit" for its anti-inflammatory, antioxidant and anticancer effects. Because of its growing reputation, demand for *açaí* is expanding around the world.

In some Amazonian *caboclo* communities, *açaí* was found to make up to 42 percent of a person's daily intake by weight. Some people in Belém drink up to 3 litres of *açaí*/day. In the 1990s, an average person from Belém consumed 60 litres of *açaí*/year. An estimated 180 000 tonnes of *açaí* are consumed each year in the city.

The fruit is being marketed in the United States of America and Europe as a "superfood". In 2006, a study found that extracts from *açaí* berries initiated a self-destruct response in up to 86 percent of the leukaemia cancer cells tested in the laboratory. These effects have not yet been demonstrated on cancer in humans. *Açaí* is rich in flavonoids, which give it its dark purple colour and provide a high dose of antioxidants.

Açaí pulp has become a fad in gyms in the south of Brazil. Athletes enjoy *açaí* mixed with *guaraná* fruit and oats to give them a burst of energy. (*Source*: FAO, 2011. *Fruit trees and useful plants in Amazonian life*.)

Mocambo. Think of the *mocambo* (*Theobroma bicolor*) seed as a less-famous sibling of the fruit world. It shares the genus of the famous *Theobroma cacao* tree and grows principally in the western Amazon, its homeland. It has a sweet pulp. Most vendors stick to just selling the fruit's seeds, which reportedly taste like peanuts when roasted. (*Source*: Peru this Week, 3 December 2011.)

Fruits that are helping to end hunger

No single fruit can put an end to hunger. But worldwide there are many different fruits and vegetables that are helping to improve nutrition and diets, while increasing incomes and improving livelihoods. Among these are the following.

Ackee. The *ackee* tree (*Blighia sapida*) is indigenous to the tropical forests of West Africa. *Ackee* fruit has a creamy texture and a mild flavour. It is commonly eaten with meat dishes as a side vegetable. It is very nutritious, high in fatty acids and rich in protein, potassium, iron and vitamin C. However, both the skin and seeds of *ackee* are poisonous; they contain toxic hypoglycin levels and can even be fatal. Care must be taken in harvesting the fruit at the right time and in the preparation of *ackee* dishes. In tropical West Africa – where *ackee* trees are indigenous, well adapted and utilized for other purposes – the safe preparation and nutritious value of *ackee* arils support food security and rural incomes. The tree is cultivated in the region for several non-food uses: immature fruits are used to make soap; the wood from the tree is termite resistant and used for building; extracts from the poisonous seeds are taken to treat parasites and are sometimes used as a fish poison; and a topical ointment made from crushed *ackee* leaves is applied to the skin to treat headaches and ulcers. *Ackee* leaves are also good as fodder for goats.

Monkey oranges. Similar in shape and size to apple, pear and orange trees, monkey oranges (*Strychnos spinosa*) come from a highly coveted African wild fruit tree, which farmers will often leave standing when clearing land for cultivation of field crops. The grapefruit-sized fruit is traditionally eaten raw, or made into jam, juice or fruit wine. It is usually yellow, orange or brown, and emits a sweet scent with a touch of clove. Monkey oranges are known for their delicious sweet and sour flavour and are rich in vitamins B and C. They are an important indigenous African resource that supports farmers in times of crop failure, providing a supplementary food in rural areas. By adding the trees to crop fields, gardens, parks, fence lines and street sides, monkey oranges can boost food security and nutrition.

Safou. Native to the humid, tropical forests of West and Central Africa, *safou* (*Dacryodes edulis*) is also known as "butterfruit" for its rich, oily pulp. People in West and Central Africa have been eating *safou* for centuries as a fresh fruit between meals, or cooked as a main course. When roasted or quickly boiled in salted water, the pulp separates from the skin and seed and takes on a buttery texture. In Nigeria, the cooked pulp is combined with starchy foods such as maize to make a main course. The World Agroforestry Centre (ICRAF) promotes *safou* as a key tree species in agroforestry systems that can be intercropped with food crops to provide shade and biomass while also producing edible fruit. And the United Kingdom-based International Centre for Underutilized Crops has been searching for varieties that combine high-quality taste, nutrition and resistance to disease. (*Source*: Worldwatch Institute, 4 October 2011.)

Wild edible fruits of sacred groves, Kodagu, Western Ghats, India

Sacred groves are one of the oldest forms of nature conservation. These forests are easily distinguished from other forest types by the presence of deity symbols or temples, and are mostly managed by local temple committees. The Western Ghats of India – one of the mega diversity centres – is dotted with sacred groves, with some of the highest concentrations located in the Kodagu district, Kamataka, central Western Ghats. A recent study assessed the species composition of the sacred groves of Kodagu and explored whether they shelter wild edible fruit species.

Edible wild fruits are found in different forest tracts of India and botanically come from widely different families. In all, about 600 kinds are known, of which 100 or so are promising. The majority of the fruits are eaten raw when ripe or after processing. However, certain unripe fruits are used either as vegetables or in making pickles. Some fruits are used under starvation or famine conditions.

Results from the study indicated that sacred groves are rich in wild edible fruit species. In fact, the authors report that the sacred groves of Kodagu harbour about

51 wild edible fruit species (23 percent) and shelter species that are absent in reserve forests. Even though the groves appear small, they are rich in biodiversity and are thus really worthy of conservation. Not much is known about the nutritive value of the wild edible fruits, but available information suggests that they are rich in proteins, minerals and carbohydrates, and thus can be used as a source of nutrition. Consequently, the authors conclude that there is a need to assess the nutritive value of available wild edible fruit species and to use them to improve the lives of people living adjacent to the forests. (*Source*: B. Tambat and G.N. Chaithra. 2011. Wild edible fruits of sacred groves, Kodagu, Western Ghats. In *MFP News*, XXI (4).)

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GINSENG

An unlikely root of China's prized cure

It was once worth its weight in gold and reserved for emperors in ancient times, but today the use of ginseng (*renshen* in Chinese) as a cure for minor ailments is flourishing among China's booming middle class. The luxury herb, and China's lust for it, is also bringing wealth to an unlikely location in the heart of the United States of America.

Discovered more than 5 000 years ago in the mountains of China, ginseng is a multimillion-dollar business and is the golden crop in the fields of Wisconsin. Many tonnes of ginseng are shipped back to China, the Middle Kingdom, each year.

As stores across China fill with shoppers rushing to buy Spring Festival gifts, few realize the most popular brands have roots in the Midwest of the United States of America. Recently, in the basement of a Beijing department store near China's National Stadium, swarms of Chinese shoppers lined up around a pharmacy display of American ginseng stamped with a red, white and blue crest bearing an American eagle and the words "Ginseng Board of Wisconsin" in bold type.

"Every year I give the best I can find to my father for Spring Festival," said Gao Feng, who was eyeing a container of large ginseng roots selling for about 150 yuan (US$23.80). He said his father, who is in his late 60s, usually mixes the bitter-tasting root into a tea to help keep him active during the cold winter. When asked if he knew what the crest meant, the 37-year-old real estate agent said he thought it was the brand name and chose Wisconsin ginseng because he was told by a sales clerk it was among the best. Asked if he knew where Wisconsin was, Gao simply replied "no".

Creating brand awareness in a potential consumer market of more than 1.3 billion is one in a long list of challenges facing Wisconsin farmers, who produce more than 90 percent of America's ginseng, or *Panax quinquefolius*, as they push to reassert the Wisconsin strain in the Chinese market.

An unexpected winter storm in 2010 destroyed more than 50 percent of the ginseng crops, which take three to four years to mature fully, making their recovery a slow-going process, says Joe Heil, President of the Ginseng Board of Wisconsin. Heil, who started growing ginseng 20 years ago after converting his family's dairy farm to grow the normally wild root, says that unlike other agriculture in Wisconsin, ginseng can only be grown once on a plot of land before the land becomes unusable for at least 100 years, which made the storm's impact more than particularly troublesome.

Producing about 60 000 lb (27 215 kg) annually on his farm, Heil is one of the largest of about 130 different ginseng farms in the state. While Heil says the storm has taken its toll, he maintains an optimistic view that the drop in Wisconsin crops is actually a turning-point for production. After suffering losses of more than half of their annual produce, the price of the crop has shot up to a record US$40–60 per pound (0.45 kg).

To help farmers get back on their feet, they have received help from one of China's biggest traditional Chinese medicine (TCM) distributors. In late 2010, the Ginseng Board of Wisconsin signed a five-year contract that guarantees one of China's oldest and most respected apothecaries, Tongrentang, exclusive distribution rights. The 360-year-old apothecary, which once served the highest echelons of Chinese society, now deals with Wisconsin farmers directly to help reduce the hefty price tag of the highly sought-after root.

Recently, Tongrentang imported about 400 000 lb (181 437 kg) of Wisconsin ginseng just in time for the Spring Festival rush when shoppers, such as Gao Feng, are buying gifts before making their annual trek home to see their families. The haul will bring in more than US$16 million in profits for Wisconsin farmers who are welcoming Tongrentang's help with open arms as they try to recover from the travails of the past two years.

Tong Song, director of internal risk management at Tongrentang, says the biggest draw among TCM practitioners in China for Wisconsin ginseng is the medicinal versatility of the North American strain. "Compared with Chinese and Korean ginseng, Wisconsin is milder in Chinese traditional medicine theory, so it can be applied to a broader number of people," she says.

With more than 1 000 outlets dotted throughout China selling the Western root, Tong says the company is pushing to establish the Wisconsin strain as a superior root, making vast efforts to inform China's consumers on the benefits while taking it on the road to TCM trade fairs. "We want to let the Chinese consumers know the effectiveness of this imported product," she says. (*Source: China Daily*, 20 January 2012.)

Ginseng

China to start equity trading of wild ginseng

Beijing. China's only online equity exchange portal, Jinmajia (jinmajia.com), will soon launch the trading of wild ginseng, the company said on Wednesday. Fan Dongping, president of Beijing Jinmajia Equity Exchange Online Service Inc., said that the trading may start in March or April, and the benchmark subscription price is likely to be set at around 10 000 yuan (US$1 588). He said that ginseng plants to be subscribed for trading are those that have been grown by Bishui Forestry Company in the mountains of northeast China's Jilin province for more than five years.

According to the Chinese national standard for regulating ginseng quality, plants grown in natural forests for several years can be regarded as wild ginseng. The forestry company in Jilin has planted 70 million of these wild ginseng plants in a natural environment.

Fan said subscribers can either sell the equity of the ginseng products via the Web site, or pay an annual fee of 50 yuan to Jinmajia to keep the equity for added value. Jinmajia is jointly funded by over 20 equity exchange firms, including China Beijing Equity Exchange and Guangzhou Enterprises Mergers and Acquisitions Services. Fan said wild ginseng has great potential to increase in market value, adding that the older the ginseng grows, the more valuable it becomes. He added that equity trading will help build up the domestic brand of high-quality wild ginseng and increase its price.

China produces annually 60–70 percent of the world's ginseng products on average and exports 70–80 percent of its annual production. However, its annual output value on the products accounts for only less than 4 percent of the world's total, as the exports are priced very low, according to the Beijing-based *Guangming Daily*.

Dubbed the "King of Herbs" in China, ginseng has been used as a traditional medicine and health care product for more than 4 000 years. (*Source*: Bernama [Malaysia], 15 February 2012.)

HONEY AND HONEYBEES

EU: pollen warning on honey jars

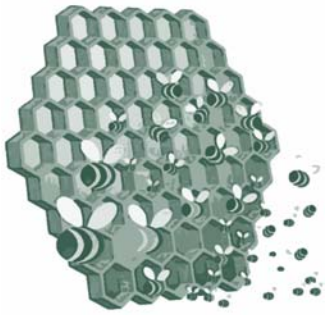
Under new European Union regulations, jars of honey will have to be marked "contains pollen" – a move that experts have branded ludicrous, and say could put some British beekeepers out of business. Honey will also have to undergo expensive tests to prove it does not contain unauthorized genetically modified pollen.

Until now, honey had always been considered an entirely unadulterated product for the purposes of food labelling. But the European Court of Justice has decreed that pollen is an ingredient of honey rather than an intrinsic component. It means that products will, for the first time, have to carry a list of ingredients such as "honey (contains pollen)".

Britain's largest supplier of retail honey, Rowse, said that the bill for relabelling and testing its entire range will run into hundreds of thousands of pounds. John Howat, secretary of the Bee Farmers' Association, which represents the United Kingdom's 300 commercial beekeepers, said the ruling was a nuisance. "The idea that pollen is an ingredient of honey is nonsense. Pollen is integral to honey. Bees collect nectar and pollen. When they are storing it away, pollen gets into the nectar and hence into the honey."

The ruling came after a German amateur beekeeper found small amounts of genetically modified (GM) pollen in his honey. He sued the state of Bavaria, which owned trial GM maize plots near his hives, for damaging his produce.

Anyone who sells honey to the public, including the United Kingdom's 40 000 amateur beekeepers, faces tests. Suppliers whose pollen is found to be more than 0.9 percent GM must undergo full safety authorization and label their honey accordingly. The European Commission is expected to finalize the regulations over the next year. (*Source: Daily Mail* [United Kingdom], 7 November 2011.)



What passes for honey on United States shelves – and the role of pollen

Food Safety News bought more than 60 samples from ten states and the District of Columbia in a recent investigation on the quality of honey on grocery shelves in the United States of America. They sent the jars, jugs and plastic bears to Texas A&M University, where Vaughn Bryant, Director of the Palynology Research Laboratory, analysed them. Bryant is a palynologist, someone who studies spores and pollen. He is also a melissopalynologist (someone who studies honey pollen). What he learned in testing for *Food Safety News* should make every honey consumer wary. His key results were that:

- 76 percent of samples bought at groceries had all the pollen removed;
- 100 percent of the honey sampled from drugstores had no pollen;
- 77 percent of the honey sampled from big box [large retail] stores had the pollen filtered out;
- 100 percent of the honey packaged in small individual service portions from fast food chains had the pollen removed;
- every one of the samples *Food Safety News* bought at farmers' markets, cooperatives and "natural" stores had the full, anticipated amount of pollen.

Pollen-free honey may not sound like a problem, but without pollen it is not possible to trace the source. One-third or more of all the honey consumed in the United States of America is likely to have been smuggled in from China and may be tainted with illegal antibiotics and heavy metals. A *Food Safety News* investigation has documented that millions of pounds of honey banned as unsafe in dozens of countries are being imported and sold here in record quantities.

No pollen, no traceability, no assurance of safety. Furthermore, when pollen is filtered from honey, so are many of the health benefits such as allergy relief and the nutritional value of vitamins, minerals and trace nutrients in bee pollen.

The *Food Safety News* test results come just as the European Union has decided to order honey producers to test for the presence of unauthorized genetically modified pollen and to identify pollen as an ingredient rather than a natural component of honey. Industry spokespeople fear the ruling will put many small-scale beekeepers and honey producers out of business. (*Source*: www.care2.com, 7 November 2011.)

MEDICINAL PLANTS AND HERBS

Liquorice named "Medicinal plant of the year 2012"

Liquorice has been selected as "Medicinal plant of the year 2012" because of its paramount importance to human well-being worldwide. The selection was made by a panel from the University of Würzburg, World Wide Fund for Nature (WWF) and TRAFFIC and was announced today at an event organized by WWF Germany.

"Liquorice is special because it can quickly soothe sore throats and coughs and was used centuries ago to treat coughing, hoarseness and asthma by Ancient Greek and Egyptian physicians," said Professor Johannes Mayer, an expert on the history of medicinal botany at the University of Würzburg.

The liquorice plant is a woody shrub that is native from the Mediterranean to East Asia,

We received this interesting feedback from one of our readers, following the reproduction of the TRAFFIC *article in NWFP-Digest 17/11.*
I am happy to note that *Jaythimadh* (in one of the main languages of India) or liquorice, has been named the Medicinal Plant of the Year 2012. The article mentions "Ancient Greek and Egyptian physicians" BUT Indian physicians knew about the medicinal properties of *Jaythimadh* even earlier. Western scholars often do not have access to Indian literature because many of the old texts have never been translated into English or other European languages. Hence, Indian scholars often go without being recognized. (Ardeshir Damania, India. E-mail: abdamania@ucdavis.edu/)

Liquorice

the Americas and Australia, and grows up to 1 m tall. It is a member of the Fabaceae (pea family), widely cultivated for its medicinal properties and also for use in beverages.

Only the root is utilized, from which a wide variety of compounds – 400 to date – have been isolated. Among the most important is glycyrrhizin, a chemical that possesses almost 50 times the sweetening power of cane sugar.

Today, liquorice is used as an important ingredient called *gan cao* in traditional Chinese medicine, while in Germany, Europe's major consumer and trader in medicinal plants, around 500 tonnes of liquorice are imported each year, 100 of them consumed domestically in medicinal teas.

The root is also used in confectionery and in many herbal liqueurs. In Japan, liquorice is used mainly in medicine but also as an ingredient in cosmetics. (*Source*: TRAFFIC, 21 November 2011.)

Japanese delegation visits India to learn about responsible and sustainable trade of medicinal plants

Representatives from leading herbal companies in Japan have just returned from a visit to India, where they witnessed at first hand the responsible and sustainable collection practices utilized in the medicinal and aromatic plant trade. The visit, organized by TRAFFIC with support from I-AIM (Institute of Ayurveda and Integrative Medicine) took place as part of a project supported by the Keidanren Nature Conservation Fund, with the aim of gaining a better understanding of the benefits of sustainable sourcing of wild medicinal plants and to help promote use of the FairWild Standard within Japanese industries.

Japan was the world's fourth largest importer of medicinal and aromatic plants in 2007, and India the second largest supplier to the country. Many of the plants are wild sourced; however, this is not widely appreciated in Japan.

The Japanese delegates were shown a variety of insights into the trade, including the techniques used to ensure the plants are not damaged during harvesting, the quantities a harvester can gather between early morning and noon, and how local NGOs organize individual harvesters into cooperatives. Briefings took place through face-to-face meetings with local communities and industry, the Forestry Department and other stakeholders.

The FairWild Standard has previously been implemented in field projects in Uttarakhand and Karnataka, and used to inform the National Committee on NTFPs and the medicinal, aromatic and dye plants (MADP) guidelines for India's National Working Plan Code. "Following the success of this visit, we hope that participating companies look favourably upon adopting and implementing the FairWild Standard, to ensure its use becomes widespread within Japanese industry," said TRAFFIC's Kahoru Kanari. "We also hope the companies can help promote our way of thinking within the private business sector. In the long run, involvement of Japanese industry should have a positive impact on conservation of wild plant resources."

An intensive round-table meeting of leading herbal companies in Japan will be held next month in Tokyo. (*Source*: TRAFFIC News Update, 10 February 2012.)

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MULBERRIES

Silk versus synthetic fibres

Scientists at the Universities of Oxford and Sheffield in the United Kingdom have demonstrated that natural silks are a thousand times more efficient than common plastics when it comes to forming fibres. A report of the research is published this week in the journal *Advanced Materials*. The finding comes from comparing silk from the Chinese silkworm with molten high-density polyethylene (HDPE) – a material from which the strongest synthetic fibres are made. The researchers used polarized light shining through a disk rotating over a plate to study how the fibres are formed as the two materials are spun.

Silk is a natural protein fibre, some forms of which can be woven into textiles. The best-known type of silk is obtained from the cocoons of the larvae of the mulberry silkworm, *Bombyx mori*, reared in captivity. The shimmering appearance of silk is a result of the triangular prism-like structure of the silk fibre, which allows silk cloth to refract incoming light at different angles, thus producing different colours.

Silk is one of the strongest natural fibres but loses up to 20 percent of its strength when wet. It has a good moisture regain of 11 percent. Its elasticity is moderate to poor: if elongated even a small amount, it remains stretched. It can be weakened if exposed to too much sunlight. It may also be attacked by insects, especially if left dirty.

HDPE forms filaments at over 125° C and in addition requires substantial energy input in the form of shear force applied to the material in its molten form. Silk, in contrast, in the same setup forms filaments at ambient temperature and in addition requires only a tenth of the shear force. If the energetic costs of melting HDPE are included for comparison, silks become a thousand times more efficient.

The discovery of a low-energy method for fibre formation has led the researchers to

view silks as a new class of polymers they call aquamelts.

"Silk produced by spiders and silk moths demonstrates combinations of strength and toughness that still outperform their synthetic counterparts," said Dr Chris Holland of the Oxford Silk Group, part of Oxford University's Department of Zoology. "Not only are silks superior to man-made fibres, they are produced at room temperature with just water as a by-product."

"Combining the best of polymer science with biology we were able to determine how much energy is required to form these two fibres," he said. "And it seems that we have discovered some fundamental differences between natural and synthetic materials. With hundreds of millions of years of R&D in fibre production it is not surprising that silkworms and spiders have found ways to conserve energy while still making superior fibres." (*Source*: University of Oxford [United Kingdom], 23 November 2011.)

Uganda to export silk to the Islamic Republic of Iran

Uganda is set to start exporting the silkworm to the Islamic Republic of Iran. Mohammad Ali Mousavi, the chairman of Iran-Uganda Establishments, said the production of silk from the 1 000-ha farm in Kisozi, Gomba district should start next month.

Mousavi said that over 500 000 mulberry trees had been planted over a period of ten years. The silkworms feed on the leaves of the mulberry tree to produce silk. "Now is the time to reap. The investment is worth US$9 million [about 27 billion Ugandan shillings]," he said. "Once we start, we shall be producing at least 1 500 tonnes for export to Iran." About 5 000 jobs will be created once production kicks off. "We have 14 000 hectares, but we are currently utilizing only 1 000. We hope to increase production this year," Mousavi added.

The multibillion investment is an initiative of the Iran Agro Industrial Group. If production hits full capacity, Uganda will be among the top producers of silk in the world. China is the number one silk producer, followed by India, Thailand, the Republic of Korea and the Islamic Republic of Iran.

Mousavi said Uganda will be exporting silk worth US$200 000 (about 560 million shillings) every year once production commences, adding that the country's climate was conducive for silk production. "Whereas we can produce silk only once a year in Iran, in Uganda we can produce it seven times." He started investing in silk production in Uganda in 1992. "We have the capacity of producing 30 bags of egg worms from just one hectare of land," he explained.

"Textile manufacturing will be possible with this silk produced from the moth of caterpillars," Mousavi said. "Once the investment grows and we get government support, we can start producing upholstery, wall coverings and carpets." (*Source*: New Vision [Uganda], 26 January 2012.)

Silk no longer reels out happiness for farmers in India

Fifty-year-old Rangamma, a landless silk farmer from Jalamangalakur village near Ramanagara (India), looks defeated as she comes to terms with the price her silk cocoons have fetched at auction at the Ramanagara Cocoon Market, the largest in Asia.

The cocoons having sold for only Rs171/kg, Rangamma, who grows mulberry on leased land, gets to take home a paltry Rs4 626 for the little over 27 kg she brought to the auction. "I will grow three more crops this year. But if the price keeps slumping, how can I feed my family of four when I need to pay Rs15 000 annually to cultivate mulberry on my leased land," she wails.

There are many more distraught mulberry growers such as Rangamma at the bustling cocoon market, which auctions about 50 000 kg of cocoons daily and sees 3 000 licensed cocoon dealers and thousands of farmers arrive not only from Ramanagara, Kanakapura and Channapatna in the state, but also from Tamil Nadu and Andhra Pradesh.

The slash in import duty on raw silk from 33 to 5 percent last March has wiped the smiles off the faces of nearly 10 lakh silk farmers of the state, who are having to battle rising expenditure and dipping incomes.

Their misery is compounded by the low minimum support price of Rs160/kg of cocoon extended by the government, which is nowhere near their cost of production of around Rs350/kg. Things were even worse some months ago when the cocoon price crashed to Rs70/kg.

With the selling price slumping below the basic cost of production, the farmers are being pushed into a debt trap, which they have no way of escaping. Small farmers are in deeper trouble, having to cope with crop loss, poor quality yield, crashing markets and an emerging labour shortage. Many are now migrating to the cities for jobs – a trend that clearly does not augur well for the state's silk rearing industry.

A majority of farmers coming to the cocoon market have no alternative occupation or lucrative crop to fall back on. All they can look forward to is more uncertainty in the future. (*Source:* Deccan Chronicle [India], 21 January 2012.)

NUTS

The Brazil nut and wildlife

The Brazil nut tree demonstrates the important links between plants and animals in an intact rain forest. For example, there are two species of poisonous frog (*Dendrobates castaneoticus* and *D. quinquevittatus*) that almost exclusively use the rain-filled hollow of Brazil nut fruits for their tadpoles.

The Brazil nut flower has a closed hood and is pollinated efficiently only by large-bodied bees capable of pushing open the hood and entering the flower. These bees of the genera *Bombus, Centris, Epicharis, Eulaema* and *Xylocopa* live in the closed forest. A recent decline in Brazil nut production has been linked to pollination deficiency, possibly owing to the smoke from forest fires reducing bee abundance or to the reluctance of some bees to visit fragmented landscapes.

The creamy, pale yellow flowers are also a favoured food of paca, peccary, armadillo and deer. Hunters often build platforms near Brazil nut trees, where they wait for game to come and devour the thousands of meaty flowers scattered on the forest floor.

The agouti is a true friend of the Brazil nut as it is one of the only animals able to gnaw through the thick, hard husk of the nut fruit to reach the nuts inside. It is primarily the agouti, but occasionally squirrels, that disperses Brazil nuts throughout the forest. The agouti scatter-hoards the seeds up to 1 km away from the mother tree, burying and reburying them at depths of 1–2 cm to dig up and eat during the leaner times between fruit seasons. Like squirrels, the agouti may forget some of their buried seeds, allowing the seeds to

germinate. Given their key role in dispersing seeds, it is important not to overhunt the agouti, so that there is no shortage of Brazil nut trees in the future. Scientists think that both the work of the agouti and that of people following indigenous management practices have been responsible for creating high concentrations of Brazil nut trees in certain areas. (*Source*: FAO, 2011. *Fruit trees and useful plants in Amazonian life*.)

Project on Maya nut: an ancient food for a healthy future

Maya nuts (*Brosimum alicastrum*) belong to the fig family (Moraceae). They were the staple food for pre-Hispanic cultures throughout the neotropics, who probably ate them boiled, and protected them as a source of food that attracted their favourite game species (deer, wild pigs and large forest rodents). Maya nuts are exceptionally nutritious, providing high-quality protein, calcium, iron, folate, fibre and antioxidants. They are also one of the best native forage species and show great promise in providing ecological alternatives to pasture for cattle ranches in the neotropics. In recent history, Maya nuts have been critical to rural food security; thousands of villages throughout Central America and Mexico have survived drought and famine by eating the "lifesaving" nuts when no other food was available.

The Maya Nut Institute is working to rescue lost traditional knowledge about the Maya nut tree for food, fodder and ecosystem services. Since our inception in 2001, we have trained more than 17 000 women from 1 150 communities in Honduras, Nicaragua, Guatemala, El Salvador, Mexico, Cuba, Peru, Jamaica and Haiti. This programme has resulted in the planting of more than 1 300 000 new seedlings.

Our programme focuses on women as the caretakers of the family and the environment, and addresses key factors for sustainable livelihoods – sociocultural, environmental and economic – by creating leadership, educational and economic opportunities for women and girls. Our newest programme, "Healthy Kids, Healthy Forests" (Bosques Sanos, Niños Sanos) aims to provide Maya nut-based school lunches to rural children. Starting in Guatemala in 2008, we are now feeding children in Nicaragua, El Salvador, Mexico, Haiti and Guatemala with Maya nut school lunches. These communities are planting Maya nut trees as "food forests" to sustain the programme in the future.

In addition to these accomplishments, we plan to carry out the following: (i) create a women's alternative marketing organization to certify Maya nuts produced and sold by Maya Nut Institute-trained producer groups; (ii) create a certification scheme to certify sustainable, women-produced, fairtrade, organic Maya nuts; (iii) establish an international Maya nut standard; (iv) promote certified Maya nuts to the public through a Web site that brings together all the producer groups in the region; (v) expand the programme to the Plurinational State of Bolivia and Colombia in 2012; (vi) obtain research funding to explore the *Brosimum* genome; (vii) expand the "Healthy Kids, Healthy Forests" school lunch programme from 46 schools in 2008 to 100 schools in 2012; and (viii) obtain recognition of the Maya nut in school lunch programmes from the World Food Programme. (*Source*: Eco-Index® Monthly Update, March 2012.)

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Le noisetier d'Afrique (*Coula edulis* Baill.). Un produit forestier non ligneux méconnu

Les produits forestiers non ligneux (PFNL) représentent un enjeu alimentaire, culturel et économique considérable pour les populations d'Afrique centrale. Les communautés rurales dépendent en effet largement de ces produits, sources d'aliments, de fourrage, de médicaments, de gomme, de résine et de matériaux de construction. Les PFNL commercialisés contribuent à satisfaire des besoins quotidiens et assurent des emplois et des revenus, notamment pour les populations rurales. Ces dernières sont en outre détentrices d'excellentes connaissances, issues du savoir traditionnel, quant à la valeur et aux propriétés de nombreuses espèces végétales encore sous-utilisées. Il s'agit là de plantes sauvages ou cultivées dont le potentiel a été peu exploité commercialement, mais qui constituent un support pour la subsistance économique et alimentaire des populations locales. Ces ressources sous-utilisées comprennent notamment des légumes africains traditionnels.

De nombreuses espèces donnant lieu à des PFNL restent cependant en outre peu étudiées sur le plan scientifique, par exemple *Coula edulis*. Les connaissances encore fragmentaires à ce sujet montrent pourtant que les fruits de cette espèce à usages multiples sont régulièrement consommés et commercialisés par différents groupes ethniques. La culture de *Coula edulis* reste toutefois limitée, notamment à cause du faible taux de germination de ses graines. Son bois, renommé pour sa résistance aux termites, est utilisé localement comme matériau de construction. Les recherches sur les propriétés mécaniques de ce bois ont confirmé ses potentialités technologiques, qui pourraient conduire à revendiquer pour cette espèce une place de choix parmi les essences commerciales. Mieux connu, le potentiel de *Coula edulis* pourrait permettre d'envisager une gestion durable de cette ressource, conciliant exploitation du bois et production alimentaire.

L'abondance actuelle de l'espèce dérive sans doute de l'intérêt que les hommes lui portent depuis 5 000 ans. La reconnaissance et l'intérêt des valeurs culturelle, économique et alimentaire de *Coula edulis* sont en effet bien établis. *Coula edulis* fait l'objet d'utilisations diverses de la part des communautés locales, principalement à des fins alimentaires et médicinales. Par ailleurs, son bois est utilisé pour confectionner les armatures de cases et ses qualités technologiques sont susceptibles d'être exploitées commercialement. Une attention particulière doit donc lui être prêtée, car il constituera alors un cas typique de ressource concurrentielle (convoitée à la fois par les compagnies forestières et les populations locales), à l'instar du moabi. Une description fiable de son écologie, de ses mécanismes de régénération et de sa dynamique des populations devrait permettre de disposer d'éléments de base pour envisager son exploitation durable. L'étude des niveaux de prélèvements par les populations locales, la description de sa filière de commercialisation et l'analyse de son potentiel de domestication devraient compléter cette approche, en vue d'aboutir à un modèle de gestion qui pourrait s'avérer applicable à d'autres PFNL moins connus. (*Source: Biotechnol. Agron. Soc. Environ.* 2011, 15(3): 485-495.)

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RATTAN

Rattan: facts and figures

What is rattan and where is it found? Rattan is a naturally renewable palm that grows in the tropical regions of Africa, Asia and Australasia and is used, among other things, for furniture, handicrafts and building material. Rattan continues to be an invaluable part of rural people's livelihoods in South and Southeast Asia.

Rattan belongs to the palm family (Arecales or Palmea) and is found from sea level up to 3 000 m. Around 600 species and 13 genera of rattan are known. Although most rattan species are native to the tropical regions of Africa, Asia and Australia, there is wide variety in their distribution. Commercially used rattan usually grows in hilly tropical areas, with a mean annual temperature of 25° C and an annual rainfall of 2 000 mm. As a result, the main area for rattan production is in the tropical regions of South and Southeast Asia.

There are different types of rattan palms, such as high or low climbers, single-stemmed or clustered rattan species. Some have very short and underground stems. Several rattan species are known to reach lengths of 100 m.

The majority of the world's rattans are found in Indonesia's forests, with most of the rest of the world's supply provided by the Philippines, Sri Lanka, Malaysia, the Lao People's Democratic Republic, Cambodia, Viet Nam and Bangladesh. Almost all rattan is collected from tropical rain forests. Because of deforestation, rattan populations have decreased over the last few decades and there is now a shortage of supply.

Rattan collection and processing. Rattan is an attractive resource because it is easier to harvest than timber, easier to transport and also grows more quickly than trees. Rattan canes are cut in the forest and are partially processed before being sold. Canes of small diameter are dried in the sun and often smoked using sulphur. Large canes are boiled in oil to make them dry and protect them from insects.

Rattan products. Because it is light, durable and relatively flexible, rattan is used for a range of purposes: food (the inner core as well as the shoot of some of the rattan species is edible); furniture (the main end-product of rattan); shelter (rattan is an approved material for house building in rural areas); and handicrafts (besides furniture, handicrafts provide the main income of the rattan industry). The skin of rattan strands is peeled off and used for weaving, while the "core" of the rattan can be used for various purposes in furniture-making (wicker). Some rattan fruits exude a red resin called dragon's blood. This resin was once considered to have medicinal properties and was also used as a dye for violins.

Other rattan benefits. Rattan harvesting and processing provide alternatives to logging timber in areas where forests are scarce. In fact, rattan grows best under some sort of tree cover, including secondary forest, fruit orchards, tree plantations or rubber estates. As a result, rattan planting indirectly protects tree cover, along with forests. Some rattan species are appropriate for small-scale cultivation under fruit trees or in rubber gardens. This allows smallholders to earn extra money on small areas of land. (*Source*: WWF Web site, wwf.panda.org/).

Rattan is the common name for a diverse group of climbing palms found throughout Old World tropical forests. They have been used for binding, basketry, home construction, food and numerous other non-market purposes for centuries while the canes of some species are gathered for the multibillion dollar furniture, handicraft and mat-making industries. Simply put, rattan is vital to the culture and economic well-being of millions of collectors, artisans and labourers throughout tropical Asia and Africa. (*Source*: S.F. Siebert. 2012. *The nature and culture of rattan: reflections on vanishing life in the forests of Southeast Asia*. University of Hawai'i Press, Honolulu, Hawaii.)

(*Please see pages 10–11 and 74 for more information*.)

The important role of rattan plantations in salvaging the rattan furniture industry in the Philippines

Rattan production in the Philippines is experiencing a drastic decline. Forest statistics show that 32 336 000 lineal metres of cane in 2008 were reduced to 3 102 000 m in 2009. This resulted in a loss in export revenue of more than US$12 000 for that period alone. With the continuing destruction of forest habitat, it is expected that this scenario will further worsen. In 1988, the Philippine Government established approximately 12 000 ha of rattan plantations to salvage this multimillion dollar industry, which means that these materials are now ready for harvest. Plantations could definitely provide an inexhaustible supply of raw canes for the industry but their use is a big risk for manufacturers. Limited information pertaining to the growth habits of the plant and on the kind and quality of cane produced in plantations is the cause of such uncertainties.

Financial assistance from the International Foundation for Science (IFS), Sweden, the Philippine Government and the University of the Philippines Los Baños has led to a series of scientific inquiries on plantation-grown *Calamus merrillii* Becc. (*palasan*), one of the commercially important Philippine species. Data revealed that the growth rate of the cane was highly affected by the soil pH, organic matter, nitrogen, potassium and phosphorous content of the site. Furthermore, site elevation, amount of sunlight exposure and topography also had a direct impact on cane production. Growth rate ranged from 0.36 to 3.79 m/yr.

In terms of basic cane properties, studies showed that fibre length was from 1.3649 to 1.9124 mm, fibre wall thickness from 0.0054 to 0.0109 mm and fibre distribution from 21.14 to 38.42 percent. Specific gravity varied from 0.38 to 0.51, modulus of rupture was from 14.35 to 32.45 MPa, while modulus of elasticity went from 3.23 to 6.37 GPa. All these properties were minimally affected by the growth rate of the plant. Unlike wood whose properties are normally altered in plantation conditions because of the production of juvenile wood, plantation-grown *palasan* stems were unaffected by growth-enhancing activities.

Furthermore, comparing the properties of plantation-grown canes with wild canes taken from natural forest revealed that the

two were practically the same in all aspects, e.g. mechanical, physical, structural and chemical properties. They were also similar in terms of their softening temperatures. Thus, it can be said that plantation-grown *palasan* stems behave similarly to wild canes during processing. This proves that plantation canes could be extensively used in the rattan industry without sacrificing the quality of the finished products. This is good news for rattan manufacturers not only in the Philippines but in all rattan-producing nations. (***Contributed by:*** Dr Willie P. Abasolo, Chair, Forest Products and Paper Science Department, University of the Philippines Los Baños, Laguna, Philippines 4031. Fax. 63-49-536-3206; e-mail: willieabasolo@yahoo.com/)

SHEA BUTTER

As the shea industry continues to grow, stakeholders set their sights on Cotonou for annual conference

With rising global interest in shea, the African shea industry is growing at an unprecedented rate. Prices for shea have increased by a staggering 50 percent since 2006 as the shea-producing industry has forged connections and built on its strength. Now, industry stakeholders will focus on positive impacts to communities and strengthening sustainability at the sixth annual shea conference, which is being hosted by the Global Shea Alliance. "The industry is expanding so rapidly – this is a critical time for shea," said Gilles Adamon of Natura, a Benin shea butter producer.

Shea nuts grow on wild trees that are critical to maintaining environmental sustainability in the West African Sahel region. Harvested mainly by some four million women in the region, shea is a significant and growing source of income for families and communities. A 2010 USAID study showed that for every US$1 000 of shea nuts sold at the farmgate level, US$1 580 in additional household income is generated in the local economy. A major aim of the 2012 shea conference (www.globalshea.com) is to highlight and strengthen the shea industry's focus on the triple bottom line of people, planet and profit.

With 12 000 tonnes in processing capacity and 35 000 tonnes of shea nuts harvested for export each year, Benin is an ideal place for industry stakeholders to identify new investment opportunities that will benefit business and local communities.

"We see our annual participation in the shea conference as critical," said Monica Hjorth of AAK, the world's leading trader of shea nuts. "It allows us to discuss the most important issues in an industry that has such a huge impact on the world."

The conference includes a business-to-business forum that will match companies to service providers, financiers, suppliers and others, according to their needs. A set of field trips will take conference participants to important industry sites across Benin.

After launching the Global Shea Alliance at Shea 2011 in April, industry stakeholders are developing the vision for the industry. The Alliance connects hundreds of companies across the sector, providing a platform for advocacy, promoting shea worldwide, and helping to set quality standards across the industry. "The Alliance has brought together the entire industry to build strength and forge collaborations for the positive development of the shea industry worldwide," said Eugenia Akuete, President of the Global Shea Alliance.

Shea, which is used widely in food products, is also growing in popularity for its benefits as a natural cosmetic as well as emerging research suggesting health benefits of its natural oils. (*Source*: West Africa Trade Hub, 21 February 2012.)
(*Please see page 70 for more information.*)

SHELLAC

Shellac's as tough as nails

Edmonton, Canada. A manicure that lasts up to two weeks without chipping or smudging may sound too good to be true, but thanks to a hybrid gel polish, it doesn't have to be.

One of the biggest nail innovations of 2010, shellac (a resin secreted by the female lac insect, *Laccifera lacca*) has steadily gained recognition for its sleek finish and long-lasting results. Developed by California-based company Creative Nail Design, shellac is steadily gaining popularity in Canada as well. The product brushes on like regular nail polish, but is the first-ever "powder polish" to set like a gel nail under ultraviolet light. This curing process makes shellac more flexible and durable than the average manicure, and avoids the lengthy drying times of regular polish.

The treatment is more nail friendly than its gel counterpart in that no sculpting or heavy filing is required, and nails may feel stronger and look healthier as a result. (*Source*: Edmonton Journal, 8 February 2012.)

STEVIA

Stevia in Europe

In case you missed it, the European Union (EU) approved stevia (*Stevia rebaudiana*) last autumn as a food additive for foods and beverages. The approval, specifically intended for stevia's sweetening compounds (steviol glycosides), comes at a time when consumers increasingly demand products with little or no added sugars. According to market research group Datamonitor, global launches of products with "no sugar added" positioning increased from 490 to 2 308 during 2009–2010.

But an EU approval is just the beginning for stevia foods in Europe. While proponents of the zero-calorie, natural sweetener are understandably smitten over its growing recognition, the European legislation (as it currently reads) presents some initial challenges. Stevia-sweetened products must have the ingredient listed under its designated E number – E 960 – which may be accompanied by the ingredient name steviol glycosides. This isn't doing much for the average consumer who isn't yet familiar with the stevia plant, much less the name of its scientifically active compound.

A listing of stevia leaf or stevia extract elsewhere on product packaging would make for a "friendlier" label, but allowing alternative wording will be up to individual member states. Marketers may also wish to fall back on images of the stevia plant, if authorized.

An acceptable daily intake (ADI) for steviol glycosides set at 4 mg/kg of body weight presents another challenge. The European Food Safety Authority (EFSA) (Parma, Italy), the health body that established ADI, considers it a "conservative" level that might still be exceeded by some users.

Flavoured soft drinks are predicted to be the biggest contributors of stevia to the EU diet. Exposure limits in these products specifically may be subject to change. EFSA says that it will reassess this ADI in the

future, following information it will request from producers and users of steviol glycosides.

But even with intangibles like these yet to be clarified, the notion of mass stevia consumption in Europe is not going anywhere. Whereas EFSA directives allow member states a "take it or leave it" approach to legislation, the stevia approval comes in the form of a regulation, something the International Stevia Council (Brussels) affirms cannot be denied in any member state. "Steviol glycosides have been authorized through a Commission Regulation and therefore EU member states have to implement the legal text in full," said the International Stevia Council's executive director Maria Teresa Scardigli. "They do not have the freedom to deny the use of stevia at a national level."

Stevia's approval in Europe casts a little more uncertainty on the artificial sweetener industry worldwide. To make Europe's case more interesting, EFSA recently announced its intent to speed up a risk assessment of the artificial sweetener aspartame, from its original 2020 deadline to a much earlier deadline of 2012. Rising concern from regulatory bodies and consumers over artificial sweeteners has already led suppliers to take stock in stevia and other alternatives. Shortly following the EU's stevia approval, Chicago-based Merisant, which supplies the artificial sweetener Equal, expanded its Misura stevia line with a launch of the first tabletop stevia sweetener in Italy. Other companies have made similar advancements. (*Source*: Nutritional Outlook, 8 February 2012.)

TAMANU OIL

Uses and products

Oil extracted from the fruit of the *tamanu* (*Calophyllum inophyllum*) has been used as a traditional medicine and cosmetic in Pacific island cultures for centuries. The oil is tinted green, is thick and woodsy or nutty smelling, and is easily absorbed into the skin. It does not solidify in cool weather as does coconut oil. Modern cosmetic products based on *tamanu* oil are sometimes mixed with olive oil or shea butter.

Traditional and modern uses are all topical – the oil is not edible. In addition to being used as a massage oil and skin moisturizer, *tamanu* oil has traditionally been used to treat various skin injuries such as scrapes, burns, insect bites, sunburn,

Calophyllum inophyllum

and diseases and sores such as dry skin, psoriasis, eczema, ringworm and even nappy rash. The oil has traditionally been used to treat rheumatism and inflammation and is believed to help heal scars.

While some claims are clearly exaggerated, medical research has shown that *tamanu* oil has antibacterial properties and may help promote healing of scars. Other *tamanu* plant extracts and chemicals derived from them have been shown to decrease the growth of tumours and inhibit leukaemia cells in laboratory settings. The results of some studies have even shown that inophyllums, chemicals extracted from *tamanu* oil, inhibit HIV reverse transcriptase in a novel way, which indicates that some day they may be used as part of a combination therapy for AIDS. The main fatty acids that comprise the oil are palmitic, stearic, oleic and linoleic acids. There has been at least one case documented of an allergic reaction to the oil, so individuals should apply a small amount first as a test before using. A qualified medical professional should be consulted for serious or long-term injuries or diseases.

Tamanu oil was traditionally used as lamp oil in Polynesia and has been proposed as a source of biodiesel. However, the high value of the oil in the cosmetics market today makes it unlikely that it would be burned for energy. In addition to the fatty acids, the oil also contains up to 30 percent resins, and there was early interest in the use of the oil as a varnish. Traditionally, the oil was used to help waterproof *kapa* (bark cloth) in Hawai'i.

Tamanu nuts are usually harvested from the ground beneath wild stands. The nuts are harvested when the husks are partially or wholly rotten but the kernels are still fresh. While processing is done by hand in most locations, simple machines used to extract the kernels from macadamia nut (*Macadamia* spp.) or *kukui* (candlenut) could also be adapted to work for *tamanu*. The kernels need to be dried to produce the oil. Sun drying takes one to two months, but nuts may also be dried in homemade solar driers similar to those used to dry fruit or coffee, or in an oven at 37° C. In former times, nuts were baked on hot rocks from a fire. Some kernels will develop mould during the drying process, and these need to be removed daily or they will ruin the whole batch. Wood-fired copra driers are sometimes used to dry *tamanu* kernels on islands where there is a copra industry, but this lends a smoky odour to the oil. Kernels may be cut in half to speed the drying process. Processing begins when the kernels turn deep golden brown and an oily film forms on the surface. The kernels are then ground in a food grinder and cold-pressed to extract the oil. Extraction of the oil in boiling water is not recommended as heating may change the chemical properties of the oil. *Tamanu* oil is usually sold in pure form but it may also be mixed with olive oil or shea butter. It has a shelf-life of about a year.

Value-added processing

The value of *tamanu* oil lies not just in its physical and healing properties, but with the connection that consumers make with the Pacific islands. For Western users, it allows an escape from the daily routine and the chance to try something exotic. For consumers in Hawai'i or Polynesia, using *tamanu* oil allows them to connect with a cultural tradition. The oil is seen as a treat or an indulgence rather than something for everyday use. As currently sold, it is packaged in very small bottles, usually only 30 ml (1 oz) and seldom more than 60 ml (2 oz) with labels evoking Hawai'i or the South Pacific. For the Hawai'i market (or for marketing to those who have visited Hawai'i), the oil is labelled *kamani* oil, using the Hawaiian name, but for the rest of the world it is more commonly labelled *tamanu* oil, using the Tahitian name. Although the oil is now also sourced from Madagascar, marketing emphasizes the connection with Tahiti or Hawai'i rather than with Africa. Value is added to the product not so much by processing as by packaging and marketing. Some oil is marketed as being USDA-certified organic, although it is unlikely that pesticides or chemical fertilizers are used to any great extent for

tamanu. *Tamanu* wood is likewise prized in Hawai'i, Tahiti and elsewhere in the Pacific because of its cultural connections.

Markets

Tamanu oil is traded internationally, from wholesale producers to bottlers and retailers. Retail prices advertised on the Internet for pure *tamanu* oil range from US$4.00 to US$40.00 for a 30 ml bottle. Shelf prices for *tamanu* oil in Hawai'i are about US$10 for a 30 ml bottle. Opportunities exist to produce and market locally sourced *tamanu* oil for local sale in resort locations rather than producing it in bulk for the wholesale market. In Hawai'i, consumers might prefer oil produced in Hawai'i from trees grown in Hawai'i, and a grower would be able to realize more income from local retail sales than from wholesale sales. (*Source*: J.B. Friday and R. Ogoshi. *Tamanu* (*Calophyllum inophyllum*). In C.R. Elevitch (ed.). 2011. Specialty crops for Pacific islands. Permanent Agriculture Resources, Holualoa, Hawaii.)

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TRUFFLES

Italian truffles achieve PEFC certification

White truffles (*Tuber magnatum* Pico) from Muzzana del Turgnano, a small town in northern Italy between Trieste and Udine, have become the world's first truffles to obtain PEFC certification (Programme for the Endorsement of Forest Certification).

"While the main focus of PEFC as the world's largest forest certification system is promoting sustainable forest management and certified timber, the importance of certified so-called 'non-timber forest products' cannot be underestimated," said Antonio Brunori, Secretary General of PEFC Italy. "These products often represent a significant source of income for rural communities (all over the world) and are an integral part of local people's lives. In addition, they help in increasing their connection to the forest, which is certified for its sustainable management: this certification of one of its products will help them in communicating their territory and natural resources, enhancing the value for tourism and hospitality activities."

"Furthermore, NWFPs allow us to better inform the public about the benefits of certification as people can relate more to forest-derived products such as truffles, essential oils, mushrooms and even beer – products that they can experience with all their senses. Timber products such as wooden beams, paper or furniture tend to be of a more 'functional' nature and therefore do not convey the message of sustainability that well," Mr Brunori continued.

The truffles are harvested by hand in the region's PEFC-certified Baredi Forest, which covers over 160 ha of communal land. The Muzzana white truffle boasts a unique odour and is considered to be very tasty and of high value to chefs everywhere, and has a retail value of around €3 000/kg.

Certification of the truffles was pioneered by the Associazione Muzzana Amatori Tartufi (Muzzana Amateur Truffle Association) and involves a system that assigns barcodes to each and every truffle harvested on behalf of the Association. In addition to originating from PEFC-certified forests, this system also ensures that the truffles come from local forests, namely the Baredi Forest.

"The white truffle is the most valued of all underground fungi and represents a great example of the value that non-wood forest resources offer to local communities," said Enore Casanova, President of PEFC Friuli-Venezia Giulia. "Only local people with the required skills and experience in harvesting are allowed to pick these certified truffles, and we are very proud to have harvested the first PEFC-certified truffles in the world."

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WILDLIFE

Biodiversity: endangered and in demand

With an ingredients list that includes rhinoceros horn and tiger bone, traditional Asian medicine is on a collision course with wildlife preservation.

It looks innocuous enough: a small phial bearing a white and orange label with the words *Shi-He Ming Yan Wan*. Yet the pills contained within are said to hold great healing powers, able to cure just about anything, from a mild fever to a brain haemorrhage, from cancer to AIDS. The pill's power, it is claimed, comes from a small amount of rhinoceros horn. Little wonder then that people pay as much as US$50 000/kg, roughly the same as the price of gold.

The rhinoceros and its horn are not alone: powdered tiger bone is used to treat rheumatism; and the scales of the toothless, anteater-like pangolin are believed to reduce swelling and improve blood circulation. It is a similar story for many other endangered species whose commercial use is restricted – or banned outright – by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The illicit trade in wildlife is a booming industry, estimated by the United States congressional research service to be worth as much as US$20 billion globally each year. Although this figure includes trade in bushmeat, skins and exotic pets, in the expanding Asian market, estimated to be the largest in the world, a significant driver is traditional Chinese medicine (TCM). Indeed, despite showing signs of decline in the 1990s, the poaching and trade of endangered animals such as tigers and rhinos are once again on the rise. Yet cheaper and more potent alternatives are available. Organizations such as the American College of Traditional Chinese Medicine say that sustainable substitutes have been used successfully for nearly two decades. So why is there still a burgeoning market to use these precious animals in traditional Asian medicine?

One likely factor driving this demand is the rise in the wealth of China, says Sabri Zain, director of advocacy for TRAFFIC International in Cambridge, United Kingdom, which was established in 1973 to monitor wildlife trade.

The market for these substances also seems to be expanding. A range of new products has emerged over the past decade, available as black market products or through online stores. "Tiger bone is now being used in wine," says Debbie Banks, a senior tiger investigator with the

Environmental Investigation Agency (EIA), a campaign group in London. Association with status is a major issue, reflected in the demographic of the modern-day user of these products, says Zain. "It is a myth that these products are only being consumed by an older generation. It is also young, wealthy professionals," he says. "It may be a way of showing their peers that they can afford these very expensive medicinal products."

In Viet Nam, which is one of the largest markets for TCM outside China, traditional remedies are much sought after. If incomes were to increase, so too would consumption of products containing endangered species. This is hardly surprising, says Zain, given the perception that products such as rhino horn are capable of curing cancer – a medicinal property previously unheard of in traditional Asian medicine.

But perhaps the most disturbing notion is the prospect that people might trade in endangered animals as a means of "investing in extinction". This is the idea that by actively buying up and stockpiling rare animal parts, one can not only push up the price, but also encourage further poaching that will eventually force the species into extinction. In cold-blooded business terms it makes an awful lot of sense, says John Scanlon, secretary-general of CITES in Geneva, Switzerland. "If something is rare it becomes more attractive," he says. "And the rarer something is, the more valuable it becomes."

Scanlon concedes that he only has "rumour and anecdotal evidence" that anyone is actually "investing" in the demise of a species. "It is still speculative," he adds. According to EIA, however, tiger farms are stockpiling the bones and skins of tigers that die. Indeed, Chinese authorities have set up two operations – one in Guangxi and one in Geilongjiang – to dismember the carcasses of dead tigers and destroy all but the bones and skins. The Chinese authorities say this is to ensure there is adequate supervision of the carcass and body parts, but why the bones and skin are then not destroyed is not clear. So although there is no proof of people stockpiling wild tiger parts, it is certainly happening in farms.

There is no simple solution to tackle illegal trade in these endangered animals, says Scanlon. But the hope is that progress can be made by adopting diverse tactics, including controlled delivery, tracking illicit substances to the buyer. (*Source*: *Nature*, 22 December 2011.)

"Illegal and unsustainable wildlife trade has reached unprecedented levels in Southeast Asia. If enforcement efforts are not stepped up, many species will be lost forever. Existing tools such as CITES and the ASEAN Wildlife Enforcement Network must be fully utilized and urgent action must start now." (*Source*: C.R. Shepherd, Deputy Regional Director, TRAFFIC Southeast Asia. *TRAFFIC Bulletin*, 23(3), 2011.)

Regional wildlife conservation project in Asia

Dhaka, Bangladesh. On Sunday, the World Bank launched a wildlife conservation project here that will also cover three neighbouring countries. The Strengthening Regional Cooperation for Wildlife Protection in Asia project, which is to be implemented in Bangladesh, Bhutan, India and Nepal, aims at helping participating governments to enhance shared capacity, institutions and knowledge. It also aims at addressing cross-border poaching and other regional conservation threats to habitats in border areas.

With South Asia's rich biodiversity, the region is a lucrative target of the illegal wildlife trade, said the Washington-based lender in a statement, adding that illegal poaching of the iconic tiger and elephant, deer and reptiles, different species of birds and corals is the most severe threat against biodiversity conservation.

To address this, the World Bank recently approved a US$36 million fund for wildlife conservation efforts in Bangladesh. Participation by other tiger range countries in South Asia and Southeast Asia is envisaged in later phases, the statement added. Bangladesh holds the largest remaining population of tigers in the Sundarbans. Habitats across Bangladesh, Bhutan, India and Nepal are home to over 65 percent of the 3 000 or so remaining wild tigers. Bangladesh faces severe conservation challenges, said the statement, adding that 4–5 percent of faunal species and about 10 percent of floral diversity have become extinct in the last century in the country.

No single country can manage or eliminate the threat of wildlife poaching on its own, said the statement, adding that neither can a single country manage contiguous cross-border wildlife habitat effectively, since wild animals cannot be confined to national boundaries.

It said conservation of these habitats would also contribute to sustainable livelihoods for people dependent on forests. The project is expected to bring about regional collaboration in combating wildlife crime. (*Source*: Zee News [India], 13 February 2012.) ♣

Nearly all men can stand adversity, but if you want to test a man's character, give him power.

Abraham Lincoln

AFGHANISTAN

Killing heroin with saffron

Weaning Afghanistan's poppy farmers away from growing the raw material for the bulk of the world's illicit heroin has never been easy, but Kashmir's saffron cultivators may have the answer. A high-value crop, saffron has long been seen as a counter-narcotics candidate, but the idea has a chance of coming to fruition with expertise from farmers in India's Jammu and Kashmir state who produce the finest saffron anywhere.

An agreement between the agriculture ministries of the two countries paved the way for a 25-member delegation from Afghanistan to visit Jammu and Kashmir in November 2011 and see how the state's success with saffron can be emulated.

After touring Pampore, the main centre of the saffron industry, located 14 km east of Srinagar, delegation chief Naseem Atai told IPS that he was hopeful of a "change of choice" in his country. "Once our farmers grow saffron in the manner of their Kashmiri counterparts, they will certainly find it a profitable agricultural activity and they may ultimately give up growing poppy," Atai said. "We have seen how Kashmiri farmers are earning good dividends by growing saffron. We can do the same for Afghanistan if we adopt the same methods and techniques."

Afghan farmers, said Atai, have already been growing saffron since 2000 in Herat province near the border with the Islamic Republic of Iran, "but the yield and quality are not good since the farmers have no expertise or access to good technology".

The Islamic Republic of Iran and Spain are the two other countries where saffron is grown, with Iran producing 85 percent of the world's supply. Yet the quality of Kashmiri saffron – essentially the dried stamen of the flower – is considered to be far superior to that grown elsewhere in the world.

Saffron is sought for the aroma, colour and flavour it gives to rice and other food. It has also been used for centuries in medicines and as a natural pigment. Depending on the variety, some 400 000 or more stigmas may go into making 1 kg of saffron. The work must be done by hand and, since it calls for nimbleness, the industry holds out employment prospects for large numbers of women.

Saffron is considered the world's costliest spice, and Kashmiri varieties currently fetch US$3 600/kg, although prices in recent years have gone as high as US$6 000/kg.

Support from India to prop up various sectors of Afghanistan's economy was formalized under a "strategic partnership agreement" signed in New Delhi during a visit by Afghan President Hamid Karzai in the first week of October 2011. This agreement came even as the United Nations Drug Control Agency released the report of a survey that showed land under poppy cultivation in Afghanistan increasing as a result of rising opium prices on the one hand and economic hardships faced by Afghans on the other. According to FAO, while Afghanistan's National Drug Control Strategy aims to eliminate illicit opium poppy cultivation by 2013, the UN survey found that poppy is now grown in 17 of the country's provinces. "Cultivation of poppy has devastated our agriculture and reputation. Our country is now known more for poppy and conflict than for any positive activity. We want to change that," said Asadullah Aurakzai, a member of the delegation. (*Source*: IPS in Real Change News, 25 January 2012.)

ANGOLA

Environment Ministry to create supervision body

The Angolan Environment Ministry, supported by its partners, will soon create a national environment controlling body to manage the country's parks. "This will be implemented under the policies and government programmes aiming at improving control and management actions in the conservation areas, mainly in the national parks, where ecotourism needs to be promoted," said the Environment Minister, Maria de Fátima Jardim.

The project started with a group of 45 former military personnel selected in the northern Cabinda province, who said they are ready to learn techniques to enable them to take care of Mayombe Forest, mainly its national park. (*Source*: Angola Press, 9 February 2012.)

ARMENIA

Norwegian Ministry of Foreign Affairs makes major commitment to Armenia Tree Project

Yerevan. In recognition of Armenia Tree Project's successful record in tree planting, environmental education and sustainable development, the Norwegian Ministry of Foreign Affairs has awarded it a US$1.2 million grant. The Norway funding will provide partial support for some of the project's core programmes, including tree planting initiatives in towns and villages throughout Armenia, an expansion of reforestation programmes in northern Armenia, maintenance of recently planted forests, environmental education programmes that train teachers and inspire youth, and community training in sustainable forest management. (*Source*: Armenia Tree Project press release, 14 March 2012.)

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AUSTRALIA

ACIAR'S forestry research in Pacific island countries

The Australian Centre for International Agricultural Research (ACIAR)'s main strategies in the Pacific islands have been to focus on research that supports the growing of high-value trees by landowners, developing value-adding opportunities for timber and non-timber products, and the protection of plantations from insects and diseases.

Forests and trees have great cultural significance for Pacific island people and provide many benefits for subsistence and livelihoods. In some of the Pacific island countries, such as the Solomon Islands, Vanuatu and Fiji, forests have also been commercially exploited and forest industries are important contributors to the national economies. Forests are held under custom landownership, but governments regulate commercial forestry operations. While timber is important, there are many NTFPs that provide significant cash income for people in remote locations. Nuts from *Canarium* trees are an important, locally traded NTFP in the Solomon Islands and Vanuatu. Sandalwood (*Santalum*

austrocaledonicum) has been traded for centuries and is still a very important forest product in Vanuatu. (*Source:* Tony Bartlett, Forestry Research Program Manager, Australian Centre for International Agricultural Research.)

BANGLADESH

Improving livelihood status through collection and management of forest resources

A recent paper explored the role of forest resources in improving the livelihoods of forest-dependent people in and around two forest ranges in Sylhet Forest Division. The authors conducted an intensive field survey from early May to mid-August 2010, collecting primary information through community profiles and household interviews, using a semi-structured questionnaire focusing on sociodemographic, livelihood activities and overall impacts on forest resources. A total of 58 respondents from two forest ranges (36 from Kulaura and 22 from Habiganj-2 range) were interviewed.

Data analyses show that overall, 26 and 33 percent of people respectively in the two ranges, are totally dependent on the forest for their livelihoods. About 42 plant species belonging to 32 families were used by the people. Of these species, trees dominated (50 percent), followed by herbs (29 percent). Collecting forest resources, especially NTFPs and building materials, helps people meet important household needs and are sources of income – such as leaves and medicinal herbs, food for livestock, fruits, fuelwood and honey – while also supporting the production of secondary goods such as processed or prepared food (animal and vegetable), baskets and other crafts.

The paper concludes that research on the use of forest resources and co-management practices should be implemented through forest-dependent people to continue to live in and around the study areas in a sustainable manner. (*Source*: Improving livelihood status through collection and management of forest resources: an experience from Sylhet Forest Division, Bangladesh. In *International Journal of Forest Usufructs Management*, 12(2), July–December 2011.)

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BENIN

Ethnic differences in use values and use patterns of *Parkia biglobosa* in northern Benin

The African locust bean tree (*Parkia biglobosa*) is a multipurpose species used widely in arid Africa by local communities. The present study focused on ethnic differences in use values and use patterns of *P. biglobosa* in northern Benin, where the species grows widely. The use values according to the various ethnic groups in the study area have been evaluated in detail.

From 13 ethnic groups, 1 587 people were interviewed in the study area using semi-structured questionnaires. All interviewees in the study area knew at least one use of *P. biglobosa*. The various uses identified were medicinal (47 percent), handicraft and domestic (3 percent), medico-magic (1 percent), veterinary (1 percent), cultural (1 percent), food (25 percent) and commercial (22 percent). The various parts involved in these types of uses were: fruits (shell [2 percent], pulp [22 percent] and seeds [36 percent]), bark (17 percent), leaves (9 percent), roots (3 percent), flowers (1 percent) and branches (10 percent). The ethnic group consensus values for *P. biglobosa* parts showed that the seeds are used the most.

The study concluded that *P. biglobosa* is well known and used in different ways by the local populations in the study area. Local knowledge on the species is diversified and influenced by ethnic group. Ethnic differences in use values and use patterns of the species were evident in this study. (*Source*: K. Koura, J.C. Ganglo, A.E. Assogbadjo and C. Agbangla, C. 2011. Ethnic differences in use values and use patterns of *Parkia biglobosa* in Northern Benin. *Journal of Ethnobiology and Ethnomedicine*, 7: 42.)

Bénin: quand les dieux préservent les forêts

(Syfia Bénin.) Le Bénin conserve encore près de 3 000 forêts sacrées, réservoirs de biodiversité et remparts contre la désertification. Bientôt intégrées dans les aires protégées, elles contribuent à leur préservation, en dépit de pressions croissantes.

À Ouidah, capitale économique du Bénin située à 40 km de Cotonou, un lopin de forêt oppose encore une résistance à une cité en pleine urbanisation. Dans la partie de la forêt accessible au public, de petites cases décorées de dessins de serpents et des amulettes accrochées aux pieds de grands arbres alertent le visiteur qu'il se trouve en un lieu habité par les esprits. Nous sommes dans la forêt sacrée de Kpassè. «Cet endroit est sacré parce que c'est ici que se trouve l'esprit du roi Kpassè qui, disparu en 1661, s'est transformé en arbre», raconte Anicet Zantchio, guide dans cette forêt érigée en site touristique. «Nous avons décidé d'ouvrir une partie du domaine au public à la demande du Gouvernement. En principe, seuls les initiés sont autorisés à se rendre dans cette forêt où nous organisons les cérémonies rituelles, en particulier l'enterrement des crânes des défunts de notre lignée», ajoute Gédéon Kpassènon, membre de la famille royale de Ouidah qui assure la gestion de la forêt.

Le Bénin, terre du vaudou, regorge toujours de réserves boisées conservées par les gardiens de la tradition, en grande majorité de petits îlots forestiers éparpillés sur le territoire. Une récente étude a répertorié 2 940 forêts sacrées et autres plantations «déifiées», abritant divinités tutélaires, sociétés secrètes ou cimetières, pour une superficie totale d'environ 18 360 hectares.

Rempart contre la désertification

Même si les forêts sacrées sont prioritairement consacrées aux rituels vaudou, elles constituent, aux yeux de nombreux spécialistes, la forme traditionnelle par excellence de conservation des écosystèmes. «Leur gestion et leur accès, indique Nestor Sokpon, enseignant en sciences agronomiques à l'Université d'Abomey-Calavi, sont réglementés par des principes religieux qui se matérialisent à travers tout un ensemble d'interdits, de prescriptions et de pratiques rituelles qui ont longtemps permis leur protection et leur régénération». La réglementation de l'accès

au lieu et à ses ressources ont souvent repoussé les propensions humaines à leur destruction. «Nos parents avaient des coutumes pour préserver les écosystèmes, forêts, marigots, etc. Quand ils sentent la pression démographique, ils implantent un fétiche pour faire reculer l'activité humaine et garantir un certain équilibre environnemental», souligne Ferdinand Kidjo, directeur technique du Centre national de gestion des réserves de faune (CENAGREF).

L'importance de ces forêts dans la préservation de la biodiversité est beaucoup plus forte dans le Nord du pays, où les rites d'initiation en forêt sont encore légion. «La conservation des forêts à des fins initiatiques constitue un vrai rempart contre la désertification, très avancée dans cette région du pays», atteste Ferdinand Kidjo. Pour lui, ces forêts sont comme un réel instrument d'adaptation au changement climatique. «Si on les regarde, renchérit Évariste Alohou, coordonnateur du projet d'intégration des forêts sacrées dans les systèmes des aires protégées du Bénin, on y retrouve des espèces végétales qui n'existent plus nulle part ailleurs. Elles regorgent d'une biodiversité que nous ne retrouvons plus dans les végétations exploitables.»

Il faut sauver la forêt

Mais la force des esprits qui préservaient autrefois l'intégrité de ces surfaces boisées semble s'effriter au fil du temps. «La forêt sacrée de Kpassè couvrait une superficie de 360 hectares, aujourd'hui elle est confinée dans un périmètre de 4 hectares parce que le domaine a été morcelé au profit des habitations», se désole Gédéon Kpassènon. Évariste Alohou constate que beaucoup de forêts sont aujourd'hui menacées de disparition, car confrontées à une dégradation avancée face à des pressions démographiques et économiques, liées surtout au recul du pouvoir des religions traditionnelles. «Les gens croient de moins en moins aux esprits des forêts sacrées, qui commencent à faire l'objet d'une exploitation frauduleuse», affirme-t-il. Ferdinand Kidjo estime, pour sa part, que l'absence des forêts sacrées dans le système national des aires protégées a contribué à leur dégradation.

Conscient du péril, l'État béninois a lancé en 2010 le projet d'intégration des forêts sacrées dans le système des aires protégées. «Il s'agit pour nous de développer des aires communautaires, de promouvoir un système d'utilisation durable et d'étendre les principes de bonne tenue de ces forêts sacrées et de leur environnement», affirme le coordonnateur du projet financé par le Fonds pour l'environnement mondial (FEM). En attendant de passer la main au Code forestier national, les esprits gardent toujours le contrôle sur ce qui reste des forêts sacrées contre la convoitise humaine de plus en plus pressante. *(Source*: Syfia Info, 22 décembre 2011.)

BHUTAN

Locals worry over sustainability of bamboo supply

Sephu Geog, an area once providing an abundant bamboo harvest, is now facing a shortage in its supply as demand for bamboo handicrafts has increased. The demand for bamboo has also doubled as a result of the booming construction industry, which is struggling to find alternatives for timber. (*Source*: Headlines Himalaya, 188, 26 December 2011.)

BURKINA FASO

Empowering women for better trade in shea

Shea is one of the main forest products in the Sahel zone of West Africa and shea nuts and butter represent a significant source of income for rural communities in Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali, Nigeria, Senegal and Togo. The trees grow naturally throughout the semi-arid region of West Africa, but their largest concentration is in Burkina Faso, where exports of shea products accounted for the country's third most important export in 2000. Shea butter – often termed as "women's gold" by villagers in Burkina Faso – is extracted from the kernel through arduous processing, and is the exclusive prerogative of rural women, who are also totally involved in the collection of shea nuts.

With communally owned wooded savannahs comprising approximately half of the landscape, shea has emerged as a vibrant sector for local economic development and sustainable forest management in Burkina Faso. The growing demand for cooking and cosmetics uses, both for domestic consumption and export, has further fostered this strong growth in recent years.

The improved economic condition of the shea trade, however, has not equitably benefited the women who have toiled the most. While women's participation had remained restricted to local markets, men continued to dominate the lucrative export markets, resulting in a very unfair situation for women. Low literacy levels, lack of technical skills and poor access to market information and formal credit have further aggravated their plight.

In response to these changes, particularly after structural adjustment had negatively impacted the livelihoods of numerous poor families, the Government of Burkina Faso and other national and international organizations took several initiatives. The key focus of these measures has been the development of the shea sector through the empowerment of women engaged in this enterprise. Some of these initiatives include launching the Projet national karité (PNK, National Shea Project), with financial and technical assistance from the Centre canadien d'étude et de coopération internationale (CECI, Centre for International Studies and Cooperation); mobilization of funding support from Taiwan Province of China; monitoring of exports by the United Nations Development Fund for Women (UNIFEM); and the establishment of a coordinating committee by the government to ensure synergy among various donor institutions. The support of UNIFEM, for example, ensured direct purchases through a network of more than 100 shea groups that have been set up and a greater share of benefits for local women engaged in the industry. The women were also trained in the trade, in order to produce a better-quality product.

The empowerment of women through the organization of local shea cooperatives, besides creating better economic opportunities for women producers, has helped them earn the respect of their family and provide new opportunities for their involvement in community development. (***Contributed by:*** Jagannadha Rao Matta, Ph.D., Forestry Officer (Finance), Forest Economics, Policy and Products Division, Forestry Department, FAO, Viale delle Terme di Caracalla, 00153 Rome. Fax: +39 0657055137; e-mail: Rao.Matta@fao.org/)

CAMEROON

Promoting sustainable medicinal wildlife use in Cameroon

As the first phase of a two-pronged community education project, "Promotion of the sustainable use of indigenous wildlife resources as medicinal wildlife, in Cameroon's Northwest Region", a study was carried out from February to November 2010 both to identify wildlife species that are used for traditional medicine and the means of their acquisition. The main objective of the project was to raise public awareness of the sustainable use of medicinal wildlife and the study, a questionnaire survey, was initially to establish the fact that wildlife products/parts are actually applied in traditional medical treatment or prevention.

To achieve the goal, we set out to administer questionnaires to 60 traditional practitioners in all seven administrative divisions of the Northwest Region, the project site. At the end of the field work we had approached 62 practitioners. Of the 61 who responded, two said they did not use wild animals for medicines and could not go into any detail.

From the responses of the 59 traditional practitioners, 58 wildlife species – comprising 26 mammals, eight birds, ten insects and two fish – were indicated as having medicinal values in 53 cases of traditional treatment of illnesses and other medicinal usages. Of the 53 indicated medicinal usages, mystical protection, mental ills, disabled children and rheumatism rank in descending order as most necessitating medicinal wildlife. However, and most important of all, of the 58 identified medicinal wildlife species, 13 are of "Class A" or "totally protected" in Cameroon, one is endemic and 14 are listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) – banned from international trade.

Paradoxically, the only wildlife species that are extinct in the Northwest Region – and classified as "totally protected" in Cameroon – rank as the first and second highly used medicinal wildlife species: the elephant (*Loxodonta africana*) and the lion (*Panthera leo*). The chimpanzee (*Pan troglodytes*) and the African rock python (*Python sebae*), both of "Class A" in Cameroon and listed as "endangered" in the International Union for Conservation of Nature (IUCN) Red List, both rank as the third most used medicinal wildlife species.

Furthermore, from the survey, only two of the 59 respondents had inherited the wildlife products used, while 13 non-licence-holding traditional practitioners hunted the required products by themselves and the rest affirmed that they ordered them from local hunters or bought them from the open but secretive bushmeat markets. This was revealing of the unsustainable use of the wildlife products, considering that only one hunter had obtained and operated with a hunting licence that year in the Northwest Region. Unless the practitioners bought their products out of the region (which was not indicated), most of what they used was illegally harvested.

The study result was presented at the Bamenda Symposium on Sustainable Medicinal Wildlife, held in Bamenda, the chief town of the Northwest Region on 10 November 2010 and presided over by the Regional Delegate of the Ministry of Forestry and Wildlife. During the historic symposium, a medicinal wildlife poster was launched for free public distribution.

Concrete recommendations were made by working groups for the three stakeholders (the government, NGOs and traditional practitioners) for them to take action in their respective spheres for the sustainable use/management of medicinal wildlife. These recommendations were the following.

For the government: take the lead in raising public awareness of the sustainable use of medicinal wildlife; intensify the protection of identified medicinal wildlife species; facilitate the obtaining of medicinal wildlife products; and promote research on the use of indigenous wildlife species for traditional medicine.

For conservation and pro-health NGOs/groups: carry out research, training and community education on the sustainable use of medicinal wildlife; and create networking among stakeholders in medicinal wildlife use/management.

For traditional practitioners: research alternatives to protected medicinal wildlife species; seek legal access to medicinal wildlife species; and create networks among practitioners to use medicinal wildlife sustainably.

For the second phase of the sustainable medicinal wildlife initiative, which is ongoing, key activities include: (i) running a "medicinal wildlife quarter hour" bimonthly radio slot; (ii) production of a short film on sustainable medicinal wildlife, with scenes on wildlife sensitization; (iii) reproduction of more medicinal wildlife posters, to raise further awareness; (iv) subsidize (by 75 percent) the acquisition of hunting licences by local people to set an example for legal access to medicinal wildlife; and (v) train some traditional practitioners to be trainers on sustainable wildlife use.

Both phases of the initiative have been or are being realized with funding support from the Rufford Small Grants Foundation, the institutional support of the regional services of the Ministries of Forestry and Wildlife and of Public Health in the Northwest Region and of the Centre for Indigenous Resources and Development (CIRMAD), a local conservation NGO.

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La valorisation des PFNL au Cameroun: cas de la forêt communautaire de Morikouali-Ye dans la région de l'Est

Une étude menée dans la forêt communautaire de Morikouali-Ye a pour principal objectif de concilier la commercialisation des produits forestiers non ligneux (PFNL) et leur exploitation durable. De façon spécifique, il s'agit d'une part, de déterminer le bénéfice que les ménages tirent de la vente des PFNL et, d'autre part, d'évaluer ce que ces ménages sont prêts à payer en vue d'exploiter durablement ces ressources.

L'étude a utilisé la méthode d'évaluation contingente à travers deux approches, l'une paramétrique (modèle Logit) et l'autre non paramétrique (estimateur de la borne inférieure de Turnbull), ainsi qu'un modèle Tobit censuré, sur un échantillon stratifié de 60 ménages ruraux. Les résultats obtenus ont été les suivants:

- L'étude sur la valorisation des PFNL a montré que cinq espèces sont les plus collectées dans la zone d'étude: *Irvingia gabonensis, Ricinodendron heudelotii*, *Gnetum*, le jujube et les écorces. Leur vente contribue significativement à 41 pour cent du revenu total des ménages. Cette part est fortement influencée par le nombre de personnes du ménage, l'âge, le niveau d'instruction, le temps passé à la collecte et l'emplacement dans la forêt communautaire. Elle diminue en outre considérablement du fait de l'augmentation de la population et de la mauvaise exploitation de la forêt.
- Quelque 68 pour cent des ménages interrogés sont disposés à payer pour garantir une exploitation durable des PFNL, en vue de profiter de l'usage de ces ressources et de conserver les revenus qu'ils tirent de leur vente. L'estimation du consentement moyen à payer par le modèle Logit et par l'estimateur de Turnbull est respectivement de l'ordre de 6 845 FCFA et 4 940 FCFA par ménage et par an, avec un coût social de la dégradation évalué à 3 237 820 FCFA l'an. La probabilité du paiement augmente avec le revenu, le sexe, le nombre de femmes dans le ménage, l'âge et l'activité en tant que commerçant de PFNL, et diminue avec l'argument du développement durable.

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CENTRAL AFRICAN REPUBLIC

Contribution à l'inventaire ethnobiologique des champignons comestibles en vue d'un essai de domestication

La République centrafricaine dispose d'un massif forestier important et d'une savane étendue sur tout le territoire. À l'instar du bois, les produits forestiers non ligneux (PFNL) contribuent considérablement aux moyens d'existence des populations urbaine et rurale riveraines. Ces PFNL sont variés et répandus sur toute la superficie, tant en forêt qu'en savane. Pratiquée par plus de la moitié de la population, leur cueillette contribue à l'alimentation, sert au traitement de certaines maladies et génère des revenus.

Parmi les PFNL, les champignons comestibles sauvages offrent un attrait

particulier du fait de leur saveur et de leur valeur alimentaire et commerciale. Ils constituent en effet un aliment complet contenant des minéraux, des glucides, des protéines et des lipides. Certains chercheurs ont étudié l'apport alimentaire des champignons comestibles sauvages, parvenant à des résultats intéressants, comme l'illustre l'exemple de *Auricularia cornea* séché – valeur énergétique: 397 kilocalories pour 100 grammes; composition chimique moyenne en pourcentage: protéines, 7,9; lipides, 1,2; vitamine B^{12}, 2.10^{-4}; fer, $64,5.10^{-3}$.

L'étude et la conservation de ces champignons constituent un axe de recherche prioritaire pour la sécurité alimentaire et la lutte contre la pauvreté en République centrafricaine. Ainsi, à travers le projet GCP/RAF/441/GER «Renforcement de la sécurité alimentaire en Afrique centrale à travers la gestion durable des produits forestiers non ligneux» mis en œuvre par la FAO, une étude ethno-mycologique a été menée sur les marchés de Bangui et des environs.

L'objectif était de collecter les diverses espèces de champignons comestibles, recueillant leurs noms vernaculaires et leurs substrats, voire leurs habitats, en vue d'effectuer un essai de domestication et de montrer leur importance pour la sécurité alimentaire des populations urbaine et rurale. Une analyse conduite par la suite en laboratoire devait déterminer les caractéristiques organoleptiques des champignons. Il s'agissait en outre d'estimer, en termes de commercialisation, la contribution de ces produits dans l'économie locale des ménages, les femmes en étant les principales vendeuses sur tous les marchés. Par ailleurs, l'étude visait à renforcer les capacités de tous les acteurs impliqués dans la filière.

Cette étude a permis de recenser les champignons comestibles et d'établir la correspondance entre leurs noms vernaculaires et leurs noms scientifiques. Ainsi, *Termitomyces stratus* s'appelle gougou ti bobo, gougou champignon et bobo termite en sango, et *Termitomyces* spp. se dénomme ngawe (jeune fille) en yakoma. L'étude a montré que les populations sont de grandes consommatrices de champignons, chaque ethnie détenant des connaissances mycologiques variées et en faisant un usage divers. Ces différences portent tant sur la nomenclature locale que sur la consommation, l'utilisation médicinale et les modes de préparation. (*Auteur*: Yolene Rellea Kouagou, stagiaire à la FAO dans le cadre du projet PFNL, s/c FAO B.P. 2157, Bangui, République centrafricaine. Courriel: kouagou_86@yahoo.fr/)
(*Please see pages 67–68 for more information on this project*.)

Commercialisation de Gnetum spp. dans la Lobaye

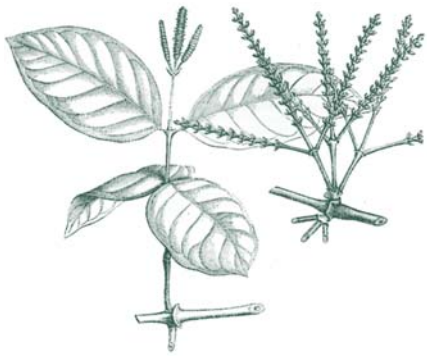
La préfecture de la Lobaye en République centrafricaine est une zone très riche en produits forestiers non ligneux (PFNL) tels que *Irvingia gabonensis* (mangue sauvage), *Gnetum* spp. (koko), *Pentaclethra macrophylla* (ebai) ou *Ricinodendron heudelotii* (essessang). Les communautés autochtones Aka, principales bénéficiaires de ces PFNL, représentent 30 à 40 pour cent de la population de cette zone. Ce sont de grandes collectrices de PFNL du fait de leur parfaite maîtrise de la forêt et de leur dépendance à l'égard de ces produits et des autres ressources naturelles forestières (fruits, écorces, feuilles, miel, gibier, etc.). Dans la plupart des cas, les prélèvements sont effectués de manière traditionnelle en vue de l'autoconsommation. Si une partie de la récolte est vendue sur les marchés locaux, la vente se fait à vil prix ou les PFNL sont échangés contre d'autres produits – tels que savon, sel, huile, cigarettes, farine de manioc, vêtements ou alcool.

Dans le cadre d'un stage pour l'obtention du diplôme d'ingénieur agronome à l'Institut supérieur de développement rural (ISDR), une étude de filière sur *Gnetum* spp. a été menée avec l'appui du projet de la FAO GCP/RAF/441/GER «Renforcement de la sécurité alimentaire en Afrique centrale à travers la gestion durable des produits forestiers non ligneux».Celle-ci a montré que la commercialisation de *Gnetum* spp. dans la Lobaye par les collecteurs primaires, les grossistes, les spéculateurs et les détaillants se fait de façon informelle. Cette faiblesse organisationnelle est due dans la majorité des cas à la méconnaissance des marchés locaux, nationaux et régionaux, lesquels pourraient

permettre aux acteurs concernés de tisser des relations commerciales et d'obtenir de la valeur ajoutée sur la matière première. Des contraintes d'ordre institutionnel entravent en outre sérieusement le développement de la filière.

Pour analyser le circuit de commercialisation de la filière *Gnetum* spp. et estimer la marge bénéficiaire des différents acteurs, l'étude s'est penchée sur 12 ménages issus des populations Aka (collecteurs), 74 ménages issus des commerçants grossistes et 54 ménages issus de commerçants détaillants (hommes ou femmes). L'objectif était d'évaluer l'impact socioéconomique de ce PFNL. Du fait du caractère informel de la filière, il est difficile de quantifier exactement la marge bénéficiaire dégagée par chaque catégorie d'acteur. En revanche, de façon qualitative, les enquêtes ont révélé que la commercialisation de *Gnetum* spp. génère de la valeur ajoutée et améliore les revenus des producteurs et autres acteurs impliqués.

Il est difficile pour le Gouvernement centrafricain de pouvoir mesurer la contribution des PFNL à l'économie du pays. Une stratégie nationale pour le développement du secteur est en cours d'élaboration et sa mise en œuvre devrait enclencher une nouvelle dynamique, notamment en termes d'organisation de la filière *Gnetum* spp. La recherche de solutions alternatives, telles que la domestication de *Gnetum* spp. par les acteurs, constitue un levier important susceptible de galvaniser la filière. (*Auteur*: Elodie Annette Hondet, élève ingénieur agronome (option Eaux et forêts), stagiaire à la FAO dans le cadre du projet PFNL, Institut supérieur de développement rural (ISDR) de Mbaïki. B.P. 909 Bangui, République centrafricaine. Courriel: hondet10@yawoo.fr/)
(*Please see pages 67–68 for more information on this project.*)



Gnetum spp.

CHINA

China kicks off new era of interagency cooperation on wildlife law enforcement

A kick-off meeting of China's National Inter-Agencies CITES Enforcement Coordination Group (NICECG) was held in Beijing in order to enhance efforts by China's responsible government agencies to combat smuggling and illegal wildlife trade in China. The meeting marked the formal establishment of NICECG and included high-level representatives from more than 15 agencies. A number of "liaison agencies" also participated.

The meeting reviewed the progress of CITES-related law enforcement in China during the past three decades, analysed the challenges and problems facing wildlife law enforcement in the country and planned major activities for the next 12 months.

"The demand for wild animals and plants for traditional Chinese medicine and food is stimulating illegal trade and overexploitation of wildlife," said Madam Yin Hong, vice minister of the Forest Police Bureau and Conservation Department of the State Forestry Administration and Chair of the Group. "With the establishment of NICECG, we can enhance exchange and sharing of information, integrate and coordinate respective efforts and design and carry out joint enforcement actions to implement CITES better in China."

The representatives at the meeting agreed to strengthen, through leadership and coordination roles, cooperation and collaboration among the agencies to improve the implementation and enforcement of CITES regulations. "Only through interagency cooperation and collaboration can we solve the problems facing us in enforcing CITES and in addressing illegal trade in wildlife," said Dr Meng Xianlin, Executive Deputy Director-General of China's CITES Management Authority.

Several priority joint enforcement actions will be undertaken under the coordination and leadership of the Group in 2012. (*Source*: TRAFFIC News Update, 21 December 2011.)

COLOMBIA

Palm hearts and sustainable extraction in Colombia

Long eaten by indigenous populations, palm hearts have also been popular abroad, usually in fine dining establishments. However, palm hearts are cut out of the inner core of various palm tree species, in some cases killing the tree. A new study, published in mongabay.com's open access journal *Tropical Conservation Science*, looks at the sustainability of palm heart extraction from the palm species *Prestoea acuminata* in the Colombian Andes. While harvesting from *P. acuminata* does not kill the host tree, better management is needed to ensure the practice does not become unsustainable.

The researchers found that it took *P. acuminata* 23–40 years before it reached a suitable size for palm heart extraction. Given this slow growth, and the fact that overharvesting from a plant can impact sexual reproduction, the authors recommend that only 10 percent of any population be harvested annually. "Our results show that the sustainable harvest potential of *P. acuminata* under natural conditions is too low to be economically viable. However, sustainable household extraction, as for traditional consumption by Indians and *campesinos*, is possible," they write.

In the Colombian Andes, palm hearts are extremely popular during Holy Week when eating meat is not allowed. The authors say future research should look at the size of this practice and whether it is unsustainable. (*Source*: www.mongabay.com, 12 December 2011.)

CÔTE D'IVOIRE

Locals key to saving primate-rich wetlands

Saved from being converted into a vast palm oil plantation by PALMCI in 2009, the Ehy Tanoé wetlands and forest in the Côte d'Ivoire are home to three gravely endangered primates as well as many other species. Since 2006, a pilot community management programme has been working to protect the 12 000 ha area, and a new study in mongabay.com's open access journal *Tropical Conservation Science* finds that long-term conservation of the Ehy Tanoé wetlands and forest is, in fact, vital for locals who depend on the area for hunting, fishing, fuelwood, building materials and medicinal plants. In addition, the study finds that the ecosystem has special cultural and spiritual importance for local people.

"Today, all over the world and especially in the global South, many people suffer from large-scale destruction of forest wealth depriving them of natural resources from which they have always drawn their livelihoods," writes the study's authors, who point out that the Côte d'Ivoire has one of the highest rates of deforestation

worldwide, plunging from 15 million ha of forest cover in the early twentieth century to around 3 million ha today.

"Decommissioning of some protected areas is even suggested by some authorities as a solution to the lack of arable land to meet the needs due to the increasingly growing population growth. The effect of deforestation, and poaching of wildlife in general, is dramatic. Wildlife is scarce in most national parks and reserves," the authors write.

Examining the community management pilot programme in the area, which includes input from NGOs, government and researchers, the study found that the value of the Ehy Tanoé wetlands and forest "is not limited to the specificity of its biodiversity. In fact, maintaining such a forest preserves, at the same time, the livelihoods of riparian communities and essential values for social and spiritual balance within these communities".

The community management programme has proved successful in combating major threats as well, including keeping loggers out of the wetlands and halting the palm oil project. (*Source*: www.mongabay.com, 12 December 2011.)

FINLAND

Akwé: *Kon* collects traditional Sámi knowledge

The words *Akwé: Kon* come from the Mohawk language spoken in North America. The original meaning of the words is "everything in creation". However, in UN language they mean the principle that indigenous peoples' traditional relationship to and knowledge about nature must be preserved. The principle was formulated in the United Nations Convention on Biological Diversity, but its adoption is voluntary for the participating countries. A Finnish working group planning its adoption suggested that the principle be followed in all planning and guidance of land use in the Sámi homeland in Finland. The responsibility for this was delegated to several public authorities and the municipalities in the Sámi homeland: Enontekiö, Inari, Sodankylä and Utsjoki.

While the working group was still dealing with the matter, the state-owned forestry company Metsähallitus decided to test the *Akwé: Kon* principles in the Hammastunturi wilderness area in Upper Lapland, where the management and land-use plan was being updated. Last spring, Metsähallitus and the Sámi Parliament established an *Akwé: Kon* group, which continues its work until next spring, when the management and land-use plan will be finalized. *Akwé: Kon* demands that representation must be balanced in terms of several aspects: the structure of livelihoods, age and sex, for example. This can also be seen in the make-up of the *Akwé: Kon* group. The group will comment on the preparation of the management and land-use plan continuously.

Ms Elina Stolt, Area Manager at Metsähallitus, who is responsible for the *Akwé: Kon* work in the company, says with pride: "This is the first time in the world that these principles are being applied in practice".

It was expressly suggested that Metsähallitus prepare permanent guidelines to implement the principles.

Metsähallitus' work has already led to one concrete result. The management and land-use plan of the Hammastunturi wilderness area is going to include the right to gather raw materials for traditional Sámi crafts from nature free of charge. However, there are some exceptions: raw materials cannot be taken from strictly protected parks, and they may not be sold on to third parties – although the products made from them may be sold freely. The decision introduces an important principle," says Stolt. "Now nobody will need to check whether anyone sees them break off a few small branches for craft work." (*Source*: www.forest.fi, 2 December 2011.)

Finns get fresh in forests on weekdays, too

During the second National Outdoor Recreation Demand and Supply Assessment or LVVI 2, the recreation activities of nearly 9 000 Finns were researched in 2009–2010. A previous, similar study was carried out in 1998–2000. The sample size of 9 000 is considerable in Finnish conditions.

On average, the nearest forest is just 700 m away from one's home. For half of the population, the trip to close-to-home forest is just 200 m and the nearest bigger forest area is situated within 1 km. The most popular recreation activities are walking and Nordic walking, walking the dog and running. The popularity of running and cross-country skiing had increased since the previous study.

Forest land covers around 66 percent of Finland's land area. About 70 percent of it is owned by private persons or companies.

The LVVI 2 study found out for the first time how much Finns rely on "everyman's rights" for recreation. The tradition of everyman's rights means that anyone can move about and stay for a short time on privately owned lands

in the Nordic countries. According to the study, private land is much used for recreation in Finland. Forty percent of Finns get their outdoor recreation at least once a week on privately owned lands, says Mr Harri Silvennoinen, researcher at the Finnish Forest Research Institute. The most common activities are walking and picking mushrooms or berries, he adds.

According to Silvennoinen, the majority of respondents felt positively about everyman's rights. The most significant related problem is the commercial use of these rights. Some have taken paying groups of tourists on trips to private forests, without prior discussions with the landowners. Some companies bring foreign pickers to pick berries and mushrooms every year. One-third of those who have met guided tours or commercial berry or mushrooms pickers felt these activities were disturbing. On the other hand, only one-fifth had met a tour group and one in four commercial pickers on private land.

Landownership affects attitudes. Landowners were more critical than others towards everyman's rights-based use of their land for these kinds of commercial activities. Some were also prepared to restrict the scope of everyman's rights. (*Source*: www.forest.fi, 9 December 2011.)

GABON

The first community forests of Gabon: towards sustainable local forest management?

Gabon is part of the Congo Basin, home to the largest dense humid forest range in Africa. The dense forest covers almost 85 percent of its territory, a surface area of more than 22 million ha. If the low population density and the underdeveloped road infrastructures have partly preserved that vast area, logging companies have gradually established themselves and today their concessions

cover almost 12 million ha – practically half of the forest surface area.

Even though rural populations have traditionally had little interest in commercial logging, they have, for generations, maintained close sociocultural ties with the forest. The communities rely directly on this ecosystem as a source of food, medication, fuelwood and construction wood and, more recently, farmland. However, their formal involvement in the management of this resource is only minimal. Relegated to a role of passive actors, they are barely taken into account in the process of allocation of large permits and perceive only a small part of the profits from this activity which is nevertheless performed, in most cases, in areas where their customary rights apply.

Forest resources abound in Gabon. Species diversity and quality of trees in the Gabonese forests make it a very lucrative production niche. Even though international forest operators are well established there and are making a profit, the Gabonese rural communities have not yet developed their own operations. In view of their remoteness from decision-making centres, villagers often unlawfully lose, without being aware of it, a great deal of the riches in their villages.

Today, the rural socio-economic component is not sufficiently integrated in the management factors of the resource, even though populations that depend on them daily are supposedly the best placed individuals to make wise use of them. In this sense, community forestry helps to promote sustainable use of forest resources on a scale that is at par with the needs of the community, and seeks to guarantee that profits are shared at village level. In Gabon, the process of legalization of community forests has been ongoing since 2001. Pilot projects such as DACEFI (Development of Community Alternatives to Illegal Logging) strive to assist communities in securing their community forest. However, their legalization is slow in coming, while logging activities in the rural forest estate are increasing and the quality of the species is deteriorating continually. (*Source*: Q. Meunier, M. Federspiel, C. Moumbogou, B. Grégoire, J.-L. Doucet and C. Vermeulen. The first community forests of Gabon: towards sustainable local forest management? In *Nature & Faune*, 25(2): 40-45.)

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GEORGIA

The Georgian Red List

The International Union for Conservation of Nature (IUCN) Species Survival Commission (SSC), upon receiving information from within the IUCN network, is currently looking at the Georgian Red List, specifically its quality in terms of applying the IUCN Red List categories and criteria. The consultations began as a result of recent legislative changes in Georgia that allow hunting of some Red List species.

Under the new regulations, each species is labelled with a price tag, allowing any individual who has paid a fixed price to hunt for them anywhere, excluding protected areas and national reserves. The Ministry of Energy and Natural Resources of Georgia published the hunting quotas and terms for the year 2012 on 10 January.

The Government of Georgia has not explained the initiative publicly. However, the newspaper *Kviris Palitra* recently published an interview with Georgian Minister Alexander Khetaguri, where he is quoted as saying "hunting is a very popular pastime so it can attract many tourists; they spend heavily on hunting".

According to Tbilisi-based environmental NGOs, the government's move will cause "irreversible damage" to Georgia's unique biodiversity. Endangered species such as the eastern and western Caucasian tur, chamois, brown bear, red deer and wild goat will decrease to alarming rates. (*Source*: *Georgia Today*, 26 January 2012.)

Georgia enacted its Law on the Red List and Red Book in 2003 and established the current national Red List of threatened animal and plant species in 2006. The law aims to protect and restore threatened species existing on the territory of Georgia, and to save specific biodiversity and genetic resources considering the interest of present and future generations. (*Source*: IUCN press release, 20 February 2012.)

FOR MORE INFORMATION, PLEASE CONTACT: IUCN Caucasus Cooperation Centre, Gogebashvili Street 38, Tbilisi 0179, Georgia. E-mail: caucasus@iucn.org/

GHANA

Shea butter project employs 3 500 women

PlaNet Finance, the global non-profit microfinance organization, says its shea butter project in northern Ghana has employed 3 500 women so far, and will create at least 1 500 more jobs next year. The project, which started 16 months ago, involves the provision of financial and other assistance to women involved in shea butter production to boost their output and incomes. PlaNet Finance has provided gloves for picking the shea nuts, grading mills for processing and silos to store the shea butter for up to two years. Additionally, the women have received mobile phones to help them check the prices of shea butter in markets in the cities.

French economist and president of PlaNet Finance, Jacques Attali, told the *Business & Financial Times* (B&FT) during a visit to Ghana to see the project that his organization intends to move up the supply chain by establishing a factory to add value to the shea butter produced. Currently, part of the production is sold as raw material to a local cosmetics maker and the rest exported to Europe. "What we intend to do after 2013 is to establish a social business with the women as shareholders that tries to pursue the highest form of value-addition to the product," he said. He added that a study by Stanford University in the United States of America showed that the project had improved the living standards of the women involved by 65 percent in the first year.

"But this is more than money. It is also a means to keep the women in the villages and stem migration to the cities," he said.

His organization is hoping to use its success in Ghana as a model that can be replicated in other countries.

PlaNet Finance coordinates the project through its local headquarters in Tamale. Its partners include the Agence française de développement (AFD), the European Union and the German software company, SAP, which together provided the €6.5 million funding for the project. Globally, the organization works in 80 countries and manages US$1 billion in funds. (*Source*: SpyGhana.com, 21 February 2012.)

INDIA

Saffron and silk wither in Kashmir

Srinagar. The saffron and silk industries in Kashmir have been dying a silent death over the last decade, with production rates for both

commodities witnessing up to 50 percent declines in some areas of the Kashmir valley. A growing market for cheap, fake saffron – either chemically manufactured or "cut" with additives to increase its weight – has dealt a harsh blow to traditional, world-renowned saffron producers and sellers in Kashmir. Meanwhile, a mismanaged government monopoly over the silk industry coupled with an invasion of cheap Chinese silk has choked local production, pushing thousands of producers out of business.

As a result, saffron farmers and silk rearers are facing hard times in the lush Kashmir valley.

Kashmir is one of a handful of places on Earth that grows natural saffron, along with the Islamic Republic of Iran and Spain, and has long been considered to have the best-quality saffron in the world, with rich plantations in Pampore, Pulwama, Budgam and Kishtiwar. But Saleem Shakeel Mir, Managing Director of Kashmir Kesar Leader, Kashmir's leading saffron producer, told IPS that the influx of false saffron has lacerated the market for honest producers. Since non-experts are unable to differentiate between pure and artificial saffron, the cheaper product is selling fast, Mir added. "If pure Kashmiri saffron costs 110 rupees/g (or just over US$2), synthetics cost as little as 30 rupees. As a result, traditional Kashmir saffron growers have suffered an almost 70 percent loss."

Mir also blames saffron growers' hardships on the rampant industrialization in the valley, including the proliferation of residential houses in the area, which eats up swathes of land that could otherwise be used for crops. "A decade ago, ten kanals (6 050 square yards [5 060 m^2) of land were under saffron cultivation; today just four kanals, less than half the original amount, are used," he said.

According to Malik Farooq, Director of the state Sericulture Department, government efforts to save the silk industry have gained much less ground, possibly because a decades-long government monopoly over the silk industry contributed to its decline in the first place. Silk is one of Kashmir's oldest trades. In 1855, Europe was Kashmir's biggest silk trading partner, purchasing 70 kg of silkworm seeds every year. The period immediately following the end of British rule opened a glorious phase for Kashmiri silk. "After the1980s, there was a sudden decline in silk production and the industry began to suffer," Farooq told IPS. The rigid state monopoly that had once boosted the industry became its greatest impediment. The government bought all the silk cocoons from the locals but managed every other stage of the production process themselves.

According to official government statistics, the number of silkworm rearers shrank from 60 000 in 1947 to a mere 7 161 in 1995. The area of land under mulberry cultivation shrivelled from thousands of ha in the early 1900s to less than 2 000 ha in 1990. From employing 1 830 labourers on 584 silk production units, the silk industry now only has the capacity for 200 workers on 30 silk production units. (*Source*: IPS News, 9 December 2011.)

Six non-timber forest projects in Maoist-hit areas

The Indian Government announced on Friday six projects on NTFPs, such as gum and medicinal plants, to cover around 60 Maoist-affected districts in the country. Addressing a national conference on NTFPs, Rural Development Minister Jairam Ramesh said the projects in "lac, gum, medicinal plants, *tasar*, bamboo and non-edible oil seeds such as neem and *mahua*" will maximize return for tribals engaged in collection of these forest products. He said the projects, to be executed in six months in the public-private partnership mode, will cover Jharkhand, Chhattisgarh, Odisha, Madhya Pradesh, Andhra Pradesh and Maharashtra.

Ramesh said that generation of NTFPs and expansion of their markets in a sustainable manner were challenges that needed to be addressed. The minister said projects will be part of the National Rural Livelihood Mission and focus primarily on livelihood generation and value addition. (*Source*: Mangalorean.com, 3 February 2012.)

Edible weeds in grape fields of Theni district in Tamil Nadu

An extensive survey was conducted on edible weeds in the grape (*Vitis vinifera* L.) fields of the Theni district in Tamil Nadu. The investigation revealed that 21 weeds of 17 genera belonging to 12 families of grape fields are commonly consumed as vegetables. The utilization of these undesired but useful weeds can: (i) free the fields from weeds; (ii) play an important role as a source of additional income for farmers; and (iii) provide promise as normal and/or scarcity or famine foods through their nutritional values (more comprehensive research should be carried out on their nutritional status). (*Source*: S. Shanmugam, N. Kamaladasan, T. Arunraja, B. Sakthivel and K. Rajendran. 2011. Edible weeds in grape (*Vitis vinifera* L.) fields of Theni district in Tamil Nadu, India. In *International Journal of Forest Usufructs Management*, 12 (1).)

EDIBLE WEEDS

- *Alternanthera sessilis* DC. Leaves and tender shoots are fried as vegetables or mixed with potato and cooked.
- *Amaranthus graecizans* L. Leaves are cooked as vegetables with onions and tomatoes.
- *A. spinosus* L. Leaves are cooked as vegetables.
- *A. viridis* L. Leaves and tender branches as well as young shoots are cooked to prepare curry.
- *Asystasia gangetica* (L.) T. Anderson. Leaves are cooked to prepare curry with onions.
- *Basella rubra* L. Leaves are cooked with onions and tomatoes.
- *Bidens pilosa* L. Leaves are cooked as vegetables.
- *Cardiospermum halicacabum* L. Leaves and tender shoots are cooked as vegetables and leaf extract is used to prepare *rasam* (soup).
- *C. microcarpum* (Kunth) Blume. Leaves and tender shoots are cooked as vegetables and leaf extract is used to prepare *rasam*.
- *Coccinia grandis* L. Unripe fruits are used to prepare curry and pickles.
- *Commelina benghalensis* L. Rhizomes are cooked as curry with potatoes or other vegetables.
- *Eclipta prostrate* (L.) L. Mant. Leaves, tender branches and young shoots are cooked and eaten with other leafy vegetables.
- *Ipomoea aquatica* Forss. Leaves and tender stems are cooked as curry.
- *Oxalis corniculata* L. Leaves are cooked as curry.
- *Portulaca oleracea* L. Leaves and tender shoots are fried with potatoes or cooked with other vegetables.
- *Pupalia atropurpurea* (Lam.) Moq. Leaves and tender shoots are fried with potatoes or cooked with other vegetables.
- *Solanum nigrum* L. Young leaves and tender branches are cooked as vegetables.

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TRAFFIC helps claw back illegal parrot trade

A parrot in captivity is one of the more visible symbols of illegal trade in India, where all native wildlife is fully protected. To help enforcement officers identify the 12 native parrot species, and thereby clip the wings of the illegal bird trade, TRAFFIC India, with support from WWF India, has produced an identification poster called "Parrots of India in illegal trade". The posters will be distributed to the police, Customs, forest departments, railway protection forces and educational institutions, including schools and colleges.

Despite the blanket ban since 1990–91 on trade in all Indian bird species, hundreds of parrots are collected and traded annually in the country. They are taken from the wild and smuggled to various parts of India and beyond. The bulk of the trade is in three- to four-week-old chicks. Parrots are caught using nets and bird lime. Adult parrots are traded throughout the year, with chicks arriving in trade between December and June. For every bird that reaches the marketplace, several are believed to die en route. Of the 12 native species, eight are regularly found being illegally traded. They include the Alexandrine, rose-ringed, plum-headed, red-breasted, Malabar, Himalayan and Finsch's parakeets and the vernal hanging parrot.

For centuries, parrots have been kept as pets mainly because they are straightforward to keep and easy to replace because of the large numbers in trade. This has in turn created demand that has led to an organized illegal trade in parrots. (*Source*: Traffic News Update, 17 February 2012.)

JAMAICA

Launch of nutraceutical industry with seven products

Renowned local scientist Dr Henry Lowe last night delivered on a promise made a year ago by launching what he said was the region's first indigenous nutraceutical industry with seven products, including his flagship Alpha Prostate Formula 1 made from Jamaican ball moss or Old man's beard (*Tillandsia recurvata*). At the same time, Dr Lowe announced that an initial public offering (IPO) will be launched next year "to give Jamaicans and diaspora members a chance to invest in this lucrative and exciting venture". "The potential earnings from this industry can be anywhere from US$500 billion, growing to a trillion dollars in the next five years," Dr Lowe told guests attending the launch in Kingston. "The question is: are we ready to make the investments required to grow our share of this lucrative industry?" he asked.

Lowe said that in addition to the Alpha Prostate Formula 1 – which is basically a halfway house to the development of the anticancer drugs he identified in the ball moss – the other products launched last night include Jamaican guinea hen weed (*Petiveria alliacea*) supplement, traditionally used for the management of cancers, arthritis, rheumatism and diabetes; and the aloe complex formula supplement, a mild laxative, which reduces inflammation and enhances colon health. (*Source: Jamaica Observer*, 24 February 2012.)

KOSOVO

Medical ethnobotany of the Albanian Alps in Kosovo

Ethnobotanical studies are crucial in southeastern Europe for fostering local development and also for investigating the dynamics of traditional environmental knowledge (TEK) related to plants in one of the most crucial European hotspots for biocultural diversity. A recent medico-ethnobotanical survey was conducted in rural alpine communities in Kosovo. The aims of the study were twofold: (i) to document the state of TEK of medicinal plants in these communities; and (ii) to compare these findings with those of similar field studies previously conducted among local populations inhabiting the Montenegrin and Albanian side of the same alpine range.

The uses of 98 plant species belonging to 42 families were recorded; the most quoted botanical families were Rosaceae, Asteraceae and Lamiaceae. Mainly decoctions and infusions were quoted as folk medicinal preparations and the most common uses referred to gastrointestinal and respiratory disorders, as well as illnesses of the urogenital system. Among the most uncommon medicinal taxa quoted by the informants, *Carduus nutans* L., *Echinops bannaticus* Rochel ex Schrad. and *Orlaya grandiflora* Hoffm. may merit phytochemical and phytopharmacological investigations.

Carduus nutans

Comparison of the data with other ethnobotanical field studies recently conducted on the Albanian and Montenegrin sides of the same Alps has shown a remarkable link between the medical ethnobotany of the Montenegrin and Kosovar side of the Albanian Alps. Moreover, folk uses of the most quoted wild medicinal taxa recorded in Kosovo often include those recorded both in Albania and in Montenegro, thus suggesting a hybrid character of the Kosovar local plant knowledge. This may also be explained by the fact that Montenegro and Kosovo, despite their differences in ethnic composition, have shared a common history during the last century. (*Source*: B. Mustafa, A. Hajdari, F. Krasniqi, E. Hoxha, H. Ademi, C.L. Quave and A. Pieroni. 2012. Medical ethnobotany of the Albanian Alps in Kosovo. *Journal of Ethnobiology and Ethnomedicine*, 8: 6.)

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Bamboo management project takes root in Huaphan

The European Union has granted €1 million and the Netherlands Development Organization (SNV) and Gret an additional €600 000 for a bamboo development project in Huaphan province. The aim of the project, which began in Viengxay, Xopbao and Xamneua districts this year and will run until 2014, is to promote the sustainable management of bamboo forests. This would in turn lead to the production and sale of handicrafts and furniture, increasing the income of local farmers.

The project is targeting those people who are most likely to ensure the growth of the project in the long term.

Prior to implementing the project, in 2009 SNV and Gret approached bamboo growers and gave them training courses on plantation management, forest allocation, production and reforestation. There are currently 478 families of bamboo growers spread across 21 villages and 22 groups of producers within the three districts. These communities have already grown about 120 ha of bamboo and are making 26 types

of products, including suitcases, baskets, small presentation boxes, trays, decorative items and pieces of furniture.

On site last week, project official Mr Souvanpheng Phommasane told the media the project will continue to run training courses and that by next year a greater variety of items will be made to meet market demand. By 2012, it is envisaged that the range of items produced will increase to 30 different types and to 275 in 2015. Mr Souvanpheng said: "In Huaphan province, bamboo forests cover about 80 percent of the land area. If we don't protect and carefully manage this area, it will continue to decrease".

In the past, people living in provinces where bamboo is grown have benefited from this resource by harvesting and collecting its shoots, which they sell at local markets. Mr Souvanpheng said farmers who had been cutting down and burning bamboo to clear land for agriculture or to make a wall or roof for their houses, for instance, were acting irresponsibly.

The bamboo sustainability project would help to increase awareness and responsibility, he said. It is hoped people will realize how important it is to protect and manage the plantations, which in future will provide income and business growth.

Provincial Agriculture and Forestry Department Deputy Director Mr Phouvong Sysomhack said that last year sales in the targeted districts represented 312 million kip (1 million kip equals approximately €94.5) for bamboo shoots and 348 million kip for handicraft and furniture products, the most productive district being Viengxay. As experience and development grow, he hopes that this year's figures will double. Mr Phouvong sees Huaphan province as the leader in the development of bamboo forest sustainability and management, not only bringing "green gold" but also alleviating poverty for many families. (*Source*: Khamphone Syvongxay, *Vientiane Times*, 19 December 2011.)

MADAGASCAR

Innovative conservation: wild silk, endangered species and poverty

For anyone who works in conservation in Madagascar, confronting the complex difficulties of widespread poverty is a part of the job. But with the wealth of Madagascar's wildlife – such as lemurs, miniature chameleons and hedgehog-like *tenrecs* found nowhere else in the world – rapidly diminishing, the island nation has become a testing ground for innovative conservation programmes that focus on tackling entrenched poverty to save dwindling species and degraded places.

The local NGO, the Madagascar Organization of Silk Workers or SEPALI, together with its United States partner Conservation through Poverty Alleviation (CPALI), promotes one such innovative programme. In order to alleviate local pressure on the newly established Makira Protected Area, SEPALI is aiding local farmers in artisanal silk production from endemic moths. The programme uses Madagascar's famed wildlife to help create more economically stable communities. "We wanted to try a new approach to conservation that could replace the needs of local populations to harvest forest resources in areas of great biological importance," Catherine Craig, founder of CPALI, told mongabay.com in a recent interview with the SEPALI/CPALI team.

The Makira Protected Area, the largest on the island, was established in 2002 by the then president, Marc Ravalomanana. The park is home to 22 species of lemur including several threatened species. It is also home to the Madagascar serpent eagle (*Eutriorchis astur*) and the island's top predator, the fossa (*Cryptoprocta ferox*). Despite being seen initially as a conservation success (although the park is now imperilled by illegal logging), the protected area has impacted surrounding communities.

"Communities that once had access to the park's resources now must abide by restrictions. Despite the fact they are not physically displaced, they are unable to gather the natural resources on which they previously depended and are hence economically displaced," explains Craig and her team, noting that a recent study found anaemia rates among children have increased since the park's demarcation, because of a decline in protein from bushmeat hunting.

Enter into the picture SEPALI and silk production. "We sought to identify a sustainable, ecologically sound, income-generating programme that allowed farmers to make between US$60 to US$200 of added annual income to ensure the security of the Makira Protected Area."

Using three native moth species, each found in the region, SEPALI has begun to work with local farmers to raise wild silkworms on native trees and to sell unique silk products to an international market. "Silk cocoons provide a new, sustainable, source of income," says Craig and her team. "Chrysalides provide a new, alternative source of protein; silk moth host trees build up a protective green zone around the Makira Protected Area. Only 100 chrysalides to produce the eggs that yield 10 000 cocoons in the next season and 9 900 chrysalides, or approximately 10 kg of protein rich food, are available for human consumption, poultry feed or fertilizer."

If successful, the programme hopes to have an ecological impact (creating a buffer around the park with silkworm trees); an economic impact (additional source of income); a health impact (more protein); and a mitigating impact (less pressure on the park's ecosystem and wildlife). "By relying on a 'proto-commodity' (a good that is large enough to make a difference at the scale of a landscape but small enough to avoid industrial attention and competition), we hope to guard against the fluctuations in market prices that often affect the prices of commodities. We are proceeding by developing diverse markets for the silk that include architectural products, fashion accessories, home design products and lighting," Craig and her team say.

Currently, SEPALI is working in 11 communities with 126 farmers, over a third of whom have planted at least 250 trees for silkworms. If conservation is to succeed in a nation facing massive development problems, entrenched poverty and a booming population, it is likely it will only be with the input of such multipurpose programmes as SEPALI's.

VIDEO – WALKING THE VANILLA TRAIL

Take a stroll along the vanilla trail with Rainforest Alliance auditor Noah Jackson. Meet communities working to harvest the fragrant spice sustainably, and see how Rainforest Alliance certification is helping them to live and work in harmony with their environment. (*Source/view*: Rainforest Alliance Web site, www.rainforest-alliance.org/)

MALAYSIA

500 000 agarwood trees for a greener Malaysia

Half a million agarwood trees will be planted throughout the country under Tesco Stores (M) Sdn Bhd's Greener Earth Tree Planting programme. Tesco Stores and the Malaysian Timber Industry Board (MTIB) recently inked a Memorandum of Understanding (MoU) to plant the trees in the next three years. Partly funded by the sale of plastic bags on Saturdays, the programme is part of Tesco's Greener Earth initiative. The MoU was signed by Tesco Malaysia chief executive officer SungHwan Do and MITB director-general Dr Jalaluddin Harun and was witnessed by MITB chairman Datuk Madius Tangau.

Do said Greener Earth was Tesco's latest initiative to protect the environment while engaging customers. "Through this programme, Tesco and MTIB will plant 160 000 trees this year and 170 000 in 2013 and 2014, respectively," said Do, who added that Tesco would spend RM4 million on the project. "This is our way of helping the country to achieve its target of planting 26 million trees by 2014," he said.

Datuk Madius said Tesco's initiative would contribute towards reafforestation efforts and keeping at least half of the country under forest cover. "It is hoped that there will be many more similar collaborations between the corporate sector and the government," he said. (*Source: New Straits Times*, 20 January 2012.)

More *gaharu* (agarwood) trees being felled in Penang forest

George Town. The illegal felling of *gaharu* (agarwood) trees appears to be continuing unabated despite extensive media coverage and the state government's declaration of a crackdown against the thieves. The latest incident involves several *gaharu* trees in Gambier Hill near Island Park. Gurdial Singh, a runner, came across around 20 felled trees, several of which were *gaharu* trees, on Tuesday while setting the trail for a run for his group. "The trees were all from one area, not scattered in the jungle. I think they were felled about a week ago, looking at the condition and colour of the wood," he said yesterday, adding that he believed the trees were felled with a chainsaw. Gurdial said the area had been green and shady when he passed it last December.

The *Sunday Star* had reported on 12 February that local syndicates with foreign connections were allegedly felling the highly valued *gaharu* trees in the rain forest near the Penang Botanic Gardens and in several other places.

The oil extracted from the agarwood is used for medicine and perfume, and fetches a handsome price in the Middle East.

Penang Health, Welfare, Caring Society and Environment Committee chairman Phee Boon Poh said yesterday that there would be joint operations with the police to tackle the situation, as it was a serious matter. State Forestry Department assistant director Azahar Ahmad said he would also get his team of officials to investigate. (*Source*: *Malaysia Star*, 23 February 2012.)

MEXICO

Potential management of *Chamaedorea seifrizii* (Palmae), a non-timber forest product from the tropical forest of Calakmul, southeast Mexico

Leaves and seeds of *Chamaedorea* (*xaté*) palms are important NTFPs. In the Calakmul region (Yucatan peninsula) of Mexico, several communities have sporadically collected and sold seeds of *C. seifrizii* since 1980. However, harvesting has intensified recently, raising concerns about overexploitation.

To evaluate the economic potential of leaf and seed exploitation in the area, we collected information on abundance, population patterns, and leaf and seed stocks in Ejido Conhuas, a community within the Calakmul Biosphere Reserve. Then we combined these data with current market values and hypothetical management regimes obtained from the literature for leaves and seeds. Conducting a quantitative analysis of 43 0.1^{ha} plots with differences in forest and soil type, we assessed the abundance of *C. seifrizii* in the area. We also conducted interviews to estimate the importance of *xaté* in the local economy.

We found *C. seifrizii* density to be highly variable, with a mean (+or-SE) of 295 (+or-35), with forest type being the most influential factor. Population structures differ between forest types, with healthy populations in medium and lower forest. We found a mean density of leaves of harvestable size of 3 750 (+or-380) leaves ha-1, while seed production was 1.5 (+or-0.3) kg/ha^{1} of fresh seeds.

Assuming sustainable harvest rates of 30–50 percent for leaves and 80 percent for seeds, 1 ha of forest could generate US$7.0–15.9/ha^{1}. Considering the number of households (102) and 10 percent of the total area managed each year (5 700 ha), this harvest could generate a household income of US$391–838 annually.

At the moment, the *xaté* trade represents a minor component in the economy of the community, but given the area's extensive forest (>57 000 ha), the resource abundance and the low human population, we believe the NTFPs derived from *C. seifrizii* have a potentially great economic impact in the area. (*Source*: L. López-Toledo, C. Horn, A. López-Cen, R. Collí-Díaz and A. Padilla. 2011. Potential management of *Chamaedorea seifrizii* (Palmae): a non-timber forest product from the tropical forest of Calakmul, southeast Mexico. *Economic Botany*. 65(4): 371–380. 29 refs. [abstract])

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NAMIBIA

Namibia's bushmen profit from nature

The nomadic San, or bushmen, are Namibia's oldest indigenous inhabitants as well as the country's most marginalized and poorest. For thousands of years, they have lived as nomads, as hunters and gatherers in harmony with nature, but they must now find their place in the modern world.

These days, the San obtain most of their supplies from the shop in Tsumkwe, in the centre of the Nyae Nyae Conservancy in northeast Namibia, near the border with Botswana. The reserve is home to around 2 500 San. With roughly 500 inhabitants, Tsumkwe is the largest village in the area.

Earning the money to pay for goods at the shop can be difficult in the remote region.

Many San, usually the women, spend their days making handicrafts for the small tourist trade. Ney, a young woman, chisels ostrich eggshells into small pieces which will later be made into necklaces and bracelets. "A bracelet can be finished in the course of a day," Ney said. "The jewellery is what brings us the most money. You craft it, sell it – and afterwards you can buy food in the shop."

Ney sells her work at the small craft shop in Tsumkwe, run by Hoan. "I am happy that this shop exists, because it has changed the lives of the people," she said. "Before, they just sat around doing nothing; they didn't have opportunities." Life has also changed for Hoan. For her new job, she learned many new skills, from bookkeeping to sales strategies. She had help from Martha Mulokoshi, a consultant for the Nyae Nyae Foundation, which offers support to the San in their transition to commercial trading. "It's an ongoing [learning] process, stocktaking, writing out receipts – every little thing that goes on," she said. "The other thing is marketing. Our biggest current challenge is that we don't really have a market to sell our products."

By contrast, devil's claw, a root that has been used as a natural medicine for centuries, sells very well on the international market. Much of the world's supply comes from Namibia. For a few months every year, business is all about devil's claw. The San painstakingly gather bags of the root, cut it into small slices and dry it. Among its many uses, it is said to be good for relieving pain from arthritis, muscles and joints, and for heartburn, fever, headaches and difficulties in childbirth.

To maintain the demand for their product, the San must produce the devil's claw according to international standards. In this respect, help also comes from outside the community. Recently, two experts from Germany and South Africa visited the area to advise in the process.

Klaus Fleissner, of the South African consultancy CRIAA, a membership-based NGO that supports rural communities and advocates better pay for the devil's claw producers, said considerable additional training is necessary, especially when it comes to administrative work. "The first thing we do is check all the paperwork," he said. "Then we drive out to the villages where the people are harvesting devil's claw and look to see if they've filled in the holes again [after digging out the roots]. This guarantees

sustainability, and the most important point for organic certification is sustainable harvesting." But Fleissner said the San, who have been harvesting the root for centuries, need little help in this last area.

Aside from medicine and handicrafts, the San also occasionally bring in some extra money by organizing trophy hunting for adventure tourists. Soon, however, the Nyae Nyae Conservancy, a region covering more than 9 000 km^2, will be awarded community forest status, which will be a distinct advantage for the San. "The community will have the opportunity to use [the land] commercially," said Eckhard Auch of the German Development Service (DED), who advises the Namibian authorities and partners when it comes to community forests. Local forestry employees are also keen on the project. "It's encouraging people to conserve their natural resources. They will make an income from them. When they conserve them, they can use them for future generations," said Rachel Andima of the forestry office in Tsumkwe.

Kunta Boo, a village elder with a face lined with deep wrinkles, often takes tourists on walks, showing them how he lives off the land. The tourists pay €5 (US$6.50) to stay at the small campsite near his settlement. A few hundred metres away, the San perform traditional dances at a village rebuilt specifically for visitors.

Making long-term plans for the future is not part of the San culture. But with steady sources of income from a sustainable mix of devil's claw, ostrich egg jewellery and tours through the bushland and the future community forest, they will be able to move forward with a mix of tradition and modernity. (*Source*: Annjochen Berends and Suse Henn, Africa News Service, 3 February 2012.)

NEW ZEALAND

Wild ginseng and Maori traditional ecological knowledge feature at Forestry Finance Conference

Wild natural ginseng growing under a pine tree canopy that can increase the revenue earned from forestry land is an initiative that the Maraeroa C Incorporation wants to share at the upcoming Forestry Finance event. It wants to promote the growing of wild natural ginseng, which is now being termed "the new kiwifruit", with Maori forest owners and relevant industry and says the conference is an ideal platform to share their success.

Other prominent speakers at the event include Dr Kepa Morgan from the Engineering School at Auckland University, who will talk about integrating Maori values and the potential role for traditional ecological knowledge in forestry management.

All speakers bring to their roles a strong belief in the potential for Maori people in rural communities around New Zealand to make good the potential for increasing their opportunities and capitalizing on industry associations. (*Source*: TangataWhenua.com: Maori News & Indigenous Views, 14 February 2012.)

NIGERIA

Utilization of NTFPs for economic development in Nigeria

NTFPs contribute immensely to food security, poverty alleviation, economic development, and household and national income generation, among many other benefits. A recent paper gives a synopsis of NTFPs in Nigeria, their diversity and diverse uses, with specific examples of the economic potential of *Moringa oleifera*, *Acacia senegal*, *Lonchocarpus cyanescens*, *Vitellaria paradoxa* and *Dacryodes edulis* (see Table on page 58). The paper highlights the challenges facing the economic utilization of NTFPs in Nigeria and proposes possible solutions.

Nigeria is blessed with vast biodiversity, mostly in forest ecosystems, many of which are used as NTFPs. One researcher in 1980 found 150 edible NTFP indigenous plant species in the rain forest and 51 species of food and fodder trees and shrubs in the savannah, while another researcher in 1995 identified over 200 plant and animal species used as NTFPs

Economic uses and potential of selected Nigerian NTFPs

Plant name	Economic uses and potential
Moringa oleifera	Parts sold for medicinal uses; seeds for water purification, biogas production; seed oil used in cosmetic industries. In the case of water purification alone, the use of moringa seed is reported to have a 99 percent success in removing bacteria. It is also used for tanning leather. This could save Nigeria up to US$2.25 million a year used to import alum.
Acacia senegal	Nigeria is the third largest gum arabic producer in the world, producing 17 000 tonnes as of 2003, reaping about US$12.75 million in exports. However, gum Arabic farmers claim only 40 percent of capacity is tapped. A tree has the capacity to produce up to 500 g of gum Arabic, and up to 200 kg/ha. Gum arabic is used as a preservative in soft drinks. Most of the production comes from the wild. Acacia plantations should be encouraged to increase production and hence economic potential.
Lonchocarpus cyanescens	The plant yields an indigo dye for making the popular *adire* cloth. The textile was very popular in the 1950s and 1960s, but is less so now in Nigeria because of popular acceptance of other textiles. A huge investment in this area could yield hundreds of thousands of dollars, especially in sales to international tourists, who like the cloth.
Vitellaria paradoxa	Nigeria is the world's largest producer of shea butter – producing about 414 000 tonnes in 2005 – but most of it is rejected on the international market. There is no record of revenue from shea butter for Nigeria since 1995 but, as of 1995, revenue generated from the shea sector was N3.58 billion (over US$23 million based on the current exchange rate). The potential of this tree has yet to be fully exploited. Shea butter is in high demand on international markets for use in cosmetics.
Dacryodes edulis	Widely eaten as food, with seeds rich in protein. It is a source of income from exports to Europe. Mature trees yield between 1 500 to 10 000 fruits/year, generating US$75–150 in cash income; 1 kg of fresh fruit costs US$14–15. Export of *D. edulis* from Central Africa and Nigeria to France, Belgium and the United Kingdom was estimated to be over 326 tonnes in 1999, worth over US$2 million.

inside the Omo Biosphere Reserve, southwest Nigeria. (*Source*: Utilization of non-timber forest products [NTFPs] for economic development in Nigeria. In *Nature & Faune*, 25(2.)

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PERU

Camu camu promoted as Peru's flagship product

The regional government of Loreto, in northeastern Peru, has submitted a proposal to the country's Ministry of Foreign Trade and Tourism, asking for the inclusion of this vitamin C-rich fruit in the growing list of Peru's flagship products. Norma Cordova, head of the regional office for foreign trade, tourism and handicrafts, said they expect a "positive" response from the ministry within the next months.

With the aim of promoting the production, sale and consumption of this fruit, Loreto's capital city Iquitos will host the Camu Camu Expoamazónica 2012 festival on 27–28 January.

Camu camu is a low-growing shrub found throughout the Amazon rain forest, mainly in swampy or flooded areas. It grows to a height of 2–3 m and has large, feathery leaves. It produces round, light orange-coloured fruits about the size of lemons, which contain a significant amount of vitamin C. Its high vitamin C content has created a demand for *camu camu* fruit in the natural products market. (*Source*: Peru this Week, 24 January 2012.)

Camu camu

Exclusive Amazon "uncontacted" tribes at risk from new highway plan

Tension is mounting in one of the remotest regions in the Peruvian Amazon over plans to build a highway through the country's biggest national park. The Alto Purus Park is inhabited by at least two "uncontacted" tribes, one of which was photographed on a beach in the park five years ago.

Carlos Tubino Arias Schreiber, a congressman from the Fuerza 2011 party, has been promoting the need for the highway in Peru's Congress, in what has become an increasingly aggressive publicity campaign. "In Purus the monkeys and plants have more rights than human beings," he stated on 18 November last year after a visit to the region. "The national parks have cut it off."

But plans for the highway have drawn fire from environmental and human rights groups concerned about its potential impact on the rain forest and the "uncontacted" tribes living there. The World Wide Fund for Nature (WWF), which helped set up the park in 2004 and now supports its ongoing protection, calls it "an area of incredible biodiversity" covering "some of the most pristine forests in the southwestern Amazon" and home to jaguars, monkeys and pink dolphins.

"There are only a handful of places left in the world as biologically and culturally important as Peru's Alto Purus," said Chris Fagan from the Upper Amazon Conservancy (UAC), an NGO working in the region that

VIDEO – STRENGTHENING A SUSTAINABLE HARVEST IN THE PERUVIAN RAIN FOREST

Thousands of people in Peru's Madre de Dios region earn their living by gathering and selling Brazil nuts, which grow wild in the Amazon rain forest. With support from the United States Agency for International Development (USAID) and Fondation Ensemble, the Rainforest Alliance has helped hundreds of them to improve their forest stewardship, working conditions and incomes. By working with the Brazil-nut gatherers' associations in eastern Peru, the Rainforest Alliance has strengthened the conservation of their forest concessions while raising their members' standard of living. (*Source/view*: video, Rainforest Alliance Web site, www.rainforest-alliance.org/)

released a damning statement about the highway on 7 January. "To cut it with a road would compromise the integrity of the entire basin and trigger the swift demise of some of the last isolated hunting and gathering tribes on Earth."

Currently, the Purus region, in southeast Peru, is only accessible by plane. A highway would connect it to the rest of the country and, so say those in favour of it, develop the local economy. (*Source*: The Ecologist, 19 January 2012.)

New Forest Peoples Programme Report

A recent report – entitled *The reality of REDD+ in Peru: between theory and practice. Indigenous Amazonian peoples' analyses and alternatives* and compiled by national and regional indigenous organizations in Peru (AIDESEP, FENAMAD, CARE) and the Forest Peoples Programme (FPP) – collates indigenous peoples' experiences with REDD policies and projects in the Peruvian Amazon. It analyses the policies and strategies of the Peruvian Government, examines the roles of international agencies and scrutinizes pilot REDD initiatives already under way in indigenous territories. Among other conclusions, the report finds that existing REDD policies and programmes are undermining the rights of indigenous peoples and are likely to lead to conflicts over land and resources.

The report calls for alternative rights-based approaches to forest and climate protection based on the recognition of land and territorial rights of indigenous peoples and support for community-based climate initiatives. (*Source*: Forest Peoples Programme, December 2011.)

REPUBLIC OF THE CONGO

Production de plants de *Gnetum* spp. par bouturage – expériences pratiques en République du Congo

Les feuilles de *Gnetum* spp., une liane forestière sempervirente, figurent parmi les aliments préférés dans le bassin du Congo. Face à l'amenuisement du potentiel de cette espèce dans certaines régions de la République du Congo et de la République centrafricaine, la FAO est intervenue. À travers le Centre for Nursery Development and Eru Propagation (CENDEP – voir www.cendep.org) de Limbe, Cameroun, des communautés de base œuvrant à la domestication de *Gnetum* spp. ont été formées en mai-juin 2011.

Au Congo, le suivi des pépinières est assuré par le Service national de reboisement (SNR). Les expériences montrent la nécessité d'adapter localement le manuel de production conçu au Cameroun et présenté lors de la formation.

Le suivi des boutures placées en juin 2011 dans le propagateur d'enracinement se fait quotidiennement. Le taux de réussite des bouturages est estimé à 86 pour cent pour Abala et à plus de 59 pour cent pour Madingo-Kayes, un quart des boutures étant toujours en observation dans le propagateur. Des sevrages ont été effectués 10 à 12 semaines après le repiquage, soit avec un décalage de deux à quatre semaines en comparaison du manuel camerounais. Ce retard peut être justifié par le fait que la saison sèche s'accompagne de températures relativement basses au Congo.

L'expérience a montré qu'il faut asperger d'eau les boutures tous les jours pendant la première semaine et deux fois par jour au cours de la deuxième semaine. En revanche, il suffit de mettre une fois par semaine 150 ml dans la jauge, au lieu des deux à trois fois par semaine préconisées par le manuel camerounais.

Pour le premier sevrage, du compost mis en place lors de la formation a été utilisé à Abala, avec un taux de réussite de 58 pour cent. Pour le deuxième sevrage, un mélange comprenant deux tiers de terre forestière et un tiers de sable fin a été utilisé. Ce changement de substrat a augmenté le taux de réussite, qui a atteint 70 pour cent à Abala, car le sol forestier contient non seulement la matière organique décomposée mais aussi du mycorhize naturel, favorable à la croissance des plants. La même observation a été faite à Madingo-Kayes.

Le bambou de Chine utilisé pour clôturer les hangars s'est révélé inapproprié car il a été attaqué par les insectes et a créé une poussière nuisible pour les boutures. En fonction de leurs coûts, d'autres matériaux – tels que des planches en bois – pourraient être adaptés.

Il a été constaté qu'une pénétration excessive des rayons solaires dans le propagateur cause un flétrissement des boutures. La clôture des hangars a ainsi été renforcée par des feuilles de palmier et des tissus (rideaux), en vue de maintenir un microclimat favorable au bouturage. L'intégralité du sevrage devrait ainsi pouvoir se faire sous les hangars.

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(*Please see pages 49–50 for more information.*)

RWANDA

Rain forest in Rwanda's main natural forest in danger of extinction

Kigali. Nyungwe rain forest in the southwestern region of Rwanda is progressively disappearing, findings released in Kigali by a team of researchers from the National University of Rwanda revealed.

According to the findings made available to Xinhua in Kigali, the main threat to the forest is the abundance of a harmful plant, scientifically known as *Serochochys scadens*. "In the past, this plant was eaten by elephants and buffaloes," the report said on Monday. Today, only five elephants are believed to remain in the Kamiranzovu swamp located in the neighbouring area, while the buffaloes have literally disappeared. Another menace to the Nyungwe rain forest is the lack of abundant rainfall compounded by encroachment on the forest by the population.

If no immediate measures are taken to preserve the high-altitude forest (3 000 m above sea level), Nyungwe faces the same fate as Gishwati forest in the northwest region, which has been destroyed by farmers. In a bid to save Nyungwe forest from extinction, the government has decided to declare it a national reserve where tourism would be directed to supporting conservation efforts and research. In July 2011, the Government of Rwanda had fully entrusted the management of the Nyungwe natural reserve to a British forestry company, New Forests Company. (*Source*: Xinhua News Service, 20 January 2012.)

Price of gorilla permit increases to US$750/day

Rwanda has raised the price of a permit to see mountain gorillas to US$750/day starting from 1 June 2012, up from US$500/day. While the price is steep, the programme each year raises millions of dollars in revenue for gorilla conservation, including US$8 million in Rwanda alone in 2008, according to a 2011 study published in PLoS ONE. The number of permits available each day is limited to reduce the impact of gorilla tourism on the endangered apes. Around 20 000 people visited Rwanda's gorillas in 2008.

The programme seems to be working: mountain gorilla populations have steadily increased in recent years, with the combined

number in Uganda, Rwanda and the Democratic Republic of the Congo reaching 790 in 2010. The opposite trend has been observed with the more numerous lowland gorillas, which are in decline in the Congo Basin through poaching, habitat loss from deforestation and logging, and disease outbreaks. (*Source*: Rhett Butler, mongabay.com, 7 February, in ENN Daily Newsletter.)

SIERRA LEONE

From war to peace, Sierra Leone eyes ecotourism

Sierra Leone is trying to change its image as a war-torn country by promoting ecotourism, writes journalist Paige McClanahan at the launch of the new Gola Rainforest National Park.

If you are thinking of planning a bird-watching holiday, Sierra Leone might not be the first destination that jumps to mind. But that could change soon, if the government of this small West African nation gets its way. Earlier this month, Sierra Leone opened the Gola Rainforest National Park, a 71 000 ha protected area that is home to more bird species than can be found breeding in the whole of the United Kingdom.

The government hopes that the new park might help nature-loving tourists see beyond the battered image that defines the country overseas. The reason for this image is a brutal 11-year civil war that claimed the lives of tens of thousands of people. But Sierra Leone has been at peace since the conflict ended in 2002.

"The great news is that despite the area being one of the worst hit during the war, the biodiversity survived relatively intact," said Jonathan Barnard, the head of the tropical forest unit at the Royal Society for the Protection of Birds, which has been doing conservation work in the Gola region since 1989.

The park is Sierra Leone's largest remaining piece of the Upper Guinea Forest Ecosystem, a region that the environmental group Conservation International has identified as one of the world's critical biodiversity hotspots. The new national park is home to over 500 butterfly species, 300 bird species and 45 species of mammals. More than two dozen of these animals are under threat globally, including the pygmy hippopotamus, the Diana monkey, the chimpanzee and the white-necked *picathartes* – a charismatic bird that the government has picked as the park's official symbol.

The government hopes that such species will lure wildlife enthusiasts from overseas.

The national park "is already receiving a modest number of adventurous tourists", Sierra Leone's President Ernest Bai Koroma said at the official opening of the park. "With further development, ecotourism will continue to grow and generate economic benefits for the country." (*Source*: BBC News, 14 December 2011.)

SOUTH AFRICA

Poor prefer NTFPs during a crisis

According to the Center for International Forestry Research (CIFOR), a recent study finds that the sale and use of NTFPs are some of the most common coping mechanisms in times of crisis for vulnerable households in two of South Africa's poorest provinces.

The study found that while all the households sampled relied, to some extent, on NTFPs as part of their livelihood portfolio, as many as 70 percent also reported using the safety-net function of NTFPs in response to a range of crises. Kinship was found to be the top coping strategy chosen by both wealthy and poor households, and poorer households cited the use or sale of NTFPs as the second most commonly adopted coping strategy.

"This highlights that in addition to the more regular use of NTFPs, they play an important role in helping households weather specific crises," said Fiona Paumgarten, CIFOR scientist and co-author of the CIFOR study conducted in collaboration with South Africa's Rhodes University. "The safety-net function of these NTFPs doesn't manifest specifically in the increased use of resources they already use but might manifest through using resources which are not normally used, or selling NTFPs which are not normally sold," she said.

Surveying both poor and wealthy households over a two-year period, researchers looked at a range of dynamics and drivers of use and sale of NTFPs. In both areas studied, overutilization of NTFPs and increasing population densities meant that these resources are becoming scarcer. This has implications on the possible safety-net option of NTFPs, Paumgarten said. "It undermines overall livelihood security, especially as alternatives are limited, a situation that is unlikely to change in the immediate future as ongoing service delivery failures and high rates of unemployment persist." (*Source*: allAfrica, 18 January 2012.)

UNITED REPUBLIC OF TANZANIA

Spice town that lets you smell and taste Zanzibar

Zanzibar boasts white sandy beaches and the history-rich alleyways of Stone Town, but a visit to the archipelago is not just about seeing the islands – it is about smelling and tasting them, too. Spice traders crowd downtown market stalls, the pungent scent of their wares hanging in the air. Hawkers offer visitors a whiff of cinnamon or a taste of spiced coffee, but these dried and powdered products are a far cry from the spices in their raw form.

Private landowners have created miniature spice plantations where tourists can sample a variety of spices in their natural form – blades of lemon grass freshly picked from their bushes or ginger roots still covered in damp soil.

Cloves (*Syzygium aromaticum*) are typically the first tastes of the tour, as the spice most important to Zanzibar's economy. The archipelago earned its nickname of the "Spice Islands" in the 1800s, after Omani settlers introduced the clove tree to the region. Other spices were introduced over time, but cloves remained the main cash crop for exporters: during the nineteenth century, the archipelago was the source of 90 percent of the world's supply of cloves. Zanzibar's economy today remains dependent on clove exports, even though only 7 percent of world supply comes from the islands. Cloves are picked as unopened flower buds from the evergreen clove tree. After being dried, they are ground or used whole in cooking,

Cloves

especially as a key ingredient in *chai masala* (mixed-spice tea). Aside from the culinary uses of cloves, they are also commonly used as painkillers in dental emergencies.

Cloves may be the centrepiece of Zanzibar's economy, but they are not as common in kitchens as another spice on the tour: ***peppercorns*** (*Schinus* spp.). Peppercorns are the world's most-traded spice and grow on a vine, like tiny grapes along a stem. The fresh green kernels pack an eye-watering punch, even when eaten raw. Depending on how they are picked and dried, they either become black, white, or green pepper.

While peppercorn is the most common spice, a third plant wins the award for versatility: ***cinnamon*** (*Cinnamomum verum*). The roots, bark, branches and leaves of the cinnamon tree can each be used for different degrees of flavour, the bark being the most pungent in odour and taste. Dried and pulverized, cinnamon tree bark is used to make cinnamon powder, or dried whole to become cinnamon sticks.

Cinnamon is often paired with ***nutmeg*** and ***mace***, two more spices found on the tour. Both impart a stronger, hotter flavour and grow intertwined inside the pithy nutmeg fruit: red ribbons of mace encircle the hard shell of the nutmeg seed, which is about the size of a Brazil nut. Nutmeg (from the *Myristica fragrans* tree), the sweeter of the two, is made when the flesh of the seed is dried, then ground or grated. Mace has a more delicate and peppery flavour, and is made from the dried membrane that surrounds the nutmeg seed. Nutmeg trees take at least seven years to begin producing fruit and do not reach their full production until after 20 years, which makes them a valuable trading commodity.

Vanilla (*Vanilla planifolia*) is perhaps one of the most intoxicating and valuable spices on the tour. It starts out not as a nut or a bark, but as an orchid. Vanilla pods grow dangling from a vine wrapped around a host tree, looking like french beans that got lost in the rain forest. The vanilla beans have to be carefully harvested, dried and aged before they can be used as flavouring, a process that takes at least six months. Once the beans are processed, the pods can be used whole, ground into a powder or turned into a liquid extract.

Cacao (from the *Theobroma cacao* tree) also lurks on the spice tour, looking nothing like its final product. This fundamental ingredient in chocolate is found within the green rind of the cacao pod, which holds about 30 seeds. The seeds, about the size of an almond, are embedded in a slightly sweet, slimy white fruit. When they are dried and ground, the paste – called chocolate liquor – can be separated into two different products: cocoa powder and cocoa butter.

Eventually all these spices and others such as cardamom, cumin and annatto, end up in the market stalls of spice hawkers in Stone Town. And while the booming spice exports of Zanzibar are largely a thing of the past, tourists can stock their suitcases with fragrances and flavours for friends back home, keeping that trade going just a little bit longer. (*Source*: The East African, 4 December 2011.)

Carya ovata

UNITED STATES OF AMERICA

Our native trees include shagbark hickory

Shagbark hickory (*Carya ovata*) is native to most of the eastern United States of America and much of Ontario and Quebec, Canada. It is found in a variety of sites, most often on upland sites in the north in association with oaks and other hardwoods. Young seedlings and saplings can survive in the shady understorey for many years until the older trees die, exposing them to sunlight; then they grow more rapidly. Hickories do not generally dominate a site; they are usually found in mixtures.

The common name of shagbark hickory comes from the distinctive peeling bark on mature trees that gives it a shaggy appearance. Other common names include shellbark, scalybark and upland hickory. The bark of young trees is smooth and grey.

Hickory comes from the Algonquian Indian word *pawcohiccora*, for the tree's nut meat. The nuts are edible and sweet-flavoured. They can be used in place of pecans in baking. Many wildlife species eat the nuts of shagbark hickory, including squirrels, chipmunks and, to a lesser degree, black bears, foxes, rabbits and mice, and birds such as mallards, wood ducks, bobwhites and wild turkeys.

Nuts are round to ovate with a thick husk. The husk is green at first, browning as it matures. When the husk dries, it splits open along four grooves exposing the nut. The shell of the nut is fairly thin and light brownish white.

The wood of the shagbark hickory is very strong and resilient. It was, and is, used for axles, axes, ploughs and other tool handles. Native Americans used it for bows. Other uses include furniture, cabinetry, flooring and speciality products such as ladder rungs, dowels and athletic equipment. It is a desirable fuelwood because of its high heat value and because it burns evenly. Charcoal made from hickories can be used to give food, particularly meat, a hickory-smoked flavour.

The bark of the shagbark hickory can be used to make a syrup much like maple syrup but with a unique flavour. Unlike maple syrup, the extract used comes from the bark, not the sap. Hickory syrup is only available from a few places and one of them is in Connecticut.

Shagbark hickory is a tall tree, growing to a mature height of about 120 ft (approximately 36 m) with a width of about 40 ft (12 m) and is adapted to a variety of sites and soil types. (*Source: The Mystic Press* [Connecticut, United States of America], 1 January 2012.)

ZIMBABWE

NTFPs as a coping strategy for HIV/AIDS-afflicted rural households

A recent article examines the role of the extraction of NTFPs as a coping strategy in response to HIV/AIDS-related economic shocks among rural households in the semi-arid Sengwe communal lands in southeastern Zimbabwe. Using panel data for 200 households in 2008 and 2009, an econometric analysis revealed NTFP extraction as an important *ex post* coping mechanism for HIV/AIDS-afflicted households. Many of the households responded to HIV-related economic crises by increasing NTFP extraction to smooth both consumption and income. On average, the additional income from NTFPs offset about 48 percent of a household's income shortfalls arising from the impact of HIV or

AIDS. The importance of NTFPs as an economic safety net for households depends more on the timing of extraction than on the magnitude (i.e. as a share of total household contribution). Hence, sustainable forest management is of great value for semi-arid tropical areas, such as the Sengwe communal lands, which are hard hit by the HIV epidemic.

Consequently, government and other stakeholders would be well advised to implement programmes that reduce pressure on forest resources, by introducing, for example, other income-generating enterprises such as raising small livestock, while improvements in access to education and health care will further help the rural poor cope with HIV/AIDS-induced economic crises. (*Source*: M.J. Mutenje, G.F. Ortmann and S.R.D. Ferrer. 2011. Extraction of non-timber forest products as a coping strategy for HIV/AIDS-afflicted rural households in southeastern Zimbabwe. *African Journal of AIDS Research*, 10(3): 195–206.)

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FAO commissions study on indigenous plants

FAO is to produce an inventory of the top ten underutilized plants with commercial potential for smallholder production. Bio-Innovation Zimbabwe (BIZ), an innovation hub acting to develop new business opportunities using indigenous plants, was recently commissioned to produce the report.

Gus Le Breton, BIZ Chief Executive Officer, says the study will focus on plants that can be used for medicines, food, biofuel, cosmetics, herbal teas, dyes, construction, gums, resins and essential oils. "As we begin rebuilding Zimbabwe's agricultural sector, we have the opportunity to position ourselves strategically in the global market as the first choice suppliers of an array of unusual African natural ingredients and products," said Le Breton.

In terms of domestic consumers and policy-makers (both of whom are now actively considering the implications of the "Proudly Zimbabwean" commercial drive) and in terms of the international market (with its focus on natural, on Africa and on ethical trade), the time has never been better, he added. Key points include short lead time for

Groundnuts

commercialization, ease of domestication/cultivation, suitability for marginal dryland areas, building on existing, abundance of geographic spread, existing markets and multiple marketing opportunities, including availability of skills.

Among the 250 useful plants already identified are: baobab (*mauyu*), pigweed (*mowa*), prickly cucumber (*magaka*), finger millet (*zviyo*), *makoni* tea (*musvisvinwa*), *mobola* plum, (*hacha/chakata*), *marula* (*mapfura*), groundnuts (*nyimo*) and pepper bark (*muranga*).

But Le Breton says the potential of these species will not be realized unaided and there is a need to identify the unique selling points of each and facilitate concentrated investment in product development, trial marketing, consumer awareness and production and yield trials.

Many foreign countries have capitalized on indigenous plant species such as kiwi fruit (New Zealand), macadamia nut (Australia), *açaí* (Brazil), argan oil (Morocco), shea butter (Burkina Faso) and *rooibos* (South Africa). (*Source:* The Zimbabwean, 11 January 2012.)

Importance of woodland resources in southeastern Zimbabwe

Like many forest and woodland resources in other areas across Africa, ecosystems in the southeastern low veldt of Zimbabwe generate a wide range of timber and non-timber products and services. These include consumptive resources such as bark for rope, building materials, fodder, fruits, fuelwood, fungi, bushmeat, gum, honey, insects, termites, leaf litter, medicines, mushrooms, roots, thatching grass, tubers and wood for small artisanal crafts; social services such as cultural and spiritual benefits; aesthetic value; wilderness experience and recreation; employment; and ecological services such as carbon sequestration, grazing, shade, soil stabilization, water catchment, wildlife habitat and windbreaks. Some of the most valued fruits include those collected from *Adansonia digitata* and *Sclerocarya birrea*.

Especially in periods of extreme weather events such as droughts and floods, woodlands become very important for the livelihoods of local communities in the study area and they form the only easily accessible safety net for food and income, since external support, for example in the form of food aid from government and non-governmental organizations, may not fully meet local communities' requirements.

Mopane woodland products are key resources for rural communities and wildlife conservation in southeastern Zimbabwe. Where mopane is dominant, it assumes economic importance especially as a source of browse for both domestic and wild animals. The "mopane worm", which is actually the caterpillar of the emperor moth, *Imbrasia belina*, used as food, is one of the best-known and most economically important woodland resource products of mopane woodland. For rural households in southern Zimbabwe, the annual harvest of mopane worms may contribute up to quarter of a household's cash income, depending on the quantity of the worms harvested, the proportion sold and the household's other sources of income. Mopane worms can, therefore, contribute to improving rural people's livelihoods in various ways, including: (i) supplementing seasonal shortages in cash or food; (ii) buffering families against unexpected shortages in food or income, for example, caused by droughts; (iii) supplementing expenditure on important factors such as education, food, health, clothing and agricultural tools; and (iv) providing cash for investment in various productive enterprises, such as purchasing agricultural inputs. (*Source*: Importance of savanna woodlands in rural livelihoods and wildlife conservation in southeastern Zimbabwe. In *Nature & Faune*, 26(1).)

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Time is the one thing we possess. Our success depends upon the use of our time, and its by-product, the odd moment.

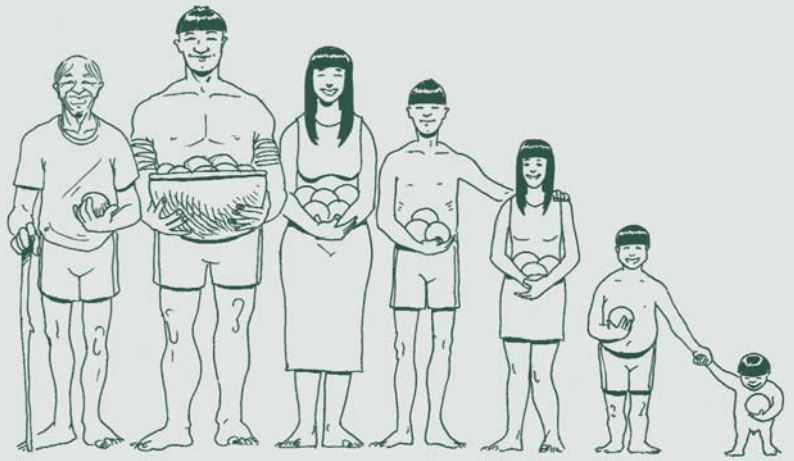
Arthur Brisbane

THE IMPACT OF SEVEN GENERATIONS

Scientists previously believed that much of the Amazonian forest was pristine and unaltered by humans. More recently, they are discovering that many forests have been managed and transformed by local people. With thousands of years of knowledge and practice, indigenous peoples have modified the abundance and distribution of select trees according to their preferences. For example, Brazil nut and *piquiá* trees are found in higher densities near old Indian villages.

Indigenous management practices enriched the concentration of useful trees, but agribusiness, logging and fire are significantly reducing the numbers of species locally valued and used. It is always important to evaluate the costs and benefits of changes to our Earth. Some changes that appear to be positive in the short term have grave consequences in the long one.

The Iroquois Indian tribe, from North America, created a wise law: *"We must consider the impact of each of our decisions on the next seven generations."* (*Source*: FAO, 2011. *Fruit trees and useful plants in Amazonian life*.)



BILLION TREE CAMPAIGN

The United Nations Environment Programme (UNEP) formally handed over the management of the Billion Tree Campaign, which has led to the planting of 12 billion trees in 193 countries, to the youth-led environment organization Plant-for-the-Planet Foundation. According to UNEP, the Plant-for-the-Planet Foundation's emphasis on young people, its academies on climate change and existing commitment to the Billion Tree Campaign will allow the campaign to continue as a supportive element in a wider youth initiative.

The Billion Tree Campaign was inspired by the work of the late Nobel Peace Prize Laureate Wangari Maathai and the Green Belt Movement. It aims to improve quality of life and limit environmental degradation through the benefits provided by trees, including mitigating climate change through the sequestration of carbon, contributing to local economies through products such as timber, and providing ecosystem services such as soil regulation, erosion control and cultural values. (*Source*: IISD Reporting Services, 7 December 2011.)

CEPF TO INVEST US$9.8 MILLION TO CONSERVE EASTERN AFROMONTANE BIODIVERSITY HOTSPOT

The Donor Council of the Critical Ecosystem Partnership Fund (CEPF) has approved the ecosystem profile for the eastern Afromontane biodiversity hotspot – a document that provides a comprehensive analysis and strategy for conservation of the 17-country region in eastern Africa and the Arabian peninsula. Approval of the profile commits CEPF to invest US$9.8 million in the region over five years.

The eastern Afromontane hotspot stretches over widely scattered but biogeographically similar mountains, covering an area of more than 1 million km^2 from Saudi Arabia to Mozambique and Zimbabwe. The rich biological diversity in the hotspot is mirrored by the massive ecosystem services that it provides – particularly as watersheds for vast areas in the region, extending far beyond its formal boundaries. Its ecosystems also provide crucial support to agriculture and, ultimately, food security.

This project marked the first time CEPF has worked in the Arabian peninsula. "Our deepest thanks go to the Saudi Wildlife Authority, Yemen's Ministry of the Environment and biologists from the peninsula for helping us get a comprehensive view of the species and ecosystems of this portion of the hotspot," said Patricia Zurita, executive director of CEPF.

CEPF also particularly appreciates the hard work put in by the profiling team, led by BirdLife International, and supported by CEPF and Conservation International scientists. They gathered information and feedback from more than 200 experts in five national workshops, two regional workshops and countless exchanges of letters. The profiling team also developed a specific strategy for CEPF's investment, including four strategic "directions", or goals that CEPF will pursue in up to 36 priority sites over the next five years. These goals are: (i) mainstream biodiversity into wider development policies, plans and projects to deliver the co-benefits of biodiversity conservation, improved local livelihoods and economic development in priority corridors; (ii) improve the protection and management of the key biodiversity area (KBA) network throughout the hotspot; (iii) initiate and support sustainable financing and related actions for the conservation of priority KBAs and corridors; and (iv) provide strategic leadership and effective coordination of CEPF investment through a regional implementation team.

CEPF's investment will focus on four priority corridors containing 22 of the 36 KBAs.

The profile also provides a road map for others interested in joining strategic conservation efforts in the region. CEPF will work with conservation and development entities in the hotspot to engage other donors in protecting the eastern Afromontane's natural areas, which are critical to the well-being of its people and all humankind. (*Source*: CEPF E-News Update, January 2012.)

COMMUNITY MAPPING OF AFRICAN RAIN FORESTS COULD SHOW WAY FORWARD FOR PRESERVATION

A new initiative to place community mapping of central African rain forests online could prove key to local rights in the region, says the United Kingdom-based NGO, Rainforest Foundation. Working with forest communities in five African countries, the Rainforest Foundation has helped create digital maps of local forests, including use areas, parks and threats such as logging and mining. The Web site www.MappingForRights.org builds on the results of many years' work to map the existence of forest dwellers in the forests of the Congo Basin.

By showing the areas where community traditional ownership and use of forests are overlapped by other users or claims, the Web site could potentially help avoid or resolve conflict, which is endemic to many African forest areas. But the clear identification of community forest areas also potentially helps to resolve one of the biggest challenges facing the REDD concept: the problem of who actually owns or controls the forest, and who should be paid to protect it under any future climate protection scheme. (*Source*: mongabay.com in Traditional Knowledge Bulletin, 1 December 2011.)

CONSERVING BIODIVERSITY HOTSPOTS "COULD BRING WORLD'S POOR US$500 BILLION A YEAR"

If poor people were to be paid for the services they provide in preserving some of the world's key biodiversity hotspots, they could reap US$500 billion. Many of these valuable habitats and species are under threat, but the people who live in these areas lack the means to improve their conservation, according to a new study in the journal *BioScience*. There are some fledgling schemes that could help to raise this cash – for instance, the United Nations-backed REDD (Reducing Emissions from Deforestation and Forest Degradation) system, which uses carbon trading to generate cash to preserve trees – but so far they are small in scale.

The benefits of safeguarding these habitats, such as providing valuable services from food, medicines and clean water to absorbing carbon dioxide from the air, are more than triple the costs of conserving them, the researchers found.

Will Turner, vice-president of Conservation International and lead author of the study, said: "Developed and developing economies cannot continue to ask the world's poor to shoulder the burden of protecting these globally important ecosystem services for the rest of the world's benefit, without compensation in return. This is exactly what we mean when we talk about valuing natural capital. Nature may not send us a bill, but its essential services and flows, both direct and indirect, have concrete economic value".

He said that preserving areas of highest biodiversity should be the priority. "What the research clearly tells us is that conserving the world's remaining biodiversity isn't just a moral imperative – it is a necessary investment for lasting economic development. But in many places where the poor depend on these natural services, we are dangerously close to exhausting them, resulting in lasting poverty," said Turner.

Many of the benefits of conservation, so-called "ecosystem services", are invisible – for instance, maintaining wooded land can help to prevent mudslides during heavy rainfall and provides valuable watersheds that keep rivers healthy and provide clean drinking-water, as well as absorbing carbon dioxide from the air. These benefits are not assigned an economic value, however, so that chopping down trees or destroying habitats appears to deliver an instant economic return, when in fact it is leading to economic losses that are only obvious when it is too late.

The study, entitled "Global Biodiversity Conservation and the Alleviation of Poverty", was led by a team from Conservation International, and co-authored by scientists at NatureServe, the United States National Fish and Wildlife Foundation, and the University of Wisconsin-Madison. They looked in particular at 17 of the world's most important areas for biodiversity.

They found that some of the ecosystem services accrued to the local people themselves – for instance, using forests as sources of food, medicines and shelter – while the rest are regional or global.

The study follows on a growing body of work from the past decade that has sought to place a value on ecosystem services, as a way of ensuring that they are accounted for in economic policy. If nature is not economically valued, many scientists have argued, it is more prone to being destroyed.

Russell Mittermeier, president of Conservation International and a co-author, said: "We have always known that biodiversity is foundational to human well-being, but we now have a strong case that ecosystems specifically located in the world's biodiversity hotspots and high biodiversity wilderness areas also provide a vital safety net for people living in poverty. Protecting these places is essential not only to safeguard life on Earth but also to support the impoverished, ensure continued broad access to nature's services, and meet the UN millennium development goals".

He called on governments to integrate the conservation of nature into economic and poverty-alleviation policies, in order to value these services better. (*Source: The Guardian*, 20 January 2012.)

EYE ON EARTH SUMMIT LAUNCHES BIODIVERSITY INITIATIVES

The Eye on Biodiversity initiative was launched, along with others of relevance to biodiversity, at the Eye on Earth summit that took place from 12 to 15 December 2011 in Abu Dhabi, United Arab Emirates, hosted by the Environment Agency-Abu Dhabi in partnership with the United Nations Environment Programme (UNEP).

Eye on Biodiversity will seek to link several existing efforts to monitor the status and loss of biodiversity. It will also help researchers harness disparate data sets to understand better what makes ecosystems resilient and what threatens them, identify and fill major gaps, and assess the economic costs of losing biodiversity on local, national, regional and global scales.

Under cross-cutting initiatives, the *Eye on Global Network of Networks* seeks to increase the collective impact of existing

geospatial and other data networks, such as the Global Biodiversity Information Facility, on global decision-making by ensuring that they can identify and communicate with one another. The *Eye on Environmental Education* initiative aims to create a global network that will support coordination, collaboration and resource-sharing among environmental educators around the world. The *Eye on Access for All* initiative seeks to create an enabling environment to ensure maximum usage of available environmental and societal data and information by all who wish to access it. (*Source*: IISD News, 18 December 2011.)

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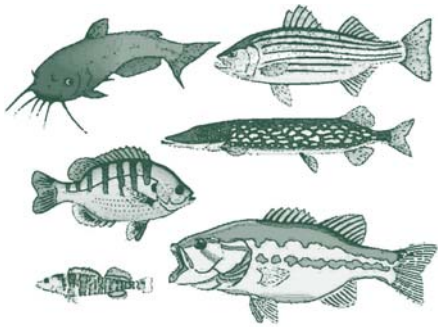

THREATS TO NATURAL ECOSYSTEMS

As average global temperatures rise, the impacts on habitats and species will depend on many factors, including local topography, changes in ocean currents, wind and rainfall patterns and changing albedo. In addition to variations in the rate and extent of temperature increases at different latitudes, there may be changes in the length and severity of seasons, including decreases in temperature in some areas. Rainfall patterns may likewise be affected in terms of overall annual quantity, seasonal distribution of precipitation and year-by-year regularity. Extreme weather events, such as droughts and floods, are expected to occur more often. In particular, droughts are projected to become more frequent and intense in subtropical and southern temperate forests; this will increase the prevalence of fire and predisposition to pests and pathogens.

Natural ecosystems are not only threatened by climate change. Loss and degradation caused by human encroachment, agricultural expansion for crop and rangelands, invasive species, overharvesting and trade in natural resources (including wildlife), epidemic diseases, fires and pollution still exceed the current impacts of climate change. It is widely recognized that measures to limit such non-climatic human-induced pressures can help reduce the overall vulnerability of ecosystems to climate change.

Non-timber forest resources, such as fuelwood, charcoal, NWFPs and wildlife sustain the livelihoods of hundreds of millions of people in forest-dependent communities. Most rural and many urban populations in developing countries rely on woody biomass as their main energy source and depend on wild plant medicines for their health care. In many developing countries, bushmeat is an important source of protein, while for coastal communities or those living near freshwater, fish can be a major source of protein. In Central Africa, there is a very large and well-established trade in bushmeat products, which is driven mainly by consumer demand in major cities. Up to five million tonnes of bushmeat are believed to be consumed every year in the Congo Basin in a trade that is recognized as unsustainable and often illegal.

Despite their importance to local communities, about 13 million ha of the world's forests are lost through deforestation each year and further large areas are also degraded. (*Source*: extracted from the introduction to *Wildlife in a changing climate*. Rome, FAO. FAO Forestry Paper 167.)

UN LAUNCHES DECADE ON BIODIVERSITY

The UN has launched the Decade on Biodiversity 2011–2020 to prevent loss of species and ecosystems and encourage humanity to live in harmony with nature.

The initiative, launched in the Japanese city of Kanazawa with Secretary-General Ban Ki-moon, is trying to preserve nature and manage its riches for the prosperity of current and future generations. "Ensuring truly sustainable development for our growing human family depends on biological diversity and the vital goods and services it offers," said Kiyo Akasaka, Under-Secretary-General for Communications and Public Information on behalf of Ban Ki-moon in his message at the opening ceremony of the event.

The Decade also aims to encourage governments to develop and communicate the results of national strategies for implementation of the Strategic Plan for Biodiversity. "Human activities have caused the extinction of plants and animals at some hundreds or thousands of times faster than what the natural rate would have been," Akasaka pointed out.

"We cannot reverse extinction. We can, however, prevent future extinction of other species right now. For the next ten years our commitment to protecting more than eight million species, and our wisdom in contributing to a balance of life, will be put to a test," he said. (*Source*: Press TV [Ireland], 18 December 2011.) ♣

The hardest work of all is to do nothing.
Proverb

FAO

FORESTRY DEPARTMENT

FAO FORESTRY LAUNCHES FIRST MULTIMEDIA IPHONE APP

FAO's Forestry Department has launched the Organization's first multimedia app, designed to bring its work on forests and forestry to a growing generation of iPhone and iPad users. The iFOn FAO Forestry App can be downloaded free from the Apple App store and provides users with news, videos, select publications and interactive maps showing world forest statistics, together with a quiz, all navigable with a touch-screen wheel. It also includes a "donate" button that takes users to the Web site of FAO's TeleFood fundraising programme – which uses public contributions to finance small-scale agriculture, livestock and fisheries projects that help poor families produce more food.

"This project increases our potential capacity to communicate FAO forestry's message to over 100 million users of iPhones and over 20 million users of iPads," said forestry officer Lauren Flejzor (lauren.flejzor@fao.org), who came up with the idea along with colleague Magnus Grylle. "We're hoping students and people in public and private organizations with an interest in forestry will start downloading the app so that they can have the information at their fingertips."

The app was financed by the Innovation Fund, which invests in creative ideas that lead to savings and increased efficiency in the Organization, and was backed by Forestry Department Assistant Director-General Eduardo Rojas-Briales. (*Source*: Forestry Department, FAO.)

Interdisciplinary collaboration shaping FAO's edible insect programme

FAO's edible insect programme. What began as a small effort in FAO's Forestry Department to recognize traditional livelihood practices and sustainably managed habitats is unfolding into a broad-based effort to look into the multiple dimensions of insect gathering and rearing. A growing body of evidence has made it increasingly apparent that insects offer unique opportunities not only to serve as important sources of food and feed – with minimal environmental costs – but also to contribute to alleviating malnutrition.

The first expert consultation meeting "Assessing the potential of insects as food and feed in assuring food security" took place from 23 to 25 January 2012 at FAO headquarters in Rome (*please see page 70 for full details*). This expert consultation proved to be a significant step forward on the global stage in enhancing awareness, networking and sharing information. The proceedings of the consultation will be included in a FAO technical position paper on edible insects which is expected to be available later this year. (***Contributed by:*** Esther Mertens, Intern, Edible Insect Programme, FAO Forestry Department.)

FOR MORE INFORMATION, PLEASE CONTACT: Paul Vantomme, Senior Forestry Officer, Non-Wood Forest Products, Forest Products and Industries Division, Forestry Department, FAO, 00153 Rome. E-mail: paul.vantomme@fao.org; www.fao.org/forestry/65422/en/

FAO raises alarm on consequences of mountain forests loss

The integrity and resilience of mountain forests is under threat from increasing temperatures and wildfires, population growth and food and fuel insecurity, warns a new FAO publication released today.

Population pressures and the expansion of intensive agriculture have forced smallholder farmers to move higher up towards marginal areas and steep slopes, sparking a loss of forests, warns *Mountain forests in a changing world*. It also notes that climate change is likely to facilitate more rapid expansion by pests and disease-causing organisms that may cause additional damage to mountain forests. The report, jointly produced by the FAO-hosted Mountain Partnership Secretariat and the Swiss Agency for Development and Cooperation, was published in the lead-up to the UN International Mountain Day on 11 December 2011.

"Mountain forests protect local communities against natural disasters and they safeguard the natural resources and environmental services that billions of people rely on for their well-being and livelihoods," said Eduardo Rojas-Briales, FAO's Assistant Director General for Forestry. "Mountain forests are being affected by many global challenges, such as climate change, water scarcity, loss of biodiversity and desertification, but they also offer significant opportunities for solutions. Sustainable development of mountain forests requires and deserves a prominent place on the international agenda."

Mountains provide 60 percent of the world's freshwater resources despite covering only 12 percent of the Earth's surface, the FAO report says. Mountain forests strongly influence both the quantity and quality of water supplies to mountain and lowland communities and industries. When forests are removed from mountains and land is left unprotected, runoff and soil erosion increase, with water quality deteriorating in streams and rivers as a consequence.

Mountain forests store a vast quantity of carbon and have an important role to play in climate change policies, the FAO report notes. The loss of mountain forests would release large amounts of carbon into the atmosphere, it says.

Mountain people – who are among the world's poorest and hungriest – are key to maintaining mountain ecosystems, adds the report. They should have a say in the management of the local forestry resources upon which they depend, and share the benefits from forest use and conservation.

Together with the report on mountain forests, FAO also released two more publications focusing on the important role of mountain ecosystems for improving rural livelihoods and poverty alleviation: *Highlands and drylands: mountains, a source of resilience in arid regions* and *Why invest in sustainable mountain development?* (*Source*: FAO newsroom, 9 December 2011.)

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FAO releases training package for community forest enterprises

The FAO Community-based Forest Enterprise Development programme has released a training package on market analysis and development (MA&D). The manual is the result of ten years of input from partners implementing MA&D in developing countries.

MA&D is a participatory training methodology that aims to assist rural people in developing sustainable forest-based enterprises that both generate income and conserve tree and forest resources. In the MA&D approach, local people are the principal decision-makers on matters such as financing, developing business plans, and sustainable management and enterprise operation. MA&D stresses linkages between social and environmental concerns, as well as with the technological, commercial and financial aspects of small enterprise development.

The training package provides for a preliminary phase to set the context, followed by four successive phases to assess the existing situation and define opportunities; carry out surveys to identify products, markets and enterprise ideas; prepare an enterprise development plan and strategies for sustainability; and support the start-up phase of the enterprise.

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Forestry in improving food security and nutrition: FAO's work in Africa

Forests and trees make a large contribution to improved diets and nutritional quality, by adding variety to diets, improving taste and palatability of staples and by providing essential vitamins, protein and calories. They provide a wide range of edible foods such as seeds, fruits, leaves, roots, mushrooms and gums; they are habitats for wild animals, insects, rodents and fish; and they provide fodder for livestock and fuelwood for food processing. Forestry contributes significantly to food security through its role in maintaining agricultural systems that are the basis of cropping. In the last two decades, there has been more and more interest in the role that forests play in food security and improved nutrition, as a result of increased realization of the dependence of local people on forests and trees to meet important needs such as food and income.

FAO's Forestry Department provides countries with legislative and policy support, capacity development and technical guidance on sustainable forest management, including trees outside forests, and sustainable management of wildlife within and outside protected areas. The aim of this work is to support improved livelihoods and poverty alleviation. There are some challenges related to policy environment, lack of hard data on contribution of NWFPs to diets, and other governance constraints that mask the visibility of forestry and its important role in national food security and nutrition policies and strategies. (*Source: Nature & Faune*, 25(2).)

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FAO IN THE FIELD

African Forestry Wildlife Commission (AFWC)

The AFWC session was held in Cotonou, Benin from 16 to 20 January 2012. It was held in parallel with the Second African Forestry and Wildlife Week. Over 200 participants from 19 member countries attended. The theme was "the importance of governance and benefit sharing in the sustainable management of Africa's forests, trees and wildlife resources". Important features of the week included dialogues on forest governance and forest financing, and a special session on the International Year of Forests 2011. (*Source*: www.fao.org/forestry/afwc/40495/)

Near East Forestry and Range Commission (NEFRC)

The 20th Session of the Commission was held together with the second Near East Forestry Week (NEFW) in Antalya, Turkey, from 29 January to 2 February, under the common theme of "Good Governance of Forests and Rangelands: Pillar of Food Security". The rationale behind the NEFW theme was to contextualize the important contribution of forests and range in reducing poverty, hunger and malnutrition in the Near East region and to re-emphasize to policy-makers the significance of forests and rangelands in national economies, and their potential as viable sectors for improving the livelihoods of their populations. (www.fao.org/forestry/65542/)

Mise à jour sur les activités du deuxième semestre 2011 du Projet GCP/RAF/441/GER «Renforcement de la sécurité alimentaire en Afrique centrale à travers la gestion durable des produits forestiers non ligneux»

Financé par le Gouvernement allemand et mis en œuvre depuis octobre 2009 par la FAO et les ministères en charge des forêts au Gabon, au Congo et en République centrafricaine, le projet contribue à l'amélioration des moyens d'existence des communautés dépendant des forêts du bassin du Congo à travers le développement du secteur PFNL et la gestion durable des ressources forestières. Les activités sont mises en œuvre au niveau international, régional, national et local, et ont compris entre autres, pour le deuxième semestre 2011, les volets suivants:

- Des représentants des ministères, des organisations de la société civile, des partenaires au développement et des producteurs membres des Comités consultatifs nationaux sur les PFNL au Gabon, au Congo et en République centrafricaine, ont été sensibilisés au droit à une alimentation adéquate et à l'importance du secteur PFNL à cet égard.
- Le volet petites et moyennes entreprises (PME) a été pris en compte: organisation d'une journée portes ouvertes sur les potentialités de création au Congo de PME s'appuyant sur les PFNL; collaboration entre la FAO et le Ministère congolais en charge des PME; et présentation de produits forestiers non ligneux à la foire internationale RaceWood au Congo.
- Une machine à fendre la mangue sauvage (*Irvingia gabonensis*) d'origine camerounaise a été adaptée aux besoins gabonais, fabriquée au Gabon puis distribuée aux producteurs sur le site pilote de Woleu Ntem.
- Au Congo et en République centrafricaine, six bourses d'étude ont été octroyées, en vue d'analyser les chaînes de valeur et la domestication

Irvingia gabonensis

de *Gnetum* spp., les possibilités de domestication des champignons et l'exportation des PFNL sur le marché international.

- L'accent a été mis sur la nécessité du transfert des connaissances issues des projets antérieurs de la FAO concernant les PFNL en Afrique centrale et sur l'importance du partage d'expériences avec et entre le Gabon, le Congo et la République centrafricaine, notamment sur des questions telles que l'internalisation des directives sous-régionales relatives à la gestion durable des PFNL d'origine végétale d'Afrique centrale de la Commission en charge des forêts d'Afrique centrale (COMIFAC), et l'étude des systèmes d'information sur les marchés des PFNL.
- Après avoir formé les communautés locales sur la commercialisation des PFNL en appliquant l'approche Analyse et développement des marchés (ADM) de la FAO, des ONG facilitatrices ont suivi la finalisation des plans de développement d'entreprises (PDE), le renforcement structurel des groupements existants ainsi que la mise en place de nouveaux groupements sur les sites pilotes du projet. Ainsi, 75 petites et moyennes entreprises forestières (PMEF) – ce qui représente au total 1 200 entrepreneurs – ont été appuyées en République centrafricaine, 25 au Congo – 407 entrepreneurs au total– et 44 au Gabon – 668 entrepreneurs au total.

POUR EN SAVOIR PLUS, CONTACTER: Ousseynou Ndoye, Coordonnateur régional du Projet PFNL GCP/RAF/441/GER, FAO, B.P. 281 Yaoundé, Cameroun. Courriel: Ousseynou.Ndoye@fao.org; www.fao.org/forestry/nwfp/55079/fr/
(*Please see pages 23, 49–50 and 59 for more information.*)

FOREST HEROES AWARDS

Forest Heroes Awards: International Year of Forests closing ceremony at UNFF

All over the world, people are working in quiet and heroic ways to sustain, protect and manage our forests. To honour these heroes, the United Nations Forum on Forests (UNFF) Secretariat launched the first ever international Forest Heroes Programme and Awards.

"The UNFF Forest Heroes Programme and Awards was launched as part of our International Year of Forests 2011 activities to identify and honour the countless individuals around the world who are dedicating their lives to nurturing forests in quiet and heroic ways," said Ms Jan McAlpine, Director of the UNFF Secretariat and member of the jury panel. "The programme aspires to spotlight everyday people working to make positive changes for forests."

WINNERS OF THE FOREST HEROES AWARD

Africa. *Paul Nzegha Mzeka* (Cameroon), Director, Apiculture and Nature Conservation Organization. After retiring from Cameroon public service in 1990, Paul founded the Apiculture and Nature Conservation Organization (ANCO), which promotes sustainable beefarming to raise awareness on biodiversity conservation. In 2004, ANCO teamed up with NGOs to integrate conservation with sustainable land management and rural poverty reduction. Since then, it has helped 30 communities protect watersheds and conserve four community forests by planting a total of 685 000 trees.

Asia. *Shigeatsu Hatakeyama* (Japan), Founder, *Kaki no Mori wo Shitau Kai* (rebuilding from land to sea), the Society to Protect Forests for Oysters. Oyster fisher by trade, Shigeatsu has been planting trees in the forest surrounding Kesennuma Bay for 20 years to protect oysters' natural habitat. After making the connection between oceans and mountains, he and his colleagues from the *Mori wa Umi no Koibito* (forests are lovers of the sea) movement initiated yearly afforestation activities that have led to a regionwide proactive movement to preserve the environment and ocean resources.

Europe. *Anatoly Lebedev* (Russian Federation), Chairman, Bureau for Regional Outreach Campaigns (BROC). Anatoly led a successful media campaign against a construction project that threatened indigenous and wildlife territories, and resulted in a national logging ban in cedar forests. While in regional office, he passed legislation ensuring sound forest management and kept national parks from destructive logging. Anatoly produced the first regional environmental television show, "Preserved", and a quarterly magazine *Ecology and Business*, focusing on environmental education and advocacy.

Latin America and the Caribbean. *Paulo Adario* (Brazil), Amazon Campaign Director, Greenpeace Brazil. In 2001, Paulo led a field team into the Amazon to assist the Deni tribe in demarcating and protecting their land, resulting in the protection of 1.6 million ha of pristine forest. He has pioneered campaigns to protect the Amazon, from boardroom meetings with industry leaders to field expeditions deep into the Amazon, to the coordination of international public campaigns to fight deforestation and demand sustainable solutions.

North America. *Rhiannon Tomtishen* and *Madison Vorva* (United States of America), Founders, Project ORANGS (Orangutans Really Appreciate And Need Girl Scouts). Since the age of 11, Rhiannon and Madison have been raising awareness on endangered orangutans and their rapidly diminishing rain forest habitat in Indonesia and Malaysia. Now in their teens, the girls have expanded their work, launching multiple campaigns to ensure that Girl Scout Cookies are made from sustainable resources. Their work prompted Girl Scouts USA to commit to improving sustainability of their cookies and boosted efforts to reduce deforestation for palm oil. (*Source*: UN Web site, www.un.org/)

Ninety nominations from 41 different countries were received. Fifteen finalists throughout five geographic regions – Asia, Africa, Europe, Latin America and North America – were in the running for one prestigious award in each region. At a special ceremony, hosted by UNFF in New York on 9 February 2012 to mark the conclusion of the International Year of Forests, the five people who made special contributions towards protecting forests and forest communities received the Forest Heroes Awards.

The five winners were: Mr Paul Nzegha Mzeka (Africa); Mr Shigeatsu Hatakeyama (Asia); Mr Anatoly Lebedev (Europe); Mr Paulo Adario (Latin America); and Ms Rhiannon Tomtishen and Ms Madison Vorva (North America).

"The Forest Heroes programme, launched by UNFF, is destined to become a grand new tradition, placing an annual spotlight on individuals who are showing extraordinary courage and determination in saving the forests of the world," said Mr Jan A. Hartke, from the Clinton Climate Initiative and member of the jury panel. "These forest heroes inspire governments, businesses and NGOs to work together to protect one of the critical life support systems of the planet, sequestering carbon, preserving biodiversity, reducing poverty, and providing a host of benefits to over one billion people who depend upon them," he added.

While these heroes come from varied backgrounds, they share a common courage, passion and perseverance that serve as inspiration to anyone who wants to make a difference for forests. (Sources: various, including UNFF, UN Web site and CPF Web site.)

Since its launch in February 2011, global observance of the International Year of Forests has been dedicated to raising public consciousness on issues of sustainable management and catalysing actions in the development and conservation of all types of forests. "The full picture of what forests offer is much more than simply economic values and carbon. Forests cover 31 percent of the total global land area, securing livelihoods for 1.6 billion people, shelter and sustenance for land-based biodiversity and climate control. To enhance these benefits, increased investments and greater action are needed, at all levels, in support of sustainable forest management and rehabilitation of degraded forest lands," said Mr Eduardo Rojas-Briales, Assistant Director-General for Forestry at FAO and member of the jury panel.

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RIO+20: UNITED NATIONS CONFERENCE ON SUSTAINABLE DEVELOPMENT

Rio+20 – the short name for the United Nations Conference on Sustainable Development (UNCSD) to take place in Rio de Janeiro, Brazil, in June 2012 – is an historic opportunity to define pathways to a safer, more equitable, cleaner, greener and more prosperous world for all. Twenty years after the 1992 Earth Summit in Rio, where countries adopted Agenda 21 – a blueprint to rethink economic growth, advance social equity and ensure environmental protection – the UN is again bringing together governments, international institutions and major groups to agree on a range of smart measures that can reduce poverty while promoting decent jobs, clean energy and a more sustainable and fair use of resources.

Rio+20 is a chance to move away from business-as-usual and to act to end poverty, address environmental destruction and build a bridge to the future.

RIO+20
United Nations Conference on Sustainable Development

About the Rio+20 Conference. At the Rio+20 Conference, world leaders, along with thousands of participants from governments, the private sector, NGOs and other groups, will come together to shape how we can reduce poverty, advance social equity and ensure environmental protection on an ever-more crowded planet to get to the future we want. The Rio+20 Conference is envisaged as a conference at the highest possible level, including Heads of State and Government or other representatives. The conference will result in a focused political document.

Themes of the conference. The conference will focus on two themes: (i) a green economy in the context of sustainable development poverty eradication; and (ii) the institutional framework for sustainable development.

Seven priority areas. The preparations for Rio+20 have highlighted seven areas that need priority attention; these are decent jobs, energy, sustainable cities, food security and sustainable agriculture, water, oceans and disaster readiness.

FOR MORE INFORMATION, PLEASE CONTACT: UNCSD Secretariat, 2 UN Plaza, Room DC2-2220, New York, NY 10017, United States of America. E-mail: uncsd2012@un.org; www.uncsd2012.org/rio20/index.html/

SILVA MEDITERRANEA

The Committee on Mediterranean Forestry Questions-Silva Mediterranea held its Twenty-First Session in Antalya, Turkey, from 2 to 3 February 2012. Eleven member countries and several observers from international and non-governmental organizations attended the session.

A decision was made to create two new working groups – one on Urban and periurban forestry and the other on Desertification and restoration in arid zones – and to extend the mandate and review the work programme of the Working Group on Cork Oak as well as change the name of the group to Mediterranean Non-Wood Forest Products in order to reinforce the active participation of all interested countries and, consequently, review the work plan for 2012 to 2013 (www.fao.org/forestry/silvamed/4911/ *and* www.fao.org/forestry/silvamed/35411/). (*Source*: InFo News.) ♣

We claim that any man who is honest, fair, tolerant, kind, charitable and well-behaved is a success. No matter what his station in life.

Proverb

ASSESSING THE POTENTIAL OF INSECTS AS FOOD AND FEED IN ASSURING FOOD SECURITY

FAO, ROME, ITALY
23–25 JANUARY 2012

This expert consultation was jointly organized by FAO and Wageningen University of the Netherlands, with financial support from the Government of the Netherlands. The meeting aimed to open a dialogue and foster an exchange of information and expertise on the potential benefits of using insects for food and feed as part of a broader strategy to achieve global food security.

A total of 37 experts from international agencies, scientific institutions and private sector stakeholders, together with staff from relevant FAO disciplines (nutrition, aquaculture, livestock, veterinary science, food safety, forestry, biodiversity and nature conservation) attended the meeting. These experts and entrepreneurs – specialized in different aspects of insect rearing, plant protection and food engineering – together mapped the state of the art and identified knowledge gaps along the following thematic topics: insect ecology and biology, farming insects, insects as livestock and fish feed, nutrition, processing and trade, food and feed safety, communication strategies, and policies to achieve food security. Critical baseline data for each of these thematic areas were compiled and reviewed through plenary presentations and through further discussions in working groups. In addition, participants proposed an action plan to move insects as food and feed sources higher on the agenda of [inter-] national food/feed related agencies.

The results and executive summary of the meeting can be obtained from the Web site of FAO's Edible Insects Programme www.fao.org/forestry/edibleinsects/en/

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(*Please see pages 32 and 66 for more information.*)

9TH WORLD BAMBOO CONGRESS

ANTWERP, BELGIUM,
10–13 APRIL 2012
TOULOUSE, FRANCE,
17–21 SEPTEMBER 2012

Every three to four years the World Bamboo Organization organizes a World Bamboo Congress (WBC) which is the culmination of the Organization's efforts physically to unite bamboo enthusiasts and professionals. The aim of WBC is to bring together people from around the world to meet, discuss, network, collaborate and exchange ideas with the intention of improving understanding and stimulating potential. Ever since its inception in Puerto Rico in 1984, each WBC has been uniquely informative, educational and culturally and intellectually challenging.

The 9th WBC will be a two-part event taking place between Belgium and France. It will focus on the future use of bamboo in Europe and innovations in bamboo development. Apart from a series of meetings and conferences, the schedule will also include field visits, a Trade Fair for bamboo products and allied wares (machinery, tools, etc.), and complimentary exhibit booths for "not-for-profit, non-profit or non-government" organizations (i.e. UNIDO, national bamboo societies, etc.).

FOR MORE INFORMATION, PLEASE CONTACT:
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SHEA 2012: SHARED VALUE

COTONOU, BENIN
23–27 APRIL 2012

Shea 2012 will bring together leading stakeholders from across the shea value chain. Producers, researchers, processors and international brands will have opportunities to connect at business-to-business networking events and social forums. Experts on shea will present on such key issues as emerging innovations in processing technology, standards and certification, and supply chain logistics.

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(*Please see page 41 for more information.*)

REGIONAL SYMPOSIUM ON PROMOTING UNDERUTILIZED FOOD RESOURCES FOR BETTER NUTRITION

KHON KAEN, THAILAND
21–23 MAY 2012

FAO, in close collaboration with Khon Kaen University, Thailand, and the National Research Council Thailand, is pleased to announce the convening of this regional symposium. The symposium will present case studies on the wealth of knowledge in indigenous communities in diverse ecosystems, the richness of their food resources, the strengths of the local traditional food systems and the circumstances of the nutrition transition in indigenous communities. It will present evidence on local and traditional food systems and their central role in public health improvement, and required policies at local, national and international levels for protection of food environments to ensure food security and nutritional quality.

The symposium will help to identify policy options to promote greater use of local food diversity addressed and recommended at national and international level; and proposals for concrete short- and medium-term measures for actions needed to support conservation and the sustainable use of indigenous and traditional foods to improve nutrition. This event will serve as the basis for future dialogue, debate and information exchange and facilitate wider support for an international movement committed to the implementation of effective, sustainable and long-term food-based solutions to hunger and malnutrition.

The themes covered will include the following.

- "Wild" indigenous plants and animals collected from uncultivated land and forests (e.g. leafy plants, roots, berries, small rodents and insects) and from aquatic environments (e.g. indigenous small fish, frogs and snails).
- Semi-domesticated indigenous plants and animals, for example gardening of indigenous plant species and culture of indigenous fish species in rice fields in Asia.

- Traditional cooking/preparation and preservation methods: a wide range of household-level, small-scale cooking and processing methods applied to improve food properties such as fermentation, soaking, drying and smoking, in particular of indigenous foods for enhancing nutritional value.
- Identification of new partnerships and areas of collaboration, particularly in the direction of advocacy, policy and public awareness, research and funding to support food systems that preserve and sustain diverse traditional food cultures in Asia.

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INTERNATIONAL WORKSHOP ON ANALYSIS, EVALUATION AND DOCUMENTATION OF LESSONS LEARNED FROM FORESTATION AND FOREST RESTORATION IN DRYLANDS

KONYA, TURKEY
28–31 MAY 2012

Organized by the Government of Turkey, Ministry of Forest and Water Affairs; the Turkish International Cooperation Agency; and FAO, the objectives of this International Workshop are: (i) setting the scene – sharing expertise from different countries/regions on forest restoration in drylands; (ii) identifying key elements of success and failure to improve effectiveness in forest restoration of drylands; (iii) contributing to the development of a comprehensive monitoring tool to guide implementers in the planning and implementation of field projects/programmes, assess success and facilitate the sharing of expertise; (iv) contributing to the development of operational guidelines; and (v) proposing recommendations on the next steps/process for the formulation of project ideas within the framework of existing cooperation initiatives.

FOR MORE INFORMATION, PLEASE CONTACT: Ms Nora Berrahmouni, Arid Zone Forestry Officer, Forestry Department, FAO, Viale delle Terme di Caracalla, 00153 Rome. E-mail: nora.berrahmouni@fao.org/

INTERNATIONAL CONFERENCE: "SOLUTIONS FOR A SUSTAINABLE PLANET"

RIO DE JANEIRO, BRAZIL
16–17 JUNE 2012

The International Institute for Environment and Development (IIED) will host this major international event immediately before the UN Conference on Sustainable Development (Rio+20) is held in late June 2012.

"Solutions for a sustainable planet" will present a set of recommendations for action drawn from 40 years of work on sustainable development. It will showcase the expertise and perspectives of practitioners and researchers from around the world working to make sustainable development a reality in a diverse range of contexts. It will provide space for dialogue on current and emerging challenges in moving towards sustainability. And it will enable alliances of willing actors to explore how they can work together towards agreed goals, benefiting from mutual learning and accountability.

Solutions for a sustainable planet include: (i) means to pay for sustainable development; (ii) ways to live within planetary boundaries, particularly climate limits, while also addressing social and economic limits and aspirations; (iii) approaches for addressing rapid urbanization; (iv) a fair "green economy" that helps to reduce poverty; and (v) tools and tactics to promote business models that move us towards sustainable development.

FOR MORE INFORMATION, PLEASE CONTACT: Tom Bigg, IIED, 80–86 Gray's Inn Road, London WC1X 8NH, United Kingdom. Fax: +44 (0)20 3514 9055; e-mail: Tom.Bigg@iied.org; www.iied.org/

2012 INBAR BAMBOO TOUR

ZHEJIANG, SICHUAN AND GUANGDONG, CHINA
19–30 JUNE 2012

The objective of the annual bamboo study tours is to share the experience of Chinese bamboo development and to promote bamboo development in other countries. The tours commenced in 2005 and have run annually since 2007. They are very popular and are targeted to those wishing to gain a better understanding of the potential and practice that bamboo-based development has to offer, based on the China experience. You can read reports of the 2005, 2007, 2008, 2009, 2010 and 2011 bamboo tours on: http://world-bamboo.blogspot.it/

FOR MORE INFORMATION, PLEASE CONTACT: Ms Li Xin and Dr Fu Jinhe, International Network for Bamboo and Rattan (INBAR), 8, Futong Dong Da Jie, Wangjing, Chaoyang District, PO Box 100102-86, Beijing 100102, China. Fax: +86-10-64702166; e-mail: xli@inbar.int *or* jfu@inbar.int; www.inbar.int/

3RD APIEXPO AFRICA

ADDIS ABABA, ETHIOPIA
26–29 SEPTEMBER 2012

The aim of ApiExpo is to showcase Africa's honey industry by creating awareness on market and business opportunities and demonstrating the relationship between beekeeping and other industries.

FOR MORE INFORMATION, PLEASE CONTACT: ApiTrade Africa, Plot 2117, Ntinda Town, 2nd Floor, Velocity Mansions (next to Apex House), PO Box 23441, Kampala, Uganda. E-mail: info@apitradeafrica.org; www.apitradeafrica.org/index.php?option= com_content&view=article&id=89&Itemid=84/ ♣

Silence is the sleep that nourishes wisdom.

Francis Bacon

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Awono, A., Ingram, V., Schure, J. & Levang, P. 2011. *Guide for small and medium enterprises in sustainable non-timber forest trade in Central Africa*. Yaoundé, Cameroon, CIFOR. Small and medium forest enterprises (SMFEs) based on NTFPs are already contributing to poverty reduction of rural and urban people, and providing a diverse range of food, energy, medicines, materials and culturally important goods. These businesses can be promising avenues for economic development and resource conservation if they practise sustainable forest management. Moving SMFEs from opportunistic entrepreneurs to economically viable businesses, however, requires an enabling environment with laws and policies that promote legal access to the resource base and incentives for sound forest management. Many businesses need support to add value to the products they deal in and to manage the resources needed for effective forest and business management. This guide sets out the main issues and significant challenges, and suggests solutions and guidelines for viable NTFP-based SMFEs.

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NTFPs are important in many ways for food security, livelihoods and health of small farmers and forest dwellers in the developing world. Often they are traded internationally and in some cases the majority of a given product crosses international borders. In these cases, external markets on the other side of the border determine the vibrancy of the sector. And often little is known about participants and their roles in international supply chains. Given the importance of NTFPs for these vulnerable groups (small farmers and forest dwellers), and the knowledge gap, especially regarding the international NTFP trade, the Global NTFP Partnership decided to do an analysis of available information to identify issues and options for interventions. The NTFP Partnership and INBAR intend that this publication, although focusing on a limited number of NTFPs in four countries, will be useful for a wider audience interested in understanding the issues and designing interventions around NTFPs and the communities depending on them.

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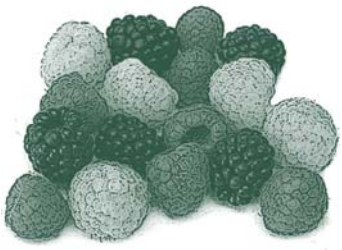

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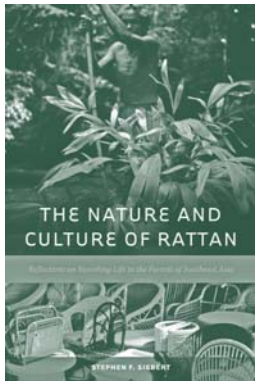
Shanley, P., Cymerys, M., Serra, M. & Medina, G. (eds). 2011. *Fruit trees and useful plants in Amazonian life*. Non-Wood Forest Products 20. Rome, Food and Agriculture Organization of the United Nations, the Center for International Forestry Research (CIFOR) and People and Plants International. Download: www.fao.org/docrep/015/i2360e/i2360e.pdf/
(*Please see pages 17, 19, 21, 24, 26 and 75–77 for more information and extracts from this publication.*)

Siebert, S.F. 2012. *The nature and culture of rattan: reflections on vanishing life in the forests of Southeast Asia*. Honolulu, Hawaii, University of Hawai'i Press.



The nature and culture of rattan examines the ecology, use, management and cultural significance of one of the world's most important forest products. It does this through the knowledge, practices and lives of rattan cane collectors and artisans in three Southeast Asian forest villages where the author lived and worked over a 25-year period. Author Siebert brings to life crucial issues in tropical forest conservation and management, including government policies; household livelihood strategies; conflicts between local resource use and Western protected area management approaches; and the value of integrating scientific inquiry with traditional ecological knowledge and practice. A comprehensive Web site with many photographs, suggested readings and discussion topics accompanies the book: www.cfc.umt.edu/rattan/
(*Please see pages 10–11 and 40 for more information.*)

Soriano, M., Kainer, K.A., Staudhammer, C.L. & Soriano, E. 2012. Implementing multiple forest management in Brazil nut-rich community forests. Effects of logging on natural regeneration and forest disturbance. *Forest Ecology and Management*, 268: 92–102.

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Torre, L. de la, Valencia, R., Altamirano, C. & Ravnborg, H.M. 2011. Legal and administrative regulation of palms and other NTFPs in Colombia, Ecuador, Peru and Bolivia. Special issue on Neotropical palm. *Botanical Rev.*, 77(4): 327–369. NTFPs derived from palms and other plants are economically and culturally important to a large part of the more than 240 million people who live in the forest areas of developing countries. The sustainable extraction of NTFPs is increasingly regarded as an important part of forest conservation strategies. This paper provides an overview and comparison of existing statutory legislation with respect to the extraction and trade of NTFPs in four Andean countries and discusses its adequacy with respect to ensuring legal and sustainable extraction and trade of NTFPs. Forest laws are primarily concerned with the regulation of timber. Hence, legal and administrative frameworks to regulate the extraction and trade of NTFPs are fragmented and ambiguous. By providing an overview of the existing legal situation, this paper seeks to inform and open debates about ways to improve the regulation of the extraction and trade of NTFPs in the region.
(*Please also see entry under Balslev above.*)

Uprety, Y., Asselin, H., Dhakal, A. & Julien, N. 2012. Traditional use of medicinal plants in the boreal forest of Canada: review and perspectives. *J. Ethnobiology and Ethnomedicine*, 8: 7.

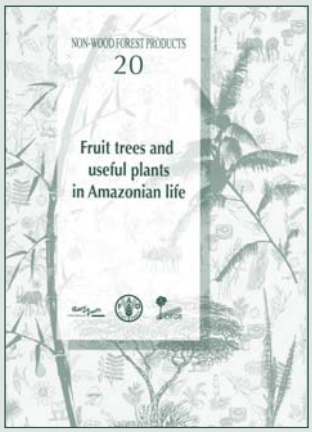
Vargas, R., Reif, A. & Faúndez, M.J. 2011. The forests of Robinson Crusoe Island, Chile: an endemism hotspot in danger. *Bosque*, 32(2):155–164.

Wan, M., Colfer, C.J.P. & Powell, B. 2011. Forests, women and health: opportunities and challenges for conservation. *International Forestry Rev.*, 13(3): 369–387.

Wickens, G.E. & Lowe, P. 2008. *The Baobabs. Pachycauls of Africa, Madagascar and Australia.* Springer-Verlag New York.

NEW PUBLICATIONS FROM FAO'S NON-WOOD FOREST PRODUCTS PROGRAMME

FRUIT TREES AND USEFUL PLANTS IN AMAZONIAN LIFE



Fruit trees and useful plants in Amazonian life, a collaboration between the Center for International Forestry Research (CIFOR) and FAO, serves two main purposes. It provides extensive information on Amazon fruits and Amazon communities, illustrating how local peoples have adopted and adapted to the plant kingdom around them to distil vital nutrients, medicines and other products fundamental to their survival; it also shows how scientific information can be presented in an innovative and more inclusive way, one that can be adapted accordingly by other actors worldwide.

The publication is a testament to the enormous potential that integrating traditional and scientific knowledge can have for both local communities and academic and development professionals alike. It also serves as a reminder to the scientific community that science should be shared with local people and not confined to journals and closed circles of technical experts. From Brazil nuts and cat's claw to *copaíba* and *titica*, this publication shares a wealth of information on a wide range of plant species that only close collaboration between local peoples and researchers could possibly breed.

Fruit trees and useful plants in Amazonian life – No. 20 in FAO's NWFP series – has been edited by Patricia Shanley, Margaret Cymerys, Murilo Serra and Gabriel Medina.

Copies of this publication can be purchased from FAO's Sales and Marketing Group at publications-sales@fao.org. or downloaded from: www.fao.org/docrep/015/i2360e/i2360e.pdf/

HEINZ BECK ENDORSES FAO'S AMAZON PUBLICATION – YOUTUBE

A video of Heinz Beck – the world-renowned Executive Chef of the Roman restaurant, La Pergola – endorsing *Fruit trees and useful plants in Amazonian life* is available on YouTube. He also talks about the various foods from the forests that he uses in his kitchen. www.youtube.com/watch?v=qX2gqSPzOB4/

Patricia Shanley talking about *Fruit trees and useful plants in Amazonian life*

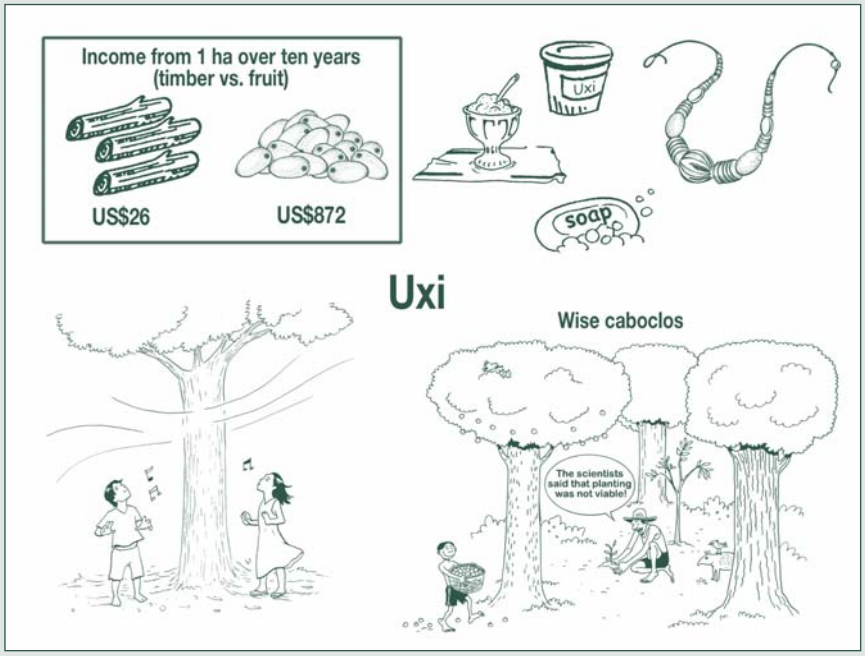
The closing event for the 2011 International Year of Forests was held on 20 December 2011 at FAO headquarters in Rome. The event launched Fruit trees and useful plants in Amazonian life and *had as its guest speaker Dr Patricia Shanley, Senior Scientist at CIFOR and lead editor of the publication. We would like to share her inspirational speech with our readers.*

It is an honour to be here with all of you to celebrate the International Year of Forests. We are particularly grateful that FAO has embraced such an unusual book. It is unusual as it was originally written in large part by and for people who do not read. These include peasant farmers, hunters, gatherers, traders and midwives. Right alongside, 90 leading tropical forest ecologists share their findings, some from a lifetime of research.

This book strives to make science accessible to rural households that daily decide whether forests stand or fall. Unlike ourselves who are mired in too much information, people in remote areas are not on the receiving end of research. For this reason, the book synthesizes rigorous ecological and trade data on 33 regionally important species. This is integrated with local knowledge of management, use and processing that has been accumulated over generations. Much of this information is conveyed through illustrations, cartoons, music and folklore.

What do folklore, art and music have to do with forests and food security? Everything – cultural and emotional connections to nature are what link people to their landscape. By placing scientific and traditional findings on the same page, the book celebrates and affirms local knowledge and fortifies the role of rural people as custodians of the forest.

For example, the chapter on *uxi*, a regionally popular fruit, illustrates the income of timber compared with fruit on one hectare; vitamin content; and recipes of how to make jam, puddings and soap. For children who may be hungry, it teaches the use of a special whistle to call the wind to help fruit fall from the tree. It also shows how to use the seed to make a good luck charm, like the one I am wearing. A cartoon shows a farmer planting an *uxi* tree stating that and scientists say it is not viable to plant *uxi*. Clearly, farmers sometimes know more than scientists.



The story of how this book came to be is two decades long, but I will share only highlights. Fresh out of forestry school, I was invited to work with forest communities along a tributary of the Amazon, the Capim River. At that time, logging companies were entering the region and would soon be extracting 15 of the most valuable fruit and medicinal oil trees. The villagers wanted to know, "Will we benefit more from selling timber or keeping our forests for game, fruit and medicines?".

It was a straightforward question, but one which we are still working on. The tree species most important to their livelihoods were not internationally traded and so poorly studied. There were no data on fruit production by which to compare timber values. So for five years we counted fruit, flowers and game capture beneath massive *piquia, bacuri* and *uxi* trees. And for 20 years we have documented fruit tree mortality and the changing household consumption of forest goods after successive logging events. What did we find out?

First, the subsistence value is substantial and far outweighs that of timber. Villagers receive the equivalent of approximately €1 per entire tree for timber, while each of the trees annually produced from 200 to 3 000 fruit – worth €50 or more. Villagers also noted that they were never sick during the season of forest fruit.

With data from hunters, we ranked trees according to how much game was captured beneath each species. Underneath the *piquia* trees, villagers captured 232 kg of game during only one flowering season – illustrating the intimate connection between fruit trees and family protein intake.

We also discovered a threshold – selective logging was initially compatible with the use of other forest products, but there is an irreversible point after which a forest does not readily recover. The first timber sales go well – few species are extracted and villagers receive quick cash. But as the frequency and intensity of logging increase, the forest becomes degraded until fire enters and consumes the rest.

Unsustainable logging of locally valued species can lead to catastrophic changes in landscapes and livelihoods.

Witnessing a steady decline in consumption of forest goods, we began to hold community workshops where villagers who had collected data, shared them to help others make more informed decisions regarding timber sales. We must have hit a nerve. Suddenly we received invitations for workshops from villages near and far.

So Jurandir (a macho *caboclo*), Curumi (the son of an Indian shaman) and I rolled the posters into our backpacks and headed down rivers and logging roads. One afternoon, hiking miles out of a workshop we forded a stream. Wet, tired and dirty, the futility of our endeavour hit us: we would never be fast enough to slow the tide of exploitive logging sweeping across Amazonia. That evening, in the darkness of a small boat, we put our workshops on paper and sketched out the first draft of the book which we have in front of us today.

The first edition was modest. Publishing for the poor in Portuguese is not a competitive career move. Everyone working on the book did so for free. But the response was overwhelming. Not only villagers and schools, but taxi drivers, housewives, industry executives and even loggers lined up to get copies.

A copy found its way to the Minister of the Environment, Marina Silva. She read it from cover to cover and asked for an expanded edition with species from across the Brazilian Amazon. Apparently, no-one wanted to lose cultural and culinary treasures such as *bacuri* ice cream, *açaí* wine and *buriti* jam.

So our young daughter and I began to travel across the basin when she was six months old, and over the next five years made trips together in search of scientists and villagers who had deep knowledge about useful species. Many were reticent to write in slang and publish in pictures – this book would not boost their publication record – but the spirit of the book grabbed them and, to their credit, they defied convention and shared their research with villagers.

Writing a book is only 50 percent of the work, however; the rest is distributing it strategically and getting it into the hands of people who truly need it. Fortunately, we have developed exceptional partnerships with groups within Brazil's social movement, such as the National Council of Rubber Tappers that works within extractive reserves throughout Amazonia. Governmental agencies such as the Minister of the Environment and Embrapa (Brazil's National Agricultural Research Agency) have helped enormously, by publishing thousands of copies of the book to distribute to rural smallholders. Radio programmes, a documentary on the role of women in forests and adult literacy courses have extended its reach into homes and schools nationwide.

Today, we are pleased to extend the reach of the book internationally. Our hope is that the English version may serve as a springboard for others in Asia, Africa, Latin America and Europe.

None of this would be possible without the long-term devotion of many people and before closing I would like to introduce you to two notable contributors who could not be with us today.

You may recognize Mangueira and his family from your invitation. Mangueira's family (*Editor's note: please see photograph on back cover*) and our research team have worked together for 20 years, measuring the game meat, fruit and fibres they glean from their forest. The results from only one hectare were so astonishing that they have never permitted their forest to be logged. They are the only family in the area that has held back the tide of logging, living within an island of primary forest surrounded by degraded areas.

Gloria Gaia is a peasant farmer and community organizer who has struggled against illegal logging on her own land. She has since taken on the task to ensure that others do not suffer the same fate. Living under difficult conditions and working with little support, she tirelessly brings the book and medicinal plant workshops to remote villages throughout Amazonia. Her workshops have catalysed communities to protect valuable species from logging, to create forest reserves and to ensure that women are part of the decision-making process regarding forest stewardship.

The trees that Mangueira and Gloria love and care for – *bacuri, piquia* and *uxi* – are wild; they are not cultivated, but are managed in forests and peri-urban areas, thus protecting valuable ecosystems. As more people live in cities and technology takes the place of play, we need to ensure that children play outside among the trees. Today, I would not be standing here if my parents had not chosen a house on a dead end, along a river in the woods.

In closing, I would like to share two tree branches with you. This one is beech which signifies prosperity. This other is magnolia, signifying love of nature. For a long while, prosperity was achieved at the expense of forests.

However, we are beginning to recognize that true prosperity and cultural resilience can only be achieved with a deep love of nature, such as that which Mangueira and Gloria live by.

Forests do not merely regulate climate and nourish our bodies; we have evolved together and they are integral to our imaginations and our souls. I suggest that we are not closing the International Year of Forests but opening ourselves to embrace their magnificence and essential role in our lives. ♣

FAO'S NWFP HOME PAGE

Please help us make our Web site a rich resource by continuing to send us (non-wood-news@fao.org) your NWFP Web sites and citations of any publications that we are missing, as well as any research that you would like to share.
www.youtube.com/watch?v=qX2gqSPzOB4/

Collaborative Partnership on Forests (CPF)
CPF's mission is to promote sustainable management of all types of forests and to strengthen long-term political commitment to this end.
www.cpfweb.org/en/

Community-based Forest Enterprise Development
FAO assists people in developing income-generating tree and forest product enterprises while also having a greater incentive to manage and protect these resources sustainably.
www.fao.org/forestry/enterprises/en/

DATABASES

Global Forest Resources Assessment 2010 (FRA 2010)
An interactive online database for FRA 2010 is now available. The main module has options to use multiple output formats providing easier, more flexible access to FRA data.
www.fao.org/forestry/fra/fra2010/en/

State of Europe's Forests 2011
This Web-based resource tool provides a comprehensive, up-to-date description of the status and trends of forests and forest management in Europe. In addition to characteristics of European forests and forestry data in general, one can access information on the balance of carbon in forest ecosystems, forest health condition and status of forest biodiversity as well as information on wood energy. Aspects of production, including wood and non-wood products and services, are presented along with information on protected forest areas. The database also provides information on social and economic aspects of the forestry sector.
http://w3.unece.org/pxweb/

FACEBOOK

FAO
www.facebook.com/UNFAO/

The Independent Evaluation Group (IEG) of the World Bank Group
www.facebook.com/forestevaluationIEG/

FAO fact sheets
A set of 15 fact sheets on the work of FAO has just been updated and uploaded in six official languages.
www.fao.org/about/en/

Foraging
www.forager.org.uk/

MAPS

Eye on Earth global mapping and information service
This new global Web service allows users to create maps and visualize data on environmental issues. It brings together vast amounts of data about the environment in a powerful, visual format. Organizations across the globe are now invited to join the network and start adding data to the range of data sets already available.
http://network.eyeonearth.org/home/index.html/

Mapping for Rights
Working with forest communities in five African countries, the Rainforest Foundation has helped create digital maps of local forests, including use areas, parks and threats such as logging and mining.
www.MappingForRights.org/

Wildlife Trade Tracker
The TRAFFIC/WWF Wildlife Trade Tracker is a new interactive online mapping tool that represents global wildlife trade data on a Google maps platform. TRAFFIC is keen to work with partners to expand the initiative.
http://wildlifetradetracker.org and *www.tigernet.nic.in/*

MekongInfo Web site
The redesigned MekongInfo site is more user friendly and focuses on sharing and featuring documents about environmental issues, society, culture and economic development in the Mekong River Basin.
http://mekonginfo.org/

Sacred Natural Sites
Emerging out of 13 years of work of the IUCN Specialist Group on the Cultural and Spiritual Values of Protected Areas, the Sacred Natural Sites Initiative builds an alliance of custodians, traditional knowledge holders, conservationists, academics and others in support of the conservation and revitalization of sacred natural sites and territories. The initiative is guided by custodians and advisors from different professions and walks of life.
http://sacrednaturalsites.org/

The Hunger Games
The cast and producers of "The Hunger Games" are teaming up with the United Nations World Food Programme (WFP) to raise awareness about hunger around the world. The Hunger Games partnership will engage fans of the book and film and enable them to make a difference. On the Web site, users can watch the video public service announcement featuring the stars of the film, participate in a hunger quiz to learn more about hunger, and also make a donation to actively become a part of the solution and help solve world hunger.

Hunger is the world's greatest solvable problem, affecting one in seven people – almost one billion men, women and children around the world. For just US$5 a month, WFP can help provide at least 20 meals for a child in need.
http://hungergames.wfp.org/

1000 Fungal Genomes project
http://1000.fungalgenomes.org/home/

7 billion and Counting campaign
www.7billionandcounting.org/

NWFP-DIGEST-L

The Digest is a free monthly e-bulletin produced by FAO's NWFP Programme and covers all aspects of non-wood forest products. Past issues can be found on FAO's NWFP home page at *www.fao.org/forestry/site/12980/en/*

You can take part in contributing to the continued success of this newsletter by sharing with the NWFP community any news that you may have regarding research, events, publications and projects. Kindly send such information to NWFP-Digest-L@mailserv.fao.org/

To subscribe: send an e-mail to: mailserv@mailserv.fao.org, with the message: subscribe NWFP-Digest-L; or through the NWFP Programme's home page at *www.fao.org/forestry/site/12980/en/* ♣

CONTRIBUTIONS TO *NON-WOOD NEWS*

A strong characteristic of *Non-Wood News* is that it is open to contributions from readers. Should you have any interesting material on any aspect of NWFPs that could be of benefit to all our readers, please do not hesitate to submit it. Articles are welcomed in English, French and Spanish and should be between 200–500 words.

The deadline for contributions for *Non-Wood News* 25 is 31 August 2012.

For more information, please contact: NON WOOD NEWS at the address on the front page or by e-mail to: non-wood-news@fao.org/

Request for information: NWFP articles in Russian

I am looking for articles on NWFPs that are in – or have been translated into – Russian. They would be really beneficial for our activities.

If you can help, please contact Gyöngyi Ország, FAO Regional Office for Europe and Central Asia, Benczur utca 34. H-1068 Budapest, Hungary. E-mail: gyongyi.orszag@fao.org. Thank you!

Reader from Brazil

Congratulations on your 20 years with *Non-Wood News*. Each volume is well received here.

Reader from India

I am regularly receiving *Non-Wood News* since 1995, which is very useful for my research and updating the latest information on NWFP data on different aspects.

Reader from Indonesia

It is very interesting and important publication for us. Our library intently visited by students and scientists. Your publication is one of the important references.

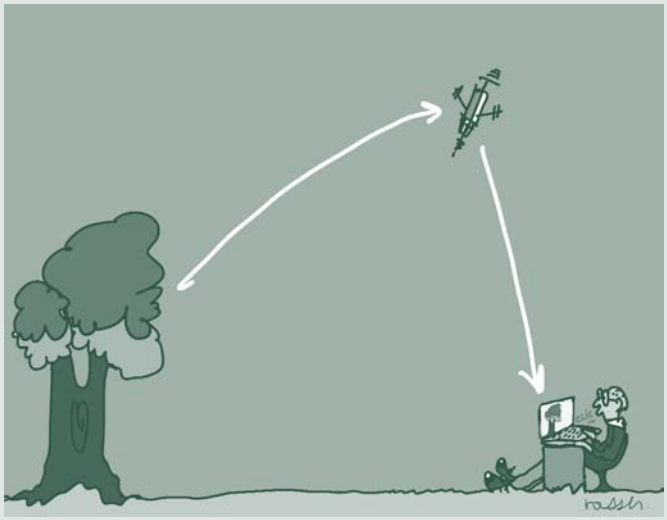
Reader from the United States of America

I'm a teacher as well as an after-school mentor. I hope it's okay I'm contacting you like this! But the reason I'm writing today is because as part of an ongoing extra credit assignment in my fifth grade class, students are encouraged to find other Internet resources on topics we're currently learning about. Your page (http://www.fao.org/forestry/nwfp/12979/en/) was one that my student found for extra credit for our earth day projects last week. I just thought you'd like to hear that.

Let no-one ever come to you without leaving better and happier.

Mother Teresa

COMMUNICATION FOR DEVELOPMENT: COMMENTS FROM AN INTERN



In September 2011, I started an internship in the Forestry Department at FAO headquarters. In general, my task was to introduce the programme of edible insects into the existing programmes of FAO and outside stakeholders. At the end of January 2012, the first meeting on edible insects took place with contributions from people around the world (*see pags 66 and 70*). I assisted in the preparation and organization of the meeting. Currently, I am helping to write a publication on edible insects to be launched in mid-2012. The publication aims to link with existing FAO programmes and therefore the content will cross-border several FAO departments. For the preparation of the meeting and writing of the publication, I work with researchers from Wageningen University in the Netherlands. I value this collaboration with the knowledge centre highly.

"Putting information within reach" is the first activity that is mentioned on the FAO Web site. I interpret it as the transformation of all kinds of information, strategies and technologies in such a way that the target group finds it useful to ensure "communication for development". During my internship at FAO, I considered this task as the most difficult and therefore the most motivating. It demands good collaboration with knowledge centres and field offices and also an understanding of cultural diversity as an indispensable skill for FAO staff.

In order to realize the latter, staff at FAO and collaborating institutions have to keep on thinking in a local and concrete way, even though all information seems more abstract and complicated at headquarters compared with the field. The illustration above from a colleague, Brahimi Nasser, symbolizes this for me. (***Contributed by:*** Esther Mertens, Intern, Edible Insect Programme, FAO Forestry Department.).

(Please see pages 32–33 and 66 for more information/articles on Esther's work experience.) ♣

Protecting the forest for our children and grandchildren

Patricia Shanley

Joel Sartore

Fruit trees and useful plants in Amazonian life **is the latest publication in FAO's Non-Wood Forest Products series and is the result of collaboration with the Center for International Forestry Research (CIFOR) and People and Plants International.**

The publication is dedicated to the people of the Amazon who are nourished by the fruits and plants of the forest – people such as Mangueira and his family (*top*) and the child holding the piquia (*bottom*). Senhor Braz, a traditional healer featured in the publication, says: "I have never planted here. I am guarding these woods. There is *piquia* in this forest. I am protecting it for my children and grandchildren".

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